NACHHALTIG FÜR NATUR UND MENSCH
SUSTAINABLE FOR NATURE AND MANKIND

Lebensqualität / Quality of life
Wir schaffen und sichern die Voraussetzungen für eine hohe Qualität des Lebens in Österreich.
We create and we safeguard the prerequisites for a high quality of life in Austria.

Lebensgrundlagen / Bases of life
We stand for a preventive preservation and responsible use of the bases of life, soil, water, air, energy, and biodiversity.

Lebensraum / Living environment
Wir setzen uns für eine umweltgerechte Entwicklung und den Schutz der Lebensräume in Stadt und Land ein.
We support an environmentally benign development and the protection of living environments in urban and rural areas.

Lebensmittel / Food
Wir sorgen für die nachhaltige Produktion insbesondere sicherer und hochwertiger Lebensmittel und nachwachsender Rohstoffe.
We provide for the sustainable production in particular of safe and high-quality foodstuffs and of renewable resources.
7. Principles for the Treatment of Specific Waste and Material Streams
### 7. PRINCIPLES FOR THE TREATMENT OF SPECIFIC WASTE AND MATERIAL STREAMS

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What needs to be observed when defining principles for the treatment of waste and material streams is that, based on the five-tiered hierarchy stipulated in the Waste Framework Directive and the Waste Management Act of 2002 (prevention – preparation for re-use – recycling – other recovery – disposal), the waste treatment processes under consideration should be judged according to their environmental impact.

However, the aim is not only to compare the various waste treatment methods, but also to evaluate any substitution effects and the potential risk of any dispersal of pollutants at every stage of the lifecycle. Evaluating consequences from an all-embracing perspective, including those caused by the production and use of a product, the option finally chosen should be the one that is best from an ecological standpoint.

Furthermore, any type of specific waste usually requires a combination of treatment methods (from sorting to the removal of residues that remain after treatment). Therefore, the production of recyclable materials is not in itself a guarantee for optimal waste treatment. A final evaluation is only possible after all necessary treatment steps and the actual potential uses have been assessed.

The environmental impact of a process can be described on the basis of the following criteria:

- consumption of resources: energy, raw materials, water and land;
- emissions into the air, water and soil (atmosphere, waste water, waste, noise, smell, heat loss); both concentration and quantity are to be considered in every case;
- the polluting potential of the substances used and released;
- risk potential – correlation between the hazardous nature of a substance and the probability of an accident occurring.

As far as pollutants are concerned, their toxicity, risk of causing damage and likelihood of diffusion, their persistence as well as bioaccumulation and geoaccumulation must be taken into account.


Based on sec. 23 of the Waste Management Act of 2002, this Ordinance defines minimum requirements for the collection, storage and treatment of the following waste streams in order to achieve the targets and implement the principles of waste management, support closed-loop recycling and the efficient use of materials while ensuring the envi-
mentally sound collection, storage, shipment and treatment of the following waste streams:
1. waste electrical and electronic equipment
2. batteries and accumulators
3. solvents, solvent-containing waste, waste paint and lacquer
4. medical waste that may cause injury
5. amalgam residues
6. electrical equipment and other waste containing PCB

The target group generally includes all the waste holders (initial waste producers, waste collectors or processors). If the waste holder is not authorised or unable to process the waste properly, he is obliged under sec. 15 (5) of the Waste Management Act of 2002 to consign the waste to an authorised collector or processor in a manner that does not prejudice the public interest (sec. 1 (3) of the Waste Management Act of 2002).

For the waste stream of waste woods, plans are to define the requirements for material recovery in the wood-based industry and criteria for end-of-waste in an ordinance. For this reason, the treatment principle for waste woods has not been included in the Federal Waste Management Plan 2011.

### 7.2. Vehicle workshop waste

A significant proportion of the different types of waste from the operation of vehicle workshops must be classified as hazardous. The table below lists the permitted treatment methods by their codes (L for landfilling, TT for thermal treatment, R for recycling and OT for other treatment methods).

<table>
<thead>
<tr>
<th>Code</th>
<th>Waste</th>
<th>Fraction</th>
<th>Permitted treatment methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>31465</td>
<td>Windscreens</td>
<td>Separate collection</td>
<td>x</td>
</tr>
<tr>
<td>31465</td>
<td>Glass and ceramics with additives specific for each type of production (e.g. light bulbs, laminated glass, wire-reinforced glass, mirrors) excluding windscreens</td>
<td>Industrial waste</td>
<td>x</td>
</tr>
<tr>
<td>35103</td>
<td>Contaminated iron and steel waste: scrap iron</td>
<td>Scrap metal</td>
<td>x</td>
</tr>
<tr>
<td>35105</td>
<td>Ferrous packaging containers and receptacles</td>
<td>Scrap metal or separate collection (aerosols)</td>
<td>x</td>
</tr>
<tr>
<td>35106*</td>
<td>Ferrous packaging containers and receptacles with hazardous residues</td>
<td>Separate collection</td>
<td>x x*</td>
</tr>
<tr>
<td>35107</td>
<td>Motor vehicle catalytic converters</td>
<td>Separate collection</td>
<td>x</td>
</tr>
<tr>
<td>35315</td>
<td>Non-ferrous scrap metal</td>
<td>Scrap metal</td>
<td>x</td>
</tr>
<tr>
<td>35322*</td>
<td>Lead storage batteries</td>
<td>Separate collection</td>
<td>x</td>
</tr>
<tr>
<td>35323*, 35324*, 35335*, 35336*, 35337*, 35338*</td>
<td>Nickel-cadmium accumulators, button cells, zinc-carbon batteries, alkali-manganese batteries, lithium batteries, mixed batteries</td>
<td>Separate collection</td>
<td>x</td>
</tr>
<tr>
<td>Code</td>
<td>Waste</td>
<td>Fraction</td>
<td>Permitted treatment methods</td>
</tr>
<tr>
<td>----------</td>
<td>-----------------------------------------------------------------------</td>
<td>-----------------------------------</td>
<td>----------------------------</td>
</tr>
<tr>
<td>35327*</td>
<td>Non-ferrous metal packaging and containers with hazardous residues</td>
<td>Separate collection</td>
<td>x</td>
</tr>
<tr>
<td>54102*</td>
<td>Waste oils</td>
<td>Separate collection or along with hydraulic oils free of halogens</td>
<td>x</td>
</tr>
<tr>
<td>54118*</td>
<td>Hydraulic oils, halogen-free</td>
<td>Separate collection or along with waste oils</td>
<td>x</td>
</tr>
<tr>
<td>54119*</td>
<td>Hydraulic oils, containing halogen</td>
<td>Separate collection</td>
<td>x</td>
</tr>
<tr>
<td>54120*</td>
<td>Brake fluid</td>
<td>Separate collection</td>
<td>x</td>
</tr>
<tr>
<td>54201*</td>
<td>Oily sludge</td>
<td>Collection along with SN 54930 (workshop waste)</td>
<td>x</td>
</tr>
<tr>
<td>54406*</td>
<td>Wax emulsions</td>
<td>Separate collection</td>
<td>x</td>
</tr>
<tr>
<td>54408*</td>
<td>Other oil/water mixtures</td>
<td>Separate collection</td>
<td>x</td>
</tr>
<tr>
<td>54701*</td>
<td>Sand catch residues, containing oil and cold cleaning agent</td>
<td>Vacuumed up during cleaning</td>
<td>x</td>
</tr>
<tr>
<td>54702*</td>
<td>Contents of oil separator</td>
<td>Vacuumed up during cleaning</td>
<td>x</td>
</tr>
<tr>
<td>54926*</td>
<td>Used oil binding agents</td>
<td>Collection along with SN 54930 (workshop waste)</td>
<td>x</td>
</tr>
<tr>
<td>54928*</td>
<td>Used oil and air filters</td>
<td>Separate collection or along with SN 54930 (workshop waste)</td>
<td>x</td>
</tr>
<tr>
<td>54929*</td>
<td>Used oil containers</td>
<td>Collection along with SN 54930 (workshop waste)</td>
<td>x</td>
</tr>
<tr>
<td>54930*</td>
<td>Solid grease- and oil-contaminated equipment (waste from workshops, industry and filling stations)</td>
<td>Separate collection</td>
<td>x</td>
</tr>
<tr>
<td>55205*</td>
<td>Refrigerants, propellants and solvents containing chlorofluorohydrocarbons</td>
<td>Separate collection</td>
<td>x</td>
</tr>
<tr>
<td>55214*</td>
<td>Cold cleaning agents containing halogen</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>55326</td>
<td>White spirit</td>
<td>Collection along with SN 55370 (solvent mixtures)</td>
<td>x</td>
</tr>
<tr>
<td>55357</td>
<td>Cold cleaner without halogen</td>
<td>Separate collection or along with SN 55370 (solvent mixtures)</td>
<td>x</td>
</tr>
<tr>
<td>55370*</td>
<td>Mixed solvents without halogenated organic ingredients, paint and lacquer thinners (e.g. nitrocellulose thinners), in this case without antifreeze</td>
<td>Separate collection</td>
<td>x</td>
</tr>
</tbody>
</table>
## 7.3. Asbestos-containing floor and wall coverings

Predominantly in the 60s and 70s, large quantities of asbestos-containing floor and wall coverings were produced which tended to be in the lower price range and therefore came to be used very extensively. Experts estimate that in Austria alone more than 15 million m² of these coverings were laid.

Preferably, these robust and easy to clean coverings were utilised for wet rooms and high-traffic areas (increased load, e.g. hallway). The limited service life of these floor and wall coverings (approx. 40 years in the private domain) leads to their increasing removal or substitution, not only by professionals but also by amateurs (DIY enthusiasts).

Field studies confirm that as far as the owners of buildings and apartments, but also where professionals (e.g. floor layers, tilers, painters and decorators) are concerned, awareness of the specific problems relating to asbestos is lacking. Unlike other asbestos-bearing products, such as storage heaters, product-specific data is rarely available for old floor and wall coverings. Therefore, apart from a very few exceptions, asbestos-bearing flooring can only be identified by specialists using SEM analysis.

In normal use of coverings (no structural damage), a significant release of fibres can be excluded, although during the removal of asbestos-bearing floor and wall coverings extremely differing levels of release can occur depending on the strength of the bonding of the covering to the substrate material and the removal method employed. Each situation therefore requires its own approach, but the mandatory minimum standards need to be observed in any case.

Floor and wall coverings that contain asbestos can be categorised into two types: cushion vinyl (multi-layer) and floor flex covering (single-layer...
7. Principles for the Treatment of Specific Waste and Material Streams

The key difference between them is in the product-specific use of the asbestos fibres which are bound into a matrix (filler) in floor flex coverings and used as an asbestos board lamination (base) on cushion vinyl coverings. As far as cushion vinyl coverings are concerned, bonding of the asbestos fibres is weak, which generally means that the potential for release is significantly higher than when they are an intrinsic part of the material as they are in floor flex covering.

The removal of asbestos-bearing floor and wall coverings by conventional means (manual, dry detachment without further precautions) inevitably puts the health of the exposed persons at serious risk. Their proper removal in accordance with the relevant technical and legal requirements is considerably more complicated and costs up to 10 times as much as conventional removal. Particularly where small areas (a few m²) of covering are concerned, the minimum cost of proper removal is relatively high. The effective implementation of handling rules thereby finds itself in conflict with the cost situation, particularly in the small (private) domain, and can therefore only be achieved through extensive educational measures by the competent bodies explaining the health risks of removing floor and wall coverings containing asbestos.

The rules for the disposal of asbestos-bearing storage heaters are for the most part analogous with those for the disposal of asbestos-bearing floor and wall coverings and can therefore also be applied for this purpose. As a result of the ubiquitous and usually strong bonding to the substrate however, additional measures need to be taken.

Generally, when using/handling floor and wall coverings containing asbestos, any release of fibres should be avoided. This applies in particular to the breaking of coverings or sanding of the substrate to remove remnants of covering adhering to it. Floor and wall coverings that contain asbestos may not be worked or transported without taking special precautions (e.g. drilled into, detached from their substrate, broken up).

The following measures should be applied for the removal of floor and wall coverings containing asbestos.

- Preparation of a portioned-off, sealed and marked working area (black zone) with airlock.
- Generation of sufficient, permanent negative air pressure in the working area during removal (low pressure appliance, air exchange 10, warning device)
- Controlled ventilation of the working area using a sensor-controlled filter leading outdoor (optical and audio warning in case of failure)
- Use of protective clothing, respiratory equipment, etc.
- Use of binding agents to immediately trap any fibres released
- Double packing of the asbestos waste in PE sacks and labelling
- Cleaning of the protective equipment and tools
- Transport of the packed asbestos waste by authorised collectors/treaters
- Consignment note obligatory according to Waste Record-Keeping Ordinance (ANVO)
- Final treatment of the removed waste (incl. contaminated appliances)
- After completing dismantling, cleaning of all surfaces and tools in the working area
- Removal of the partitioning and the low pressure appliances
- Final putting in order of the restoration area
For detailed instructions on the procedure preferably cf. EN ISO 16000-7, ÖNORM M 9406, M 9405 as well as TRGS 519. Further information can be obtained from the following competent authorities:

7.4. Asbestos-containing storage heaters

Asbestos-containing storage heaters must be processed as hazardous waste. According to sec. 6 (7) of the Waste Treatment Obligations Ordinance, Federal Law Gazette II No 495/2004 as amended, asbestos waste and building components containing asbestos must be removed from waste electrical and electronic equipment to ensure that contamination from other building components is excluded and properly treated. According to information from the Association of German Electricity Plants (Vereinigung Deutscher Elektrizitätswerke - VEDEW e.V.), the majority of electric storage heaters manufactured before 1977 have components which contain asbestos. These components contain asbestos which is usually weakly bonded. A differentiation must be made as to whether components containing asbestos are only located in the partitioned off switch area - these are of secondary significance when assessing a possible health hazard from normal operation - or whether these components are exposed to the air current.

In the majority of appliances, the asbestos can be found in the heat insulation surrounding the storage base and is partially exposed to the air current. Asbestos is also used as sealing strip on the bypass flap in the air outlet. In some types of appliance, the plates at the side of and over the storage core are made of weakly bound asbestos. These are generally not exposed to the air current. In the electrical switch area, elements containing asbestos - e.g. the insulation sleeves for the control cartridge of the charge governor, in certain cases the insulating plates on the ventilator housing - were used until 1984 in some cases. Information on whether any specific storage heater contains asbestos products can be obtained primarily from the manufacturers or specialised electrical retail outlets.

The following measures need to be taken when removing asbestos-containing building components:

» In appliances that contain only small asbestos components in the partitioned-off electrical switch area, core stones may be removed to reduce the weight without the need for special safety measures.

» If removal of core stones from the appliances would release asbestos fibres, these are not to be opened at their location on any account; they must be removed intact and unopened from the building. In addition, all openings in the appliance must be sealed off using industrial adhesive tape to prevent dust from escaping. Plate metal seams (front, cover, etc.) must also be sealed off. Alternatively, the appliance may be packed dust-free in plastic. A label reading “Warning: contains asbestos” must be attached.

» Where the removal of the core stones, which would result in the release of asbestos, is inevitable, the following safety procedures need to be observed without fail (cf. preferably ÖNORM M 9406, M 9405 as well as TRGS 519):
  - The working area is to be kept as small as possible.
  - The working area must be hermetically sealed and dustproof.
  - The working area must continuously be kept at an adequately effective level below atmospheric pressure during the removal process.
  - Once the removal work has been concluded, all surfaces in the partitioned area, incl. the partitioning materials, must be cleaned and if necessary treated with fibre binding agent.
Prior to any further handling of the storage heater, all components containing asbestos must be removed. For this purpose, the appliances need to be professionally dismantled and the components containing asbestos must be prepared in such a fashion as to avoid the release of any asbestos fibres (residual fibre binding agent and double wrapping). To dismantle the components containing weakly bonded asbestos a hermetically sealed working area (black zone) is required. Disassembly is to be carried out by an authorised processor. When shipping asbestos-containing appliances, the transport must be accompanied by a consignment note conforming to the Waste Record-Keeping Ordinance.

**Heat storage stones containing chromium**
Storage heaters containing asbestos may also have stones that contain chromium, which as a rule cannot be landfilled. Chromates are water-soluble and can be absorbed through the skin. Removal and the subsequent treatment should only be carried out by an authorized handler. The waste should be handled in accordance with SN 31109g, “Furnace linings from non-metallurgical processes containing product-specific dangerous substances” (European Waste List: 16 11 05).

### 7.5. Waste cooking fats and oils and fat separator contents


**Collection, storage and transport requirements**

**Waste edible oils and fats**
The collection containers must be odourless and leak-proof, particularly when they are used for both storage at the point of collection and transport to the treatment plant.
The following fats and oils should be collected:
- waste oils or fats that have been used for frying, roasting or deep frying (animal and vegetable)
- rancid edible fat
- oil that has been used to conserve food

Not suitable for the waste edible fat collection are:
- salad dressings and mayonnaise
- mineral and synthetic oils and fats

**Fat separator contents**
Fat separators should be maintained to state-of-the-art standard and regularly emptied (disposal as fat separator contents, SN 12501 - not to be subsumed hereunder are contents of traps from slaughterhouses and rendering plants). Back-flows into the drains via the overflow should be avoided.
The current practice of emptying by means of a road tanker corresponds to the state of the art.

**Treatment procedure**

**Waste cooking oils and fats**
Waste cooking oils or fats should be preferably used
- to manufacture loss lubricants
- in the production of biodiesel with glycerine extraction and
- for saponification (with glycerine extraction)
The glycerine extracted in the process should undergo recycling, e.g. as basic ingredient for the cosmetic industry. The quantities of glycerine that cannot be recycled may be recovered in biogas plants approved under waste law or subjected to thermal recovery. Direct utilisation as fertilizer by direct application to the soil is in no way admissible due to the ozone problems caused by the methanol content.

**Fat separator contents**
The following specific processes are admissible for treating the contents of fat separators:

- production of bio-fuels
- production of secondary products (particularly for manufacturing soaps or lubricants).
- biogas generation

Direct depositing of fat separator contents in landfills or after physico-chemical treatment is not permitted.

### 7.6. Galvanic sludge

Galvanic sludge should be prevented primarily by integrating adequate measures into the process, e.g. by minimising dirt and grease input, extending the life of process solutions, avoiding drag-out and return of escaped process solutions.

**Collection, storage and transport requirements**

Galvanic sludge belonging to waste types SN 51101, 51102, 51103, 51104, 51105, 51106, 51107, 51108, 51110, 51112, 51113, 51114, 51115, as well as similar hydroxide sludge of SN 51302, 51310 are hazardous wastes as defined by the List of Waste Ordinance (Federal Law Gazette II No 570/2003 as amended) and must therefore be collected, stored and transported with due consideration of their hazardous properties as defined in Annex 3 of the Waste Management Act of 2002 as amended.

Galvanic sludges, in particular, may be irritant (H4), hazardous to health (H5), toxic (H6), carcinogenic (H7), corrosive (H8) and hazardous on account of leachate (H13). Consequently, the following requirements must be complied with.

- Galvanic sludges must be stored in containers or carboys with adequate stability. Unclassified galvanic sludges should be kept in hermetically sealed containers.
- The store must be protected against the weather and be located on a solidified foundation that is impervious to water.

- Immediately prior to backfilling, or at least immediately after backfilling, the containers should be permanently marked according to their potential hazards.
- The provisions of the Carriage of Dangerous Goods Act (Federal Law Gazette I No 145/1998 as amended) and of the ARD or RID (Guidelines for the transporting of hazardous materials by road or rail) need to be observed in all cases.
- Proof of delivery for proper treatment or recovery is provided by the consignment notes.
- Notification in compliance with the EC Waste Shipment Regulation (No 2006/1013/EC) is required for any shipment of galvanic sludge.
- The shipment for recovery purposes is only permitted in OECD countries that have implemented the decision of the OECD Council C92/39 or C (2001) 107 (with notification) and for disposal only in EFTA and EU Member States.

**Requirements for recovery procedures**

As far as technically possible and economically reasonable, galvanic sludges must be pure, i.e. contain the highest possible concentration of only one relevant constituent ("mono sludge"). A combined precipitation of different concentrates is therefore to be avoided in light of the above secondary conditions.

The eligible processes are metallurgical processes with at least one thermal treatment procedure.
and/or wet or electro-chemical refinement procedures.

<table>
<thead>
<tr>
<th>Recovery processes for galvanic sludges</th>
</tr>
</thead>
<tbody>
<tr>
<td>SN</td>
</tr>
<tr>
<td>51107</td>
</tr>
<tr>
<td>Parts</td>
</tr>
<tr>
<td>51108</td>
</tr>
<tr>
<td>51114</td>
</tr>
<tr>
<td>51105</td>
</tr>
</tbody>
</table>

Since the emission from the exhaust air (as well as the slags and overburden) from the metallurgical processing of non-ferrous metals are generally environmentally relevant, suitable processing of the emission must be ensured.

The output consists of metal or metal alloys with the same specifications as those originally won and refined from raw materials.

Requirements for treatment processes
The sludges must be neutralised or detoxified to reduce their potential hazard. Then, the sludge should be drained. It must be ensured that the TOC content of the sludge, e.g. from precipitation or additives, does not exceed the relevant limit value of the Landfill Ordinance of 2008, Federal Law Gazette II No 39/2008 as amended.

Landfilling hazardous waste above ground has been expressly forbidden since 16 July 2001. Galvanic sludge grades that can be deposited in surface landfills according to the Landfill Ordinance of 2008 may be exempted from this rule for the purpose of appropriate landfilling if they meet the requirements of the Landfill Ordinance of 2008. Otherwise, further treatment processes must be applied. In a solidifying or stabilising process is applied, proof of long-term consistency must be furnished in order to comply with Landfill Ordinance. Preference should be give to stabilization procedures that allow both for permanent bonding of ingredients into a fixed matrix and conversion of hazardous ingredients into harmless substances (partial oxidation of hydrocarbons and other organic compounds or cyanides, reduction of chromates, etc.).

7.7. Fire debris
The term fire debris is applied to the residuals from fire. These generally contain mineral-based construction materials, incompletely burned (inflammable) building materials, furnishings, stored goods, etc., and hazardous materials may also be present. Immediately identifiable as problematic
materials are asbestos-containing building materials and glass or rock wool. During clean-up, care should be taken not to soil non-contaminated material or mix it with contaminated waste. Additionally, organic fractions should be handled separately.

**Treatment**
Larger amounts of incineration residues without serious contamination should be recycled whenever possible. The treatment method should always be chosen on a case-by-case basis. With regard to the mineral fractions, a differentiation is to be made between domestic and similar fires and those in industrial or trade premises: As a rule, mineral building debris from domestic or similar fires contaminated with carbon black can be deposited in residual waste or mass waste landfills and in certain cases in construction and demolition waste landfills in compliance with the Landfill Ordinance (determining parameter: PAHs). This excludes incidents during which significant quantities of PVC or similar materials containing chloro-organic substances are combusted or carbonised and for which a test for dioxins/furans is indicated. The method of treatment, particularly the separation and protection procedures at the scene of the fire, and the treatment methods are to be determined specifically for each individual case.

For mineral residues from fires in the industrial and trade category, where significant quantities of dioxins and furans are frequently found, treatment has to be decided on a case-by-case basis. Organic material contaminated with carbon black (e.g. wood, plastics) should undergo thermal treatment in a suitable facility as it is usually contaminated with PAHs and dioxins irrespective of the type of fire. Asbestos-containing wastes should be deposited at a landfill for non-hazardous waste after suitable pre-treatment to bind the asbestos fibres (in own structurally separated compartments). The same applies to glass and rock wool, which must undergo fibre-binding before being landfilled.

**Developing, bleaching and fixing baths**
The state of the art calls for the vaporisation of the listed fluid wastes (SN 52707, SN 52715, SN 52723) after the desilvering process; if necessary, the residues should be subjected to further treatment. In cases where vaporization is not expedient (e.g. plate developers based on NaOH), chemical-physical processes (e.g. precipitation of the heavy metals and reverse osmosis) and thermal treatments can be applied.

Discharge into the sewer system is only permitted if this has been duly authorised under water law and the stipulations and limit values of the Ordinance Restricting Waste Water Emissions from Operations Using Graphic and Photographic Processes, Federal Law Gazette II No 45/2002 as amended are complied with.

**Rinsing and flush water**
Washing and flushing water (SN 52722) are treated by vaporisation, too. Additional treatments include precipitation, neutralisation, ion exchange and reverse osmosis. Discharge into the sewer system is only permitted if this has been duly authorised under water law and the provisions and limit values of the Ordinance Restricting Waste Water Emissions from Operations Using Graphic and Photographic Processes, Federal Law Gazette II No 45/2002 as amended are observed.

**7.8. Photo chemicals**
When treating these chemicals, it is important to distinguish between developing, bleaching and fixing baths, or laboratory waste and chemical residues or washing and flushing water. The aim is to separate non-hazardous from hazardous components, to immobilise the hazardous components and recover materials. Furthermore, when assessing the state of the art used, the entire process and thus the environmentally sound treatment of the residues needs to be verified.
Laboratory waste and chemical residues from graphics processes
These wastes must be treated in authorised plants and may not be discharged into the public sewer system untreated under any circumstances. Attention is drawn to the relevant specific ordinances restricting waste water emissions.

7.9. PCB-containing waste
Polychlorinated biphenyls (PCBs) are a class of substances that includes 209 isomers and homologous compounds. Synthetic PCBs are always a mixture of different isomers.
Known since the 30s, PCBs were deployed over a wide area after World War II because of their relatively low toxicity and positive material properties (low flammability, good electrical isolation, softening properties in plastics, high boiling point). Areas of application included isolating and hydraulic oils, dielectrics in high-performance capacitors, coolants in high-performance transformers, plasticizers in synthetics materials, fillers and paints, carrier substances for pesticides and others.
In the 60s, a continual accumulation (persistence) of PCBs in the environment was determined. At the same time, PCBs were discovered to have clear biological effects (reduction in the thickness of bird’s eggshells, hormone-like effects, carcinogenic potential). PCBs were also discovered to be a significant source of dibenzodioxins and dibenzo-furans (PCDD/PCDF). Under thermal and oxidative load, PCDD and PCDF are formed in PCB mixtures by ring closure.
In 1976, an EU Directive together with national restrictions drastically reduced the open use of PCBs. With the adoption of Directive 96/59/EC, PCBs were phased out completely, also in closed systems. The Directive also governs the disposal of PCBs, although the definitions and provisions apply primarily to electrical appliances such as capacitors and transformers. In conformity with the definition of the Directive, compounds similar to PCB (polychlorinated terphenyls, = PCTs, monomethyl-tetrachlordiphenyl methanol, monomethyl-dichlordiphenyl methanol, monomethyl-dibromodiphenyl methanol) were also designated as “PCBs”.
With the 2004 Stockholm Convention on persistent organic pollutants, also known as POPs, a worldwide ban on the production and use of PCBs was introduced. At the same time, the Convention also demanded the removal of all remaining stocks and waste. During the first conference of the signatories to the Stockholm Convention, the guidelines of the Basel Convention for the disposal of POP wastes (http://www.basel.int/pub/techguid/pcb_guid_final.pdf) were recommended. These technical guidelines define POP waste as waste containing more than 50 ppm PCB (this means that the waste falls within the scope of the elimination requirement under the Stockholm Convention).
At EU level, the treatment of POP waste is governed by Directive 850/2004/EC (POPs). For PCB-containing waste, a limit value of 50 ppm applies in compliance with the Stockholm Convention recommendation.

PCB-containing electrical and electronic equipment
PCB-containing electrical and electronic equipment is assigned the designations 54110 12, 54110 13, 54110 14, 54110 15 or 54110 16 subject to the level of PCB/PCT it contains. (Note: if the PCB content cannot be determined, as with capacitors for instance, specification 16 should be chosen).
The labelling and decommissioning of PCB-containing equipment is governed by the Ordinance on the Ban of Halogenated Substances, Federal Law Gazette No 210/1993. The “phase out” of PCB-containing electrical and electronic equip-
ment in compliance with the Directive ended on 31 December 1999. According to the Directive, only capacitors with a liquid content of less than 1 litre (and additionally for fields of multiple capacitors with a liquid content of less than 2 litres for the complete field) and transformers containing <500 ppm of PCB in oil may continue to operate until the end of their technical service life. In the near future, however, the decommissioning and appropriate treatment of transformers with oil containing between 30 ppm and 500 ppm of PCB will be decreed in compliance with the Stockholm Convention.

PCB-containing electrical and electronic equipment bears two potential risks:
1. the possibility of PCB release (and PCTs) and
2. the risk of the formation of polyhalogenated dibenzodioxins and dibenzofurans (PCDD/PCDF) through thermal influences (particular at temperatures above 180°C).

Accordingly, PCB-containing oils have to undergo thermal treatment. In the process, the incinerators must ensure a dwell time for the incinerating gases of at least 2 seconds at 1,200°C in order to guarantee a sufficient level of PCB destruction (compare this to the recommendations of the technical working group of the Basel Convention on the elimination of PCB-containing wastes; Basel Convention Series/SBC No 94/005; Geneva, 1994). In accordance with the EU provisions, thermal treatment of PCB waste is always to be classified as D10 disposal.

Other acceptable methods of destruction are summarised in the guidelines of the Basel Convention for the disposal of POP waste. For solid electrical and electronic equipment (transformers, capacitors), the dismantlement and separation of the PCB component with subsequent destruction is another option. In using this option, it must be ensured that

» no PCBs escape into the environment when draining PCB oils out of electrical and electronic equipment. In particular, when executing this kind of work, it must be ensured that any PCB oils that are spilt are caught in suitable oil- and solvent-tight catch basins. Drainage of PCBs “on site” is only permissible if it is necessary for technical reasons. To the extent possible, PCB-containing electrical and electronic equipment (capacitors and transformers) should be prepared for further treatment in suitable transfer stations.

» that all work is carried out in a separate black zone during treatment in transfer stations (with regard to the exhaust air from the black zone, suitable measures have to be taken (e.g. charcoal filter or equivalent) to exclude any release of PCBs into the environment. The floor of the black zone must be executed as a catch basin and be oil- and solvent-resistant.

» employees need to be protected against contamination with PCBs by means of suitable protective clothing and

» suitable measures must be taken (airlock, etc.) to ensure that PCBs are not carried out of the black zone. If electrical equipment is to be put through a recovery process (reclaiming of metal), adequate decontamination needs to be ensured. Since PCBs already tend to form PCDD/PCDF under relatively low thermal stress, thorough decontamination before the actual recovery process is indispensable. Simply washing PCB-containing electrical equipment with a solvent and subsequent treatment with a shredder is not permitted since experience from the retro-filling of transformers has shown that substantial quantities of PCB-containing oil remain in the coil (transformer coil, transformer plates, capacitor plates) and in the insulation, which leads to dioxin formation during shredding and contamination of the shredded waste with PCBs. Because of the significantly higher toxicity of dioxins, there is a risk of environmental contamination even with the smallest residual quantities of PCBs. Before recovery of the metal parts from PCB-bearing electrical equipment, complete dismantling (unwind copper wires, dismantle the sheet metal plates, extract oil imbued insulating papers etc.) and decontamination of the metal parts is therefore necessary. In terms of the pre-treatment process, all these operations must be carried out in a suitable plant with a secure black zone. As a result of the far more complicated handling, special precautions need to be taken in the disassembly for recovery purposes, particularly with regard to the drag-out of PCBs (airlock, treatment of exhausted air, etc.). Contaminated materials such as paper, wooden cores, etc. need to be thermally eliminated while inert materials which do not exceed the limit value according to Annex V of Directive 850/2004/EC are to be stored in an underground landfill.

If the existence of PCBs cannot be ruled out for small capacitors (with a volume of < 1 litre, e.g. start or compensation capacitors for washing machines, fluorescent light bulbs, etc.) due to the production date and/or labelling, these capacitors should be treated as potentially containing PCBs and subjected to thermal treatment in a suitable incineration plant.
Other PCB-containing waste
In addition to electrical and electronic equipment (capacitors, transformers, power cables), the occurrence of PCB-containing waste should be expected particularly in the construction trade during restructuring and dismantling. PCBs were used as plasticisers up to the mid-70s in open applications in the building trade, particularly in gaskets (e.g. window gaskets), and permanent elastic joint sealants and emulsion paints. An indication of the presence of this kind of PCB-bearing materials can be obtained by analysing the air inside a building. What needs to be borne in mind when removing this kind of PCB-containing contamination is that PCBs have a relatively high tendency to diffuse into concrete and plaster. Apart from removal of the actual source of contamination (sealant, coating), removal of the immediately adjacent parts of the wall is also necessary. For this purpose, cryogenic processes to remove sealants (embrittlement of the gaskets with liquid nitrogen) have proven useful.

PCB-bearing gaskets as well as construction and demolition waste are to be assigned the codes SN 54111 13, 54111 14, 54111 15 or 54111 16 and disposed of. Inert portions (PBC-contaminated concrete or plaster) can be landfilled underground in accordance with Annex V of Directive 850/2004/EC. Organic parts (gaskets, etc.) must be thermally eliminated (high-temperature incineration) or subjected to special chemical treatment (e.g. catalytic dehalogenation and hydrogenation). A list of the principal elimination processes available can be found in the guidelines of the Basel Convention.

As a result of the extensive dissemination of PCB-bearing gaskets (until around 1977/78) and PCB-contaminating micro-capacitors (until approx. 1985/86), the light shredded fraction from the processing of white goods and from the processing of end-of-life vehicles (capacitors, from gaskets, box-section sealing and underseal from motor vehicles) may contain significant amounts of PBC. These kinds of fractions need to be subjected to a suitable means of elimination in accordance with Directive 850/2004/EC (as a rule, high-temperature incineration). What needs to be noted is that the PBC content of the waste must be appraised at the same time in accordance with the EU Directive (content of seven congeners x 5).

7.10. Sewage sludge
Sewage sludge is generated as waste when implementing the statutory requirements for keeping bodies of water clean. Sewage sludge contains nutrients such as nitrogen and phosphorus, on the one hand, but may be contaminated with organic substances that are not easily biodegradable and contain high concentrations of heavy metal, pathogens (e.g. viruses and bacteria) as well as hormonally active substances, on the other. Quantitative prevention is impossible.

Sewage sludge treatment in the treatment facility has repercussions on waste water purification and therefore needs to be planned, built and operated as part of the overall treatment facility. This planning must be coordinated with any further treatment of sewage sludge.

The following measures may need to be implemented for treatment directly in the treatment facility:
- stabilisation (odour prevention, improvement of storability and transportability, use of energy contained in the organic solids)
- volume reduction (thickening – draining – drying as required and depending on the subsequent treatment)
- sanitisation (if required)
- interim storage (buffer between generation, recovery and treatment)

In recent years, sewage sludge treatment methods have become increasingly differentiated in recent years; the following treatment principles are applicable to all methods. The landfilling of sewage sludge has been prohibited since the expiration of the exemption clauses to the Landfill Ordinance on 1 January 2009.

Spreading sewage sludge on land
When recovering sewage sludge for agricultural purposes, the aim is to close nutrient cycles without endangering human health, the environment and sustainable soil fertility. This requires that the sewage sludge be of appropriate quality. Contaminated sewage sludge must not be spread onto the soil (risk of increase in the concentration of pollutants). Moreover, it must be ascertained that the long-term agricultural use of sewage sludge does not result in an illegal increase in the concentration of pollutants in the soil. The pertinent general framework is defined by the laws on soil protection and the ordinances on sewage sludge, some of which vary between the Federal Provinces, must be observed in every case.

Our knowledge concerning the effects of organic compounds with heavy metals is highly heterogeneous. To date, the risk of persistent pollutants has only been determined for a handful of substance groups. In terms of most organic substance groups, sewage sludge recovery usually only results in small quantities entering the soil; however, they can accumulate over the years and affect soil fertility or enter the food chain in the long run. In light of this, recovery of sewage sludge for agricultural purposes should be seen critically; for reasons of food safety, their use is coming under increased scrutiny.

When using sewage sludge for fertilising and soil improvement, recovery does not commence until the actual application, i.e. spreading onto the land. How method of use depends strongly on the regional conditions (e.g. lime requirement of the soil, use of the water contained in sewage sludge, need for sewage sludge as a replacement fertiliser in the region, type of cultivated crops). The epidemiological requirements must be observed depending on the spreading method. Sewage sludge can primarily be considered a phosphorus fertiliser. The amount to be spread is generally limited by the phosphorus content.

The pre-requisite for any recovery is, in particular, the benefit of the measure and the fulfilment of a specific purpose. Sewage sludge may be spread out for the purpose of fertilising, i.e. time and quantity must be adjusted to the growth of vegetation and the soil characteristics. For sewage sludge to be spread out on soil for agricultural or ecological use it must contain sufficient bioavailable nutrients to provide fertilisation while not exceeding the permissible spread amount, and the use of the sewage sludge must be adjusted to the nutrient requirements of the plants. As evidence, the amount of nutrient applied should be compared with the nutrient requirements for plant growth and this should be documented.

Due to the high phosphorus content of sewage sludge from treatment facilities with phosphorus extraction, the soil may be supplied with too much phosphorus if this sludge is used on fields over a number of years, even if the legal quantitative limit for dry solids is observed. Existing Provincial regulations on the spreading of sewage sludge in some cases do not take into account the phosphorus loads. In order to optimise cultivation using phosphorus, the amounts used need also to be determined by the phosphorus requirement of the cultivated crops in addition to the pollutant concentrations or loads.

The provisions of the Austrian Water Act and the Waste Management Act of 2002 as well as the soil protection laws and ordinances of the Federal Provinces are to be observed in addition to the following requirements.

Limit values for heavy metals
The limit values for heavy metals (total content) shown in tables 1 and 2, which are taken from the Compost Ordinance, should be used together with other sources of information, to assess whether recovery is permissible (table 1 covers non-agricultural recovery; table 2 covers agricultural recovery). If the heavy metal content is exceeded, recovery can no longer be considered permissible. It is not permitted to spread sewage sludge with a heavy metal content that exceeds the figures listed in table 1 onto the soil.
Limitation of heavy metal content

In order to achieve a beneficial application, the heavy metal content pursuant to Rule Sheet 17 of the Austrian Water and Waste Management Association (ÖWAV) must be complied with on the three-year average (Table 3):

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Limit value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zn</td>
<td>2,000 mg/kg DM</td>
</tr>
<tr>
<td>Cu</td>
<td>500 mg/kg DM</td>
</tr>
<tr>
<td>Cr</td>
<td>300 mg/kg DM</td>
</tr>
<tr>
<td>Ni</td>
<td>100 mg/kg DM</td>
</tr>
<tr>
<td>Pb</td>
<td>200 mg/kg DM</td>
</tr>
<tr>
<td>Cd</td>
<td>3 mg/kg DM</td>
</tr>
<tr>
<td>Hg</td>
<td>3 mg/kg DM</td>
</tr>
</tbody>
</table>

Organic pollutants

For most classes of substances, it is yet impossible to determine the hazard potential or establish ecotoxicologically justified limit values and further research is needed. Examples of organic substances that may serve as a basis for such research can be found in Rule Sheet 17 (table 4) of the Austrian Water and Waste Management Association (ÖWAV):

<table>
<thead>
<tr>
<th>Primary organic substance</th>
<th>Limit value proposal pursuant to EU document (2000)</th>
</tr>
</thead>
<tbody>
<tr>
<td>AOX</td>
<td>500 mg/kg DM</td>
</tr>
<tr>
<td>LAS</td>
<td>2,600 mg/kg DM</td>
</tr>
<tr>
<td>PAH</td>
<td>6 mg/kg DM</td>
</tr>
<tr>
<td>Benzo(a)pyrene (= BaP)</td>
<td>–</td>
</tr>
<tr>
<td>PCB</td>
<td>0.8 mg/kg DM</td>
</tr>
<tr>
<td>PCDD/F</td>
<td>100 ng/kg DM (TE)</td>
</tr>
<tr>
<td>DEHP</td>
<td>100 mg/kg DM</td>
</tr>
<tr>
<td>4-NP techn.</td>
<td>50 mg/kg DM</td>
</tr>
<tr>
<td>NP(1)EO</td>
<td>–</td>
</tr>
<tr>
<td>NP(2)EO</td>
<td>–</td>
</tr>
<tr>
<td>Total HC</td>
<td>–</td>
</tr>
</tbody>
</table>

Epidemiology

Third parties may only spread sewage sludge onto agricultural land if the sewage sludge has been subjected to a suitable sanitation procedure. This can be considered to be the case if no pathogens posing a danger to the environment are contained in the sludge. Sewage sludge with a pH value of 12 or higher due to liming, which has been composted in accordance with the Guidelines for State-of-the-Art Composting or dried is deemed sufficiently sanitised. Sewage sludge that has not been subjected to any treatment other than stabilisation is deemed sanitised if no salmonella can be detected.

Sanitation is not necessary when the farmer obtains the sewage sludge directly from the treatment facility operator, if the following points have been verifiably observed:

- Compliance with the prohibitions on spreading sewage sludge onto the soil according to the Water Act, Nitrates Action Programme, the laws governing soil protection and ordinances on the use of sewage sludge.
- Choosing the optimal time of spreading in accordance with “good agricultural practice”, at which time other manure, such as farmyard manure, liquid manure, biogas manure and digestate can also be spread onto the field without causing problems.
- On uncultivated arable land, the sludge should be worked in immediately in accordance with the Nitrates Action Programme.
- On winter crops (e.g. grain, rapeseed) the sludge should be spread out onto the ground up to when the crop starts seeding.
Composting
Composting breaks down a range of organic pollutants and pathogens. Moreover, composting results in the full retention of the phosphorous content, which is then available for agricultural recovery in the long term. Waste ceases to be waste when the composting process is complete in accordance with the Compost Ordinance. By admixing carbon-rich structural material (such as straw, wood shavings, shredded material, etc.) it is prepared for use as a soil improver (replacing humus) and substrate, which is principally used in landscape conservation, horticulture and agriculture.

Sewage sludge must be composted in accordance with the Compost Ordinance and the Guidelines on State-of-the-Art Composting (Federal Ministry of Agriculture, Forestry, Environment and Water Management 2005). The specifications for spreading the sludge onto soil should be observed accordingly.

Thermal treatment
Thermal treatment constitutes an ecologically sound and safe treatment option for municipal and industrial sewage sludge. It comes with the following advantages:
- sanitisation, mineralisation and best-possible inertisation of waste
- complete destruction of organic pollutants (endocrine substances, pathogens, etc.)
- separation of inorganic pollutants
- weight and volume reduction
- energy recovery
- reduction in greenhouse gas emissions (Kyoto target)

For the thermal treatment of sewage sludge, the requirements of the Ordinance on Waste Incineration (AVV) should generally be observed. The Ordinance on Waste Incineration also provides clear requirements on input control, plant conditions and limit emission values.

Large-scale thermal treatment plants (waste incineration and co-incineration plants) in urban centres are also suited for the thermal treatment of sewage sludge. De-centralised incineration of sewage sludge is another thermal treatment option in rural areas characterised by weak infrastructure with small catchment areas. Through transregional approaches to thermal treatment and the joint use of de-centralised sewage sludge incineration plants, smaller sewage treatment plants can also be provided sensible treatment concepts.

In the co-incineration of sewage sludge in industrial combustion plants, limits under the amended Waste Incineration Ordinance (AVV Novelle 2010) apply to the volume of potential pollutants in residues or products brought in by the substitute fuel. This is achieved, in particular, by regulating the input limit values for sewage sludge with respect to the thermal treatment plants subsequently used. I.e. limit values, particularly for the maximum permissible amount of heavy metals, have been defined for the co-incineration of sewage sludge in cement works, (coal-fired) power stations and other co-incinerators.

Mechanical-biological waste treatment followed by landfilling
In addition to thermal treatment, state-of-the-art mechanical-biological treatment is another option for treating sewage sludge. The suitability of each mechanical-biological waste treatment plant (MBA plant) for the co-treatment of sewage sludge must be verified on a case-by-case basis.

In all cases, the prerequisite for the co-processing of sewage sludge is compliance with the Guidelines for the Mechanical-Biological Treatment of Waste (BMLFUW, 2002) and, additionally for IPPC plants, consideration of the specific requirements for mechanical-biological pre-treatment of the IPPC “Reference Document on Best Available Technology for the Waste Treatment Industries” (August 2006) within the relevant period given for adaptation.

When verifying whether the mechanical-biological plant is suitable for the co-treatment of sewage sludge from biological sewage plants, specific examinations and preliminary tests need to be carried out. These are primarily designed for
- analysing the quality of sewage sludge,
- optimising the plant-specific process,
- ensuring a good mix/homogenisation of the sewage sludge with the other wastes,
- guaranteeing optimum rotting conditions and
- warranting the desired qualities of the output materials.

When inspecting the quality of the sewage sludge to ensure that only suitable sewage sludge are treated, the following criteria, in particular, need to be taken into account: degree of stabilisation and type of stabilisation, nutrient content, pollutant content and moisture content (and consistency). According to the objectives of mechanical-biological pre-treatment (e.g. mechanical-biological pre-treatment before landfilling, mechanical-biological pre-treatment before thermal
treatment) the criteria must be prioritised differently. Prior to mixing in the infeed hopper or mixing with the other waste, and taking into account the volume loss in the biological stage, the heavy metal content of the added sludge must not be greater than the amount stipulated for the output material intended for landfilling or thermal treatment. In other words, the heavy metal content of the input materials for the biological stage need to be calculated on the basis of the reduced mass after rotting.

The sewage sludge needs to be stabilised and de-watersed by suitable means before co-processing (e.g. chamber filter or screen belt press or centrifuge). Dehumidification is not necessary. Solely mechanically drained sewage sludges that have not been generated through the biological treatment of waste water are unsuitable for mechanical-biological treatment. Sewage sludges that are liable to extensively hinder the biological processes and thereby substantially increase the length of time required for biological treatment as a result of their pollutant content or the way they have been stabilised (e.g. chemical stabilisation, lime stabilisation) are not suitable either.

Not only is continuous visual up-front inspection of sewage sludge necessary but monitoring of the quality in the form of periodic analyses (e.g. by the sewage sludge producer or as part of the inward inspection) as well. The frequency of analyses needs to be scheduled depending on the range and mutability of the relevant properties determined (e.g. heavy metal content).

To optimise plant specific processes, the most suitable process stage for the introduction of the sewage sludge is to be determined based on the process technology used and the objectives of the mechanical-biological treatment in order to minimise impairment of (subsequent) manipulative or treatment stages. In particular, this can pertain to transport methods (e.g. by conveyor belt) or the processes used for the extraction of substances (e.g. valuable, contaminating or inert substances) as well as additional fractions (e.g. high calorific value fractions) by impairing the separation selectivity rate and the quality of the separated substances.

When introducing the sewage sludge to the waste stream, precautions are to be taken to ensure good mixing/homogenisation with the other wastes. This stage of the process must be optimised for the plant concerned by carrying out suitable preliminary trials.

In addition, preliminary testing of the rotting behaviour of the mixtures from the mechanically pre-treated input materials and of the sewage sludges to determine a suitable mixing ratio (e.g. regarding dispersion of nutrients, C:N:P ratio, humidity and distribution), a prerequisite to ensure optimum rotting conditions, is necessary.

When delivering, storing, handling and co-treating sewage sludges, the possibility of additional (diffuse) emissions of odours and other gaseous substances must be taken into account, which may not only entail stricter requirements with regard to the protection of personnel but also for the collection and cleansing of waste gases.

In particular, the use of sewage sludges introduces additional nitrogen into the mechanical-biological treatment plant. Through speedier degradation or conversion of the carbon compounds during the biological treatment, a shift in the C:N ratio towards a relative excess of N-compounds may occur. Suitable measures need to be taken to counteract any elevated formation of N-containing gaseous emissions (in particular, laughing gas or N₂O) as the duration of the treatment increases (e.g. no overloading with sewage sludge, analysis of the C:N ratio, optimisation of rotter management [e.g. rent determination, turning intervals], the emission measurements particularly for N₂O).

Furthermore, when applying sewage sludges, the possibility of contaminated process water forming needs to be taken into account subject to the water content and the degree of stabilisation. Where the process water used to humidify the rotting material (closed loop) is contaminated, not only the rotting process (salinisation) may be impaired but emissions of odour-bearing and other gaseous substances may also be produced. Adequate measures must be introduced to avoid any such impairment and at the same time prevent, to the extent possible, any emissions from being carried into (open) post-rotting.

What needs to be assessed during preliminary testing is whether or not in the event of co-processing sewage sludge any measures are required to achieve the desired grades of the residual materials. Co-processing sewage sludges tends to raise the calorific value of the rotting end product. In the event of mechanical-biological treatment before landfilling, measures may prove necessary that ensure compliance with the requirements for the landfilling of waste from mechanical-biological treatment set forth by the Landfill Ordinance of 2008 (in particular, calorific value), such as end screening with a fine-gauge screen or a limitation to the share of sewage sludge permitted in the overall input to biological treatment.
Recovering phosphorus
One essential argument favouring the recovery of sewage sludge in agriculture is its high phosphorus content; phosphorus, however, can also be recovered from waste water and ashes from mono-incineration for use as a fertiliser in agriculture.

The phosphorus contained in incineration ash is not readily available to plants and, depending on the quality of the sludge, the ash is contaminated with pollutants to various degrees. Wet or thermochemical procedures can be used to convert the phosphorus into plant-available form. Depending on the treatment method, pollutants can also be removed from the ash (e.g. thermally).

If sewage sludge is used in the cement industry, the phosphorus bonds with the cement and thus lost as a resource.

Recovering phosphorus from the sewage sludge ash offers advantages over direct agricultural recovery when it comes to using phosphorus as a resource. This is particularly true when phosphorus is used to make a product that can compete with commonly marketed fertiliser in terms of pollution and plant-availability, allowing for a much more flexible recovery of phosphorus than the agricultural use of sewage sludge. These advantages are offset by an increased use of resources (energy and chemicals), as well as higher processing costs.

Currently, the processes used to recover phosphorus are not economically viable. With a view to achieving economic viability, the phosphorus load of the ash should be as high as possible. This requires mono-incineration of sewage sludge or, as the case may be, incineration with other phosphorus-rich materials.

The processes used to recover phosphorus can be divided into two categories:

- processes that use wet chemical processes to extract the phosphorus from waste water or extract it from the sludge water by way of precipitation
- processes that use thermo-chemical processes to separate the ash from sewage sludge mono-incineration plants from heavy metals

In the German-speaking world, a great deal of research is currently being done into such processes, also by Austrian companies, research institutes and one large-scale pilot plant. The existing geological nutrient deposits cannot ensure our food production over the long run. The recovery of phosphorus is therefore expedient not only from an ecological perspective but also from an economic one, because it reduces our dependence on imported resources in the long run, thus contributing to a reliable supply of nutrients for the production of quality foodstuffs, while at the same time substantially mitigating the environmental impact of extensive phosphorus-based farming (overburden, waste water, release of heavy metals, etc.) abroad.

7.11. Non-mineral waste from construction activities

Non-mineral wastes from construction activities are usually understood to be mixed wastes from building sites that include wood, metals, plastics, glass, cardboard, organic residues and bulky wastes with low mineral content and were still designated construction and demolition waste in the Federal Waste Management Plan 2006.

However, the composition of this waste stream varies depending on:

- the type of construction work, the building structure and the construction method,
- the construction phase,
- the construction volume,
- the regional conditions such as available space on the construction site,
- regional collection system, services and incentives offered by the collectors (esp. collection prices by fraction), information and motivation of the operators.

Separating the waste by construction activity
The separate collection of varietal fractions on construction sites is generally important in order to ensure material recovery of the fractions. Every mixed collection with mineral constituents increases the degree of contamination and reduces the possibilities of recycling. For this reason, the most extensive separate collection possible on site is to be sought (cf. the obligations under the Ordinance on Construction and Demolition Waste and in Chapter 7.14. Construction and demolition waste).

Sorting
Hazardous waste, such as batteries, paint and lacquer wastes, waste oils, fluorescent tubes, waste electrical and electronic equipment, waste asbestos, asbestos cement waste as well as mineral fractions generally need to be collected separately, directly at the construction site itself.

Additionally, and irrespective of the size of the construction project, the following fractions should be separated directly on site, as a matter of priority,
or, at any rate, subsequently sorted and separated:

- paper packaging and cardboard
- plastic packaging and films
- polystyrene
- metal packaging
- other waste metals
- untreated wood (e.g. boxes and pallets)
- plastic windows (if quantities are substantial)
- pipes (if quantities are substantial)
- Sorted fraction of other high-calorific fractions (contaminated plastic waste, not individually collected plastic waste other than packaging waste, contaminated paper and cardboard packaging, organic insulation materials, treated woods, organic composite building materials)

**Storage**

The storage areas or collection containers for the different fractions need to be clearly marked out to avoid incorrect allocation. Tight weatherproof containers need to be used for storing hazardous wastes.

On the construction site and during sorting, measures must be taken to limit the emission of dust (e.g. low fall height, closed material chutes, moisturising of input materials) and against carrying off by the wind (by collecting in containers and coverings).

In addition to the requirements for the construction site, sorted waste from construction activities may only be stored on a solid surface in collection and sorting areas.
Delivery / treatment
According to sec. 15 of the Waste Management Act of 2002, waste may only be delivered for treatment to duly authorised collectors / processors. What needs to be verified when accepting non-hazardous waste from construction activities, is that all hazardous wastes have been removed.

Recovery
Provided no adhering contaminants oppose recovery, the following fractions should be recovered, and preferably recycled, according to sec. 16 (7) of the Waste Management Act of 2002:
- paper packaging and cardboard
- plastic packaging and films
- polystyrene
- metal packaging
- other waste metals
- untreated wood
- plastic windows
- pipes
- plasterboard (left over cuttings)

Disposal
Pursuant to Annex 2 of the Landfill Ordinance, only sorted or slightly contaminated construction and demolition waste may be accepted for deposition in landfills for construction and demolition waste or mass waste landfills without further analytical investigation. Generally, fractions collected on construction sites will need to undergo additional sorting/treatment to ensure compliance with the criteria for landfilling.

Because of the composition of the residual waste to be expected after sorting, it is to be assumed that biological treatment in a mechanical-biological plant before deposition is not usually expedient and these fractions should be subject to thermal treatment.

7.12. Hydrocarbon- or PAH-contaminated soils or materials similar to soil (biological treatment in ex-situ processes)

The biological treatment of hydrocarbon- and/or PAH-contaminated soil and/or materials similar to soil can represent a key ecologically and economically alternative to thermal treatment. In this case, biological treatment is carried out ex situ in ricks. As a basic principle, care should be taken to ensure that biological degradation actually takes place (hydrocarbons and PAHs) and not just a reduction of the pollutant concentration by dilution (e.g. mixing of soils with varying contamination) or through the volatility of certain pollutants (particularly hydrocarbons with a low boiling point).

Dilution is prohibited by the Waste Management Act 2002 and goes against the principles of sustainable waste management. It should be noted that for the purposes of the clearance procedure for potentially hazardous waste, the authorised expert or institution is obliged to confirm that there are no indications of the waste having been mixed with other materials (see also Annex 3 item II of the Ordinance on the Definition of Hazardous Waste and Hazardous Household Waste).

For biological treatment ex situ, ÖNORM S 2028 “Biological Treatment of Contaminated Soil” of 1 April 2004 should be consulted and can serve to assess the quality of the treatment and that of the treated materials.

In accordance with the state of the art, analytical control of the input streams and the output streams from the process is essential. The analytical control of every material to be treated must at least include the pollutants that will be degraded in the treatment. The identity of the output material with the input material is verified using reference parameters. It may also be necessary for the sake
of controlling individual risks to identify any retarding factors (pursuant to Chapter 5.2 of ÖNORM S 2028) as well as other characteristics (pursuant to Chapter 5.3 of ÖNORM S 2028). In order to exclude any illicit reduction of pollutant concentration by dilution (e.g. mixing of soils with varying contamination), proof needs to be provided that only soils or materials similar to the soil contaminated with degradable pollutants for which biological degradation under the basic conditions of the relevant treatment is fundamentally possible are being subjected to the biological treatment. Only such materials as are contaminated with the same pollutants and in similar concentrations can be treated together. The reduction of pollutants needs to be proven by measuring the difference in concentration before (input) and after (output) treatment.

With regard to the use of waste types (incl. the specific characteristics) for recovery (or disposal), cf. Annex 5 of the Ordinance on the Definition of Hazardous Waste and Hazardous Household Waste.

Generally, what needs to be pointed out is that the biological treatment of hydrocarbons and/or PAH-contaminated soils and/or materials similar to soil does not constitute mechanical-biological treatment as defined by the Landfill Ordinance.

7.13. Compost

Recovery by way of composting is permissible if the requirements of the Compost Ordinance are met and the guidelines on the state of the art for composting (2005) are observed. Further requirements to be met by the state of the art for the use of compost in gardening and landscape design are specified in standard ÖNORM S 2202-1 "Application Guidelines for Composts, Part 1: Gardening and Landscape Design and Technical Requirements" and Part 2 "Agricultural Applications". In order for it to qualify as recovery, at least 90% by weight of the materials belonging to SN Group 92 of the Water Catalogue Ordinance and accepted for composting must be recovered.

The provisions of the Compost Ordinance apply when it comes to assessing the admissibility of marketing composts. Utilisation of compost in the case of exports is considered environmentally sound once the minimum requirements for environmentally sound utilization have been met. When importing compost, the input materials and additives must not only meet the quality requirements; the basic principles of demonstrable quality assurance as set forth by the Compost Ordinance (incoming material inspection, separation of undesirables, documentation, requirements for composts, final product inspection with compost appraisal and declaration) also come to bear. The importer is responsible for fulfilling the obligations under the Compost Ordinance with regard to labelling, documentation and notification.

Provincial laws for soil protection must be observed, as well as the requirements of agricultural practice. As input materials for compost and fermenting plants, waste groups 921 through 925 under the Waste Directory Ordinance, ÖNORM S 2100 “Waste Catalogue" and ÖNORM S 2201 “Organic Waste – Quality Requirements" should be used, taking into account the quality requirements of the Compost Ordinance. Waste groups 922 and 925 may not be used for the production of high-grade compost intended for organic farming.

Household waste (household refuse and similar commercial waste collected through the waste collection system) may generally not be used for the production of compost and for subsequent application to the soil owing to the high levels of pollutants it contains.

The residues left over after composting consist of undesirables from incoming material controls and screenings from compost preparation. Undesirables found during the incoming material controls must be treated as residual waste. Screenings can either be fed back into the process or subjected to thermal/energy recovery. Small quantities of impurities (e.g. plastics) contained in the screen overflow have to be extracted and disposed of as residual waste before it is fed back into the composting process or sent to thermal processing in biomass combustion plants. Undesirables and impurities always need to be extracted and must not be mixed with the compost material.

Sanitation is ascertained by complying with the temperature and time guidelines published in the guidelines on the state of the art for composting. Additionally, with regard to the use of animal by-products (excl. the utilisation of catering waste and former foodstuffs which have not been in contact with raw meat or other animal by-products) attention needs to be paid to the microbiological parameters and application requirements of the Animal By-Product Regulation (EC) No 1069/2009. If catering waste is composted, including processed former foodstuffs of animal origin, the requirements under veterinary law pursuant to the Animal By-
Catering waste collected in a municipal collection system are exempt from the scope of the Animal Materials Act and the Animal By-Products Ordinance.

Agricultural recovery
In view of the influx of inorganic contents, the requirements for recovery by means of fertilization in agriculture should be geared toward the average application scenarios for soil protection regimes of the Federal Provinces which exist predominantly for the area of sewage sludge application. In so doing, the lower organic content of composted wastes (30% - 40% DM) compared to sewage sludge (50% - 60% DM) was taken into account. When defining the quantities to be applied in the course of recovery measures, the quality classes set forth in the Compost Ordinance should be used as a basis.

The Austrian Compost Ordinance defines three quality classes for composts according to inorganic pollutant contents (see Table):

- **Quality class A+** (highest quality)
- **Quality class A** (high quality)
- **Quality class B** (minimum quality for composts)

Note: The Austrian Compost Ordinance for the use of compost as a product in agriculture contains an exemption for quality class B and, based on the nutrient freights and thus applicable to quality class A+ and A, a limitation of the annual application quantity to 8 t animal materials per ha averaged over 5 years. This strict limitation is necessary for...
the use of a product that is no longer subject to the inspection regime under waste law. Under the soil protection regulations of the Federal Provinces, quality classes may be defined that deviate from those under the Compost Ordinance. The limit values of quality class B may however not be exceeded. Whenever animal by-products are used, a waiting period of 21 days between applying the compost and grazing or using the by-products as fodder must be observed according to Directive (EC) 1069/2009. Exempt is any compost for which process manures (liquid manure) or catering waste - constituting the only fraction that is relevant under the Animal By-Product Regulation - have been used in compliance with the national requirements.

Based on the approach described above and the quality classes defined under the Compost Ordinance, the following maximum application amounts are valid for suitable and approved recovery when undertaking agricultural recovery of compost as waste through fertilising measures.

- Quality class A+: application of a maximum of 16 t of animal materials per ha and year on a 5-year average, split over at least two applications.
- Quality class A: application of a maximum of 12 t of animal materials per ha and year on a 5-year average, split over at least two applications.
- Quality class B: application of a maximum of 4 t of animal materials per ha and year on a 5-year average. (Due to the markedly higher risk of misuse of quality class B compost, the use of this class in agriculture constitutes recovery only when a guideline for soil protection is available at Provincial level).

When local parameters are taken into account, the soil protection regulations of the Federal Provinces may contain stricter limitations, conformance to which is also a prerequisite for recovery to be admissible.

For recultivation and erosion protection measures with subsequent or possible future agricultural utilisation of the acreage, the single application of 160 t of animal materials per ha may not be exceeded. This kind of agricultural recovery may only be performed within the framework provided by an authorisation under water law. The compost used must comply at least with the limit values of quality class A.

### Quality classes pursuant to the Compost Ordinance

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Quality class A+</th>
<th>Quality class A</th>
<th>Quality class B*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cd</td>
<td>0.7 mg/kg DM</td>
<td>1 mg/kg DM</td>
<td>3.0 mg/kg DM</td>
</tr>
<tr>
<td>Cr</td>
<td>70 mg/kg DM</td>
<td>70 mg/kg DM</td>
<td>250 mg/kg DM</td>
</tr>
<tr>
<td>Hg</td>
<td>0.4 mg/kg DM</td>
<td>0.7 mg/kg DM</td>
<td>3.0 mg/kg DM</td>
</tr>
<tr>
<td>Ni</td>
<td>25 mg/kg DM</td>
<td>60 mg/kg DM</td>
<td>100 mg/kg DM</td>
</tr>
<tr>
<td>Pb</td>
<td>45 mg/kg DM</td>
<td>120 mg/kg DM</td>
<td>200 mg/kg DM</td>
</tr>
<tr>
<td>Cu</td>
<td>70 mg/kg DM</td>
<td>150 mg/kg DM</td>
<td>500 mg/kg DM</td>
</tr>
<tr>
<td>Zn</td>
<td>200 mg/kg DM</td>
<td>500 mg/kg DM</td>
<td>1,800 mg/kg DM</td>
</tr>
</tbody>
</table>

* In addition, the following reference values for the parameters copper (Cu) and zinc (Zn) should be observed:
  - Cu: 400 mg/kg DM
  - Zn: 1,200 mg/kg DM

If a target value is exceeded, the compost must be labelled accordingly.

### 7.14. Demolition and construction waste

Recycled construction materials are generated in recycling plants and result from the processing of construction and demolition waste; they are defined as mineral aggregates suitable for recovery in accordance with the material descriptions in the relevant standards (e.g. ÖNORM EN 13242 “Aggregates for unbound and hydraulically bound materials for use in civil engineering work and road...
In the case of underground constructions, it is waste concept purpose: The following measures, in particular, can serve this of recovery.

In order to produce aggregates from construction and demolition, which also lends itself to expedient recovery, the input materials for the recycling plant needs to be of good quality. Such quality can only be achieved by identifying pollutants at the construction site and through dismantling for the sake of recovery.

The following measures, in particular, can serve this purpose:

- A waste concept should be developed for the handling of waste originating from the construction, renovation or demolition of buildings with a gross internal volume of more than 5,000 m³. This applies equally to new building structures, conversions, demolition or general redevelopments of roads and railway tracks with a length exceeding 1,000 metres.

- In addition, pollutants must be determined and the results documented in accordance with ONR 192130 “Investigation of pollutants in buildings before demolition” (1 May 2006) for buildings with a gross internal volume of more than 5,000 m³. The same applies for all building structures where there is reason to suspect contamination with pollutants in view of their previous use, irrespective of their gross internal volume.

- The input materials for the production of recycled construction materials from structural engineering should be extracted by dismantling with a view to recovery and documented. The term “dismantling” (German: “Rückbau”) is defined in ÖNORM B 2251 “Demolition work - Works contract” (1 August 2006): “Buildings and building components should be dismantled in such a way as to ensure that they can be mostly recovered (recycled), re-used or disposed of properly. When dismantling a building, care should be taken to avoid mixing, contaminating and damaging the dismantled material. The different materials should be stored in separate locations. Dismantling should be carried out in reverse order from the construction of the building. Dismantling should start with the building components and fittings such as installations, windows, doors, floor constructions, insulating materials, roof constructions, facade constructions and similar objects.” One example of documentation is included in the publication “Verwertungsorientierter Rückbau – Ein Leitfaden für Bauherren und Ausführende” (ÖBRV 1996).

The number of steps dismantling involves depends on the types of materials used. Older building structures with a smaller number of different building materials can often be fully dismantled in just a few steps, while modern buildings generally require a number of disassembly steps, as insulation and easling layers, facade panels and similar objects must be removed before the building shell can be dismantled. Pollutants and sources of pollutants (materials containing asbestos and bitumen, used oil, fluorescent lamps, smoke detectors, etc.; for a comprehensive list, cf. ONR 192130 “Investigation of pollutants in buildings before demolition” of 1 May 2006), as well as furniture and furnishings (carpets, panelling, etc.) should be removed prior to demolition. Dust-like emissions and the release of mineral wool fibres (glass and rock wool) should be avoided.

Non-load-bearing building parts (incl. non-load-bearing walls) should also be removed or dismantled prior to demolition, whenever they are made of a material that will adversely affect the quality of the recycled construction materials to be produced (e.g. gypsum plasterboard, wood wool, etc.). Materials that need to be separated should be collected separately at the construction site.

The demolition material is to be declared as such at the recycling plant. Upon delivery of the material to the recycling plant, the plant operator obtains and checks the material declaration (e.g. the “Bau- restmassenachweisformular” and the report on the inspection for pollutants if required), as well as the dismantling report. A visual inspection should be carried out both at delivery and during unloading of the material. If relevant impurities are found which cannot be sorted out, the material must be rejected.

Grit from road sweeping may be subjected to recovery following pre-treatment (preliminary screening) in accordance with the 8th edition of the guidelines for recycled building materials published by
the Austrian Association for the Recycling of Building Materials and adopted in September 2009. The fine and coarse aggregate should be subjected to proper treatment. For instance, in order to be used as construction material (e.g. as an aggregate or a base material) this recovered aggregate can be treated together with the aggregates of material descriptions RA, RB, RM and RG, for as long as the limit values of table 1 and, in the case of a suspected contamination, of table 2 are observed.

Chapter A7.3 (incl. the relevant annexes) of the 8th edition of the guidelines for recycled building materials published by the Austrian Association for the Recycling of Building Materials (ÖBRV) and adopted in September 2009 governs the test specifications for environmental compatibility (internal and external monitoring).

The relevant applications permitted for recycled construction material depend on the quality of the material, which is rated according to the four quality grades A+, A, B and C (the latter is only applied to demolition material from structural engineering), defined in tables 1 and 2. The following key parameters are generally sufficient to give a quality rating.

If, based on the provenance of the construction and demolition waste, there are indications of a contamination during use or of elevated pollutant levels in the material (e.g. lead, chromium, copper and nickel contents in rail ballast) or if visual inspection raises concerns about possible contamination, then the parameters in the following list need to be checked in the construction materials to be recycled in which higher content levels are suspected: significant HC content is only permitted on condition that it originates from primary construction materials and not from oil contamination.

If there are indications of contaminants or if there is suspected contamination, the parameters and limit values in tables 5 and 6 of Annex 1 of the Landfill Ordinance of 2008 must be used and complied with for quality class C.

### Table 1: Quality classes: limit values for recycled construction materials

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Unit</th>
<th>Quality class A+</th>
<th>Quality class A</th>
<th>Quality class B</th>
<th>Quality class C (only construction and demolition waste from structural engineering projects)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eluate with a L/S 10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>pH value</td>
<td>-</td>
<td>7.5 to 12.5&lt;sup&gt;1&lt;/sup&gt;</td>
<td>7.5 to 12.5&lt;sup&gt;2&lt;/sup&gt;</td>
<td>7.5 to 12.5&lt;sup&gt;3&lt;/sup&gt;</td>
<td>7.5 to 12.5&lt;sup&gt;4&lt;/sup&gt;</td>
</tr>
<tr>
<td>Electrical conductivity</td>
<td>mS/m</td>
<td>150&lt;sup&gt;5&lt;/sup&gt;</td>
<td>150&lt;sup&gt;6&lt;/sup&gt;</td>
<td>150&lt;sup&gt;7&lt;/sup&gt;</td>
<td>250&lt;sup&gt;8&lt;/sup&gt;</td>
</tr>
<tr>
<td>Chromium, total</td>
<td>mg/kg DS</td>
<td>0.3</td>
<td>0.5</td>
<td>1</td>
<td>1.5</td>
</tr>
<tr>
<td>Copper</td>
<td>mg/kg DS</td>
<td>0.5</td>
<td>1</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>Ammonium (as N)&lt;sup&gt;9&lt;/sup&gt;</td>
<td>mg/kg DS</td>
<td>1</td>
<td>4</td>
<td>8</td>
<td>30</td>
</tr>
<tr>
<td>Nitrite (as N)&lt;sup&gt;10&lt;/sup&gt;</td>
<td>mg/kg DS</td>
<td>0.5</td>
<td>1</td>
<td>2</td>
<td>8</td>
</tr>
<tr>
<td>Sulphate (as SO&lt;sub&gt;4&lt;/sub&gt;)</td>
<td>mg/kg DS</td>
<td>1,500</td>
<td>2,500</td>
<td>6,000&lt;sup&gt;11&lt;/sup&gt;</td>
<td>6,000&lt;sup&gt;12&lt;/sup&gt;</td>
</tr>
<tr>
<td>CH index</td>
<td>mg/kg DS</td>
<td>1</td>
<td>3</td>
<td>5</td>
<td>40</td>
</tr>
<tr>
<td>Total content</td>
<td>PAH (16 compounds)&lt;sup&gt;13&lt;/sup&gt;</td>
<td>mg/kg DS</td>
<td>4</td>
<td>12</td>
<td>20</td>
</tr>
</tbody>
</table>

<sup>1</sup> For a pH value between 11.0 and 12.5, the limit value for electrical conductivity is 200 mS/m.
<sup>2</sup> Cf. section R4.1.4 of the 8th edition of the guidelines for recycled construction materials published by ÖBRV and adopted in 2009 if this value is exceeded.
<sup>3</sup> At a Ca/SO<sub>4</sub> ratio of ≥ 0.43 in eluate, the limit value is 8,000 mg/kg DS.
<sup>4</sup> Where the asphalt content is no higher than 5 M-%, this test is not carried out.
<sup>5</sup> At a Ca/SO<sub>4</sub> ratio of ≥ 0.43 in eluate, the limit value is 10,000 mg/kg DS.
<sup>6</sup> The result is considered within the limit value if the arithmetic mean of all test results over the 12 months preceding the test are within the limit value and no single test result has exceeded the respective tolerance limit. Cf. section A7.3.2 of the 8th edition of the guidelines for recycled construction materials published by ÖBRV and adopted in 2009 for the calculation method used for tolerance values.
The respective applications permissible for recycled construction materials depend on the quality classes. Depending on the application, a distinction should be made between use in bound form (analogous to the definition for stabilised base of the Austrian road construction guidelines and regulations (RVS 08.17.01), a layer reinforced with cement or mixed with a bituminous binder can be considered a bound layer), use in loose form with capping (capping is defined as a layer mixed with a binder such as asphalt or a concrete cover to prevent rain from seeping through the recycled construction material) and use in loose form without capping. It may also be used as an aggregate in asphalt and concrete production, where greater safety is achieved by the processing itself.

The second determining characteristic, alongside how it is used, are the hydro-geological conditions prevailing on site. Depending on the thickness of the geological layer above the groundwater level (depth-to-groundwater) as well as the thickness and permeability of any existing capping, sites can be differentiated by their hydrogeological sensitivity. Site conditions should always be assessed by experts in hydrogeology and groundwater management.

Given the general concern for keeping bodies of water clean (sec. 30 of the Austrian Water Act in conjunction with sec. 31 of the Austrian Water Act), recycled construction materials may not be used in the following areas:

- in protected areas pursuant to sections 34, 35 and 37 Austrian Water Act of 1959
- below the highest groundwater level (HGW)
- quality class B may not be used below the highest groundwater level plus 1.0 m (HGW+1 m)

### Table 2: Quality classes: additional limit values for recycled construction materials

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Unit</th>
<th>Quality class A+</th>
<th>Quality class A</th>
<th>Quality class B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eluate with a L/S 10</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Antimony</td>
<td>mg/kg DS</td>
<td>0.06</td>
<td>0.06</td>
<td>0.1</td>
</tr>
<tr>
<td>Arsenic</td>
<td>mg/kg DS</td>
<td>0.5</td>
<td>0.5</td>
<td>0.5</td>
</tr>
<tr>
<td>Barium</td>
<td>mg/kg DS</td>
<td>20</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>Lead</td>
<td>mg/kg DS</td>
<td>0.5</td>
<td>0.5</td>
<td>0.5</td>
</tr>
<tr>
<td>Cadmium</td>
<td>mg/kg DS</td>
<td>0.04</td>
<td>0.04</td>
<td>0.04</td>
</tr>
<tr>
<td>Molybdenum</td>
<td>mg/kg DS</td>
<td>0.5</td>
<td>0.5</td>
<td>0.5</td>
</tr>
<tr>
<td>Nickel</td>
<td>mg/kg DS</td>
<td>0.4</td>
<td>0.4</td>
<td>0.6</td>
</tr>
<tr>
<td>Mercury</td>
<td>mg/kg DS</td>
<td>0.01</td>
<td>0.01</td>
<td>0.01</td>
</tr>
<tr>
<td>Selenium</td>
<td>mg/kg DS</td>
<td>0.1</td>
<td>0.1</td>
<td>0.1</td>
</tr>
<tr>
<td>Zinc</td>
<td>mg/kg DS</td>
<td>4</td>
<td>4</td>
<td>18</td>
</tr>
<tr>
<td>Chloride</td>
<td>mg/kg DS</td>
<td>800</td>
<td>800</td>
<td>1,000</td>
</tr>
<tr>
<td>Fluoride</td>
<td>mg/kg DS</td>
<td>10</td>
<td>10</td>
<td>15</td>
</tr>
<tr>
<td>Phenolic index</td>
<td>mg/kg DS</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>DOC&lt;sup&gt;1&lt;/sup&gt;</td>
<td>mg/kg DS</td>
<td>500</td>
<td>500</td>
<td>500</td>
</tr>
<tr>
<td>TDS&lt;sup&gt;2&lt;/sup&gt;</td>
<td>mg/kg DS</td>
<td>4,000</td>
<td>4,000</td>
<td>8,000</td>
</tr>
</tbody>
</table>

**Total content**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Unit</th>
<th>Quality class A+</th>
<th>Quality class A</th>
<th>Quality class B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arsenic</td>
<td>mg/kg DS</td>
<td>20</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td>Lead</td>
<td>mg/kg DS</td>
<td>30</td>
<td>100</td>
<td>100&lt;sup&gt;3&lt;/sup&gt;</td>
</tr>
<tr>
<td>Cadmium</td>
<td>mg/kg DS</td>
<td>0.5</td>
<td>1.1</td>
<td>1.1</td>
</tr>
<tr>
<td>Chromium, total</td>
<td>mg/kg DS</td>
<td>40</td>
<td>90</td>
<td>90&lt;sup&gt;3&lt;/sup&gt;</td>
</tr>
<tr>
<td>Copper</td>
<td>mg/kg DS</td>
<td>30</td>
<td>90</td>
<td>90&lt;sup&gt;3&lt;/sup&gt;</td>
</tr>
<tr>
<td>Nickel</td>
<td>mg/kg DS</td>
<td>30</td>
<td>55</td>
<td>55&lt;sup&gt;3&lt;/sup&gt;</td>
</tr>
<tr>
<td>Mercury</td>
<td>mg/kg DS</td>
<td>0.2</td>
<td>0.7</td>
<td>0.7</td>
</tr>
<tr>
<td>Zinc</td>
<td>mg/kg DS</td>
<td>100</td>
<td>450</td>
<td>450</td>
</tr>
</tbody>
</table>

<sup>1</sup> Can be checked if own pH value or, alternatively, where L/S = 10 l/kg and pH value 7.5 to 8.3.
<sup>2</sup> The values for totally dissolved solids (TDS) can be used instead of those for sulphate and chloride. Sulphate must be determined in any case, however.
<sup>3</sup> Where the content in aggregates is due to geogenic factors, the limit values of Column II in Table 1 of Annex 1 of the Landfill Ordinance of 2008 is applicable (cf. also Chapter 7.16 on track excavation materials).
Quality class C describes recycled construction materials that can be used for building engineering purposes within a landfill (sub-)class for non-hazardous waste (without prejudice to the laws and regulations on the payment of a contribution for the remediation of contaminated sites) subject to the necessity and suitability of the construction and provided the plans exist as required and necessary where approved (e.g. approved peripheral walls with blueprints or drainage layers for the base drainage system defined in the landfill project). Engineering purposes do not include roads on the landfill site and levelling layers.

A quality assurance system must ensure consistent quality when producing these recycled construction materials. The quality assurance system covers the organisation, responsibilities, procedures, methods and means used in achieving these quality goals and includes guidelines on checking incoming material, internal and external monitoring, record-keeping obligations as well as labelling for user information.

Quality-assured, environmentally sound processing of mineral-based construction and demolition waste can be assumed (it is not necessary to comply with Chapter A8 of the guidelines) where the 8th edition of the guidelines for recycled building materials published by the Austrian Association for the Recycling of Building Materials (ÖBRV) and adopted in September 2009 are complied with and the above requirements have been met whenever indications or suspicions of contamination exist. These guidelines also set out the specifications for the construction criteria of recycled construction materials. The quality assurance system may, for instance, be documented using the quality label for recycled construction materials.

The Federal Ministry of Agriculture, Forestry, Environment and Water Management plans to issue an End-of-Waste Ordinance to complement the Waste Management Act of 2002 for quality classes A+ and A.

### 7.15. Excavated materials

Excavated material is material that is generated by the excavation or removal of soil or subsoil. The provisions below define the requirements for possible recovery methods.

Uncontaminated soil and other naturally occurring materials excavated in the course of construction work is not considered waste whenever it can be ascertained that the materials will be used for construction purposes in its natural state on the site from which it was excavated (cf. sec. 3 (1) (8) Waste Management Act of 2002).

For the continued development of the requirements set forth in this chapter, implementation is planned as part of a Treatment Obligations Ordinance for excavated material.

<table>
<thead>
<tr>
<th>Form of application</th>
<th>hydrogeologically sensitive area</th>
<th>hydrogeologically less sensitive area</th>
<th>within the landfill</th>
</tr>
</thead>
<tbody>
<tr>
<td>loose w/o capping</td>
<td>quality class A+</td>
<td>quality classes A+, A</td>
<td>quality classes A+, A, B, C</td>
</tr>
<tr>
<td>loose with capping</td>
<td>quality classes A+, A</td>
<td>quality classes A+, A, B</td>
<td>quality classes A+, A, B, C</td>
</tr>
<tr>
<td>as aggregate for asphalt or concrete</td>
<td>quality classes A+, A, B</td>
<td>quality classes A+, A, B</td>
<td>quality classes A+, A, B, C</td>
</tr>
</tbody>
</table>

1) Layers bonded with binders can be considered capping (asphalt layer or concrete cover) that prevents precipitation from seeping through the recycled construction material.

2) Recycled construction materials of different quality classes may be used for layers with a maximum thickness of 2 metres and a maximum cubage of 20,000 m³, provided the limit values of quality class A are only exceeded for the sulphate parameter by up to no more than 4,500 mg/kg DS.

3) Recycled construction materials of other quality classes may also be used for capping, provided the limit values of quality class A are only exceeded for the sulphate parameter by no more than 4,500 mg/kg DS.

4) Only in the case of landfills for non-hazardous waste, if the landfill leachate is collected from the area of use.
Excavated soil material
Excavated soil material is material that is generated by the excavation or removal of naturally produced soil or subsoil – also after relocation – to the extent that the inorganic non-soil components, e.g. mineral construction and demolition waste, account for no more than 5% by volume and the organic non-soil components, e.g. plastics, wood, do not make up more than 1% by volume. These non-soil constituents must be present in the soil or subsoil before excavation and removal.

The limitations for organic portions of non-soil components do not apply to plant components in humus-containing topsoil.

Technical fill material
Technical fill material is excavated material from structural layers, such as gravel layers, antifrost layers, and drainage layers, that, unlike excavated soil material, is not made of naturally produced soil or subsoil but rather is produced and put into place in compliance with technical specifications, e.g. by sifting it.

Depending on the source material, technical fill material should be classified into:

- waste code SN 31411 34 “Excavated soil”; technical filling material containing less than 5% by volume of non-soil inorganic components (e.g. construction and demolition waste) and less than 1% non-soil organic components (e.g. plastics or wood);
- waste code SN 31411 35 “Excavated soil”; technical filling material containing 5% by volume or more of non-soil inorganic components (e.g. construction and demolition waste) and less than 1% non-soil organic components (e.g. plastics or wood).

Slags should not be assigned to waste codes SN 31411 34 or 35 and are not covered by the provisions in this chapter.

Treated excavated materials
Treated excavated material as defined in this chapter is excavated soil, technical fill material and tunnel excavation material after biological, chemical and/or mechanical treatment.

7.15.1. Basic characterisation of excavated material
Where uncontaminated excavated soil material is to be recovered without prior treatment or processing, this material must be characterised beforehand by a competent external specialist or institute (for the special regulation for small amounts of uncontaminated soil excavation material < 2,000 tonnes, refer to Chapter 7.15.8). In principle, samples must be taken before the excavation or removal work begins. ÖNORM S 2126 “Basic characterization of dredged material prior to excavation or removal activities”, effective 1 December 2010, applies in conjunction with all requirements detailed in this chapter, particularly inasmuch with regard to the scope of the parameters, the quality classes and the limit values. Uncontaminated excavated soil material belonging to the first two categories under ÖNORM S 2126 may be recovered.

If heaps that have already been excavated undergo recovery, the basic characterisation of the excavated material in accordance with the Landfill Ordinance of 2008 must be conducted once initial excavation or removal work has commenced. In the process, the provisions of this chapter concerning the scope of the parameters, the quality classes and limit values apply.

The relevant sections of the Landfill Ordinance of 2008 are applicable for the basic classification of tunnel excavation material intended for recovery. For the scope of parameters to examine the main sample acceptance points, the quality classes and limit values the provisions of this chapter apply. Technical fill material (from a layer density of 20 cm) and excavated soil material from a construction site should be characterised as different ex-
cavation sites and assessed separately from each other. For layer densities of less than 20 cm of technical fill material, the material may be examined and excavated together with the excavated soil material.

**Scope of parameters**

An initial soil examination should be carried out, i.e. all parameters in tables 1 and 2 (see Chapter 7.15.9) from the respective field samples must undergo an analysis. In addition, the eluate parameters in table 3 (Chapter 7.15.9) should be analysed if there are plans to use the material immediately above the groundwater (class A2-G).

If the material is to be recovered as a recultivation layer for agricultural purposes (quality class A1) or as a recultivation layer in areas with a similar level of pollution (quality class BA), the total content of the parameters arsenic through zinc (see table 1, Chapter 7.15.9) should be examined in the (plant-available) fine fraction < 2 mm for each field sample used for the initial examination.

Where there is any suspected contamination or increased pollution levels not covered by the scope of parameters indicated here (e.g. PCBs, dioxins or pesticides), these parameters should be examined as well and assessed with a view to the specific recovery at hand. Further testing (e.g. eco-toxicological testing) may be needed to assess the expediency of recovery.

The scope of parameters for the initial soil analysis is designed in such a manner that not only the recovery can be assessed, but also the admissibility of depositing (except in mass waste landfills, where the total barium and silver content also need to be determined) without requiring an analysis of additional parameters.

**Compliance with limit values / specific values**

The assessment value of each portion must comply with all limit values of the desired quality class (as per tables 1 through 3), otherwise the respective portion must either be assigned a different quality class (in application of all required limit values) or subjected to a detailed examination. If some or all portions cannot be assigned to a quality class (A1 through BA) following a detailed examination, recovery (without treatment) is not permitted for these portions.

The specific values should always be met in order to ensure the relevant soil functions. Any departures from the specific values are permissible if assurance of the relevant soil functions necessary for a specific recovery measure can still be demonstrated.

**Documenting basic characterisation**

The basic characterisation must be documented in an assessment report. Sampling prior to the excavation or removal work for the use of materials must be ensured in compliance with the minimum requirements of ÖNORM S 2126. If samples are taken after the excavation or removal work has commenced, the minimum requirements of the Landfill Ordinance of 2008 are applicable.

Moreover, if specific values diverge or material is to be used in sites exhibiting a similar level of pollution (class BA, q.v.), the authorised specialist institute needs to confirm that the specific recovery activity is permitted.

**Validity of assessment reports**

Assessment reports providing basic characterisation prior to commencement of the excavation or removal work are valid for a period of ten years. If the assessment report was issued more than three years prior to the start of the installation, the authorised expert or institute is obliged to confirm that the present assessment report still accurately describes the current situation.

Assessment reports providing basic characterisation after commencement of the excavation or removal work are valid for a period of no more than three years.

**Backup samples**

Of all qualified random samples taken, backup samples (of at least 1 kg) must be retained for a minimum of one year after issuance of the respective assessment report.

**7.15.2. Use of excavated soil material**

Uncontaminated excavated soil material may be used for recultivation or underground backfilling activities. A recultivation layer and any underground backfilling must meet certain quality criteria (pollutant content, leaching properties) and specific geological values, both to guarantee soil functionality and prevent damage from the soil to the plant (especially in food and feed production), as well as from the soil to the groundwater.

In the course of basic characterisation, an authorised expert or institute must assign one of the following recovery quality classes prior to recultivation or underground backfilling.
Class A1 – Use as agricultural recultivation layer
Uncontaminated excavated soil material of quality class A1 may be used as a recultivation layer (root-penetrable layer of a depth of no more than 2 metres) for agricultural purposes. The limit values of this quality class are primarily optimised for plants as a protected good, and thus require an assessment of the total pollution content for the fines < 2 mm.
For this quality class, use is permitted in all areas on which food and feed is produced or where the vegetation cover is to be fed to livestock. This also applies, for example, where grass cuttings from parks are fed to livestock or where livestock are put out to graze on ski slopes that are being recultivated.
Uncontaminated excavated soil material of quality class A1 may be used for non-agricultural recultivation layers and for soil improvement.

Class A2 – Use as underground backfilling
Uncontaminated excavated soil material of quality class A2 may be used for underground backfilling (except in and directly above groundwater). The limit values have been established primarily to protect the groundwater.
In addition, the use for recultivation layers (root-penetrable layers) is permitted if the agricultural use of this area and utilisation of the plant covering as feed can be excluded with a high degree of certainty (e.g. road embankments, green verges in traffic areas, cloverleaf junctions).

Class A2-G – Use in and directly above the groundwater
Uncontaminated excavated material of quality class A2-G may – in addition to the potential applications of quality class A2 – also be used for underground backfilling in and directly above the groundwater.

“Directly above the groundwater" refers to the area between the highest groundwater level and 1 metre above this level.

Class BA – Special rules for excavated soil material with higher background contamination
Uncontaminated excavated soil material of quality class BA may be used as a recultivation layer or as underground backfilling in areas with a similar pollution profile. The authorised expert or institute needs to verify this for each specific application through appropriate examinations and certify this in the assessment report.
If only the higher limit values (footnote 8, table 1) can be met due to geogenic background pollution, the authorised expert or institute is obliged to provide an explanation and certify that this is in fact caused by geogenic background pollution. The assessment report and the planned implementation of a specific application must be coordinated with the competent waste authority prior to installation by the responsible developer.
Material of this quality class may in no case be used as underground backfilling in and directly above the groundwater.

7.15.3. Use of technical fill material
Uncontaminated technical fill material belonging to waste categories SN 31411 34 or SN 31411 35 may be re-used as construction work material for structural engineering purposes, even without further treatment. In such cases, the material must undergo basic characterisation in accordance with Chapter 7.15.1; the provisions of Chapter 7.14 (Construction and demolition waste) specify which parameters need to be assessed, the applicable limit values of the quality classes and the potential applications.

<table>
<thead>
<tr>
<th>Overview of applications of the individual quality classes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class</td>
</tr>
<tr>
<td>-------</td>
</tr>
<tr>
<td>Class A1</td>
</tr>
<tr>
<td>Class A2</td>
</tr>
<tr>
<td>Class A2-G</td>
</tr>
<tr>
<td>Class BA</td>
</tr>
</tbody>
</table>

\(^{(1)}\) If the limit values for total TOC and TOC in eluate of A2 are observed, underground backfilling is also permitted.
\(^{(2)}\) Only in areas with a similar pollution profile in coordination with the local competent waste authority.
Technical fill material also has to undergo processing (e.g. using a mobile screening plant) prior to being used. Substances (undesirables) extracted during processing should be subjected to further admissible treatment (recovery/disposal). The related guidelines published by the Austrian Association for the Recycling of Building Materials (BRV) may be used in this treatment process.

The prohibition to mix pursuant to sec. 15 (2) Waste Management Act of 2002 must be observed during processing and recovery of the material.

If the material is recovered as recycled construction material, the requirements of Chapter 7.14 (Construction and demolition waste) apply.

Underground backfilling using technical fill material is not permitted.

**7.15.4. Recovery of tunnel excavation material**

Material from tunnel excavation may be used for underground backfilling or as recycled construction material if it meets the quality criteria. The provisions in this chapter apply to underground backfilling; those of Chapter 7.14 (Construction and demolition waste) apply to the use of this material as recycled construction material. The related guidelines published by the Austrian Association for the Recycling of Building Materials (BRV) may be used in this treatment process.

**7.15.5. Requirements for the implementation of underground backfilling or the production of a recultivation layer**

Bearing in mind that this type of recovery creates and applies new soil, the underground backfilling and recultivation layers must take the structure and properties of natural soil as their point of reference. Underground backfilling is not permitted without a suitable recultivation layer, unless it is done under another construction (e.g. roads, buildings or pathways).
If material of quality class BA is to be used for recultivation or underground backfilling, the use is only permissible in areas with a similar pollution profile. The assessment report and the planned implementation of a specific recovery measure should be coordinated with the competent waste authority prior to installation by the responsible developer.

Recultivation layer:
For recultivation layers (root-penetrable layers up to a maximum depth of 2 m) the layered structure, which orients itself on the structure of a natural soil, is to be ensured with particular consideration of the graduated content in organic substances and nutrients. Therefore, the structure of a recultivation layer needs to be created according to specific plans. The separately collected humus-bearing topsoil should be used as topsoil material in a recultivation layer.

The guidelines for the proper recultivation of soil used in agriculture and forestry as published by the Soil Recultivation working group of the Expert Committee for Soil Fertility and Protection (Fachbeirat für Bodenfruchtbarkeit und Bodenschutz, Arbeitsgruppe Bodenrekultivierung) should be observed for any agricultural, non-agricultural or forestry-related recultivation. The (ecological) benefits of each recultivation measure must be demonstrated. If the benefits cannot be demonstrated or if the provisions in this chapter are not observed during recultivation, the measure should be treated as a removal operation.

Underground backfilling:
The (ecological or technical) benefits of underground backfilling also require justification. In the case of underground backfilling that serves a specific structural engineering purpose and is part of a specific construction project (e.g. filling or topsoil replacement in connection with dam construction and substructures for roads, railways or foundations, the filling of foundations or ditches or construction of a noise abatement barrier) it is sufficient to provide the certification of compliance with the pollutant limits (tables 1 and 2) and the certification of technical suitability (e.g. based on the relevant standards and guidelines) to demonstrate the benefits. If the benefits cannot be demonstrated or if the provisions in this chapter are not observed in the underground backfilling, the measure should be treated as a disposal operation.

Each underground backfilling should be capped by a recultivation layer that is commensurate with the intended use and the function of the soils in the region, unless under a structural entities (e.g. roads, buildings or pathways). If it cannot be ruled out that the recultivation layer will be used for agricultural purposes, the material used for the recultivation layer must be of quality class A1 and have a minimum thickness of 1.2 metres. Material of quality class A1 may be used for underground backfilling if the limit value for TOC in eluate (for A2) is observed; this must be explicitly assessed during the basic characterisation of the material and documented in the assessment report. Topsoil containing humus must not be used for underground backfilling. Only excavated soil material of quality class A2-G may be used for underground backfilling in and directly above the groundwater level.

7.15.6. Using excavated soil material as concrete aggregate
Excavated soil material or technical fill material (SN 31411 34) to be used as a concrete aggregate must undergo basic characterisation in accordance with Chapter 7.15.1. The provisions of Chapter 7.14 (Construction and demolition waste) cover the parameters to be examined, the applicable limit values of the quality classes and the potential applications.

7.15.7. Documenting a recovery operation
Any recovery measure for excavated soil material or technical fill material with a total mass of more than 2,000 tonnes should be documented in an installation information document by the developer instructing the installation of the material; this document must indicate the following minimum information:
- place of installation
- purpose of installation / description of the benefits achieved by the operation
- type of use (e.g. as a recultivation layer)
- mass of the installed material
- drawing of the installation with standard section (layers)
- reference number of the assessment report used for basic characterisation of the installed excavated material
- certification that no impurities were detected during installation

The appropriate form, available for download from the website of the Federal Ministry of Agriculture, Forestry, Environment and Water Management,
must be used for this installation information document.
The developer instructing the installation is obliged to retain this installation information document and the corresponding assessment report along with his/her records for a minimum of seven years.

7.15.8. Special rules for the recovery of small quantities < 2,000 tonnes from harmless areas without analysis

The basic characterisation of excavated material does not need to be subjected to an analysis if the following conditions are met:

- The total quantity of material excavated during a construction project or on a construction site is no more than 2,000 tonnes (equivalent to approx. 1,300 m³).
- The material is excavated soil material (less than 5% by volume of non-soil inorganic components and less than 1% by volume of non-soil organic components).
- No known (prior) industrial use on the site from which the small quantity is excavated, nor commercial (prior) use which could indicate soil contamination.
- There is no known contamination with pollutants (heavy metals, organic pollutants, etc.) and no such contamination was discovered during the excavation.

The installation of excavated material subjected to basic characterisation without chemical analysis in accordance with the above provisions is restricted as follows:

- Installation only for projects in which up to at total of 2,000 tonnes of excavated material are used for a recultivation layer or in underground backfilling.
- Where local background pollution is known to exist, the material may only be used in the same area that exhibits this background pollution.

Assuming compliance with the above provisions, the material can be used for recultivation for agricultural and non-agricultural purposes, as well as underground backfilling (unless in or directly above the groundwater level).

The waste producer (developer) is obliged to record the waste information in a specific document for small amounts of excavated soil material (“Abfallinformation für Kleinnengen Boden­aus­hubmaterial”), sign it and hand it over to the developer who instructed the use of the small quantity of material. The latter must keep this document with his/her records for a period of seven years.

The company in charge of the excavation work is obliged to describe the excavated material and certify by signing that no contamination was evident from the visual check.

The pertinent forms provided by the Federal Ministry of Agriculture, Forestry, Environment and Water Management should be used for this information. They can be obtained on the Ministry’s website.

7.15.9. Parameters and limit values for individual quality classes

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Class A1</th>
<th>Class A2-G</th>
<th>Class A2</th>
<th>Class BA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arsenic (as As) in [mg/kg DM]</td>
<td>20</td>
<td>30</td>
<td>30</td>
<td>50/200</td>
</tr>
<tr>
<td>Lead (as Pb) in [mg/kg DM]</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>150/500</td>
</tr>
<tr>
<td>Cadmium (as Cd) in [mg/kg DM]</td>
<td>0.5</td>
<td>1.1</td>
<td>1.1</td>
<td>2/4</td>
</tr>
<tr>
<td>Chromium, total (as Cr) in [mg/kg DM]</td>
<td>100</td>
<td>90</td>
<td>100</td>
<td>300/500</td>
</tr>
<tr>
<td>Cobalt (as Co) in [mg/kg DM]</td>
<td>50</td>
<td>30</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>Copper (as Cu) in [mg/kg DM]</td>
<td>60</td>
<td>60</td>
<td>90</td>
<td>100/500</td>
</tr>
<tr>
<td>Nickel (as Ni) in [mg/kg DM]</td>
<td>60</td>
<td>55</td>
<td>60</td>
<td>100/500</td>
</tr>
<tr>
<td>Mercury (as Hg) in [mg/kg DM]</td>
<td>0.5</td>
<td>0.7</td>
<td>0.7</td>
<td>1/2</td>
</tr>
<tr>
<td>Zink (as Zn) in [mg/kg DM]</td>
<td>150</td>
<td>300</td>
<td>450</td>
<td>500/1,000</td>
</tr>
<tr>
<td>*BTEX in [mg/kg DM]</td>
<td>0.5</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>HC index in [mg/kg DM]</td>
<td>50/100/200</td>
<td>20</td>
<td>50/100/200</td>
<td>50/100/200</td>
</tr>
<tr>
<td>PAH (16 compounds) in [mg/kg DM]</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>PAH (benz[a]pyrene) in [mg/kg DM]</td>
<td>0.2</td>
<td>0.2</td>
<td>0.2</td>
<td>0.4</td>
</tr>
</tbody>
</table>
### Table 1: Initial analysis of soil - total contents

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Class A1</th>
<th>Class A2-G</th>
<th>Class A2</th>
<th>Class BA</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>PCB</em> (7 compounds) in [mg/kg DM]</td>
<td>0.1</td>
<td>0.1</td>
<td>0.1</td>
<td>1</td>
</tr>
<tr>
<td><em>POX</em> in [mg/kg DM]</td>
<td>(5,000)</td>
<td>10,000(^{6}) (applicable for underground backfilling)</td>
<td>10,000(^{6}) () (applicable for underground backfilling)</td>
<td></td>
</tr>
<tr>
<td>TOC (as C) in [mg/kg DM]</td>
<td>(5,000)</td>
<td>(10,000)(^{5}) (applicable for underground backfilling)</td>
<td>(10,000)(^{5}) () (applicable for underground backfilling)</td>
<td></td>
</tr>
</tbody>
</table>

* ... only to be examined in case of suspicion (even if there is no limit value for recovery)

\(1\) 1 mg/kg DM at a pH value ≥ 6; pH value according to ÖNORM L 1083

\(2\) 50 mg/kg DM for excavated soil and material with a TOC ≤ 5,000 mg/kg DM

\(3\) 100 mg/kg DM for excavated soil and material with a TOC > 5,000 mg/kg DM and ≤ 20,000 mg/kg DM

\(4\) 200 mg/kg applies for excavated soil and excavated soil material with TOC > 20,000 mg/kg DM

\(5\) by drying at 30° Celsius

\(6\) Excavated soil from industrial, commercial and residential areas with PAH background contamination of up to 20 mg/kg DM can be used for infilling in areas with similar contamination outside the groundwater and directly above the groundwater level; in the process, the formation of water seepage is to be prevented by sealing and compressing the surface.

\(7\) The specific values of the Recultivation Guidelines apply for the creation of recultivation layers.

\(8\) For excavated material containing peat it is necessary to coordinate with the public authority; exemptions are permissible in individual cases.

\(9\) Each field sample must also be analysed for pollution in the fraction < 2 mm if the material is to be recovered in the form of a recultivation layer for agricultural purposes (class A1) or as a recultivation layer in areas with a similar pollution profile (class BA).

\(10\) If the content of a pollutant in excavated soil material is due to geogenic factors, the limit value may be exceeded up to the higher indicated limit value.

### Table 2: Initial analysis soil - Eluate contents

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Class A1</th>
<th>Class A2-G</th>
<th>Class A2</th>
<th>Class BA</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH value(^{5})</td>
<td>4(^{6})</td>
<td>6.5-9.5</td>
<td>Specific value for underground backfilling: 4.5-8(^{6})</td>
<td>Specific value for underground backfilling: 4.5-8(^{6})</td>
</tr>
<tr>
<td>Electrical conductivity(^{4}) in [mS/m]</td>
<td>4(^{6})</td>
<td>50</td>
<td>Specific value for underground backfilling: 40(^{6})</td>
<td>Specific value for underground backfilling: 40(^{6})</td>
</tr>
<tr>
<td>Evaporation residue in [mg/kg DM]</td>
<td>(5,000)</td>
<td>()</td>
<td>()</td>
<td>()</td>
</tr>
<tr>
<td>Aluminium (as Al) in [mg/kg DM]</td>
<td>()</td>
<td>()</td>
<td>()</td>
<td>()</td>
</tr>
<tr>
<td>Antimony (as Sb) in [mg/kg DM]</td>
<td>()</td>
<td>()</td>
<td>()</td>
<td>()</td>
</tr>
<tr>
<td>Arsenic (as As) in [mg/kg DM]</td>
<td>0.3</td>
<td>0.3</td>
<td>0.3</td>
<td>0.5</td>
</tr>
<tr>
<td>Barium (as Ba) in [mg/kg DM]</td>
<td>10</td>
<td>5</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Lead (as Pb) in [mg/kg DM]</td>
<td>0.3</td>
<td>0.3</td>
<td>0.3</td>
<td>1</td>
</tr>
<tr>
<td>Cadmium (as Cd) in [mg/kg DM]</td>
<td>0.03</td>
<td>0.03</td>
<td>0.03</td>
<td>0.05</td>
</tr>
<tr>
<td>Chromium, total (as Cr) in [mg/kg DM]</td>
<td>0.3</td>
<td>0.3</td>
<td>0.3</td>
<td>1</td>
</tr>
<tr>
<td>Cobalt (as Co) in [mg/kg DM]</td>
<td>1</td>
<td>0.5</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Iron (as Fe) in [mg/kg DM]</td>
<td>()</td>
<td>()</td>
<td>()</td>
<td>()</td>
</tr>
<tr>
<td>Copper (as Cu) in [mg/kg DM]</td>
<td>0.6</td>
<td>0.6</td>
<td>0.6</td>
<td>2</td>
</tr>
<tr>
<td>Molybdenum (as Mo) in [mg/kg DM]</td>
<td>0.5</td>
<td>0.5</td>
<td>0.5</td>
<td>0.5</td>
</tr>
<tr>
<td>Nickel (as Ni) in [mg/kg DM]</td>
<td>0.6</td>
<td>0.6</td>
<td>0.6</td>
<td>1</td>
</tr>
<tr>
<td>Mercury (as Hg) in [mg/kg DM]</td>
<td>0.01</td>
<td>0.01</td>
<td>0.01</td>
<td>0.01</td>
</tr>
<tr>
<td>Selenium (as Se) in [mg/kg DM]</td>
<td>0.1</td>
<td>0.1</td>
<td>0.1</td>
<td>0.1</td>
</tr>
<tr>
<td>Silver (as Ag) in [mg/kg DM]</td>
<td>0.2</td>
<td>0.2</td>
<td>0.2</td>
<td>0.2</td>
</tr>
<tr>
<td>Zin(k) (as Zn) in [mg/kg DM]</td>
<td>18</td>
<td>18</td>
<td>18</td>
<td>20</td>
</tr>
<tr>
<td>Tin (as Sn) in [mg/kg DM]</td>
<td>2</td>
<td>0.5</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Ammonium (as N) in [mg/kg DM]</td>
<td>8</td>
<td>1</td>
<td>8</td>
<td>8(^{5})</td>
</tr>
<tr>
<td>Cyanide, easily releasable (as CN) in [mg/kg DM]</td>
<td>0.2</td>
<td>0.1</td>
<td>0.2</td>
<td>0.2</td>
</tr>
<tr>
<td>Fluoride (as F) in [mg/kg DM]</td>
<td>20</td>
<td>15</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>Nitrate (as N) in [mg/kg DM]</td>
<td>100</td>
<td>70</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Nitrite (as N) in [mg/kg DM]</td>
<td>2</td>
<td>0.5</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Phosphate (as P) in [mg/kg DM]</td>
<td>5</td>
<td>1</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Sulphate (as SO(_4)) in [mg/kg DM]</td>
<td>1500</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
7.15.10. Recovery of contaminated excavated material after treatment

Whenever contaminated excavated material is to be used for recovery, the waste must be subjected to biological, chemical and/or physical/mechanical treatment and a chemical analysis must be carried out to determine whether the material is suitable for recovery. Furthermore, when treating hazardous contaminated excavated materials it should be ensured that the waste does not exhibit any hazard-related properties following treatment. To confirm this, a clearance procedure must be carried out in accordance with sec. 7 Waste Management Act of 2002. Hazardous contaminated excavated materials must not be subjected to a recovery procedure.

Off-site biological treatment must comply with the provisions of Chapter 7.12. One major prerequisite for this is that the input and output streams of the treatment process are subjected to an analytical analysis in accordance with the state of the art. At the very least, the scope of the analytical analysis of each batch of material to be treated should extend to the pollutants that are to be degraded during treatment. The identity of the output material and the input material should be determined using key parameters. Recovery from exclusively physically/mechanically treated (screened) excavated materials is permissible for the purpose of underground backfilling or for use in a recultivation layer as long as a chemical analysis shows that the treated material is suitable for this application. This requires basic characterisation of each treated waste according to the investigation model for other, non-repeating waste pursuant to Chapter 1.5, Part 2, Annex 4 of the Landfill Ordinance of 2008. The limit values of the various quality classes for recovery in accordance with Chapter 7.15.9. apply.

Biologically or chemically treated excavated material must not be used directly in underground backfilling or in a recultivation layer. This material may,
however, be recovered as recycled construction material after treatment once the material has undergone basic characterisation according to the following two examination models of the Landfill Ordinance of 2008 prior to release for the recycling procedure:

- other non-recurring waste (Chapter 1.5, Part 2, Annex 4)
- recurring waste (Chapter 2, Part 2, Annex 4)

This basic characterisation is carried out as proof of compliance with the relevant limit values in Chapter 7.14. (Construction and demolition waste) for each individual quality class and application; the parameter “PAH total content” must be examined in any case.

7.16. Track excavation material

Track excavation material is accumulated at construction sites on railway tracks and consists of the following fractions (or mixes thereof):

- Rail ballast: ballast (natural, crushed, unbound aggregates from mineral sources), including abraded and fine material with undefined micro-aggregate;
- Base material: a layer produced from technical fill material, bounded at the top by the track formation and at the bottom by the substructure; the thickness is usually between 20 cm and 45 cm;
- Subsoil material: natural in-situ soil or excavated material even after it has been shifted (e.g. in dam construction) that is below the substructure.

These individual fractions should be collected separately, if possible, and analysed by an authorised expert or institute to ensure that recovery is carried out reliably.

Re-use or recovery of such materials is possible both on and off railway construction sites – provided the provisions of this chapter are observed. The tables below describe the permissible methods for re-use and recovery of rail ballast, base and subsoil material from areas with low and higher likelihood of contamination.

Ballast or base material from obviously contaminated areas (e.g. with oil, Diesel, solvents, etc.) should be disposed of or recovered only after treatment and if the relevant limit values are met.

Rail ballast and base material may only be used for soil improvement (installation in subsoil) if it is sourced from areas with a low likelihood of contamination.

Basic characterisation of excavated track material

If track excavation material is to be recovered, a preliminary assessment and subsequent horizontal and vertical classification of the planned excavation sites must be carried out in accordance with Chapter 1.4 Annex 4 Part 1 of the Landfill Ordinance of 2008.

Ballast from areas with a low likelihood of contamination which is intended to be re-used on the site as ballast or base material requires basic characterisation only in form of an organoleptic test, carried out by an external authorised expert or institute (see also table). For all other types of track excavation material to be recovered on-site or off-site, basic characterisation must include a chemical analysis. The taking of samples should be planned (benchmarks, sam-
### Applications and scope of parameters for recovery and re-use of track excavation material

#### Use and re-use of ballast material

<table>
<thead>
<tr>
<th>No.</th>
<th>Material designation prior to excavation</th>
<th>Area of use</th>
<th>Parameter scope for track areas with low likelihood of contamination</th>
<th>Parameter scope for track areas with high likelihood of contamination</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ballast material</td>
<td>Re-use as ballast at same track construction site (on-site)</td>
<td>organoleptic examination by external competent FP/FA</td>
<td>Tables 1 and 2 of Chapter 7.14. Construction and demolition waste</td>
</tr>
<tr>
<td>2</td>
<td>Ballast material</td>
<td>Use as base on the same track construction site (on-site)</td>
<td>organoleptic examination by external competent FP/FA</td>
<td>Tables 1 and 2 of Chapter 7.14. Construction and demolition waste</td>
</tr>
<tr>
<td>3</td>
<td>Ballast material</td>
<td>Use for soil improvement in underground (on-site)</td>
<td>Table 1 of Chapter 7.14, Construction and demolition waste</td>
<td>Not permitted</td>
</tr>
<tr>
<td>4</td>
<td>Ballast material</td>
<td>Re-use as ballast on a different track construction site (off-site)</td>
<td>Table 1 of Chapter 7.14, Construction and demolition waste</td>
<td>Tables 1 and 2 of Chapter 7.14. Construction and demolition waste</td>
</tr>
<tr>
<td>5</td>
<td>Ballast material</td>
<td>Use as recycled construction material (off-site)</td>
<td>Table 1 of Chapter 7.14, Construction and demolition waste</td>
<td>Tables 1 and 2 of Chapter 7.14. Construction and demolition waste</td>
</tr>
</tbody>
</table>

#### Use and re-use of base material

<table>
<thead>
<tr>
<th>No.</th>
<th>Material designation prior to excavation</th>
<th>Area of use</th>
<th>Parameter scope for track areas with low likelihood of contamination</th>
<th>Parameter scope for track areas with high likelihood of contamination</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>Base material</td>
<td>Re-use as base material on site</td>
<td>Table 1 of Chapter 7.14, Construction and demolition waste</td>
<td>Tables 1 and 2 of Chapter 7.14. Construction and demolition waste</td>
</tr>
<tr>
<td>7</td>
<td>Base material</td>
<td>Use for soil improvement in underground (on-site)</td>
<td>Table 1 of Chapter 7.14, Construction and demolition waste</td>
<td>Not permitted</td>
</tr>
<tr>
<td>8</td>
<td>Base material</td>
<td>Re-use as base material on another track construction site (off-site)</td>
<td>Table 1 of Chapter 7.14, Construction and demolition waste</td>
<td>Tables 1 and 2 of Chapter 7.14. Construction and demolition waste</td>
</tr>
<tr>
<td>9</td>
<td>Base material</td>
<td>Use as recycled construction material (off-site)</td>
<td>Table 1 of Chapter 7.14, Construction and demolition waste</td>
<td>Tables 1 and 2 of Chapter 7.14. Construction and demolition waste</td>
</tr>
</tbody>
</table>

#### Use of subsoil material

<table>
<thead>
<tr>
<th>No.</th>
<th>Material designation prior to excavation</th>
<th>Area of use</th>
<th>Parameter scope for track areas with low likelihood of contamination</th>
<th>Parameter scope for track areas with high likelihood of contamination</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>Subsoil material</td>
<td>Use as excavated soil material</td>
<td>Chapter 7.15. Excavated material</td>
<td>Chapter 7.15. Excavated material</td>
</tr>
</tbody>
</table>

![Diagram of track excavation material usage](image-url)
pling density, number of subsets, etc.) and carried out in accordance with the relevant provisions of Chapter 1.4 Annex 4 Part 1 of the Landfill Ordinance of 2008, depending on the horizontal and vertical classification. Subsoil material, as excavated soil material, has to undergo basic characterisation in accordance with Chapter 7.15 (Excavated materials).

The scope of parameters for the chemical examination should be taken from the table for the respective intended application(s). If there is no proof that no herbicides have been used for at least one year (minimum waiting period) on the track sections to be examined, the field samples should also be tested for herbicide residues and permissibility of the intended recovery needs to be verified. Interim storage of the track excavation material counts towards the waiting period.

**Compliance with the limit values:**
Ballast or base material to be re-used or recovered in track construction (on or off-site, applications 1 through 4 and 6 through 8 in the table) must at least meet the limit values of quality class B in accordance with Chapter 7.14 (Construction and demolition waste).

For applications 1 and 2 in the table, adherence to the limit values of quality class B in Chapter 7.14 (Construction and demolition waste) is assumed after performance of the organoleptic test by an authorised expert or institute in areas with a low likelihood of contamination.

Where ballast or base material is recovered for use as recycled construction material away from track construction sites (applications 5 and 9), the quality classes and limit values and related areas of use (bound/unbound, capped/uncapped) for recycled construction materials as set forth by Chapter 7.14 (Construction and demolition waste) apply.

If the parameters for nickel, chromium, copper and lead are exceeded due to geogenic factors, the following applies:

» For use or recovery as ballast or base material in track construction (applications 1, 2, 4, 6 and 8 in the table) there is no limitation as to the total content of nickel, chromium, copper and lead if caused by geogenic factors.

» If ballast or base material is to be recovered in the subsoil (applications 3 and 7 in the table) or as recycled construction materials of quality class B away from track construction sites (applications 5 and 9 in the table) the total content of nickel, chromium, copper and lead must not exceed the limit values of column II, Table 1, Annex 1 of the Landfill Ordinance of 2008.

For the subsoil material the relevant limit values, quality classes and other regulations in Chapter 7.15 (Excavated materials) apply.

**Documentation of basic characterisation:**
The basic characterisation must be documented in an assessment report. The relevant minimum requirements of the Landfill Ordinance of 2008 apply.

If the limit values for the total content of nickel, chromium, copper or lead (Pb) are exceeded, the authorised expert should certify in the relevant assessment report that the exceedance of limit values is in fact caused by geogenic background pollution rather than any other causes, such as local contamination. The breakdown of Ni, Cr, Cu and Pb contents and their distribution in the individual field samples of that section of railway track may be used for the assessment.

For a basic characterisation based on organoleptic testing (applications 1 and 2) the results of the preliminary assessment or the organoleptic testing should be documented in a assessment report by the authorised expert.

**Validity of the assessment report:**
Assessment reports providing basic characterisation prior to commencement of the excavation or removal work are valid for a period of ten years. If the assessment report was issued more than three years prior to the start of recovery or re-use, the authorised expert or institute is obliged to confirm that the present assessment report still accurately describes the current situation.

Assessment reports providing basic characterisation after commencement of the excavation or removal work are valid for a period of no more than three years.

**Backup samples**
Of all qualified random samples taken, backup samples (of at least 1 kg) must be taken and retained for a minimum of one year after completion of the respective assessment report.

**Guidelines for track excavation work**
Technical guidelines on the re-use, recovery and disposal of track excavation material are currently being drawn up in coordination with the Federal Ministry of Agriculture, Forestry, Environment and
Water Management. These guidelines provide detailed technical specifications on the requirements of this chapter.

7.17. Soils from waste

The following criteria constitute minimum requirements for the production of soils from waste through recovery. For actual recycling, the prevalent local conditions must also be taken into consideration. This means, for instance, that further limitations or additional requirements with respect to the application of soils compared to the following requirements may be necessary. Compliance with existing soil conservation regulations, however, is a prerequisite for any permissible recovery measure.

Definition of terms
Soils from waste consist of uncontaminated mineral-organic material that is identical or similar to soil, corresponding in its essential characteristics to natural soil or subsoil and which can fulfil relevant soil functions (e.g. habitat, filter, barrier and transformation).

Based on the materials employed, a differentiation is made between:
- soils exclusively from excavated soil material;
- soils produced using non-soil constituents.

Quality requirements in respect of objects worthy of protection
An external authorised expert or institute should be instructed to ensure, by way of basic characterisation, that the limit values defined below are observed. The examination should be carried out in compliance with the provisions of the Landfill Ordinance of 2008 (Chapter 1.5, Annex 4, Part 2). However, the provisions of this chapter take precedence over the Landfill Ordinance of 2008, particularly where they concern the scope of parameters, the quality classes and limit values. The definition of the term “excavated soil material” should be noted for this purpose. Synthetic and treated soils cannot be classified as waste types SN 31411 spec. 29-32.

The limit values specified in Tables 1 and 2 apply to the separate measurement of the fine crumb (≤ 2mm). Conformance with the limit values is to be assured through an adequate number of measurements.
Class A1 – unlimited use
Tables 1 and 2 lists the limit values for soils from waste for largely unlimited use on agricultural areas, e.g. also for recultivation layers (root-penetrable layers). In developing these values, a comprehensive evaluation of all objects meriting protection and the paths of action was undertaken. These limit values apply to all exposed areas on which food and feed are produced (incl. grassland). This also applies if the areas are used for purposes other than the production of food and feed plants but the vegetation growing on them is still used as a feed. The latter applies, for example, when grass cuttings from parks are used as feed or when ski slopes, which have been “recultivated” with soil, are used for grazing.

If contamination with persistent pesticides is suspected, they are to be identified and evaluated. In order to assess any impairment of the habitat function of the soil by pollutants not regulated in Tables 1 and 2, ecotoxological testing needs to be carried out. Ecotoxological tests (e.g. bacterial luminescence, algae) with a 1/s eluate ratio of 2:1 should be conducted in order to identify pollutants that are spread via the water pathway. Information concerning any impairment of the habitat function is obtained using terrestrial test systems (e.g., micro-organisms, compost worms, springtails). Information concerning any impairment of the habitat function is obtained using terrestrial test systems (e.g., micro-organisms, compost worms, springtails).

Class A2 - restricted usability
Unlike Tables 1 and 2, the limit values for pollutants in Tables 3 and 4 reflect only the pollution pathways possible under the restrictive applications for the sake of protective environmental protection. Here the first and foremost object of protection is the groundwater. This is permitted whenever the continuation from the soil-plant path of action to the farm animal-human pathway is excluded for now or even for the long run. Generally, soils from waste that meets these requirements can, given their pollutant content, be used for backfill. The utilisation for recultivation layers (root-penetrable layers) is permissible if an agricultural utilisation of this area and the use of the plant cover as feed can be permanently excluded. If this is not the case, the top root-penetrable layer must be made of material that conforms to the limit pollutant values of classification A1 (Tables 1 and 2) up to a depth of 1.2 m in order to account for the soil - crop pathway of action. If the soil is applied as a root-penetrable layer but not for backfill purposes with Class A2 material, but applied directly onto an existing natural substrata (sediment, rock), the depth of the soil applied may also be less (e.g. even only a few centimetres).

It is not permitted to use soils produced using non-soil constituents in the groundwater fluctuating zone. Where contamination with persistent pesticides is suspected, they are to be identified and evaluated by comparison with the limit values laid out by Drinking Water Pesticide Ordinance (Federal Law Gazette No 448/1991). To evaluate possible ecotoxological risks, an ecotoxological evaluation from an eluate with a 1/s ratio of 2:1 is to be carried out. In order to include pollutants which are spread via the water pathway, aquatic ecotoxological tests (e.g. bacterial luminescence, algae) with an eluate ratio 1:s = 2:1 are to be conducted. Information concerning any impairment of the habitat function is obtained using terrestrial test systems (e.g., micro-organisms, compost worms, springtails).

Quality requirements for input materials in the production of soils from waste
In order to prevent a strategy of diluting pollutants through specifically mixing contaminated materials with less contaminated materials, it is necessary to define the quality of the input materials. Soils must be manufactured according to approved formulas adapted to each individual area of use. The relevant soil functions need to be given special attention in the process. The organic carbon content is strictly limited for soils to be used for underground backfilling (cf. Table 5), excluding any use of organic input materials for these soils. Soils used to produce recultivation layers can also be manufactured using organic input materials (the depth-related limitation of organic carbon is to be observed). These input materials must undergo a humus creating process (such as composting or humification) before or during soil production in order to ensure that the basic soil requirements (uncontaminated, soil-identical mineral or mineral-organic material or mineral-organic material that is similar to soil that corresponds in its essential characteristics to naturally grown soil or subsoil and is able to fulfil the relevant soil functions e.g. habitat, filter, barrier and transformer) are met. Simple mixtures of mineral materials together with a nutrient supplier, e.g. sand with sewage
sludge, in no way meet the specified requirements.

The principles of recovery for composting apply to composts used as input material for the production of soils from waste. Input materials that are suitable for composting according to these requirements, as a rule, also be directly utilised in a humification process. For organic input materials of soils for use in agriculture, the same requirements as for the use in composting apply (cf. treatment principles composting).

As municipal waste may contain a great number of organic pollutants which cannot be entirely assessed by analysis, the use of municipal and similar waste for the production of soils from waste is generally not permitted.

The following types of waste may be used as organic input materials, provided the following conditions are met:

SN 31306 Wood ash, straw ash – only coarse fractions
SN 31411 Excavated soil
SN 31438 Gypsum
SN 31485 Garden and potting soils
SN 31601 Sludge from concrete production
SN 31602 Grinding stone sludge
SN 31604 Clay suspensions
SN 31605 Sludge from cement production
SN 31606 Sludge from sand-lime block production
SN 31625 Soil and sand sludge, diaphragm wall excavation
SN 31634 Carbonatation sludge
SN 31635 Sugar beet soil
SN 54501 Drilling fluids and cuttings, free of oil
SN 94101 Sedimentation sludge
SN 99102 Moor sludge and healing earth

Depending on the actual application and on-site conditions, the exclusion of certain input materials, which would otherwise be generally suitable, may become necessary.

In order to limit pollutants, ecologically acceptable dilution factors subject to the requirements of the final product are used. Basically, this factor lies at 4, but for very critical elements, which, given the already existing problems, should be removed from the ecological system to the extent possible, lower factors are to be applied (e.g. for Cd).

Particularly with soils intended for agricultural use, input material selection should be particularly careful, giving special attention to low pollutant levels. Basically, only input materials that provide a comprehensible and provable advantage for the application concerned may be used. The production of the soils must follow tried and tested recipes (e.g. through scientifically managed field trials) that describe the input materials in detail (for this purpose an indication of the type of waste alone is usually insufficient), state the mixing ratio of the input materials and provide proof of the usefulness of each input material in terms of relevant soil functions and the specific as well as reference values.

**Evaluation and verification of input materials:**

The examination must comply with the requirements for one-time waste Chapter 1.5, Annex 4, Part 2 of the Landfill Ordinance of 2008. For the input materials, input inspections and the documentary proof of compliance with the recycling criteria for composting are to be geared towards these targets. In the case of mineral waste, an authorised external expert or expert organisation needs to carry out an evaluation based on the state of the art for the sake of an initial evaluation (evaluation of basic suitability) and a regular verification of conformity. The following is of importance here:

- a detailed description of the waste
- the evaluation of the legitimacy of recovering this waste to manufacture soils based on a chemical analysis and taking into account the origin and possible risks of contamination,
- where applicable, quantity limits required to guarantee a high-value soil quality (e.g. no more than 10% of the total input quantity),
- specification of any required pre-treatment steps, where applicable; in such cases stipulation of exact process conditions,
- targets and recommendations for a professional input check and
- a detailed documentation by the authorised expert or expert institute of all available information concerning the waste, the completed evaluations with documents for the sampling plan and the sampling protocols and the results of the examinations as well as the conclusions drawn together with all substantiations.

Wastes that, because of their origin or composition, represent an increased risk of contamination, are excluded from the production of Class A1 soils.

Based on the results of the initial evaluation, the regular input inspection measures must ensure that only permissible and suitable wastes are utilised and that the ban on mixing in accordance with sec. 15 (2) of the Waste Management Act of 2002 is upheld. If it is not possible to assure an essential
quality by means of the certificate of origin and a visual inspection, analytical verifications of identity are to be made.
The usefulness of the input materials in relation to the envisaged application of the finished soil is to be evaluated by a soil expert for every recipe.
Records must provide adequate proof that only suitable input materials are used and an appropriate input inspection regime has been implemented.
The principles and specifications of a quality assurance system for the production of soils from waste are described in ÖNORM S 2122-4 “Soils from waste - Part 4: Requirements for a quality assurance system for the production of soils from waste”, published 1 September 2007.

Usefulness of the measure
Bearing in mind that with this type of recovery new soil is to be created or spread out, the subsoil and layer to be re-cultivated must take the structure and properties of natural soil as its point of reference. On no account may uncontrolled tipping be involved. Rather, the structure must be created according to detailed plans based upon this principle of recovery. In addition to the requirements described below, ÖNORM S 2122-3 “Soils from waste, Part 3: Application guidelines for soils from waste”, issued on 1 September 2004, applies for the use of soils from waste.

Backfill measures not related to the actual construction projects
Generally, compliance with the limit values for pollutants set forth in Tables 3 and 4, confirmation of ecotoxicological harmlessness by an expert and compliance with the specific values set out in Table 5 are to be considered prerequisites for the fulfilment of the relevant soil functions. Any departure from the reference values set out in Table 5 is only permitted if an expert opinion is drawn up by a competent expert or expert institution, who/which, based on detailed assessments, confirms that the relevant soil functions have been fulfilled in spite of the envisaged departure.

Backfill measures or adjustments to terrain related to the actual construction projects
For backfill measures or terrain adjustments that together with actual construction projects fulfill a specific structural function (e.g. backfill or soil replacement in connection with the creation of embankments and foundations for roads, railway lines or foundations, trench or culvert filling, creation of noise abatement barrier) proof of technical suitability (e.g. based on relevant standards or guidelines) together with proof of compliance with the limit values for pollutants provided in Tables 3 and 4 and a confirmation of the ecotoxicological harmlessness by an expert person is sufficient to prove usefulness.
For large-volume backfill operations or adjustments to terrain, the requirements in Table 5 categorically apply. Where these requirements contradict the technical requirements (documents to support this should be included with the documentation), the technical requirements take precedence.
The creation of an aggregate layer for drainage, an aggregate layer for frost protection, a drainage layer or a separate bearing layer for road or rail construction does not represent a backfill measure.

Recultivation measures
For recultivation layers, proof must be provided especially for the layered structure, which takes the structure of natural soil as its reference, with particular emphasis on the graduated content of organic substances and nutrients. Generally, compliance with the limit values for pollutants in Tables 1 and 2, confirmation of ecotoxicological harmlessness by an expert and compliance with the specific values of “Guidelines for the proper soil cultivation of areas used for the purpose of agriculture and forestry” of the Soil Recultivation working group of the Expert Committee for Soil Fertility and Protection (Fachbeirat für Bodenfruchtbarkeit und Bodenschutz, Arbeitsgruppe Bodenrekrultivierung) are to be considered prerequisites for the fulfilment of relevant soil functions. For the recultivation of landfills, the requirements set forth by the Landfill Ordinance of 2008, Federal Law Gazette II No 39/2008 as amended must be met. Generally, documents, e.g. in the form of expert opinions by a competent expert or expert institution, must be presented to confirm that this soil fulfils the relevant soil functions for a plant location in order to ensure preventive environmental protection and especially soil protection.

Documentation
To demonstrate compliance with the above-mentioned requirements, a document containing ample information with regard to the suitability in the
7. Principles for the Treatment of Specific Waste and Material Streams

sense of soil science and/or technical suitability (pursuant to section “Usefulness of the measure”) as well as about the type and quality (pursuant to section “Quality requirements for input materials for the production of soils from waste”) must be provided.

Professional installation as a prerequisite for the fulfilment of the relevant soil functions (e.g. compression when spreading out the material can impair the air and water balance and the filtering function) is to be documented. This does not apply to backfill activities that, together with actual construction projects, fulfil a specific structural function (see section “Usefulness of the measure”).
7.18. Fermentation residues (residues from biogas facilities)

It is therefore necessary, through a suitable selection of the substrate and substrate preparation method, and through the correct choice of the fermentation process, to ensure that the quality of fermentation residues suffices for recovery. When recovery of fermentation residues is not possible, they are to be treated using an admissible method (preferably thermal treatment). With regard to the recovery of fermentation residues, reference is made to the ordinance by which provisions for the implementation of the Fertiliser Act are decreed (Federal Law Gazette II No 100/2004 as amended by Federal Law Gazette II No 162/2010).

**Recovery of fermentation residues**

Taking into account the quality requirements set forth by the Compost Ordinance, only waste groups 921 through 925 of the List of Waste Ordinance or ÖNORM S 2100 “Waste Catalogue” and ÖNORM S 2201 “Organic Waste – Quality Requirements” are suitable for recycling processes involving anaerobic treatment and the subsequent spreading out on soil or composting of the digestate. Ongoing quality assurance (continuous sampling and analysis) should capture quality-influencing factors and reduce their negative effects on the recoverability of the digestate. The relevant quality assurance concepts should be included into operating manual.

When intended for spread-out onto agricultural areas, the material should dwell in the fermentation reactor or subsequent storage place for as long as possible. Doing so should result in an increased stability of the digestate. When spreading the material, the specifications guidelines on the proper use of biogas manure and digestate in fields and grassland, which was published by the Expert Committee for Soil Fertility and Protection (Fachbeirat für Bodenfruchtbarkeit und Bodenschutz), should be observed.

As far as possible, digestate should be spread out on soil without any vegetation and worked in as quickly as possible; if use on vegetated soil can-

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**Table 5: Specific values for soils intended for underground backfilling (depth greater than 1.2 m)**

<table>
<thead>
<tr>
<th>Limit value range</th>
<th>Symbol</th>
<th>Unit</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skeleton content &gt; 2 mm $^{1,2}$</td>
<td></td>
<td></td>
<td>0-50</td>
</tr>
<tr>
<td>Skeleton fraction &gt; 200 mm $^{1,2}$</td>
<td></td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>TOC</td>
<td></td>
<td>mg/kg DM</td>
<td>&lt; 0.3%</td>
</tr>
<tr>
<td>TOC in the eluate acc. to ÖNORM S 2115</td>
<td></td>
<td></td>
<td>50</td>
</tr>
<tr>
<td>pH value acc. to ÖNORM L 1083</td>
<td></td>
<td>pH</td>
<td>6.5-8</td>
</tr>
<tr>
<td>Electrical conductivity measurement EN 27888 in extract acc. to ÖNORM S 2115</td>
<td></td>
<td>mS/m</td>
<td>&lt; 40</td>
</tr>
<tr>
<td>C/N ratio</td>
<td></td>
<td>C/N</td>
<td>&gt; 10</td>
</tr>
<tr>
<td>Total phosphorous</td>
<td>P total</td>
<td>Weight% DM</td>
<td>&lt; 0.05</td>
</tr>
<tr>
<td>Ballast (undesirables)</td>
<td>Plastics Metal</td>
<td>Weight% DM</td>
<td>&lt; 0.5</td>
</tr>
<tr>
<td>Ballast (undesirables)</td>
<td>Metal</td>
<td>Weight% DM</td>
<td>&lt; 0.5</td>
</tr>
</tbody>
</table>

$^{1}$ reference value
$^{2}$ skeleton content: individual particles with a diameter of > 2 mm
not be avoided, the digestate should be applied using a trailing hose. Spreading digestate by injection causes nitrous oxide emissions to increase by a factor of 2 to 3 and should therefore be avoided.

In the event of subsequent composting of the digestate, it needs to contain sufficient reactive organic material. Overly stabilised digestate results in compost with a low humic substance content.

7.19. Residues from waste incineration plants

For the purposes of this treatment principle, residues from waste incineration plants comprises grate1, bottom and pre-separator ash2 as well as ash from fluidised-bed combustion plants.

Requirements for the permissible use of residues from waste incineration plants as base layer

Where the following specifications are met, residues from waste incineration plants may be used in unbound base layers or base layers stabilised with binders, both of which must feature a low-seepage capping (hydraulic or bituminous stabilisation).

A roadbase is defined as a pressure-distributing layer constructed in various ways, located between the substructure or subsoil and the road surface (defined in RVS 01.02.11 Principles – Definition of Terms, Civil Engineering of September 1984).

Grate ash from waste incineration plants and bed ash from fluidised-bed incineration plants which has been subjected to permissible use in unbound roadbase or roadbase stabilised with binders has to undergo a metal separation process; the upper limit for ferrous metal portions is 1% DM (portion of the magnetisable components in dry matter) and 0.8% DM for non-ferrous metal (portion of the non-magnetisable metallic components in dry matter).

Moreover, the limit values in the table below must be observed when residues from waste incineration plants are used in unbound roadbase and roadbase stabilised with binders.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Unit</th>
<th>Limit value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total content</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pb</td>
<td>mg/kg DM</td>
<td>900</td>
</tr>
<tr>
<td>Cd</td>
<td>mg/kg DM</td>
<td>10</td>
</tr>
<tr>
<td>Cr</td>
<td>mg/kg DM</td>
<td>800</td>
</tr>
<tr>
<td>Ni</td>
<td>mg/kg DM</td>
<td>300</td>
</tr>
<tr>
<td>TOC</td>
<td>% DM</td>
<td>1</td>
</tr>
<tr>
<td>Content in the eluate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>pH value</td>
<td></td>
<td>12.0 maximum</td>
</tr>
<tr>
<td>Sb</td>
<td>mg/kg DM</td>
<td>0.3</td>
</tr>
<tr>
<td>As</td>
<td>mg/kg DM</td>
<td>0.5</td>
</tr>
<tr>
<td>Pb</td>
<td>mg/kg DM</td>
<td>0.5</td>
</tr>
<tr>
<td>Crtot</td>
<td>mg/kg DM</td>
<td>0.5</td>
</tr>
<tr>
<td>Cu</td>
<td>mg/kg DM</td>
<td>4</td>
</tr>
<tr>
<td>Mo</td>
<td>mg/kg DM</td>
<td>1</td>
</tr>
<tr>
<td>Ni</td>
<td>mg/kg DM</td>
<td>0.4</td>
</tr>
<tr>
<td>Chloride (as Cl)</td>
<td>mg/kg DM</td>
<td>3,000</td>
</tr>
<tr>
<td>Sulphate (as SO₄)</td>
<td>mg/kg DM</td>
<td>5,000</td>
</tr>
</tbody>
</table>

Electrical conductivity must be determined and documented in the records.

(An analysis of the metal portions, total content and content in the eluate must be carried out in accordance with the specifications below.) Please refer to the following technical regulations concerning the technical eligibility of material for use in unbound roadbase and roadbase stabilised with binders:

1 Grate ash from wet application and dry application are classified as belonging to one and the same group. According to how the terms have been used to date, they include slag from waste incineration facilities (grate firing systems).
2 Pre-separators include cyclones and deflectors from fabric filters and electrostatic precipitators.
Use of residues from waste incineration plants is prohibited in the following areas:
- in protection and conservation areas as defined in sections 34, 35 and 37 of the Water Act of 1959 (WRG)
- below the highest groundwater level (HGW) plus 2.0 metres
- within the bounds of discharge of a 30-year flood (sec. 38 of the Water Act of 1959)

Where necessary, ecotoxicological testing should be carried out to determine whether the hazard-relevant property “ecotoxic” (criterion H14) exists in accordance with Annex 3 of the Waste Directory Ordinance and CEN/TR 16110 “Characterization of waste – Guidance on the use of ecotoxicity tests applied to waste”.

To serve as proof of compliance with the relevant provisions, the records must include sufficient information on the quantity, quality and technical suitability of the residues from waste incineration plants used. The site at which the material is used must also be recorded.

Please note the documenting and reporting duties – particularly where they apply to users as per Ordinance on Waste Balance Sheets, Federal Law Gazette II No 497/2008 as amended.

Requirements concerning residues from waste incineration plants prior to landfiling
For grate ash from waste incineration plants and bed ash from fluidised-bed incineration plants the separation of ferrous and non-ferrous metal parts is in line with the state of the art.

Specifications for sampling plans, the taking of samples and the implementation of inspections

Determining metal portions
The metal portions are to be determined by following the steps below:

1. Preparation of a weekly composite sample from a minimum of 10 random samples. The minimum amount of the sample for the weekly composite samples is determined by the upper screen size of the grain size group:
   - Upper screen size
   - Minimum sample size
     - ≤ 8 mm: 10 kg as well as an additional 6 kg for water content
     - ≤ 15 mm: 25 kg as well as an additional 6 kg for water content
     - ≤ 20 mm: 40 kg
     - ≤ 30 mm: 70 kg
     - ≤ 40 mm: 140 kg
     - ≤ 50 mm: 230 kg
     - ≤ 60 mm: 380 kg
     - > 60 mm: To be determined on a case-by-case basis, at least 380 kg

2. To analyse the water content, the sample must be dried at a temperature of 105°C until constant weight in one sample equivalent is reached. The remainder of the weekly composite sample must be weighed.

3. Screening at 8 mm; for grain size groups of an upper screen size ≤ 10 mm, screening is not obligatory (if this applies, continue with step 6); for grain size groups of a lower screen size ≥ 8 mm, screening is optional (in this case, this should be documented on graph paper that only a small portion consisting of grain < 8 mm exist).
   N.B.: A vibrating roller may be used to separate mineral adherences on the metal portions prior to screening.

4. The coarse aggregate (> 8 mm) is weighed and metals are sorted out manually.

5. The metals are separated into one magnetic and one non-magnetic portion using a hand magnet and are subsequently weighed. The permanent magnet should be placed at a distance of 1 to 1.5 cm from the sample.

6. The fines (< 8 mm) are reduced to approx. 10 kg using a sample splitter. The reduced sample is then weighed.

7. Screening at 4 mm particle size.

8. The fines (< 4 mm) are discarded; metals without adherences and organic impurities are sorted out manually from the coarse aggregate; the remaining material is deposited in the laboratory’s jaw crusher (2-3 mm clearance). Steps 7 and 8 should be repeated at least once.
   N.B.: Use of the laboratory’s jaw crusher is optional for ash from fluidised-bed incineration plants. Subsequent sorting should be ensured using a permanent magnet (flow density = 1.35 Tesla (Grade N45), minimum volume 70 cm³, distance to sample = 5-6 cm). Then continue with step 11.

9. Screening at 4 mm particle size.

10. The fines (< 4 mm) are discarded; metals without adherences are sorted out manually from the coarse aggregate.
The metals are separated into one magnetic and one non-magnetic portion using a hand magnet and are subsequently weighed. The permanent magnet should be placed at a distance of 1 to 1.5 cm from the sample.

The ferrous metal portion (the magnetisable part) is calculated using the following formula:

\[
\text{Share Fe in } \% \ DM = \frac{M_{Fe > 8} + \frac{M_{WMP, f} - M_{8/8}}{M_{0/8}} \cdot M_{Fe 4/8}}{M_{WMP, dr}} \cdot 100
\]

\[
M_{Fe > 8} \ldots \text{Mass of the ferrous metals from the coarse aggregate (> 8 mm), see step 5}
M_{WMP, f} \ldots \text{Mass of the wet weekly composite sample, see step 2}
M_{8/8} \ldots \text{Mass of the > 8 mm fraction after screening at 8 mm, see step 3}
M_{WMP, f} \ldots \text{Mass of the sample after reduction using the sample splitter, see step 6}
M_{Fe 4/8} \ldots \text{Mass of the ferrous metals in the fraction 4/8, see step 11}
M_{WMP, dr} \ldots \text{Mass of the dry weekly composite sample, see step 2}
\]

The non-ferrous metal portion (the non-magnetisable part) is calculated using the following formula:

\[
\text{Share NE in } \% \ DM = \frac{M_{NE > 8} + \frac{M_{WMP, f} - M_{8/8}}{M_{0/8}} \cdot M_{NE 4/8}}{M_{WMP, dr}} \cdot 100
\]

\[
M_{NE > 8} \ldots \text{Mass of the non-ferrous metals from the coarse aggregate (> 8 mm), see step 5}
M_{WMP, f} \ldots \text{Mass of the wet weekly composite sample, see step 2}
M_{8/8} \ldots \text{Mass of the > 8 mm fraction after screening at 8 mm, see step 3}
M_{WMP, f} \ldots \text{Mass of the sample after reduction using the sample splitter, see step 6}
M_{NE 4/8} \ldots \text{Mass of non-ferrous metals in the 4/8 fraction, see step 11}
M_{WMP, dr} \ldots \text{Mass of the dry weekly composite sample, see step 2}
\]

\(^1\) Cf. ÖNORM EN 13342 “Aggregates for unbound and hydraulically bound mixtures for civil engineering and road construction” issued on 1 March 2008.

The figure below provides a graphical illustration of the individual steps involved in determining the metal portions.

The metal portions should be determined on the basis of two parallel weekly composite samples at least once per quarter during regular operation of the processing plant.

When sorting, proper lighting must be ensured and that the sample on the sorting table is thinned out. Minerals caked onto metal parts can be removed with a hammer. If necessary, metals can be made discernible by filing or using a pair of cutting pliers. Depending on the water content in the residues, it may be necessary to wear protective masks when sorting the material to avoid breathing in dust. The sorting itself should be carried out in dry weather conditions or under a roof.

Determining the total content and content in the eluate

Sampling plans and sampling should be carried out in consideration of the specifications set forth by the Landfill Ordinance of 2008.

Test portions (sample sizes) from the laboratory sample should always be extracted in accordance with ÖNORM EN 15002 “Characterization of waste – Preparation of test portions from the laboratory sample” published on 1 April 2006.

In order to determine the content in solid matter, acid digestion should be carried out in accordance with ÖNORM EN 13657 “Characterization of waste. Digestion for subsequent determination of aqua regia soluble portion of elements” published on 1 December 2002.

Elution should be carried out in accordance with ÖNORM S 2115 “Determination of the elution capacity of waste with water” published on 1 July 1997, and ÖNORM EN 12457-4 “Characterization of waste – Leaching – Compliance Test for Leaching of Granular Waste Materials and Sludges – Part 4: One-stage batch test with at a liquid-to-solid ratio of 10 l/kg for materials with particle size below 10 mm (with or without particle size reduction)” published on 1 January 2003.

The sample should be crushed if necessary for taking the sample or for conducting the examination, or if the particle size of the waste exceeds 10 mm. Grinding of the waste is not permissible. The fine material produced in the crushing process should be admixed to the sample.

The following characterisation methods should be employed: ÖNORM EN 14346 “Characterization of waste – Determination of dry matter and water content on a mass basis” published on 1 March 2007,
Graphical illustration of the individual steps involved in determining the metal portions

1. Creation of weekly mixed sample
2. Determination of water content
3. Weighing
4. Screening 8 mm
5. > 8 mm
   - Weighing
   - Sorting
     - Metals
     - Minerals, organic material
   - Magnetic separation
     - Non-ferrous metals
     - Fe-metals
6. < 8 mm
   - Sample division
   - Weighing, at least 10 kg
   - Screening 4 mm
7 & 9. > 4 mm
   - Rejection
   - Sorting
     - Organic material
     - Metals
     - Minerals
   - Laboratory’s jaw crushe
8. < 4 mm
   - Rejection of remainder
   - Weighing, at least 10 kg
   - Screening 4 mm
10. > 4 mm
11. Magnetic separation
12. Calculation of Fe component
13. Calculation of Non-ferrous component
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ÖNORM EN 12506 “Characterization of waste – Analysis of eluates – Determination of pH, As, Ba, Cd, Cl, Co, Cr, Cr (VI), Cu, Mo, Ni, NO₂⁻, Pb, total S, SO₄²⁻, V and Zn” published on 1 August 2003,

ÖNORM EN 13370 “Characterization of waste – Chemical analysis of eluates – Determination of ammonium, AOX, conductivity, Hg, phenol index, TOC, easily liberatable CN⁻, F⁻” published on 1 August 2003 as well as


7.20. Non-mining waste – recovery in underground backfilling

This chapter describes the state of the art for the recovery of non-mining waste in underground backfilling, i.e. of waste that is not deemed mining waste in accordance with sec. 3 (1) 3 Waste Management Act of 2002. Application of state-of-the-art technology should ensure prevention of any detriment to the protected goods (of public interest in accordance with sec. 1 (3) Waste Management Act of 2002). For backfilling to be considered a permissible recovery method, the following conditions must be met (cf. sec. 15 (4) a Waste Management Act of 2002):

1. backfilling is necessary; the waste serves as a substitute for other materials;
2. the waste is environmentally compatible and suitable for the intended purpose;
3. the measure is in line with statutory law.

Waste for which underground backfilling is prohibited under Annex 6 sec. 2 (1) of the Landfill Ordinance of 2008 must not be used for this purpose. Each of the criteria below must be checked and documented.

The main purpose of the backfilling operation must be mining-related, for example and especially:

- to stabilise the mine shafts and pits
- to prevent mining-related damage above ground
- to improve the deposit yield
- to create a work platform in a stope

Planning of the backfilling system should include a definition of the operating targets, the required work method and the properties of the backfill material, as well as the choice of backfilling method. The backfilling material is produced from input materials that may be non-mining-related or mining-related waste or mixtures. When using non-mining waste or mixtures, all properties of the individual input materials of relevance to underground backfilling, including their fluctuation margins, must be known.

The backfilling materials must exhibit the physical properties necessary for backfilling (e.g. compressive strength and deformation characteristics), as well as the environmental compatibility requirements. Environmental compatibility must be assessed in each case. In particular, the environmental compatibility test requires the following:

- Knowledge of the geogenic background in the envisaged backfilling area
- Knowledge of the total pollutant content and eluate values of the wastes and other backfilling materials (if any), including the observed fluctuation margins
- The pollution content of the backfilling materials must not exceed the geogenic background pollution
- Observance of the dilution and mixing prohibition for waste; for this purpose the geogenic background value should be used as a benchmark for the pollution content of each individual waste item. Waste used as a binder or to improve the substance properties (e.g. to enhance...
flux), which accounts for only a small part of the mix, may be assessed separately.

- Assessment of the leaching properties of the backfilling material under special consideration of the local geochemical conditions
- Assessment of the long-term properties of the backfilling material with regard to potential interactions between the various input materials and between the input materials and the surrounding medium; e.g. testing in accordance with Annex 5 of the Landfill Ordinance of 2008 for hydraulic or latent-hydraulic binders, if relevant.

The potential distribution pathways of pollutants in the environment, particularly in groundwater and surface water, should be determined as far as possible.

A quality assurance system should be set up with special emphasis on the analysis of non-mining waste, to which the backfilling operation should be geared.
8. Guidelines for the Shipment of Waste
8. GUIDELINES FOR THE SHIPMENT OF WASTE

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8.2.8.1. ANNEX IIIA (Waste mixtures – Green List procedure)

8.2.8.2. ANNEX III (Green List)
The Federal Waste Management Plan is expected to provide guidelines for the shipment of waste to or from Austria for recovery or disposal purposes as well as special arrangements and treatment principles for specific types of waste which also apply to the shipment of waste. Treatment requirements are set forth in a binding manner in related ordinances; in this regard, reference is made to Chapter 7 of the Federal Waste Management Plan.

8.1. General Principles for the Shipment of Waste

The principle of proximity and the principle of self-sufficiency in waste disposal

The shipment of waste from and to Austria for disposal on the basis of Art. 11 and for recovery on the basis of Art. 12 of Regulation (EC) No 1013/2006 on shipments of waste (EC Waste Shipment Regulation) may be prohibited. The principles of proximity and self-sufficiency in waste disposal are also contained in the EC Waste Shipment Regulation (cf. Art. 11 (1) (a) and (g) in particular).

For the implementation of Art. 16 of EC Directive 2008/98/EC, the Waste Management Act of 2002 stipulates that self-sufficiency in waste disposal and the principle of proximity must be aspired to for waste collected in disposal plants or in installations for the recovery of mixed municipal waste collected from private households, including where such collection also covers waste from other producers.

According to sec. 69 of the Waste Management Act of 2002, the shipment of waste to disposal plants must be prohibited if the principles of self-sufficiency in waste disposal or proximity are not complied with. This also applies to the shipment of waste to installations for the recovery of mixed municipal waste collected from private households, including where such collection also covers waste from other producers.

Moreover, the shipment of waste for disposal to incineration plants in Austria must be prohibited where it has been established that national waste would have to be disposed of or that waste would have to be treated in a way that is not consistent with the waste management rules set forth in the Federal Waste Management Plan.

Whether or not the principles of self-sufficiency in waste disposal or proximity are complied with shall be assessed in a notification procedure on the basis of the following criteria:

- Disposal possibilities in Austria, in OECD member countries or other states
  - No suitable domestic disposal facilities
  - Equivalent or superior disposal option compared to Austria (equivalent means in particular the utilisation of comparable technology and compliance to comparable emission limit values in line with state-of-the-art technology.)
- Availability of domestic treatment capacities
- Distance
  - Short transport routes reduce negative effects and risks for the environment and health
- Reasonableness of the transport route
  - This must take into consideration transport risks, means of transport, necessity of transshipment, necessity of wrapping material, etc.

Self-sufficiency in disposal and the principle of proximity are basically equal principles and can sometimes contradict each other. Which of the two principles should be applied must be assessed separately in each individual case. In the case of export, the principle of proximity will be applied, if there is a significantly shorter transport route, as is the case e.g. for waste shipments from Vorarlberg to a close state-of-the-art treatment plant in Switzerland. In this case, the principle of self-sufficiency in waste disposal shall not be applied, also because this disposal complies with the Federal Waste Management Plan.

Concerning the shipment of mixed municipal waste collected from private households – including where such collection also covers such waste from other producers – to recovery or disposal facilities, the EC Waste Shipment Regulation stipulates that they shall be subject to the same provisions as shipments of waste destined for disposal (Art. (3) (5)) and provides a separate reason for objection (Art. 11 (1) (i)).

Particularly for the achievement of self-sufficiency in the disposal of mixed municipal waste, there is a demand for suitable treatment facilities since the untreated landfilling of such waste does not comply with the principles of the Waste Management Act of 2002, Federal Law Gazette I No 102/2002 as amended and state-of-the-art technology as defined by the Austrian Landfill Ordinance, Federal Law Gazette II No 39/2008 as amended.

Mixed municipal waste remains mixed municipal when it has been subject to a waste treatment operation that has not substantially altered its properties.
Where it is necessary for the purpose of creating sufficient treatment capacities, the temporary allocation to processing facilities that are to be newly built (obligation to offer) may be established, based on regional Waste Management Plans (cf. the ECJ judgment in case C-209/98).

Moreover, according to EC Directive 2008/98 EC on waste, Member States may, in order to protect their network, and by way of derogation from the EC Waste Shipment Regulation, limit incoming shipments of waste destined to incinerators that are classified as recovery, where it has been established that such shipments would result in national waste having to be disposed of or waste having to be treated in a way that is not consistent with their waste management plans.

The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal (Basel Convention 1989; Federal Law Gazette No 229/1993 as amended), which has been ratified not only by Austria but by the European Union as a Community as well, obliges the partners to the treaty in Article (4) (9) to allow exports of waste under the meaning of the Convention only if,

a) there are no suitable disposal facilities in the exporting country

b) or the wastes in question are required for recycling or recovery industries.

On the basis of these obligations and the general principles of waste management, shipments of hazardous and non-hazardous waste from Austria for disposal purposes (treatment according to procedures in Annex II A of the Directive on Waste) are only in compliance with the principles of Austrian waste management if,

a) there is no equivalent1 or superior disposal facility in Austria or,

b) as a result of an export of waste, the negative effects and risks for the environment are reduced due to shorter transport distances2.

Invoking higher environmental standards for shipments destined for recovery

Shipment of waste for subsequent recovery is prohibited if it is not in compliance with Austrian legislation (reason for objection pursuant to Art. 12 (1) (c) of the EC Waste Shipment Regulation) or with legally binding environmental standards for recovery operations or legally binding recovery or recycling obligations established in Community legislation (ground of objection pursuant to Art. 12 (1) (j)).

At the same time, however, the necessity of the proper functioning of the internal market must be taken into account (principle of proportionality).


An objection pursuant to Art. 12 (1) (c) EC Waste Shipment Regulation is not permitted if there is corresponding Community legislation and this legislation has been transposed or if requirements that are at least as stringent as those laid down in the Community legislation have been introduced into national legislation in the state of destination.

8.1.1. Important ECJ judgments on the shipment of waste

The following EJC judgments on the shipment of waste are particularly relevant (details see curia.europa.eu):

- C-2/90 Commission versus Belgium
- C-192/96 Beside
- C-203/96 Chemische Afvalstoffen Dusseldorp
- C-209/98 Entreprenørforeningens Affalds/ Miljøsektion (FFAD)
- C-324/99 DaimlerChrysler AG
- C-6/00 ASA
- C-307/00 through C-311/00 Oliehandel Koeweit
- C-277/02 „EU-Wood-Trading”
- C-472/02 Siomab SA
- C-215/04 Marius Pedersen A/S
- C-176/05 KVZ retec GmbH
- C-259/05 Omni Metal Service
- C-411/06 Commission versus Parliament and Council

8.1.2. Important ECJ Judgments on Disposal/ Recovery/Sham Recovery

The following ECJ judgments are particularly relevant for differentiation between the disposal/recovery/sham recovery of waste:

- C-6/00 Abfall Service AG (ASA)
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8.1.3. Preventing sham recovery

According to ECJ case law, waste is considered recovered if it is used to substitute a natural raw material. However, Article 12 of the Regulation (EC) No 1013/2006 of the European Parliament and of the Council of 14 June 2006 on shipments of waste (EU Waste Shipment Regulation) does accept grounds for objection in this case that are based in particular on one of the following points (lit. acc. to Art. 12):

(g) that the ratio of the recoverable and non-recoverable waste, the estimated value of the materials to be finally recovered or the cost of the recovery and the cost of the disposal of the non-recoverable fraction do not justify the recovery, having regard to economic and/or environmental considerations;
(h) that the waste shipped is destined for disposal and not for recovery;
(i) that the waste will be treated in a facility which is covered by Directive 96/61/EC (or Directive 2008/1/EC), but which does not apply best available techniques as defined in Article 9 (4) of that Directive in compliance with the permit of the facility;
(j) that the waste concerned will not be treated in accordance with legally binding environmental protection standards in relation to recovery operations, or legally binding recovery or recycling obligations established in Community legislation (also in cases where temporary derogations are granted);
(k) that the waste concerned will not be treated in accordance with waste management plans drawn up pursuant to Article 7 of Directive 2006/12/EC with the purpose of ensuring the implementation of legally binding recovery or recycling obligations established in Community legislation.

The reason for objection according to (g) is often subsumed under the concept of „sham recovery“. The R and D procedures according to the Directive on waste are no distinction criteria in themselves as defined under (g) because technologically identical procedures are often described by both an R code and a D code.
It is evident that export for “sham recovery” is pursued only where it comes at a lower cost to the waste owner than domestic disposal. Whether, beyond this reduction of cost, resources were conserved to actually justify the treatment (which also includes a reduction of environmental pollution) can only be assessed individually for each case. It is not possible to provide a general limit value for the share of recovered materials; instead – according to the definition of recovery as the substitution of natural resources – a comparison must be made to precisely these natural resources.

For example, the presence of metal in many ores lies at a percentage level. So, if, for example, comparable amounts of metal can be recovered from waste, and if the remaining waste does not cause any environmental pollution that is more serious than the pollution caused by primary metal extraction residues, then this recovery is justified both in terms of ecology and economy. According to these considerations, the recovery of precious metals (e.g. in catalysts, galvanic sludges or ground material from printed circuit boards) is a recovery, even if it is only in the range of some 100 ppm. In the case of ferrous metals, however, waste with a presence of metal in the two-digit percentage range marks the limit between true recovery and sham recovery.

The P/C treatment of oil-and-water mixtures can be assessed in a similar manner. If the oil content amounts to only a few percent, the emulsion splitting and recovery of the oil content (e.g. as a fuel substitute) shall be defined as a disposal operation D9 (P/C treatment prior to final disposal).

If, conversely, the water content amounts to only a few percent, conditions are considered comparable to the processing of natural resources (oil); therefore emulsion separation shall be classified as the reclamation of organic substances – operation R3 Recycling/reclamation of organic substances which are not used as solvents.

A particular focus should be on the recovery of mixed municipal waste, with an eye to the fact that the orderly removal of such waste constitutes a service of general interest, like water supply and waste water disposal, and that there are significant differences in treatment procedures and treatment costs across the Union. On the one hand, the incineration of mixed municipal waste in an incineration plant with energy utilisation qualifies as an R1 recovery operation (when a minimum efficiency of energy utilisation is achieved), at the same time, however, in consideration of the special conditions in terms of this waste stream, the Waste Shipment Regulation grants that objections may be raised as in the case of disposal.

With regard to municipal waste to which the reason for objection in Art. 11 (1) (i) (waste from private households) of the Waste Shipment Regulation does not already apply (self-sufficiency in disposal), objection may also be raised against its shipment to non-thermal recovery according to Article 12 (g) (sham recovery).

Typically, the metal content of mixed municipal waste amounts to a few percent so that the recovery of the metal content alone does not justify the treatment to be classified as recovery. The predominantly organic part is usually submitted to thermal treatment. Provided the quality criteria of the Waste Incineration Ordinance for waste fuels are complied with during processing into fuel (RDF – refuse-derived fuel), it would probably be classified as other recovery in the overall context. If this quality goal is not achieved or cannot be achieved, and if the residual waste must be submitted to a dedicated waste incineration plant like mixed municipal waste, then evidently the reason for objection according to Article 12 (g) applies (in conjunction with Article 12 (i)) (because the same reasons for objection apply to this specific thermal treatment as to the disposal, and, according to the state-of-the-art, because the fuel fraction is not suitable for use in co-incineration plants).

Mixed municipal waste (according to Annex V of the EC Waste Shipment Regulation Code Y46) is always subject to notification. As a result, the notification procedure provides the instruments for preventing sham recovery by requiring evidence for
both the (expected) recovery rates as well as the quality and further treatment of the thermal fraction. Only if, on the one hand, a substantial amount of the metal fraction is separated and, on the other hand, the thermal fraction (mostly) achieves the quality of substitute fuels (for the purposes of the Waste Incineration Ordinance) and is submitted to a co-incineration plant, does a recovery in the overall context apply (a small part of the thermal fraction can be submitted to a waste incineration plant for the removal of pollutants). In cases where the appropriate recovery of the thermal fraction cannot be evidenced or such recovery is not performed, objection according to Article 12 (g) must be raised.


General legal situation

8.2.1. Introduction

Annexes II (Categories of wastes requiring special consideration) and VIII (List A – hazardous wastes under Art. 1.1.a of the Basel Convention) of the Basel Convention are the basis of Annex IV of the EC Waste Shipment Regulation. However, to complement this, certain entries have been included from the previous list system of the OECD Council Decision C (92) 39 FINAL for waste not yet included in the lists set forth by the Basel Convention.

These entries can be recognised by their specific code (e.g. GC010, AA010, RB020) and were attributed to the respective applicable Annex (Annex III – Green List and Annex IV – Amber List). Annexes VIII and IX of the Basel Convention are subject to an ongoing review process in the framework of the Conference of the Parties to the Basel Convention with any amendments made there also being adopted by the OECD and the EU (no automatic acceptance however).

8.2.1.1. Summary List of the Basel Convention countries
The current summary list (ratification status) is available on the website www.basel.int. Total number of parties to the Basel Convention: 175 (including the European Union), (last updated: spring 2011)

Asia and Oceania
Azerbaijan, Bahrain, Bangladesh, Bhutan, Brunei, Cambodia, China, Cook Islands, Democratic People’s Republic of Korea, India, Indonesia, Iran (Islamic Republic), Japan, Jordan, Kazakhstan, Kiribati, Korea, Kuwait, Kyrgyz Republic, Lao People’s Democratic Republic, Lebanon, Malaysia, Maldives, Marshall Islands, Micronesia, Mongolia, Nauru, Nepal, Oman, Pakistan, Papua New Guinea, Philippines, Qatar, Samoa, Saudi Arabia, Singapore, Sri Lanka, Syrian Arab Republic, Thailand, Turkmenistan, United Arab Emirates, Uzbekistan, Vietnam, Yemen

Africa
Western Europe and others
Andorra, Australia, Austria, Belgium, Canada, Cyprus, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Israel, Italy, Liechtenstein, Luxembourg, Malta, Monaco, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, Turkey, United Kingdom of Great Britain and Northern Ireland

Central and Eastern Europe
Albania, Armenia, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Estonia, Former Yugoslav Republic of Macedonia, Georgia, Hungary, Latvia, Lithuania, Montenegro, Poland, Republic of Moldova, Romania, Russian Federation, Serbia, Slovakia, Slovenia, Ukraine

Latin America and the Caribbean
Antigua and Barbuda, Argentina, Bahamas, Barbados, Belize, Bolivia, Brazil, Chile, Columbia, Costa Rica, Cuba, Dominica, Dominican Republic, Ecuador, El Salvador, Guatemala, Guyana, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, Saint Kitts and Nevis, Santa Lucia, Saint Vincent and Grenadines, Trinidad and Tobago, Uruguay, Venezuela

Political and/or economic organisations:
European Community
Signatories to the Basel Convention
(no ratification):
Afghanistan, USA, Haiti.

8.2.1.2. Summary list of the OECD Member Countries
The current summary list is available on the website www.oecd.org.
Total number of OECD states: 34 (last updated: spring 2011). The countries of Slovenia, Estonia, Chile and Israel recently acceded to the OECD. Russia and Bulgaria are also making efforts to be admitted to the OECD.
OECD states: Australia, Austria, Belgium, Canada, Chile, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Korea, Japan, Luxembourg, Mexico, Netherlands, New Zealand, Norway, Poland, Portugal, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Turkey, United Kingdom, United States
Note: According to EC Regulation No 740/2008, Liechtenstein shall be considered a state to which the OECD Council Decision applies.

8.2.1.3. Summary list of EU Member States
EU Member States: Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Sweden, Slovak Republic, Slovenia, Spain, United Kingdom
Transitional provisions regarding the application of the EC Waste Shipment Regulation (notification requirement for Green-Listed Waste) must be observed for the following Member States: Bulgaria, Romania, Slovak Republic, Poland. Moreover, in the case of waste subject to notification, objections are possible in some new EU Member States by way of derogation from Article 12 of the EC Waste Shipment Regulation pursuant to Art. 11 (“Objections to shipments of waste destined for disposal”).

8.2.1.4. Bilateral agreement between the government of the Republic of Austria and the government of the Republic of Germany on transboundary movements of waste
The agreement between the government of the Republic of Austria and the government of the Republic of Germany on transboundary movements of waste according to Article 30 of the Regulation (EC) No 1013/2006 of the European Parliament and the Council of 14 June 2006 on shipments of waste, Federal Law Gazette III No 72/2009, came into effect on 1 July 2009. This bilateral agreement establishes provisions that make the notification procedure less stringent for specific transboundary movements of waste subject to notification in the border regions of Austria and Germany (cf. for example the special location of the Kleinwalsertal).

8.2.2. The EC Waste Shipment Regulation
8.2.2.1. Exceptions from the application
The EC Waste Shipment Regulation does not apply to:
- Offloading waste to shore, including waste water and residues, generated by the normal operation of ships and offshore platforms (in the presence of binding international agreements e.g. the International Convention for the Prevention of Pollution from Ships – MARPOL)
- Waste generated on board vehicles, trains, aeroplanes and ships, until such waste is offloaded in order to be recovered or disposed of
- Radioactive waste
- Shipments of animal by-products (waste) including processed products, to which the approval requirements of the EC Regulation No 1069/2009
Guidelines for the Shipment of Waste

(Health rules concerning animal by-products not intended for human consumption) apply; animal by-products of Categories 1 and 2 as well as their mixtures are not subject to the provisions of the EC Waste Shipment Regulation in the event of transboundary movement. Since approval requirements also apply to processed animal proteins belonging to Categories 1 to 3 according to the above-referenced veterinary regulation, provided these originate from animal carcass processing plants (rendering plants), the transboundary movement of processed animal proteins (meat-and-bone meal) of Category 3 originating from such plants for recovery or disposal no longer fall under the waste-related provisions of EC Waste Shipment Regulation No 1013/2006. The same applies to carcasses of animals that have died other than by being slaughtered, including animals killed to eradicate epizootic diseases, and that are disposed of in accordance with Regulation (EC) No 1069/2009.

- Waste resulting from prospecting, extraction, treatment and storage of mineral resources and the working of quarries that are subject to the provisions of Directive 2006/21/EC on the management of waste from extractive industries.
- Faecal matter, straw and other natural non-hazardous agricultural or forestry material used in farming, forestry or for the production of energy from such biomass through processes or methods which do not harm the environment or endanger human health.
- Gaseous effluents emitted into the atmosphere;
- Sediments relocated inside surface waters for the purpose of managing waters and waterways or of preventing floods or mitigating the effects of floods and droughts or land reclamation if it is proved that the sediments are non-hazardous.
- Waste waters, with the exception of waste in liquid form (where such shipments are already covered by other Community legislation containing similar provisions).
- Decommissioned explosives (where such shipments are already covered by other Community legislation containing similar provisions).
- Shipments of waste from the Antarctic into the Community which are in accordance with the requirements of the Protocol on Environ-
Imports into the Community of waste generated by armed forces or relief organisations in situations of crisis, peacemaking or peacekeeping operations where such waste is shipped, by the armed forces or relief organisations concerned or on their behalf, directly or indirectly to the country of destination. In these cases, however, every authority responsible for the transit and the authority responsible at the point of destination in the Community must be informed in advance of the shipment and its destination.

In this context, the form developed by the EU Commission for the harmonisation of reports should be used – see Correspondents’ Guidelines No 2 concerning Article 1 (3) (g) of the EC Waste Shipment Regulation – see ec.europa.eu/environment/waste/shipments/index.htm.

8.2.2.2. The EC Waste Shipment Regulation, its amendments and annexes

Important websites:

- www.edm.gv.at – user information/downloads shipment notification and movement documents
- The notification document and the movement document for new notification requests for shipments from Austria (export, Deutsches Eck) are available online and can be completed using the eShipment application.
- www.umwelt.net.at – waste – waste shipment instructional note for shipments of waste, model texts for contracts, sub-contracts, financial guarantees, etc.


Shipments of waste listed in Annex III and IIIA (Green List) in non-OECD countries (partially subject to notification requirement or import ban) – list of countries of the Federal Environment Agency Berlin: www.umwelt.dien.de/abfallwirtschaft/gav/Staatenliste.pdf

Regarding the notification procedure, the legal provisions of the Waste Management Act of 2002 as amended and the EC Waste Shipment Regulation No 1013/2006, amended by

- the EC Regulation No 1379/2007 of the Commission amending Annexes IA (notification document), IB (transport and movement document), VII (document according to Art. 18) and VIII
- the corrections to the EC Waste Shipment Regulation No 1013/2006 (such as the confusion of the terms “country of destination” and “country of dispatch”) according to the Official Journal of the EU L318/15 of 28.11.2008.
- the EC Regulation No 669/2008 of the Commission on completing Annex IC (instructions for completing the notification and movement documents)
- the EC Regulation No 1418/2007 of the Commission concerning the export of waste listed in Annex III and IIIA in certain non-OECD countries, amended by EC Regulation No 740/2008, EC Regulation No 967/2009 and EC Regulation No 837/2010
- the EC Regulation No 413/2010 of the Commission amending the Annexes III, IV and V for the purpose of taking into account the amendments adopted by OECD Council Decision C(2008) 156 must be observed.

The current documents pursuant to Annexes IA, IB and VII are available at www.edm.gv.at. A consolidated version of the EC Waste Shipment Regulation can be downloaded from the EURLEX website (eur-lex.europa.eu).

The Annexes of the EC Waste Shipment Regulation are structured as follows:

- Annex IA: notification document
- Annex IB: movement document
- Annex IC: specific instructions for completing the notification and movement documents
- Annex II: information and documentation related to notification
- Annex III: Green List
- Annex IIIA: mixtures of two or more wastes listed in Annex III and not classified under one single entry (“Mixtures of Green-Listed Waste”)
- Annex IIIB: Additional Green-Listed Waste awaiting inclusion in the relevant annexes to the Basel Convention or the OECD Decision (“Other Green-Listed Waste in the EU; notification in case of shipments outside the EU”)
- Annex IV: Amber List
- Annex IVA: Waste listed in Annex III but subject to the procedure of prior written notification and approval (“Green-Listed Waste subject to notification on EU level”)
- Annex V: Export prohibition for hazardous waste into non-OECD countries
- Annex VI: Form for pre-consented facilities (Art. 14 EC Waste Shipment Regulation)
- Annex VII: Information accompanying shipments of waste as referred to in Article 3 (2) and
8.2.2.3. EU Correspondents’ Guidelines on EC Waste Shipment Regulation No 1013/2006

These Correspondents’ Guidelines represent the common position of all Member States concerning the interpretation of Regulation (EC) No 1013/2006 on shipments of waste. The guidelines were established by the correspondents at the meetings held in accordance with Article 57 of Regulation (EC) No 1013/2006. They are not legally binding. The binding interpretation of Community law is the exclusive responsibility of the European Court of Justice. In a few years, the guidelines will be revised, if necessary.

- **Correspondents’ Guideline No 1** – Shipment of waste electrical and electronic equipment for re-use and relevant requirements (for clarifications on this, see sec. A of this chapter)
- **Correspondents’ Guideline No 2** – Notification form pursuant to Article 1 (3) (g) on shipments of waste in situations of crisis or war, during peacemaking or peacekeeping measures
- **Correspondents’ Guideline No 3** – Certificate for recovery or disposal in the case of shipments of waste for interim recovery and disposal operations (e.g. conditioning or pre-treatment/intermediate storage) pursuant to Article 15 (e)
- **Correspondents’ Guideline No 4** – Classification of waste electrical and electronic equipment and fly ash from coal-fired power plants
- **Correspondents’ Guideline No 5** – Classification of wood waste under entries B3050 or AC170
- **Correspondents’ Guideline No 6** – Classification of slags from processing of copper alloys under entries GB040 and B1100
- **Correspondents’ Guideline No 7** – Classification of glass waste originating from cathode ray tubes under entries A2010 or B2020
- **Correspondents’ Guideline No 8** – Classification of waste cartridges containing toner or ink (for national clarifications on classification in the case of refilling/upgrading, see sec. C of this chapter)
- **Correspondents’ Guideline No 9** – Transboundary shipment of waste vehicles – distinction of used vehicles from end-of-life vehicles (will soon be adopted on EU level); for national clarifications on this and delimitation of used spare vehicle parts from waste, see sec. B of this chapter

A) **Clarifications on Correspondents’ Guideline No 1: Electrical and Electronic Equipment – Waste or Product**

**Product**

If the holder claims the intention to ship used electrical and electronic equipment, the following documents must be provided to the authorities during transport to validate such claim:

a) a copy of the invoice and contract relating to the sale and/or transfer of ownership of the electrical and electronic equipment which states that the equipment is for direct re-use and fully functional (see record of functional capability**),

b) an evaluation (certificate of testing – record of functional capability**) for every item within the consignment and a protocol containing all the document details

c) a statement made by the holder who arranges the transport of the electrical and electronic equipment stating that none of the equipment/components within the consignment is/are waste as defined by the EC Waste Framework Directive or the Waste Management Act of 2002 as amended,

d) sufficient packaging* to protect the equipment from damage during transportation, loading and unloading.

Prior to any transboundary shipment of used electrical and electronic equipment the holder should be able to provide details to the relevant State authorities (for example customs, police or environmental authorities) providing evidence for compliance with the above-mentioned criteria for electrical and electronic equipment.

In any case, a certificate of testing (record of functional capability) must be provided; statements made by the holder alone are generally insufficient (special case: transboundary shipment of an individual used item of equipment for own re-use).

It should be noted that the shipment of used, functioning old refrigerator and air conditioning appliances containing HCFCs or partially halogenated HCFCs or HFCs to third countries is prohibited according to Regulation (EC) No 1005/2009 on substances that deplete the ozone layer.

Exports of products and appliances containing or requiring these substances are prohibited, where...
they do not constitute personal effects (individual appliance for own use).

**Record of functional capability**
The record should be fixed securely but not permanently on either the EEE itself (if not packed separately) or on the packaging so that it can be read without unpacking the equipment. The protocol of testing and evaluation should accompany the transport. The testing should be based on the standard: ÖVE/ÖNORM E8701 Inspection after repair and modification and repeat tests of electrical appliances or a comparable standard.

Record of functional capability should contain the following information:

1. Name of item (name of the equipment according to Annex IB and number of category according to Annex IA of the WEEE Directive),
2. Identification number of the item (or type number, or, if no serial number is available, a self-issued sequential identification number),
3. Year of production (if available),
4. Name and address of the company responsible for evidence of functionality (name of the authorized and qualified expert performing the functional capability test)
5. Result of tests (e.g. naming defective parts and defects and certification that the defect can be remedied by minor repair or indication of full functionality according to the generally prevailing objective opinion),
6. Kind of tests performed (date and content of the functional capability test), maybe also name and address of the buyer.

The person performing the functional capability test must have an appropriate training or verifiable equivalent knowledge.

Electrical and electronic equipment would not normally be considered waste where
a) the aforementioned documents (a to d) are provided and the appliances are fully functioning and not destined for any recovery or disposal operations (according to Annex II of the EC Waste Framework Directive) but for the purpose it was originally intended for or if it is sold to end users for such re-use, or
b) the equipment is sent back as defective collective shipment to the producer or repair centres for repair (e.g. under warranty or repair not covered under warranty) with the intention of re-use, and if the above mentioned conditions under c) (non-waste declaration made by the holder) and d) (sufficient packaging) are met.

In the case of return to repair centres that work for a specific equipment manufacturer, appropriate cooperation contracts between the manufacturer and the repair centre must be presented for documentation.

**Minor repair**
The shipment of electrical and electronic equipment as non-waste is also admissible if the appliances can be made functional by means of “minor repair”. The term “minor repair” is to be interpreted in a stringent way, meaning “repair of a defect that is not essential to the functionality of the appliance that does not impair the security of the device, by means of simple tools in a short time”, such as installing a new key. “Minor repair” is by no means the change or repair of components essential to the functioning of the appliance such as the exchange of cathode ray tubes.

If used equipment, the main (mass-related) component of which are batteries or accumulators, require merely a change of batteries/accumulators, the batteries or accumulators must be removed prior to the transboundary shipment and the fact that the appliances can be made operational merely by insertion of new batteries or new accumulators must be stated in the “record of functional capability”. Accumulators with a capacity below 40% of the nominal capacity and waste equipment containing such accumulators must be classified as hazardous waste.

**Indicators for waste status applicability are the following**

a) the product is not complete, i.e. essential parts are missing (except power cords which are not firmly attached to the equipment)
b) it exhibits physical damage that impairs its functionality or safety, as defined in relevant standards,
c) the packaging* for protection of the equipment from damage during transport, loading and unloading is insufficient,
* in specific cases, e.g. for white goods, packaging is not mandatory, appropriately securing the cargo would be sufficient. Therefore, item d) should be interpreted as indicating that sufficient measures are taken to ensure protection of the equipment during transport, loading and unloading.
d) the appearance leaves a generally worn or damaged impression and the marketability of the equipment is therefore significantly reduced,
e) the equipment contains components that must be disposed or are prohibited under Community law or national law (cf. asbestos, CFC, PCB, etc.),
f) the electrical or electronic equipment is intended for disposal or recovery (e.g. scrapping, landfill** etc.) and not for re-use, 
g) there is no regular market for electrical and electronic equipment (e.g. very old equipment, very slow PCs with a processing capacity below that of standard operating systems conventionally used according to generally prevailing opinion (e.g. performance “below Pentium 4” [last updated 2011], cheap and outdated equipment).
h) it is old or outdated electrical and electronic equipment destined for cannibalisation (for the extraction of spare parts).

Failure to meet these criteria would generally indicate to the relevant authorities that the material constitutes waste electrical and electronic equipment (waste or hazardous waste) (subject to either notification or, in case of classification of specific used equipment as Green-Listed Waste (cf. notes referring to the entries GC010 and GC020 – mandatory carriage of documents with each shipment pursuant to Art. 18 of the EC Waste Shipment Regulation No 1013/2006 (Annex VII form and existence of a contract).

Waste electrical and electronic equipment from bulky waste collections which have not been subjected to a functional capability test (cf. presentation of a certificate of testing – record of functional capability) shall be considered as waste or hazardous waste a priori.

For shipments within the EU, the transitional rules (notification requirement) of some EU Member States must be considered. For shipments of non-hazardous waste electrical and electronic equipment (Green-Listed Waste) to non-OECD countries, the respective specified national controlling procedures of these countries must be respected (cf. relevant Commission Regulations – List of countries of the Federal Environment Agency Berlin: www.umweltdaten.de/abfallwirtschaft/gav/Staatenliste.pdf.

The shipment of hazardous waste to non-OECD countries is prohibited.

* In certain specific cases, unpacked waste equipment (mostly individual shipments) can constitute products, provided they are transported in an otherwise secure manner thus excluding transport damages.

** Subject to recovery in the EU

B) National code of practice for the distinction between used vehicles, end-of-life vehicles as well as accident vehicles and vehicle parts: waste versus product

Product
Where the holder claims the intention to ship used vehicles or vehicle parts, the following documents must be provided to the authorities during transport to validate such claim:

a) a copy of the invoice and contract relating to the sale and/or transfer of ownership of the used vehicles or vehicle parts which states that the equipment is intended for direct re-use and is fully functional,

b) a statement made by the holder who arranges the transport of the used vehicles or vehicle parts, stating that they do not constitute waste as defined by the EC Waste Framework Regulation or the Waste Management Act of 2002 as amended,

c) in case of the shipment of components from vehicles, sufficient packaging or appropriate storage to protect them from damage during transportation, loading and unloading is required,

d) seriously damaged end-of-life vehicles or accident vehicles shall only constitute products if a record of functional capability or repairability is available (= confirmation from a licensed workshop or an authorised and qualified technical expert which reflects that the used vehicles are directly suitable for re-use or will be re-used subsequent to minor repair).

Exemption: transboundary shipment of an end-of-life vehicle acquired for personal re-use

Waste status of end-of-life vehicles and accident vehicles
Waste status applies if:

a) the owner or holder of the vehicle wishes to dispose of or has disposed of the vehicle (verification of the intention to discard – “subjective waste status”). Such an intention to discard within the meaning of the Waste Management Act of 2002 as amended (in the EC Waste Framework Directive) and the EC Waste Shipment Regulation No 1013/2006 shall apply if at least one the following conditions apply:

- the vehicles are intended for dismantling (disassembly) for re-use of components or for scrapping (e.g. processing in a shredder process)

- the vehicles have been cut apart (e.g. into two halves) or are sealed with foam or welding (must be forced open to make end-of-life ve-
Vehicle roadworthy); sometimes these end-of-life vehicles that are sealed by welding are used as “containers” for spare parts or waste
- the vehicles are partially dismantled (e.g. missing seats) or essential parts are missing, resulting in severe safety risks (e.g. missing doors)
- the vehicle is no longer considered repairworthy in Austria or Europe

In any case, repairworthiness can no longer be assumed if the repair costs (costs of repair in Austria or other EU Member States) exceed the present value of the vehicle.

Criteria for the assessment of repairworthiness
- Present value (see Eurotax lists, e.g. to model year 1999: www.dat.de/fzgwerte/index.php)
- Condition (extent of damage, year of manufacture, mileage (if apparent))
- Cost of repair (estimate)
- Purchase price as a possible indicator (remark: the actual purchase price need not be identical with the price indicated in the documents).
- The vehicle was handed over to a waste collecting, waste management or recovery company for end-of-life vehicles.

b) the treatment of the vehicles as waste is in the public interest (verification of the environmental hazard – “objective waste status”)

The treatment as waste is definitely assumed to be in the public interest (Waste Management Act of 2002 as amended) if there is an environmental hazard due to at least one of the following reasons:
- Escape of fuel or fuel vapours (fire and explosion hazard in the case of leakages)
- Leaking liquid gas system (fire and explosion hazard)
- Escape of operating liquids (hazard to water from fuel, oil, brake fluid, anti-freeze fluid, battery acid, coolant)
- Significant impairment of the overall appearance of the site and landscape

c) the vehicle contains component substances the disposal of which is mandatory or the export of which is prohibited (in third countries) according to European or national law1 (exempt therefrom are individual vehicles as personal effects).

More indicators for the waste status
- The vehicles are not registered or have been de-registered.
- The vehicles have not been subjected to any new technical inspection for more than 2 years after the date for which the next technical inspection was scheduled.
- The vehicle does not have an identification number (chassis number = VIN vehicle identification number) or the holder of the end-of-life vehicle is unknown.

Historical vehicles (“vintage cars”)
In principle, historical vehicles (‘vintage’ cars) are not considered waste. With regard to the classification of vehicles as historical vehicles, reference is made to the provisions of the Motor Vehicles Act of 1967 (Kraftfahrgesetz – KFG) as amended (Article 2 et seq.).

According to sec. 2 of the Motor Vehicles Act of 1967 in the version of Federal Law Gazette I No 80/2002, vehicles which are worth being conserved and which are not intended for permanent use a) manufactured in 1955 or earlier or b) which are over 25 years old and have been entered into the list for historical vehicles that has been approved by the Federal Minister for Transport, Innovation and Technology qualify as historical vehicles.

Classification as waste according to Annex III of the EC Waste Shipment Regulation No 1013/2006 (Green List)
The end-of-life vehicles or accident cars can be assigned to the Green List entry B1250 waste end-of-life motor vehicles containing neither liquids nor other hazardous components’ of Annex III of the EC Waste Shipment Regulation No 1013/2006 if they have been depolluted in accordance with the requirements under entry B1250 (see Technical Part).

The shipment of end-of-life vehicles which do not hold hazardous liquids or other hazardous components (Green-Listed Waste) destined for recovery in countries to which the OECD Council Decision C (2001) 107 Final applies without transitional provisions, is not subject to notification and approval (notification requirement applies to the following EU Member States: Poland, the Slovak Republic, Bulgaria and Romania).

For shipments to non-OECD countries, the respective specified national controlling procedures of these countries must be respected (cf. relevant Commission Regulations No 1418/2007 and its amendments No 740/2008, No 967/2009 and No 837/2010 or the list of countries of the Federal

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1 e.g. CFCs or HCFCs in air-conditioning systems (cf. EC Regulation No 1005/2009 on substances that deplete the ozone layer); Note: HCFCs e.g. R134a would still be a permitted refrigerant
Classification as unlisted waste according to the EC Waste Shipment Regulation (subject to notification and approval)
The shipment of end-of-life vehicles or accident vehicles with hazardous liquids and other hazardous components to be classified as hazardous waste, if they fulfil the above waste status criteria, to other EU Member States and OECD states having implemented OECD Council Decision C (2001) 107 FINAL are always subject to notification and approval (non-listed waste – Amber List control procedure).
The shipment of non-depolluted end-of-life vehicles or accident cars to be classified as hazardous waste, if they fulfil the above waste status criteria, to other non-OECD states or to states that have not yet implemented OECD Council Decision C (2001) 107 FINAL is prohibited due to the ban on the export of hazardous waste.

Intermediate storage (e.g. also after detainment of illegal transports)
In the event of any intermediate storage of end-of-life vehicles or accident vehicles, precautions (impermeable surfaces, spillage collection facilities and separators) must be taken in order to protect the environment, in particular in the event of loss of water-polluting substances (e.g. motor oil).

Classification of used spare vehicle parts as waste
With regard to the execution of the End-of-Life Vehicle Ordinance, it is necessary to verify whether the shipment of used spare vehicle parts is carried out by individuals or companies (e-end-of-life vehicles) that are ERAS-registered. The fact of non-registering may be an indication that the components might not be functional as they were not removed in accordance with the state-of-the-art (and are thus waste).

All used spare parts including engines and gear units must be checked by a licensed mechanic for their functionality or repairability/repairworthiness and usability for their original purpose. The certificate for this purpose should describe the test procedure and contain both the contact data and the signature of the responsible mechanic.

If the spare parts are removed by a workshop that is not licensed or not licensed according to the Waste Management Act or by a car dismantling business not registered in accordance with the End-of-Life Vehicles Ordinance, a certificate issued by an externally authorised workshop is required for each load intended for shipment (cf. also warranty for tested spare parts).

Indicators for waste status applicability to car spare parts are the following:
a) The components are leaking oil or are oil-contaminated (sprinkling them with oil binding agents does not replace the required cleaning of used vehicle spare parts!).
b) The components are severely corroded or exhibit physical damage (e.g. bent, buckled doors, components with cut cables and hoses, porous and useless hoses, cut apart parts), impairing functionality or safety, as defined in relevant standards.
c) The spare parts are not specifically catalogued in a loading list.
d) The spare parts are not packaged or are not stored in a manner to specifically protect them against transport damages or damages during loading and unloading.
e) The used car parts or components are obviously not suitable for re-use.
f) The components or car parts are destined for recovery or disposal (e.g. scrapping, landfiling, etc.) and not for re-use.

For details on the assessment of waste status for waste pneumatic tyres see under heading B3140.

In case of doubt regarding the waste or non-waste status of end-of-life vehicles or accident cars or car components, a request for a declaratory decree can be submitted to the relevant district authorities according to sec. 6 Waste Management Act of 2002 as amended.

C) National clarifications on EU Correspondents’ Guidelines No 8 on waste cartridges containing toner or ink in particular with regard to refilling and upgrading
In principle, a distinction must be made between cartridges with and without hazardous constituents. If a mix of toner or ink cartridges with and without hazardous toner or ink residues is contained or if it is not a priori known whether only non-hazardous toner or ink cartridges are contained, these mixes must be handed over as hazardous waste with a consignment note. Transboundary shipment of such mixes is subject to notification and approval (Amber List – A1180).

Safety data sheets or product information can be used to facilitate correct classification. In terms of the classification of empty toner or ink cartridges as hazardous or non-hazardous waste (and thus in terms of the question of assignment to Annex III),
differences may arise among the individual Member States, because not all hazard criteria have been harmonised.

Furthermore, there may also be different interpretations with regard to whether empty toner or ink cartridges without hazardous constituents should be refilled or upgraded or converted to other models in the waste regime (cf. “Preparation for re-use”) or whether they constitute non-waste (see national explanations regarding re-use under b).

Under the provisions of Art. 28 of the EC Waste Shipment Regulation, the more stringent procedure shall prevail in any case of different classification by the authorities involved.

**a) Waste shipment destined for recovery (material recovery)**

Empty **toner and ink cartridges without hazardous toner or ink residues** (according to current knowledge these are the majority of all toner systems available on the market) or drum-driven cartridges with unproblematic organic OPC (organic photo conducting) coatings or scratch-free silicon or zinc oxide coating, shall be assigned to EAV 16 02 16 components removed from discarded equipment other than those mentioned in 16 02 15* in the European List of Waste, even if they are cartridges from equipment that is still in use; the cartridges shall be subsumed under entry GC020 of Annex III (Green List) of the Waste Shipment Regulation.

**Toner and ink cartridges with hazardous toner or ink residues** (e.g. toners and inks classified as toxic, carcinogenic, mutagenic or teratogenic) or drum-driven cartridges that contain hazardous substances such as cadmium sulphide or selenium-arsenic compounds shall be assigned to EAV 16 02 15* in the European List of Waste, even if they are cartridges from equipment that is still in use; the cartridges shall be subsumed under entry A1180 of Annex III (Green List) of the Waste Shipment Regulation.

**b) Shipment destined for recovery (refilling, upgrading, conversion to other models)**

Prior sorting shall be a prerequisite for the shipment of cartridges destined for refilling or upgrading. Sorting is not required according to specific brands or models but is necessary in order to sort out unsuitable cartridges and to properly dispose of them as waste.

Moreover, toner and ink cartridges with hazardous toner or ink residues shall be sorted out, even if they are destined for refilling/upgrading/conversion to other models, because the transboundary shipment of a mix of ink and toner cartridges with and without hazardous toner and ink is always subject to notification.

**Product**

For the shipment of sorted (empty) toner or ink cartridges that are destined for the purpose of reuse in terms of refilling, upgrading or conversion to other models, an intention to discard and the identification as waste in the public interest shall not be assumed. Therefore, it is not considered a shipment of waste.

For transboundary shipments, credible evidence must be provided that waste status does not apply in these cases (presentation of a contract for refilling/upgrading/conversion to other models; confirmation of the holder that the cartridges do not contain hazardous toners or inks).

It must be pointed out that on top of sorting, some states also require the cleaning of the cartridges for classification as non-waste. Therefore the relevant status in the importing country (possibly waste) must always be verified prior to transboundary shipment.

**Waste**

Due to their hazardous components, toner and ink cartridges that contain hazardous toner or ink residues must be treated as waste in the public interest. A shipment of toner and ink cartridges that contain hazardous toner and ink residues intended for refilling, upgrading or conversion to other models is therefore subject to the EC Waste Shipment Regulation and notification (entry: A1180 Amber List).

**8.2.3. The notification procedure**


**Commission Regulation (EC) No 669/2008 of 15 July 2008 to supplement Annex IC of the Regulation (EC) No 1013/2006 establishes specific instructions for the completion of the notification and movement documents (see www.edm.gv.at).**
Documents to accompany the shipment

The movement document as well as copies of the notification document and the written consents of the competent authorities must accompany every shipment; all consents of the concerned to the specific notification authorities of dispatch and destination in the EU shall be made in writing, for transit countries in the EU, however, the required consent can also be given tacitly.

It is pointed out that some EU Member States require the shipment to be accompanied by certified shipment/movement documents (e.g. Slovak Republic).

8.2.3.1. Waste destined for DISPOSAL

1. It is prohibited to export any waste out of the EU for disposal except to EFTA Countries. List of EFTA Countries: Iceland, Liechtenstein, Norway, Switzerland

2. It is permissible to import waste into the EU for disposal only from such countries as:
   - are signatories of the Basel Convention or
   - with which there are corresponding agreements
   - are in situations of crisis or war, in the case of peacemaking or peacekeeping measures (exemption from the notification requirement – but mandatory reporting)

The transboundary shipment of waste destined for disposal into/between EU Member States and the export of waste to EFTA Countries is subject to written notification and approval (exception to the notification requirement: only in situations of crises or war during peacemaking or peacekeeping measures in the above-mentioned cases).

8.2.3.2. Waste for RECOVERY

The following waste is subject to the NOTIFICATION REQUIREMENT:

1. Annexes IV and IVA (AMBER LIST) (except for import in situations of crisis, peacemaking or peacekeeping measures)

The following waste shall be subject to the prior written notification and approval procedure (Amber List – Annex IV of the EC Waste Shipment Regulation) in the case of transboundary shipment destined for recovery:


Annex II of the Basel Convention contains the following entries:

Y46 Waste collected from households unless appropriately classified under a single entry and Y47 Residues arising from the incineration of household wastes

For the purpose of the EC Waste Shipment Regulation, the following shall apply:

a) References to Annex VIII List B of the Basel Convention shall be considered references to Annex III of the EC Waste Shipment Regulation.

b) In Basel entry A1010, the term “excluding such wastes specifically listed on List B (Annex IX)” is a reference both to Basel entry B1020 and the note on B1020 in Annex III Part I (b).

c) Entries A1180 and A2060 of the Basel Convention do not apply; instead the OECD entries GC010, GC020 and GG040 in Annex III Part II apply, if appropriate (cf. Correspondents’ Guidelines No 4 on classification of hazardous waste electrical and electronic equipment and fly ash from coal-fired plants with hazardous characteristics).

d) Basel entry A4050 includes spent potlinings from aluminium smelting because they contain Y33 inorganic cyanides. If the cyanides have
been destroyed, spent potlinings are assigned to Part II entry AB120 because they contain Y32, inorganic fluorine compounds excluding calcium fluoride.

It is permissible to import Amber-Listed Waste into the EU that is destined for recovery only from countries:

- to which the OECD Council Decision applies or
- which are signatories of the Basel Convention or
- with which there are corresponding agreements
- in situations of crisis or war, in the case of peace-making or peacekeeping measures.

The wastes mentioned in Annex IV and IVA of the EC Waste Shipment Regulation are always subject to the written notification and approval procedure if they are subject to transboundary shipment unless the export of such wastes to countries, to which the OECD Decision does not apply, is prohibited anyway (see Chapter 8.2.5. – Ban on export of hazardous wastes into non-OECD countries).

Note on Annex IVA:
This is a listing of waste mentioned in Annex III of the EC Waste Shipment Regulation that are also subject to the prior written notification and approval procedure. The Annex IVA is currently empty.

2. Unlisted waste – subject to the notification requirement

The lists are not a complete system containing all possible types of waste. All wastes not mentioned in the above Annexes are still subject to the written notification and approval procedure unless the export of such waste to countries to which the OECD Decision does not apply is prohibited a priori because of its hazardous characteristics.

3. Waste mixtures listed in Annex III (Green List Waste Mixtures)

The shipment of mixtures of Green-Listed Waste is subject to the notification requirement unless they are explicitly mentioned in Annex III, IIA or IIB (cf. also Judgment of the European Court of Justice in the “BESIDE” case of 25 June 1998 – Case C192/96).

4. Waste mixtures composed of Green-Listed Waste and other waste

Such waste mixtures always require written notification and approval if they are subject to transboundary waste shipment, provided no export ban applies.

5. Waste in Annex III or IIA in EU Member States for which transitional provisions exist

(see Chapter 8.2.4.) and in non-OECD countries which require a notification procedure (certain non-OECD countries have also imposed an import ban; certain entries in Annex IIA may not be shipped into non-OECD countries – see Chapter 8.2.8) – a future Commission Regulation shall establish the control regime for non-OECD countries for Annex IIA.

6. Wastes in Annex IIB for shipments into OECD and non-OECD countries

The Annex has not been filled yet.

8.2.3.3. Interim recovery and interim disposal

This encompasses shipments to the interim recovery operations R12 (Exchange of waste – e.g. conditioning processes, such as the production of waste fuels; reduction, sorting) or R13 (Intermediate storage) prior to the final (non-interim) recovery operation or interim disposal operation D13 (Blending or mixing), D14 (Repackaging) or D15 (Intermediate storage) prior to application of a final (non-interim) disposal operation.

Regarding the issue of the certificate of recovery or disposal, reference is made to the Correspondents’ Guidelines No 3 – Certificate for subsequent non-interim recovery or disposal according to Article 15(e) of Regulation (EC) No 1013/2006.

General information

If wastes are picked up or collected in Austrian territory by a collector whose place of business is located in a different EU Member State, it is always necessary to verify whether this collector also holds the required Austrian or equivalent foreign collection authorisations and – in the case of wastes subject to the notification requirement – whether this collector holds a valid permit for transboundary shipments of wastes obtained within the scope of a notification procedure. The evaluation of the equivalence of the authorisation is incumbent upon the Governor of the relevant Austrian Federal Province.

A pre-requisite for classification as “equivalent permit” pursuant to § 24a (2) (3) of the Austrian Federal Waste Management Act of 2002 as amended, is that the foreign legislation foresees the presence of appropriate technical qualifications, the reliability of the collector or conditioner as well as the protection of public interests by the nature of the collection or treatment method.
8.2.4. Waste not subject to notification – formal requirements according to Art. 18 EC Waste Shipment Regulation

Annex III – GREEN LIST


For the purpose of the EC Waste Shipment Regulation, the following shall apply:

a) References to List A in Annex IX to the Basel Convention shall be understood as a reference to Annex IV to the EC Waste Shipment Regulation.

b) In Basel entry B1020, the term “bulk finished form” includes all metallic non-dispersible forms of the scrap listed therein (definition dispersibility see Chapter 8.2.6).

c) The part of Basel entry B1100 that refers to “Slags from copper processing” etc., does not apply and OECD entry GB040 in Part II applies instead.

d) Basel entry B1110 does not apply and OECD entries GC010 and GC020 in Part II apply instead.

e) Basel entry B2050 does not apply and OECD entry GG040 in Part II applies instead.

f) The reference in Basel entry B3010 to fluorinated polymer wastes shall be deemed to include polymers and co-polymers of fluorinated ethylene (PTFE).

In the following cases, transboundary shipment of Annex III waste destined for recovery does not require written notification and approval:

- Shipment from all countries into/between EU Member States that are not subject to any separately agreed transitional rules

- Export into countries to which the OECD Council Decision C(2001)107/Final on control of transboundary movements of wastes destined for recovery operations (OECD Decision) applies

- Export into countries to which the OECD Council Decision C (2001)107/Final on control of transboundary wastes destined for recovery operations does not apply (= non-OECD countries), but which pursuant to Article 37 of the EC Waste Shipment Regulation have determined that the shipment of all or certain wastes listed in Annexes III and IIIA is permissible without notification (cf. EC Commission Regulation No 1418/2007 and its amendments No 740/2008, No 967/2009 and No 837/2010 or the list of countries of the Federal Environment Agency Berlin: www.umweltdaten.de/abfallwirtschaft/gav/Staaatenliste.pdf)

Wastes not requiring notification – documents to accompany the shipment

Transboundary shipments of waste, which do not require notification, must be accompanied by the documents defined in Article 18 of the EC Waste Shipment Regulation (form according to Annex VII of the EC Waste Shipment Regulation), provided the quantity of waste transported is greater than 20 kg.

Prior to the shipment, a written recovery contract must be concluded in accordance with Art. 18. The obligation to carry documents pursuant to Article 18 of the EC Waste Shipment Regulation also applies to the shipment of hazardous and non-hazardous waste up to an amount of 25 kg if they are destined for laboratory analysis (Art. 3 (4) of the EC Waste Shipment Regulation).

In the Annex VII document it is also possible to specify a disposal operation (e.g. incineration test D10 or physico-chemical treatment as specified in D9) but only, and without exception, for laboratory tests.

In the case of shipments of hazardous wastes as defined by the Austrian List of Wastes Ordinance, as amended, which are explicitly specified in the Green List, the document pursuant to Annex VII of the EC Waste Shipment Regulation is also considered a national consignment note for hazardous wastes pursuant to the List of Wastes Ordinance, Federal Law Gazette No 2003/613 as amended. Furthermore, the Austrian consignee must report receipt of hazardous wastes to the Governor of the relevant Austrian Federal Province pursuant to Article 18 (3) of the Waste Management Act of 2002 as amended.

The document contained in Annex VII must be signed by the person who arranges for the shipment before the shipment takes place and shall be signed by the recovery facility or the laboratory and the consignee when the waste in question is received.

The written recovery contract (see sample text at www.lebensministerium.at – waste, waste shipment) between the person who arranges for the shipment and the consignee shall be effective when the shipment starts and shall include an obligation, where the shipment of waste or its recovery cannot be completed as intended or where it has been effected as an illegal shipment, on the person who arranges for the shipment or, where that person is not in a position to complete the shipment of waste
or its recovery (for example, in case of insolvency), on the consignee, to
a) take the waste back or ensure its recovery in an
alternative way and
b) provide, if necessary, for its storage in the mean-
time.
Upon request, the person who arranges for the
shipment or the consignee must provide a copy of
the contract to the representatives of the authori-
ties (Federal Ministry of Agriculture, Forestry, Envi-
ronment and Water Management) or enforcement
officers such as customs and federal police.
A contract of this type is not required for shipments
of waste destined for laboratory analysis as defined
by Art. 3 (4) of the EC Waste Shipment Regula-
tion.

Shipment of Green-Listed Waste not requiring
notification destined for interim recovery opera-
tions (R12, R13)
In accordance with the explanations of the ECJ in
the “BESIDE” case, (C-192/96), specification of
the end-recovery business and final treatment op-
eration on the Annex VII form (or a supplemen-
tary sheet) is required. Preferably, the supplemen-
tary sheet should be attached to the Annex VII
document so that any exchange is not easily pos-
sible.
Upon request, this information must be provided to
the representatives of the authorities (Federal Min-
istry of Agriculture, Forestry, Environment and Wa-
ter Management) or enforcement officers, such as
customs and federal police.
If waste is classified as Green-Listed Waste in
the context of a declaratory decree by the re-
gional district authority (“Bezirksverwaltungsbe-
hörde”), an assessment of the recovery operation
following the interim treatment operation shall
take place, in order to exclude subsequent dis-
posal, given that all shipments of wastes destined
disposal are subject to notification and
approval.
Annex III and IIIA waste does not require written
notification and approval in the case of transbound-
ary shipments destined for recovery unless it
► is shipped into an EU Member State subject to
corresponding transitional provisions for the im-
port of such waste (Poland, Slovakia, Bulgaria,
and Romania) or
► is shipped into a country to which the OECD
Decision C (2001)107/Final does not apply and
that at the same time intends to apply a control
procedure for the importing of such waste or
that has issued no declaration to the EU.
Relating to the control procedure to be applied to
the export of Annex III and IIIA waste into non-
OECD countries for recovery, reference is made to
EC Commission Regulation No 1418/2007 and its
amendments No 740/2008, No 967/2009 and No
837/2010 (in each current version – see the Euro-
pean Commission website concerning the ship-
ment of waste: ec.europa.eu/environment/waste/ship-
ments/legis.htm or the consolidated list of
countries of the Federal Environment Agency
Berlin: www.umweltdaten.de/abfallwirtschaft/gav/
Staatenliste.pdf).

### Effective period of the transitional rules for
transboundary shipments of Green-Listed Waste
into new EU Member States:

<table>
<thead>
<tr>
<th>Member State</th>
<th>Transitional period for the import of Green-Listed Waste – Notification duty until</th>
</tr>
</thead>
<tbody>
<tr>
<td>Slovakia</td>
<td>31 December 2011</td>
</tr>
<tr>
<td>Poland</td>
<td>31 December 2012</td>
</tr>
<tr>
<td>Bulgaria</td>
<td>31 December 2014</td>
</tr>
<tr>
<td>Romania</td>
<td>31 December 2015</td>
</tr>
</tbody>
</table>

### Annex IIIA – waste mixtures composed of
Green-Listed Waste
Mixtures of certain Green-Listed Wastes that are
not subject to notification for shipment for recovery
in the EU and in OECD countries (provided there
are no deviations from the OECD Council Decision)
have been defined explicitly in Regulation (EC) No
308/2009.
All mixtures that are not specified in Annex IIIA are
subject to the notification requirement.
Enquiries must be made to the competent author-
ity for information on the applicable control proce-
dure for exports of waste listed in Annex IIIA into
OECD countries or non-OECD countries.
To date, all wastes listed in Annex IIIA are subject
to the notification requirement (last updated: spring
2011), when being shipped to non-OECD coun-
tries.

### Annex IIIB – additional Green List – waste for
recovery within the EU
Annex IIIB lists waste that is not subject to the writ-
ten notification and approval procedure except in
the case of transboundary shipment destined for
recovery operations between EU Member States to
which no transitional rules apply.
This instrument can facilitate the shipment of cer-
tain types of wastes without hazardous character-
istics within the EU pending the decision on wheth-
er they will be included in the corresponding An-
8. Guidelines for the Shipment of Waste

nexes of the Basel Convention or of the OECD Decision. This Annex is currently blank, but applications are pending at EU level for the inclusion of certain specified wastes.

**General information concerning wastes not requiring a notification procedure**

In any case it is always necessary for the person who arranges for the transboundary waste shipment to verify whether the waste receiver holds the required approvals in the country of import.

### 8.2.5. Ban on export of hazardous wastes into non-OECD countries

Exports from the Community of the following wastes destined for recovery in countries to which the OECD Decision does not apply are prohibited:

- hazardous wastes mentioned in Annex V of the EC Waste Shipment Regulation
- waste mentioned in Part 3 of Annex V (Basel Annex II: waste collected from households and residues arising from the incineration of household waste as well as certain entries from the earlier OECD Decision)
- hazardous wastes not classified under one single entry in Annex V
- mixtures of hazardous waste and mixtures of hazardous with non-hazardous wastes not classified under one single entry in Annex V
- wastes that the country of destination has notified to be hazardous under Article 3 of the Basel Convention
- waste the import of which has been prohibited by the country of destination; or
- wastes which the competent authority of dispatch has reason to believe will not be managed in an environmentally sound manner in the country of destination concerned.

#### 8.2.5.1. Note concerning Annex V

This Annex consists of three parts, Parts 2 and 3 of which apply only when Part 1 is not applicable. First, it is necessary to verify whether the wastes destined for export are listed in Part 1 of Annex V; if they are mentioned in List A of Part 1 of Annex V, they are generally subject to an export ban (see below for the “opting-out” clause governing exceptions).

If the wastes are mentioned in List B of Part 1, they may generally be exported (see below for the “opting-in” clause governing exceptions).

If wastes are not listed in Part 1, it is necessary to verify whether they are listed as hazardous wastes (= wastes followed by *) in Part 2 (EU List of Waste). If so, they are generally subject to an export ban (see below for the “opting-out” clause governing exceptions).

If the waste is not listed in Part 2, either, it is necessary to verify whether it is mentioned in Part 3.

**Opting-in Clause**

The fact that a type of waste is not listed as hazardous in Annex V or that it is mentioned in List B of Part 1 of Annex V does not mean that it cannot be classified as hazardous in exceptional cases; in fact waste is subject to an export ban, if it exhibits one of the hazardous characteristics defined by the EU; in the case of properties H3 through H8, H10, and H11, the EU limit values should be taken into account.

Example: Vanadium pentoxide catalysts (without additional contaminants from the process) constitute hazardous waste because of their material properties (note: in the list of substances included in the laws governing chemicals, vanadium pentoxide is classified as a class-3 teratogen and mutagen). Such vanadium pentoxide catalysts should be considered Green-Listed Waste (item B1120) if they are subject to shipment between EU Member States for which no transitional period exists, because the Green List also includes wastes, the recovery of which does not pose risks, but that nevertheless exhibit hazardous properties.

Exporting such wastes to non-EU countries where the OECD Decision does not apply is prohibited, since the waste exhibits a hazardous characteristic under EU law.

In the above-mentioned cases, the Member State shall inform the envisaged country of destination prior to taking a decision.

**Opting-out Clause**

In exceptional cases, on the basis of substantiating documents to be properly submitted by the notifier, it may be decided that certain hazardous wastes listed in Annex V should be exempted from the
export ban because they exhibit no hazardous characteristic; in the case of properties H3 through H8, H10, and H11, the EU limit values should be taken into account. Such proof might conceivably be provided for certain (chemically) treated wood waste, for example. In the above-mentioned cases, the relevant Member State shall inform the envisaged country of destination prior to taking a decision; in any case, shipment still requires written notification and approval.

Excursus: Hazardous characteristics of the Basel Convention, OECD and European Union

The hazardous characteristics of the Basel Convention and OECD are mainly defined by the UN classification criteria for the transport of hazardous goods. The EU hazardous characteristics, in contrast, are based on classifications under laws governing chemicals, in which certain hazardous properties, such as H13, have not yet been standardised on the international level. As a result, the waste classifications may differ from one Member State to the next. In such cases, the stricter control procedure according to Article 28 of the EC Waste Shipment Regulation No 1013/2006 must always be applied.

The waste list in the Basel Convention is based on substance-specific characteristics; only the hazardous constituents mentioned in Annex I of the Basel Convention are taken into account. However, Annex I of the Basel Convention (categories of wastes to be controlled or wastes containing certain components) does not reflect the current state of technical and scientific knowledge. Annexes VIII and IX of the Basel Convention are based on the lists in the original OECD Council Decision C(92)39 (three-tiered list system of recoverable waste); in any case, in the above-mentioned OECD Decision, the wastes are listed according to their risk and not only according to their substance-specific characteristics. The evaluation took into account criteria such as the risk of possible contamination of the waste with hazardous substances, the risk of dissipation of the waste in the environment in the case of an accident, and the risk of potentially environmentally unsound treatment in industrialised OECD countries. The developments at Basel Convention level, especially the adoption of the two Lists A and B (Annexes VIII and IX) of the Basel Convention in November 1998, caused the OECD to harmonise Decision C(92)39 with those Basel Convention lists in order to avoid duplication of activities. The result was the adoption of the OECD Council Decision C(2001)107 FINAL on 14 June 2001, in which Basel lists A and B (Annexes VIII and IX) are incorporated and additional entries of the earlier OECD Decision C(92)39 were listed. The OECD Council Decision was adopted in the context of the Amendment of the EC Waste Shipment Regulation with the intervening adaptations of the Basel Annexes VIII and IX.

8.2.6. Classification criteria for Green-Listed Waste – List of waste subject to the general information requirements laid down in Article 18 of the EC Waste Shipment Regulation

The following section gives the decisive criteria for classifying waste under the Green List.

Basic Requirements

Regardless of whether or not wastes are included on the Green List, they may not be classified as such if they are contaminated by other materials to an extent which:

- a) increases the risks associated with the wastes sufficiently to render them appropriate for submission to the procedure of prior written notification and approval, when taking into account the hazardous characteristics defined at EU level or
- b) prevents the recovery of the wastes in an environmentally sound manner.

The entries in the Annexes to the EC Waste Shipment Regulation should not be considered in isolation for the purposes of interpretation; rather, they should be viewed as integral parts of a waste classification system. The entries of Annex III of the EC Waste Shipment Regulation refer to mirror entries of Annex IV of the EC Waste Shipment Regulation and vice-versa.

When classifying a type of waste, it should be matched with the most appropriate entry of any of the lists that best describes it in terms of its description and origin; in so doing, specific contaminants or constituents must be taken into account.

Note:

Certain Green List entries make reference to standards. Those standards are mentioned by way of example and are by no means exhaustive.

Contribution to the remediation of contaminated sites

Attention is drawn to the requirement to pay the contribution to the remediation of contaminated sites also for transboundary shipments of Green-Listed Waste (Annexes III, IIIA, IIIB), for instance for energy recovery, production of fuel products or for waste fractions that are submitted to permanent landfilling or backfilling. Details of and exceptions
from the ALSAG requirement are listed in sec. 3 of the Act on the Remediation of Contaminated Sites (ALSAG) as amended.

**Shipments of waste for regeneration**

Spent catalysts, activated carbon, acids, alkalines, solvents etc. intended for regeneration always constitute waste and are subject, in the event of transboundary shipment, to the provisions of the EC Waste Shipment Regulation No 1013/2006 as amended (see relevant entries in the Green or Amber List).

**Non-dispersible / waste without risk of dispersion**

Waste without risk of dispersion absolutely does not include waste in the form of powder, sludge, dust, or solid objects containing or encasing hazardous waste in liquid form (e.g., storage batteries, partially filled containers).

Note:
For example, waste metal is to be classified in the category “scrap” if most of the waste is in non-dispersible metallic form (no metal oxides or other compounds) and only a small portion of the waste has a particle size less than 100 micrometres (recommended value for dispersibility).

That reference value of 100 micrometres is based on a 1994 study commissioned by the OECD entitled: “A Criterion for Non-Dispersibility of Metal and Metal Containing Material in Waste Classification”. This study concludes that if no more than 0.1% of the waste is composed of particles small enough to be blown away by the wind (particle size under 100 micrometres), there is little risk of exceeding the acceptable levels of atmospheric concentration for most toxic metals.

It must be noted that certain metal oxides or other metal compounds (= disperse or dispersible part) should be considered toxic even in small quantities (cancerogenic nickel oxides, beryllium oxides and cadmium oxides and compounds – limit value 0.1%, teratogenic lead compounds – limit value 0.5%) and that it is imperative not to exceed the limit values under chemical law if waste is to be classifiable as Green-Listed Waste.

Thus, the permissible dispersible portion of waste (scrap) varies and depends on the toxicity of the metal compounds. In the case of iron or aluminium scrap, higher portions of iron oxide (rust) or aluminium oxide are permitted (see also the classification of iron scaling and aluminium oxides/aluminium skimmings on the Green List).

This approach is also used in the EU Member States Finland and Bulgaria, for example. There is still no EU-wide standard interpretation of the terms “disperse” or “dispersible”, so that the interpretations by individual Member States may lead to different, sometimes contradictory results.

**Relevance of hazardous content to classification of waste**

**Limit values and reference values**

In general, when Green-Listed Wastes are contaminated, the applicable limit values are those stipulated by the Austrian List of Wastes Ordinance, Federal Law Gazette II No 570/2003 as amended (= implementing the Commission Decision amending Decision 2000/532/EC concerning a List of Waste as amended).

If the associated limit values are exceeded (as defined by Annex 3 of the Austrian List of Wastes Ordinance), it should be assumed that such waste is hazardous waste not classifiable under the Green List unless specifically stipulated otherwise in the notes on certain items on the Green List (cf., catalysts).

**Recovery restrictions on the basis of pollutant limitations at EU level**

For the classification of waste under the Green List, it is always necessary to also consider the recovery restrictions for waste exceeding a certain pollutant level, which have been laid down at EU level. An environmentally sound recovery should only be assumed if these pollutant levels are complied with, even if according to the national legislation of the country of import, higher pollutant levels would be accepted in non-EU Member States and the waste would be subjected to the procedures of the Green List in this country.

Accordingly, the notification requirement applies if the pollutant levels are exceeded (recovery restrictions at EU level) even if no hazard criterion is triggered as a result.
Percent by mass
All specified percentages of hazardous substances or allowed components (limit values or, in certain cases, reference values) in the context of the Green List entries (or references to the Amber List) should be understood to mean percent by mass.

Priority to the stricter classification (Art. 28 of the EC Waste Shipment Regulation)
If the country of export or the country of import have defined stricter limit values/reference values or criteria for the classification of waste in the Green List than Austria, the stricter criteria apply in any case, especially since, in accordance with Article 28 of the EC Waste Shipment Regulation, the stricter procedure (notification) must always be applied if there are divergent classifications!

Waste shipment for energy recovery (principal use as a fuel or other means to generate energy)
Green-Listed Waste destined for energy recovery (waste fuel) must also comply with the criteria of the Guidelines for Waste Fuels or the Waste Incineration Ordinance as amended, so that an admissible recovery in the meaning of R1 can be assumed.
For shipments of Green-Listed Waste to incineration plants whose purpose is to treat solid municipal waste, a recovery in accordance with R1 can only be assumed if its energy efficiency achieves at least the following values:
- 0.60 for installations in operation and permitted in accordance with applicable Community legislation before 1 January 2009,
- 0.65 for installations that were authorised after 31 December 2008.
Otherwise the shipment will be considered a disposal (consequence: notification procedure).

Depollution
Particularly in the case of waste electrical and electronic equipment (WEEE), end-of-life vehicles and end-of-life ships, attention must be paid to the fact that it is generally necessary to prove that all pollutants have been removed (e.g. removal of hazardous components from printed circuit boards; removal of hazardous liquids such as oil, petrol, batteries from end-of-life vehicles, removal of asbestos from old ships) in order to classify such waste in the Green List. For more details, see the descriptions for those entries.
Baled scrap cars with no proof of removal of pollutants do not qualify as Green-Listed Waste because they contain a high percentage of undesirable and extraneous matter other than steel which impairs the recovery operation and increases environmental pollution during recovery (it is therefore unlisted waste subject to the written notification and approval procedure).

PCB/PCT
Waste, substances and objects that contain, consist of, or are contaminated with polychlorinated biphenyls (PCB) and/or polychlorinated terphenyls (PCT), including all analogous compounds, and that exhibit a concentration greater than 30 mg/kg dry mass (= Austrian legislation; according to international legislation: 50 mg/kg dry mass) are classifiable as waste subject to notification requirements (e.g. the contaminated non-ferrous metal heavy fraction scrap).

Note on PCB analysis:
When shipping PCB-contaminated or PCB-containing wastes, it is necessary to follow the guidelines in the relevant EU regulations as well as national specifications concerning PCB analysis and PCB limit values laid down in the country of destination. According to a customary method in Germany, the total PCB-content is estimated from the concentration of 7 main substances and then multiplied by a factor of 5!
This means that the PCB content in wastes destined for transboundary shipments to Germany (according to Austrian provisions for PCB analysis) must not exceed 10 mg/kg dry mass.

PBDE (polybrominated diphenyl ether) and PBB (polybrominated biphenyls)
According to the EC Regulation on the restriction of the use of certain hazardous substances in electrical and electronic equipment 2002/95/EC (ROHS Directive), it is forbidden to place PBB (polybrominated biphenyls) and PBDE (polybrominated diphenyl ether) on the market, while a maximum concentration of 0.1% by weight of PBB and 0.1% of PBDE per homogeneous material is considered tolerable.
Therefore, in the case of recycling waste with brominated flame retardants for the electrical and electronics industry, it is important to comply with the bans on use in accordance with the ROHS Directive for the sum of all PBDE congeners (monoBDE to decaBDE in total max. of 0.1% – see Analytical Standard EN 62321).
Notification is required where the limit of 0.1% for polybrominated diphenyl ethers or 50 ppm (= 0.005%) for polybrominated biphenyls in wastes (homogenous material) is exceeded, regardless of the subsequent recovery operation in order to ensure the environmentally sound management of this waste, subject to the bans on use set out in
European legislation and the provisions of the Austrian Ordinance on Waste Treatment Obligations as amended. The limit value of 50 ppm (=0.005%) in polybrominated biphenyls (PBB) follows from Annexes I and VIII of the Basel Convention. Where wastes are recycled that contain brominated flame retardants, reference is made to the relevant provisions of chemical law (bans on the use of octabrominated diphenyl ether – limit value 0.1% under Annex XVII of the REACH Regulation 1907/2006, item 45 and bans on use under Regulation (EC) No 757/2010 on persistent organic pollutants as regards tetra-, penta-, hexa-, hepta-BDEs). In Austria, however, the additional restriction applies under the requirements of the Austrian Ordinance on Waste Treatment Obligations as amended, that a material recovery of e.g. plastic cases with halogenated retardants is only allowed in those cases where the respective substances or additives must be added to the new product due to technical requirements. Stricter limit values yet to be defined within the framework of the Stockholm Convention or the EC POP Regulation must also be taken into account.

**Mineral oil contamination**

Wastes that are contaminated with mineral oil to an extent of more than 2% (=20,000 mg/kg dry mass) are always subject to the written notification and approval procedure if they are subject to transboundary shipment. Comment: In Bulgaria or Germany, according to national regulations, waste may be shipped as Green-Listed Waste only if contaminated with mineral oil by no more than 1% and 0.8% respectively.

**Waste with persistent organic pollutants (POP waste)**

Regulation (EC) No 850/2004 on persistent organic pollutants (EC-POP-R) amended by Regulation (EC) No 304/2009 last amended by the Regulations (EC) No 756/2010 (amendment to Annexes IV and V) and No 757/2010 (amendment to Annexes I and III) contains regulations regarding the treatment of POP wastes. POP wastes must be recovered or disposed of in a manner ensuring that the pollutants they contain are destroyed or irreversibly transformed. Moreover, on the one hand, POP wastes with POP levels below certain limit values (5,000 mg/kg – with the exception of PCB and PCDD/PCDF) may be disposed of at landfills for hazardous wastes (pursuant to the EC Landfill Directive or the EC Landfill Decision) and on the other hand, certain wastes listed in Annex V of the Regulation can be disposed of underground, e.g. in salt domes, even if they exceed the specified limit values. These lower limit values, which have been integrated in Annex IV of the Regulation, are as follows:

- for PCBs: 50 mg/kg,
- for polychlorinated dibenzo-p-dioxins and furans (PCDD/PCDF): 15 µg TEQ/kg,
- for other pesticides 50 mg/kg respectively.

At the 5th Conference of the Parties to the Stockholm Convention in May 2009, new substances were added to the list of POP wastes, including the flame retardants octabrominated and pentabrominated diphenyl ether, tetrabrominated diphenyl ether as well as hexa and heptabrominated diphenyl ether as impurities of octabrominated diphenyl ether and the impregnation agent perfluorooctanesulfonic acid (PFOS). Harmonised limit values for these new POP substances are currently not yet available in the CLP Regulation (EC) No 1272/2008 (CLP = Classification, Labelling and Packaging). The requirements of EC Regulation No 757/2010 amending Regulation (EC) No 850/2004 on persistent organic pollutants (Annexes I and III) must be observed which, among other things, define limit values for PBDE (polybrominated diphenyl ether) or PFOS (perfluorooctane sulfonate) for placing on the market products and preparations in consideration of the recycling of waste (“secondary materials”). Following the adoption of limit values applicable across Europe for the necessary destruction of waste containing PBDE and PFOS, the limit values adopted on EU level are applicable to the classification of waste under the Green List.

**Radioactivity**

Green-Listed Waste, particularly scrap, must not be radioactive (e.g. due to neutron activation; this is especially applicable to metal waste accumulating from nuclear reactor technology; another source of radioactivity may be, for example, technetium content in corrosion-resistant steel alloys) or have any radioactive contaminants (substances are considered radioactive if their level of radioactivity exceeds that of the natural background radiation, e.g. non-natural radionuclides such as potassium). The Ordinance on the Supervision and Control of Shipments of Radioactive Waste and Spent Fuel from, into or through the Federal Austrian Territory (Radioactive Waste Shipment Ordinance 2009, RAfb-VV 2009, Federal Law Gazette II No 47/2009) completely implements Directive 2006/117/Euratom into national legislation.
The Radiation Protection Act (Federal Law Gazette No 227/1969) has been amended several times in order to comply with the requirements of European legislation. A number of ordinances are based on the Radiation Protection Act, among others also the General Radiation Protection Ordinance (Federal Law Gazette II No 191/2006).

The limit values for the different nuclides (exemption values) are listed in the Annex to the General Radiation Protection Ordinance.

Wastes (e.g. waste metals) considered radioactive according to the Austrian Radiation Protection Ordinance, require the appropriate regulatory approvals in accordance with radiation protection legislation.

**EU End-of-Waste Regulation**

EC Regulation No 333/2011 establishes specific criteria determining when iron, steel and aluminium scrap cease to be waste. As of 9 October 2011, this Regulation shall apply in all EU Member States.

Criteria were established for an early end of waste with regard to
1. scrap quality
2. the input material sent to recovery and
3. treatment processes and techniques.

All treatment operations such as cutting, shredding, cleaning or decontaminating, needed to prepare scrap metal for use in steel works and aluminium plants must have been completed before it can cease to be waste.

The total permissible amount of foreign materials in iron and steel scrap was established at 2% by weight and the total permissible amount of foreign materials in aluminium scrap was established at 5% by weight or a metal yield of at least 90%. Further criteria are that the scrap shall be free of visible oils, oily emulsions and lubricants except negligible amounts that will not lead to any dripping. It shall not display any hazardous properties and must be “free of radioactivity”.

One particular condition is that the producers of this waste with product status shall implement a quality management system and hold a declaration of conformity to demonstrate compliance with all the required criteria (Annex III of Regulation No 333/2011) for each scrap metal consignment. The producer or the importer into the European Union shall transmit the statement of conformity to the next holder of the scrap metal consignment. The statement of conformity may be in electronic form.

The quality management system shall provide evidence for compliance with all the requirements of this Regulation. The producer shall give competent authorities access to the quality management system upon request.

In order to facilitate the implementation of the EC Regulation No 333/2011, it is recommended to accompany all transboundary shipments with a copy of the completed and signed Annex III Document (statement of conformity).

**8.2.7. Chemicals Legislation**

**8.2.7.1. REACH**

REACH stands for Registration, Evaluation, Authorisation and Restriction of Chemicals. The REACH Regulation (EC) No 1907/2006 must be directly applied in all Member States and does not require national implementation.

Waste is not included in REACH because waste, as defined by the EU Waste Regulation, is not considered a substance, preparation (mixture) or article defined by REACH.

If materials are recycled from wastes and cease to be waste, they are subject to registration in accordance with REACH, in the absence of express exemption provisions in REACH.

Under certain conditions, REACH stipulates exemptions from the registration requirement for recycling materials. Registration is not an act with which waste status can be changed.

**8.2.7.2. CLP Regulation**

In parallel with REACH, the European classification and labelling of chemicals has been adjusted to meet the specifications of the United Nations to establish a Globally Harmonised System (GHS).

The main content of the CLP Regulation (CLP = Classification, Labelling and Packaging) (EC) No 1272/2008 refers to new provisions for the classification and labelling of hazardous chemicals and
mixtures (preparations). Instead of the previously 15 hazardous characteristics, some 30 hazard classes will apply in the future (increase in the number of hazard classes due to additional subdivision of the physicochemical characteristics in accordance with the legislation on the transport of dangerous goods).

An extensive harmonisation of waste legislation with the CLP Regulation is being undertaken in the context of the revision of the European List of Waste which is scheduled to come into effect in 2015.

**Technical Framework Conditions**

8.2.8. **Notes on the waste types in accordance with Annex IIIA (defined mixtures of Green-Listed Waste) and Annex III (Green List) as follows:**

Comment:

Note: items followed by ¹ are Annexes to the Basel Convention.

Please note that the classification of Green List entries under the codes of the European List of Waste (LoW) are given only by way of example and are not exhaustive.

8.2.8.1. **ANNEX IIIA (Waste mixtures – Green List procedure)**

With Annex IIIA pursuant to Regulation (EC) No 308/2009, shipments of defined mixtures of Green-Listed Waste destined for recovery in the EU or OECD are subject to the control procedure of the Green List. Annex IIIA wastes may also be shipped to certain non-OECD countries for recovery without notification (exception: mixtures containing code GB040 waste), provided this has been established in a corresponding EC Regulation.

Irrespective of whether or not mixtures are specified in this list, these mixtures may not be shipped in accordance with the procedure laid down in Article 18 (general information obligation – document pursuant to Annex VII; existence of a recovery contract) if this, due to contamination with other materials

a) increases the risks associated with the wastes sufficiently to render appropriate their submission to the procedure of prior written notification and approval, when taking into account the hazardous characteristics defined in Annex III or Directive 91/689/EEC or

b) prevents the recovery of the wastes in an environmentally sound manner.

**Entries of ANNEX IIIA according to Regulation (EC) No 308/2009**

The following waste mixtures:

1. Mixtures of wastes classified under Basel entries B1010 (ferrous and non-ferrous metals) and B1050 mixed non-ferrous metals, heavy fraction scrap (shredder scrap) of the Basel Convention.
2. Mixtures of wastes classified under Basel entries B1010 (ferrous and non-ferrous metals) and B1070 (waste of copper and copper alloys in dispersible form) of the Basel Convention.

3. Mixtures of waste classified under OECD entry GB040 (slags from processing of precious metals and copper) and the entry B1100 (metal-bearing wastes arising from the melting, smelting and refining of metals) of the Basel Convention, restricted to: **
   - Hard zinc spelter
   - Zinc-containing drosses
   - Aluminium skimmings (or skims) excluding salt slag
   - Wastes of refractory linings, including crucibles, originating from copper smelting

4. Mixtures of wastes classified under OECD entry GB040 (slags from processing of precious metals and copper), entry B1070 (waste of copper and copper alloys in dispersible form) of the Basel Convention and the entry B1100 (metal-bearing wastes arising from the melting, smelting and refining of metals) of the Basel Convention, restricted to: **
   - Waste of refractory linings, including crucibles, originating from copper smelting

** The absence of one or several components of the defined mixture requires (contrary to the addition of other types of waste) no change of the classification, i.e. assignment to Annex IIIA unless the waste constitutes a single fraction mentioned in Annex III.

Ban on the export of waste mixtures with the code GB040 to non-OECD countries (see entries 3 and 4 above)
The shipment of waste mixtures that include wastes from entry GB040 into non-OECD countries is prohibited because modern recovery techniques are required for the recovery of mixtures that contain slags from the processing of precious metals and copper (code GB040) and it cannot be guaranteed that countries for which the OECD Decision does not apply meet these requirements.

Physical properties
Concerning mixture 1: solid, non-dispersible
Concerning mixtures 2 through 4: solid, with dispersible content

Detailed description
For further details, such as waste descriptions, waste designations and the European Waste Codes, see the respective individual entries of the aforementioned mixtures.

For all entries of Annex IIIA, the following shall apply from a technical point of view:
In accordance with the scrap type lists (lowest quality), the level of non-metallic, non-hazardous contaminations in the aforementioned mixtures, which do not disrupt the recovery process, must not exceed 8% to 10% (in individual batches). The fundamental requirement for the assignment of the above mixtures to Annex IIIA is that each individual component of the mixture on its own does not constitute hazardous waste and that no other components, such as hazardous or non-hazardous wastes or materials have been added to the specifically defined mixture.
Mixing hazardous waste with non-hazardous waste for the purposes of diluting pollutants is not in any event permissible and causes the waste mixture to be subject to notification (unlisted waste).

Distinction from other, similar Green-Listed Waste:
- Mixed non-ferrous metals, heavy fraction (shredder scrap) not containing Annex I substances in concentrations sufficient to exhibit Annex III characteristics – see B1050

Distinction from other Amber-Listed Waste or unlisted waste (notification):
- Mixtures of scraps and other metallic wastes in accordance with the above description with contents of non-hazardous undesirables, such as lightweight fraction from shredding or plastics, of more than 8% (or more than 10% in individual batches) or mixtures contaminated with hazardous materials (e.g. asbestos, mineral oil, chlorophenol) or hazardous wastes (e.g. waste oil, PCB, mercury) to such an environmentally relevant extent that a hazardous characteristic is triggered (see limit values of the Austrian List of Wastes Ordinance) – non-listed waste

Further to ANNEX IIIA entries (the relevant amendment amending Regulation (EC) No 308/2009 should be adopted in the near future)
Waste mixtures
Mixtures of waste classified under entry B3040 (rubber wastes) and B3080 (waste parings and scrap of rubber)
The following mixtures of wastes classified under separate indents or sub-indents of one single entry:
  a) Mixtures of wastes classified under Basel entry B1010 (ferrous and non-ferrous scrap metal)
  b) Mixtures of wastes classified under Basel entry B2010 (Waste from mining operations in non-dispersible form)
c) Mixtures of wastes classified under Basel entry B2030 (ceramic waste in non-dispersible form)
d) Mixtures of wastes classified under Basel entry B3010 and listed under “Scrap plastic from non-halogenated polymers and copolymers”
e) Mixtures of wastes classified under Basel entry B3010 and listed under “Cured waste resins or condensation products”
f) Mixtures of wastes listed in Basel entry B3010 under “Perfluoro alkoxyl alkane”
g) Mixtures of wastes classified under Basel entry B3020 (waste paper - restricted to unbleached paper or paperboard or of unbleached corrugated paper and paperboard, other paper or paperboard made mainly of bleached chemical pulp, not coloured in the mass, and other paper or paperboard made mainly of mechanical pulp (for example, newspapers, journals and similar printed matter))
h) Mixtures of wastes classified under Basel entry B3030 (textile wastes)
i) Mixtures of wastes classified under Basel entry B3040 (rubber wastes)
j) Mixtures of wastes classified under Basel entry B3050 (Untreated cork and wood waste)

Notes on items d), e), f): plastic waste
Mixtures of halogenated and non-halogenated plastics or of fluorinated and chlorinated plastics (see separate entry for PVC GH 013) or mixtures of cured resins and halogenated and non-halogenated plastics are always subject to notification and approval.

Notes on item g): waste paper
Other waste paper, including but not limited to: 1) glued/laminated paperboard (cardboard) and 2) unsorted scrap must not be present in a waste paper mixture. A mixture of waste paper with coated cartons ("tetrabricks") or unsorted scrap would be subject to notification and approval!

For shipments of the specified waste mixtures to third countries, pending an EC Regulation regarding applicable control procedures, the person who arranges the shipment must verify which control procedure is required by the importing country and comply with it.

As a general rule, Article 28 of the EC Waste Shipment Regulation No 1013/2006 applies (priority to the stricter control procedure).

8.2.8.2. ANNEX III (Green List)
B1 Metal and metal-bearing wastes

Waste precious metal
Designation: Green List B1010
Metal and metal alloy wastes in metallic, non-dispersible form:
Precious metals (gold, silver, the platinum group, but not mercury)

Physical properties: solid, in metallic non-dispersible form

Other designations: precious metal waste, silver (Ag), platinum (Pt), gold (Au) scrap; the following are described as platinum-group metals: ruthenium (Ru), osmium (Os), rhodium (Rh), iridium (Ir), palladium (Pd) and platinum (Pt)

LoW designation:
10 07 99 wastes not otherwise specified
12 01 03 non-ferrous metal filings and turnings**
16 01 18 non-ferrous metals
19 10 02 non-ferrous metals
19 12 03 non-ferrous metals
20 01 40 metals

** For lack of a different code and owing to the identical material quality, this LoW code is to be used whenever the material is lumpy punched waste.

Detailed description:
The following are designated as platinum-group metals: iridium, osmium, palladium, rhodium and ruthenium.
- Silver oxide/silver electrodes removed from silver-zinc storage batteries
- Lab apparatus scrap
- Shafts and pins for instrument making, writing pen and spinneret waste
- Platinum-ceramic chip sensors (electronic)

Note:
Waste contaminated with mercury or containing alloys, as well as amalgams, are not classifiable as “Green List” waste. The precious metals must be available in a form that can be used in precious metal refinement without first separating out any Hg-containing components.

Demarcation from other, similar Green List wastes:
Metallic gold, silver and platinum-group wastes in a dispersible, non-liquid form – see B1150
- Circuit boards and printed circuit boards with precious metals (“goldfingers”), without hazardous characteristics – see GC 020
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- Waste photographic film containing silver halides and paper waste – see B1180 and B1190
- Ash from the incineration of photographic film containing silver – see B1170
- Precious metal ash, sludge, dust and other residues – see B1150
- Ash from the incineration of printed circuit boards without hazardous characteristics – see B1160
- Silver-containing precipitation residues from photo processing solutions (by no means concentrates or baths) – see B1150
- Precious metal waste with traces of cyanide (limit values as per LoW) – see B1140
- Silver oxide-bearing round-cell batteries (such batteries have a mercury content as high as 2%) – see A1170
- Ash from the incineration of printed circuit boards, to the extent that they have hazardous characteristics – see A1150
- Precious metal ash, sludge, dust and other residues of with hazardous characteristics (e.g. fly ash) – see A4100
- Precious metal compounds in the form of salts or solutions with hazardous contaminations – see A4140 (chemicals) or unlisted waste
- Spent precious metal catalysts, contaminated – see A2030
- Drums/containers with residues of solvent-bearing precious metal paste or precious metal pastes containing toxic heavy metals – see A4130
- Precious metal alloys with mercury (amalgams, e.g. dental amalgams) – see A1010 and A1030

### Iron and Steel Scrap

**Designation:** Green List B1010
**Metal and metal alloy wastes in metallic, non-dispersible form:** Iron and steel scrap

**Physical properties:** solid, in metallic non-dispersible form
**Note:** dispensible oxide residues are permitted

**Other designations:** Waste and scrap of iron (Fe) and steel, stainless steel, “household scrap”, cast iron waste, iron drums, tinplate waste, shavings from turning, milling and filing, * “skimmer iron” (with iron slag components under 10%), “steel skimmer” (with iron slag component under 10%).
* Note: Skimmer iron and steel skimmer from electric furnace slag and secondary metallurgical slags may have to be reduced and freed of any slag residues in order to ensure a slag component of no more than 10%.

**LoW designation:**
- 02 01 10 waste metal
- 12 01 01 ferrous metal filings and turnings**
- 15 01 04 metallic packaging
- 16 01 17 ferrous metal
- 17 04 05 iron and steel
- 19 01 02 ferrous materials removed from bottom ash
- 19 10 01 iron and steel waste
- 19 12 02 ferrous metal
- 20 01 40 metals

**For lack of a different code and owing to the identical material quality, this LoW code is to be used whenever the material is lumpy punched waste.

**Quality requirements**
The quality requirements for iron scrap are published in the European Steel Scrap Specification, and established in agreement between EUROFER (European Steel Industry Association) and EFR (European Recycling Association for iron and steel). According to that European Steel Scrap Specification, (www.bdsv.org/downloads/sortenliste_eu.pdf) the permissible amounts of non-metallic, non-hazardous materials (“steriles”) are limited accordingly; higher percentages of non-hazardous materials are allowed only in the case of the somewhat lower
quality or inferior type of waste incineration scrap (the iron content must be greater than or equal to 92%).

Note: Iron and steel scrap whose share of non-hazardous, non-ferrous contaminants exceeds the 8% level required by the European Steel Scrap Specification are subject to notification and authorisation by the Austrian Ministry of Agriculture, Forestry, Environment and Water Management in the event of transboundary shipment. From a waste-management point of view, contamination with non-hazardous, non-metallic contaminations of no more than 10% in total is tolerated in individual batches.

If an average of more than 5% of waste incineration slag is present in waste incineration scrap (even if these slags were de-classified as non-hazardous waste), it cannot be assumed that these scraps are green-listed, especially since waste incineration slag is always considered notifiable waste since the Green List does not include any entry for it (Y47 – Amber List). Individual batches from iron and steel scrap transports must contain no more than 8% of waste incineration slag (scrap specification). Any excess of the specified limit values constitutes a contamination of the Green List scrap with Amber List waste resulting in the notification duty for the contaminated scrap.

Citation from the scrap specification – purity

- “All grades shall be free of all but negligible amounts of other non-ferrous metals and non-metallic materials, earth, insulation, excessive iron oxide in any form, except for nominal amounts of surface rust arising from outside storage of prepared scrap under normal atmospheric conditions.
- All grades shall be free of all but negligible amounts of combustible non-metallic materials, including, but not limited to rubber, plastic, fabric, wood, oil, lubricants and other chemical or organic substances.
- All scrap shall be free of larger pieces (brick-size) which are non-conductors of electricity such as tires, pipes filled with cement, wood or concrete.
- All grades shall be free of waste or of by-products arising from steel melting, heating, surface conditioning (including scarfing), grinding, sawing, welding and torch cutting operations, such as slag, mill scale, baghouse dust, grinder dust, and sludge.
- Loose steel scrap processed through an incinerating plant for household waste followed by magnetic separation, fragmentized into pieces not exceeding 200 mm in any direction and consisting partly of tin-coated steel cans. Should be prepared in a manner to ensure direct charging. The scrap shall be free of excessive moisture and rust. Must be free of excessive metallic copper, tin, lead and alloys) and steriles to meet the aimed analytical contents."

Detailed description:
Scrap is considered unalloyed iron scrap when the relevant levels of certain elements are above certain limit values.
- Cast iron scrap
- Stainless steel scrap
- Other steel alloy scrap
- Tin-coated iron or steel scrap
- Zinc-coated iron or steel scrap
- Tinplate cans and drums without hazardous contamination
- Turnings, milling shavings, planing shavings, grinding shavings, saw chips, filings and stamping or cutting waste, including compacted waste; in this regard, it is particularly important to ensure that the shavings are largely free of drilling and grinding oils (drain).
- Scrap from scrap collections consisting mostly of iron and steel scrap
- Drums emptied of residue, drained, scraped out (cleaned with a scraper) or brushed out clean, provided no hazardous properties are displayed
- “Household scrap” (iron scrap from home pickup), such as bicycles, iron sheets, etc. (metal content (greater than) 92%), provided it is not contaminated with hazardous substances or waste in quantities that pose a risk to the environment
- “Magnetic scrap” (e.g. from industrial waste treatment), provided it has a metallic content of (more than) 92%.
- Used iron or steel rails (without railway sleepers)
- Skimmer iron or steel skimmer, provided its iron and steel slag content amounts to no more than 10% maximum.

Note: The slag that is produced is skimmed off along with pig iron or crude steel; in practice, the slag/metal mixture usually contains 5 – 25% of slag. If the iron and steel slag contained in the skimmer iron and steel skimmer amounts to no more than 10%, it is considered an unlisted waste mixture from B1010 iron and steel scrap and B1210 slags from iron and steel production and requires notification in the event of transboundary shipment.
Note:
Drilling shavings, lathing shavings and filings with a high oil content (more than 2%) constitute hazardous waste because of the oil contamination and are therefore subject to notification. Containers emptied of substances and preparations subject to labelling with a skull and crossbones or “explosive” danger symbol in acc. with chemicals law constitute hazardous waste and are excluded from the Green List; drained drums that contained oils or other hazardous viscous substances constitute hazardous waste by reason of the residual contamination (not completely drained), which is classifiable under A4130 (Amber List) (notification is required).

Demarcation from other, similar Green List wastes:
- Engines (without capacitors) consisting of iron and copper and classifiable in the Green List – see GC 010
- Mill cinder (mill scale), if free from contamination (e.g. oil) as generally required for classification in the Green List – see B1230
- End-of-life motor vehicles, after drainage of all liquids (removal of hazardous substances) – see B1250

Demarcation from other Amber List wastes or unlisted waste (notification):
- Old refrigerators with CFCs/HFCs, pentane, butane, ammonia, etc. – see A1180
- Oil radiators – see A1180
- Asbestos-containing storage heaters or asbestos-containing scrap – see A1180 (or perhaps A2050 asbestos)
- Compacted waste end-of-life cars or waste end-of-life cars whose level of hazardous substances has not been reduced (high percentage of non-steel undesirables that make recovery more difficult and cause environmental pollution) – unlisted waste
- “Iron braid” from paper production (mixture of iron/steel wire, recovered paper and plastics) – unlisted waste
- “Magnetic scrap” (e.g. from industrial waste treatment), provided it has a high component (more than 10%) of non-metallic, non-hazardous contaminants (e.g. shredder waste) – unlisted waste.
- Slags, cinder or scalings with hazardous contamination and other wastes from iron and steel production (e.g. scalings from processes other than milling processes or mill scale, contaminated) – see AA 010
- Ferrous fly dust – see A4100
- Fully or partially drained containers (e.g. spray cans with residual contents or iron drums with chemicals, mineral oil) – see A4130
- Containers fully emptied of substances and preparations that must be labelled with a skull and crossbones or “explosive” danger symbol according to chemicals law, “fully” emptied tight-head (drums) that contained oil or other hazardous viscous substances – see A4130
- Blast-cleaning residues on iron/steel basis with hazardous or also non-hazardous contaminations – see AB130
- Wastes from pellet shell casings (consisting of plastic, metal and cardboard) – unlisted (composite)
- Skimmer iron or steel skimmer containing more than 10% slag – unlisted (mixture)

### Copper scrap

**Designation:**
Green List B1010
Metal and metal-alloy wastes in metallic, non-dispersible form: Copper scrap

**Physical properties:** solid, in metallic non-dispersible form
Note: dispersible oxide residues are permitted

**Other designations:** wastes and scrap of copper (Cu) and copper alloys (brass, bronze, gunmetal); copper, bronze, brass and gunmetal shavings; copper, bronze, brass and gunmetal sheets; tombak (brass alloy); Nordic gold (alloy of 89% copper, 5% aluminium, 5% zinc and 1% tin)

**LoW designation:**
02 01 10 waste metal
12 01 03 non-ferrous metal filings and turnings**
15 01 04 metallic packaging
16 01 18 non-ferrous metal
17 04 01 copper, bronze, brass
19 10 02 non-ferrous waste
19 12 03 non-ferrous metal
20 01 40 metals
** For lack of a different code and owing to the identical material quality, this LoW code is to be used whenever the material is lumpy punched waste.

**Detailed description:**
**Alloys:**
Brass: alloy of copper and zinc
Bronze: alloy of copper (80 – 90%) and tin
Gunmetal: alloy of copper, tin and zinc
Tombak: brass alloy with high copper content
8. Guidelines for the Shipment of Waste

Bare copper wire scrap, mixed copper wire scrap (containing tin solder or tin-alloy solder), shredded copper wire scrap (without cable insulation)

Heavy copper scrap (uncoated stamping scrap, sheet copper scrap, overhead wires)

Copper radiators and parts

Mixed copper scrap

Light copper scrap (roof gutters, sheet copper, drain pipes, pots, single-faucet water heaters)

Copper shavings (without significant oil contamination)

Carbon brush waste (copper with carbon residue for copper recycling), not dispersible

Gunmetal and bronze waste (gunmetal scraps such as machine bearings, valves, etc.)

Gunmetal shavings, bronze sieves, faucets and taps, etc.

Brass (brass wastes and shavings, brass pipes and brass scrap, brass cartridge cases (free from explosives) and cartridge cases, brass and light brass scrap, brass radiators, copper-brass radiators)

Demarcation from other, similar Green List wastes:

Copper or copper alloy powder, copper refinement material with high contents of copper oxide, copper ash and dross, copper-containing residue, brass dross, gunmetal dross and ash without hazardous properties (e.g. discharges with high metal content), carbon brush waste (copper with coal residue for copper recycling), in dispersible form – see B1070

Copper cable with insulation without hazardous contamination – see B1115

Copper catalysts (cleaned) – see B1120

Ash from the incineration of printed circuit boards without hazardous contamination – see B1116

Copper mill scale, brass scale, copper sintering materials (without hazardous properties) – see B1240


Demarcation from other Amber List wastes or unlisted waste (notification):

Copper-containing galvanic sludge – see A1050

Nickel scrap

Designation: Green List B1010

Metal and metal alloy wastes in metallic, non-dispersible form: Nickel scrap

Note:

Beryllium and its compounds are to be classified as carcinogenic substances belonging to Category 2 (H7 criterion), beryllium-containing vapours and aerosols (atomised) cause lung damage.
Physical properties: solid, in metallic non-dispersible form

Other designations: wastes and scrap of nickel (Ni), Monel scrap (nickel-copper-iron alloy), nickel-silver scrap (nickel-copper-zinc alloy); formerly known in German as “Alpaka”, “Argentan”, “Minargent” “Pakfong”; plata alemana (“German silver”)

LoW designation:
02 01 10 waste metal
12 01 03 non-ferrous metal filings and turnings**
15 01 04 metallic packaging
16 01 18 non-ferrous metal
19 10 02 non-ferrous waste
19 12 03 non-ferrous metal
20 01 40 metals
** For lack of a different code and owing to the identical material quality, this LoW code is to be used whenever the material is lumpy punched waste.

Detailed description:
Nickel scrap (sheets, plates, pipes, bars)
Monel scrap and shavings, soldered pieces of Monel and sheets, copper-nickel scrap (pipes, sheet, plate)
Nickel silver scrap
Note: Nickel oxide is classified as carcinogenic (H7: 0.1%). Nickel compounds are classified as carcinogenic (Categories 1 through 3; limit value: 0.1% or 1%). Scrap must therefore contain virtually no nickel compounds (e.g. nickel oxides, nickel dross, slag or ash components)!
Metallic nickel in dispersible form is classified as carcinogenic substance belonging to Category 3 and therefore excluded from the Green List (limit value: 1%)

Demarcation from other, similar Green List wastes:
Raney-nickel catalysts – see B1120, provided they are not contaminated with hazardous substances (e.g. from processing)

Demarcation from other Amber List wastes or unlisted waste (notification):
Nickel-cadmium batteries, nickel/iron, nickel/nickel hydrid storage batteries (hazardous wastes (cf. also electrolyte)) – see A1170
Nickel electrodes removed from nickel storage batteries – unlisted waste
Nickel catalysts, contaminated – see A2030
Nickel dust and nickel powder (in dispersible form), nickel-containing slag, ashes, dross – unlisted waste

Nickel salts and nickel oxide – see A4140
Nickel-containing galvanic sludge – see A1050
Nickel-containing waste liquors from the pickling of metals – see A1060

Aluminium scrap

Designation: Green List B1010
Metal and metal alloy wastes in metallic, non-dispersible form: Aluminium scrap

Physical properties: solid, in metallic non-dispersible form

Other designations: wastes and scrap of aluminium (Al) or aluminium; aluminium sheet, aluminium profiles, turnings, grindings and filings, aluminium alloy scrap

LoW designation:
02 01 10 waste metal
12 01 03 non-ferrous metal filings and turnings**
15 01 04 metallic packaging
16 01 18 non-ferrous metal
17 04 02 aluminium
19 10 02 non-ferrous waste
19 12 03 non-ferrous metal
20 01 40 metals
** For lack of a different code and owing to the identical material quality, this LoW code is to be used whenever the material is lumpy punched waste.

Detailed description:
This include the following wastes, provided they are not mixed with hazardous wastes:
Wire and sheet scrap, rolled aluminium, household scrap/household pots and pans
Aluminium, free from shredder waste
Beverage cans, steel-free, lead-free, and free from bottle caps and rubbish, sorted
Aluminium lithograph plates (without ink)
Aluminium foil, free from tinsel or anti-radar foil
Aluminium alloy scrap and aluminium cylinder
Aluminium parts of end-of-life cars or aircraft
Cast aluminium scrap, shavings (without hazardous characteristics)
Aluminium-copper radiators, if drained and cleaned
Die-cast aluminium grates and ribs, that accumulate homogeneously
Waste aluminium windows (without glass content) and parts thereof, provided that it is ensured that possibly attached insulation foam is free from CFCs and PCBs (wastes from modern productions are CFC- and PCB-free).
Aluminium engines (combustion engines); low iron content should usually not interfere with the recovery.

Aluminium discharges (= metallic aluminium that is discharged from the aluminium dross mixture after the dross is skimmed off and contains very high amounts of metal and low amounts of oxide dross).

Wastes from coal/aluminium profiles (aluminium graphite), ALG for short (in German)

Note:
Containers fully emptied of substances and preparations subject to labelling with a skull and crossbones or “explosive” danger symbol in acc. with chemicals law constitute hazardous waste and are excluded from the Green List; “fully” drained tight-head drums that contained oils or other hazardous viscous substances constitute hazardous waste by reason of the residual contamination (not completely drained), which is classifiable under A4130 (Amber List) (notification is required).

Demarcation from other, similar Green List wastes:
- Alumina and hydrates of aluminium (hydroxide) and residues from alumina production excluding such materials as are used for gas cleaning, flocculation and filtration processes – see B2100
- Catalysts on alumina basis (zeolites), not contaminated – GC 050
- Aluminium motor units after oil drainage – see also GC 010
- Light-alloy skimmings, containing aluminium (without hazardous characteristics; minimum metallic aluminium content of 45%, in individual batches the lower limit is 40.5%) – see B1100

Demarcation from other Amber List wastes or unlisted waste (notification):
- Aluminium dross with hazardous characteristics – unlisted waste
- Aluminium salt slag – unlisted waste
- Ball-mill dust from dross preparation – unlisted waste
- Alumina and hydrate of aluminium (=hydroxide), contaminated – unlisted waste
- Fly ash and dust from industrial pollution control devices for cleaning of industrial off-gases that contain aluminium – see A4100
- Catalysts based on aluminium oxide, to the extent contaminated – see A2030
- Coffee capsules made of aluminium (contamination: approx. 80 – 90% coffee and water, 10% aluminium) – unlisted waste (mixture)

**Zinc scrap**

| Designation: | Green List B1010 Metal and metal alloy wastes in metallic, non-dispersible form: Zinc scrap |

Physical properties: solid, in metallic non-dispersible form

Other designations: wastes and scrap of zinc (Zn), titanium zinc (alloy with small quantities of titanium and copper)

LoW designation:
- 02 01 10 waste metal
- 12 01 03 non-ferrous metal filings and turnings**
- 15 01 04 metallic packaging
- 16 01 18 non-ferrous metal
- 17 04 04 zinc
- 19 10 02 non-ferrous waste
- 19 12 03 non-ferrous metal
- 20 01 40 metals

** For lack of a different code and owing to the identical material quality, this LoW code is to be used whenever the material is lumpy punched waste.

Detailed description:
- Sheet zinc scrap (stamping scrap, covers)
- Cast zinc parts, plates, mouldings
- Zinc alloy scrap
- Zinc anodes from zinc-air storage batteries (zinc-air batteries are button cell batteries; anode = zinc powder, cathode = atmospheric oxygen that oxidises into zinc hydroxide as the zinc discharges)

Demarcation from other, similar Green List wastes:
- Hard zinc spelter and zinc residues/slags/drosses/skimmings (metallic zinc content at least 45%, lower limit in individual batches 40.5%) – see B1100
- Zinc ash and dust, residues in dispersible form – see B1080
- Zinc catalysts, cleaned – see B1120

Demarcation from other Amber List wastes or unlisted waste (notification):
- Leaching residues from zinc processing, dust and sludges such as jarosite, hematite – see A1070
- Zinc catalysts, contaminated – see A2030
- Zinc-containing galvanic sludge – see A1050
- Zinc-containing filter dust – see A4100
- Zinc-air batteries, whole, zinc-carbon batteries and alkali–manganese batteries (zinc/manganese dioxide/caustic potash – such batteries
should be classified as hazardous waste – see also electrolytes) – see A1170
- Zinc-ammonium chloride dross, ash and slag with lead, cadmium contamination or hazardous characteristics – see A1080 or unlisted waste

### Tin scrap

**Designation:** Green List B1010

**Metal and metal alloy wastes in metallic, non-dispersible form:** Zinc scrap

**Physical properties:** solid, non-dispersible

**Other designations:** wastes and scrap of tin; sheet tin; tinfoil

**LoW designation:**

- 02 01 10 waste metal
- 12 01 03 non-ferrous metal filings and turnings**
- 15 01 04 metallic packaging
- 16 01 18 non-ferrous metal
- 17 04 06 tin
- 19 10 02 non-ferrous waste
- 19 12 03 non-ferrous metal
- 20 01 40 metals

**Detailed description:**

- Hard pewter (table ware and siphon trap), tin pipes, block tin
- Babbit metal with high tin content
- Soldering tin, if it has low oxide contamination (less than 0.5% lead oxide)
- Skimmed metallic tin (hardened bars, less than 0.5% lead compounds) from a tin electrolyte

Note: Soldering scrap (in metallic form) can also be classified under the entry B1020 “Lead scrap” if the lead content is higher than the tin content.

For classification in the Green List, the oxide component must be negligible (cf. lead – teratogen – if lead compound content exceeds 0.5% – hazardous waste); it must not be dross.

**Demarcation from other, similar Green List wastes:**

- Tantalum-bearing tin slags with less than 0.5% tin – see B1100

**Demarcation from other Amber List wastes or unlisted waste (notification):**

- Tin dross, slag, ash and other residues (filter cake, dust, sludge) – unlisted waste

### Tungsten scrap

**Designation:** Green List B1010

**Metal and metal alloy wastes in metallic, non-dispersible form:** Tungsten scrap

**Physical properties:** solid, in non-dispersible form

**Other designations:** waste and scrap of tungsten (T); tungsten waste, Widia; (tungsten carbide = chemical symbol: WC is a registered trade name for hard metal); waste of sintered material

**LoW designation:**

- 12 01 03 non-ferrous metal filings and turnings**
- (15 01 04 metallic packaging)
- 16 01 18 non-ferrous metal
- 19 10 02 non-ferrous waste
- 19 12 03 non-ferrous metal
- 20 01 40 metals

**Detailed description:**

- Off-specification batches from powder metallurgy in non-dispersible form
- Tungsten pressing fragments, shavings, pieces
- Tungsten shavings, tungsten pieces (sheets, wires)
- Tungsten foils and wires
- Tungsten /copper shavings, pieces

**Demarcation from other, similar Green List wastes:**

- Tungsten carbide (hard metals and high-speed tool steel waste) – see B1030 Refractory metals containing residues (high melting point metals)
- Metallic tungsten waste and alloys in dispersible form (e.g. tungsten powder and metallic filter or press cakes) – see B1031
- Tungsten catalysts (cleaned) – see B1120
8. Guidelines for the Shipment of Waste

Demarcation from other Amber List wastes or unlisted waste (notification):

- Tungstenate and tungsten compounds (other than carbides) – unlisted waste or if chemicals – see A4140
- Tungsten catalysts (contaminated) – see A2030

Molybdenum scrap

<table>
<thead>
<tr>
<th>Designation:</th>
<th>Green List B1010</th>
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<tbody>
<tr>
<td>Metal and metal alloy wastes in metallic, non-dispersible form:</td>
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</tr>
<tr>
<td>Molybdenum scrap</td>
<td></td>
</tr>
</tbody>
</table>

Physical properties: solid, in non-dispersible form

Other designations: wastes and scrap of molybdenum (Mo); ferromolybdenum waste

LoW designation:
- 12 01 03 non-ferrous metal filings and turnings**
- 16 01 18 non-ferrous metal
- 19 10 02 non-ferrous waste
- 19 12 03 non-ferrous metal
- 20 01 40 metals

** For lack of a different code and owing to the identical material quality, this LoW code is to be used whenever the material is lumpy punched waste.

Detailed description:
- Molybdenum alloy waste such as ferromolybdenum, nickel-molybdenum, nickel-chromium molybdenum
- Molybdenum aircraft scrap and rocket parts (heat shield)

Demarcation from other, similar Green List wastes:
- Metallic molybdenum waste and alloys in dispersible form – see B1031
- Molybdenum carbide waste (refractory metals containing residues) – see B1030
- Molybdenum catalysts (cleaned) – see B1120

Demarcation from other Amber List wastes or unlisted waste (notification):
- Molybdenum compounds other than carbides (e.g. finely powdered molybdenum sulphide with a particle size ranging from 1 to 100 µm is a general dry technical lubricant), molybdenum sludge, molybdenum-containing filter cake – unlisted waste or if molybdenum compounds accumulate as waste chemical substances – see A4140
- Molybdenum-containing filter dust – see A4100

Tantalum scrap

<table>
<thead>
<tr>
<th>Designation:</th>
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</thead>
<tbody>
<tr>
<td>Metal and metal alloy wastes in metallic, non-dispersible form:</td>
<td></td>
</tr>
<tr>
<td>Tantalum scrap</td>
<td></td>
</tr>
</tbody>
</table>

Physical properties: solid, in metallic non-dispersible form

Other designations: wastes and scrap of tantalum (Ta)

LoW designation:
- 12 01 03 non-ferrous metal filings and turnings**
- 16 01 18 non-ferrous metal
- 19 10 02 non-ferrous waste
- 19 12 03 non-ferrous metal
- 20 01 40 metals

** For lack of a different code and owing to the identical material quality, this LoW code is to be used whenever the material is lumpy punched waste.

Detailed description:
- Metallic tantalum waste from the manufacture of special apparatus (medical implants, instruments)
- Off-specification batches from powder metalurgy in non-dispersible form

Demarcation from other, similar Green List wastes:
- Metallic tantalum waste and alloys in dispersible form (e.g. tantalum powder) – see B1031
- Tantalum carbide waste (tool steel and cutting steel waste; refractory metals containing residues) – see B1030
- Tantalum-bearing tin slags (with less than 0.5% tin), without hazardous characteristics – see B1100
- Tantalum catalysts (cleaned) – see B1120
- Tantalum fine wire – perhaps also see GC 020

Demarcation from other Amber List wastes or unlisted waste (notification):
- Tantalum-bearing salts, to the extent that they accumulate as chemical waste – see A4140
- Tantalum catalysts (contaminated) – see A2030
- Tantalum-bearing tin slag with hazardous characteristics – unlisted waste
- Tantalum-electrolytic capacitors – unlisted waste or perhaps A1180
**Magnesium scrap**

**Designation:** Green List B1010

Metal and metal alloy wastes in metallic, non-dispersible form:

Magnesium scrap

**Physical properties:** solid

**Other designations:** wastes and scrap of magnesium (Mg), cast magnesium scrap, magnesium foam blocks with more than 75% metallic magnesium (uncontaminated, non-flammable and non-self-igniting)

**LoW designation:**

02 01 10 waste metal
15 01 04 metallic packaging
16 01 18 non-ferrous metal
19 10 02 non-ferrous waste
19 12 03 non-ferrous metal
20 01 40 metals

**Detailed description:**

- Rolling and drawing waste from magnesium alloys (sheets, pipes, bars nozzles)
- Cast scrap
- Clean magnesium engraving plates
- Undercarriages and fuselage of aircraft and bicycle parts made of magnesium alloys
- Housing parts, rims, gaskets, engine cowl parts, engine covers, hand brake levers
- Magnesium foam blocks with more than 75% metallic magnesium (where the remainder is magnesium oxide or aluminium oxide and intermetallic Al-Fe-Mn precipitates) from magnesium casting (no dross) provided that the blocks are not contaminated, not flammable, and not self-igniting, and do not emit dangerous quantities of flammable gases upon contact with water (pressure compaction with massive iron plates prevents the magnesium from igniting, which limits the oxide component)

**Demarcation from other, similar Green List wastes:**

- Housings, engine parts (oil-free) – see GC 010

**Demarcation from other Amber List wastes or unlisted waste (notification):**

Flammable and pyrophoric magnesium waste such as magnesium milling shavings, file shavings, powder; magnesium salt slags; magnesium dross – see AA 190

**Note:**

Magnesium powder and dust are highly inflammable. They react very violently to air and water. Magnesium fires must not be extinguished with water. The bright radiant light of burning magnesium may be harmful to the eyes!

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**Cobalt scrap**

**Designation:** Green List B1010

Metal and metal alloy wastes in metallic, non-dispersible form:

Cobalt scrap

**Physical properties:** solid, in metallic non-dispersible form

**Other designations:** wastes and scrap of cobalt (Co)

**LoW designation:**

12 01 03 non-ferrous metal filings and turnings**
16 01 18 non-ferrous metal
19 10 02 non-ferrous waste
19 12 03 non-ferrous metal
20 01 40 metals

**Detailed description:**

- Cobalt magnets (cobalt/samarium, etc.)
- Cobalt alloys (cobalt-alloyed steels, etc.) or super alloys (alloys of complex composition) for high-temperature applications (motor, turbine, and aircraft engine manufacture and aeronautics as well as space travel)

**Demarcation from other, similar Green List wastes:**

- Spent cobalt catalysts (cleaned) – see B1120

**Demarcation from other Amber List wastes or unlisted waste (notification):**

- Spent cobalt catalysts, if contaminated – see A2030
- Cobalt salts that accumulate in the form of chemicals – see A4140
- Cobalt-containing galvanic sludges – see A1050
- Dust, slag and ash – unlisted waste or in the case of filter dust, fly ash – see A4100

**Note:**

The radioactive isotope $^{60}$Co emits gamma rays – the corresponding radiation protection provisions need to be observed!
Bismuth scrap

**Designation:** Green List B1010

**Metal and metal alloy wastes in metallic, non-dispersible form:**

**Bismuth scrap**

**Physical properties:** solid, in metallic non-dispersible form

**Other designations:** bismuth scrap (Bi), wastes and scrap, shavings of bismuth; bismanol (magnetic alloy with manganese)

**LoW designation:**
12 01 03 non-ferrous metal filings and turnings**
16 01 18 non-ferrous metal
19 10 02 non-ferrous waste
19 12 03 non-ferrous metal
20 01 40 metals

**For lack of a different code and owing to the identical material quality, this LoW code is to be used whenever the material is lumpy punched waste.**

**Detailed description:**
- Alloys with a low melting point (Wood’s metal: melting point 60 °C; Rose metal: melting point of 94 °C)
- The alloy of bismanol and manganese is a strong permanent magnet.

**Demarcation from other, similar Green List wastes:**
- There is no relevant similar waste on the Green List

**Demarcation from other Amber List wastes or unlisted waste (notification):**
- Bismuth-containing filter dust from copper production is the main source of bismuth reclaiming – see A1100
- Bismuth-containing fly ash, filter dust from lead production, etc., are also major sources for bismuth production – see A4100

Titanium scrap

**Designation:** Green List B1010

**Metal and metal alloy wastes in metallic, non-dispersible form:**

**Titanium scrap**

**Physical properties:** solid, in metallic non-dispersible form

**Other designations:** wastes and scrap of titanium

**LoW designation:**
12 01 03 non-ferrous metal filings and turnings**
16 01 18 non-ferrous metal
19 10 02 non-ferrous waste
19 12 03 non-ferrous metal
20 01 40 metals

**For lack of a different code and owing to the identical material quality, this LoW code is to be used whenever the material is lumpy punched waste.**

**Detailed description:**
- Metallic titanium waste (wastes from propeller parts such as shafts, superconductor niobium-titanium alloys, springs in motor vehicle chassis)
- Waste implant materials in medical technology
- Waste from high-stress parts of aircraft and spacecraft that are nevertheless required to be lightweight, waste from the frames of high-quality bicycles in combination with aluminium and vanadium

**Demarcation from other, similar Green List wastes:**
- Titanium waste in metallic dispersible form – see B1031
- Titanium carbide – see B1030 (refractory metals containing residues)
- Spent titanium catalysts (cleaned) – see B1120
- Titanium oxide residue in the form of paints (“titanium white”, non-toxic) not containing solvents or other hazardous substances – see B4010

**Demarcation from other Amber List wastes or unlisted waste (notification):**
- Titanium compounds that arise in the form of chemical waste – see A4140
- Spent titanium catalysts, if contaminated – see A2030
- Titanium-containing galvanic sludges – see A1050
- Titanium oxide residue in the form of paints, dyes and pigments containing solvents or other hazardous substances – see A4070

Zirconium scrap

**Designation:** Green List B1010

**Metal and metal alloy wastes in metallic, non-dispersible form:**

**Zirconium scrap**

**Physical properties:** solid, in metallic non-dispersible form
Other designations: wastes and scrap of zirconium (Zr); zirconium scrap

LoW designation:
- 12 01 03 non-ferrous metal filings and turnings**
- 16 01 18 non-ferrous metal
- 19 10 02 non-ferrous waste
- 19 12 03 non-ferrous metal
- 20 01 40 metals

** For lack of a different code and owing to the identical material quality, this LoW code is to be used whenever the material is lumpy punched waste.

Detailed description:
- Zirconium scrap, e.g. from light-alloy construction (aircraft)

Demarcation from other, similar Green List wastes:
- Spent zirconium catalysts (cleaned) – see B1120
- Waste from refractory linings (zirconium oxide has a melting point of approx. 3000 °C), including crucibles, arising from melting, smelting and refining of copper (without hazardous contamination) – see B1100
- Furnace linings from metallurgical and non-metallurgical processes, proven to have no hazardous characteristics – ceramic wastes – see GF 010

Demarcation from other Amber List wastes or unlisted waste (notification):
- Zirconium-based polishing and grinding products – unlisted waste
- Sands used in foundry operations – see AB 070
- Blasting grit- see AB 130
- Zirconium compounds in the form of chemical waste – see A4140
- Crushed cathode-ray tubes with coatings (e.g. zirconium-based phosphor) – see A2010
- Phosphors and pigments – see A4070
- Zirconium-oxide-containing furnace linings from metallurgical and non-metallurgical processes with hazardous characteristics – unlisted waste or listing in accordance with contaminants on list A (Amber List)
- Spent zirconium catalysts (contaminated) – see A2030

Zirconium itself is used in nuclear reactors, for instance – in the case of radioactive zirconium waste, it is important to observe the radiation protection provisions!

### Manganese scrap

<table>
<thead>
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<tr>
<td>Metal and metal alloy wastes in metallic, non-dispersible form:</td>
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<tr>
<td>Manganese scrap</td>
<td></td>
</tr>
</tbody>
</table>

Physical properties: solid, in metallic non-dispersible form

Other designations: wastes and scrap of manganese (Mn); waste ferromanganese

LoW designation:
- 12 01 03 non-ferrous metal filings and turnings**
- 16 01 18 non-ferrous metal
- 19 10 02 non-ferrous waste
- 19 12 03 non-ferrous metal
- 20 01 40 metals

** For lack of a different code and owing to the identical material quality, this LoW code is to be used whenever the material is lumpy punched waste.

Detailed description:
- Manganese alloy waste
- Ferromanganese waste (ferromanganese is an intermediate alloy of iron, manganese and carbon. The manganese content ranges from 30% to 80%.)

Demarcation from other, similar Green List wastes:
- Manganese-containing dry batteries and zinc-manganese dioxide storage batteries – entry B1090 must not be used. Alkali-manganese and zinc-manganese batteries as well as all other batteries are classified as waste in the Amber List waste as they exhibit one hazardous characteristic (cf. electrolytes) (see A1170).
- Manganese catalysts (cleaned) – see B1120

Demarcation from other Amber List wastes or unlisted waste (notification):
- Manganese-containing dry batteries and zinc-manganese dioxide storage batteries (hazardous waste) – see A1170
- Electrodes removed from storage batteries or batteries- unlisted waste
- Manganese-containing galvanic sludge – see A1050
- Salts (manganates, permanganates, etc.), manganese compounds – unlisted waste or to the extent that they accumulate in the form of chemical waste – see A4140
- Manganese catalysts (contaminated) – see A2030
Germanium scrap

Designation: Green List B1010
Metal and metal alloy wastes in metallic, non-dispersible form: Germanium scrap

Physical properties: solid, in metallic non-dispersible form

Other designations: waste and scrap of germanium (Ge)

LoW designation:
12 01 03 non-ferrous metal filings and turnings**
16 01 18 non-ferrous metal
19 10 02 non-ferrous waste
19 12 03 non-ferrous metal
20 01 40 metals

** For lack of a different code and owing to the identical material quality, this LoW code is to be used whenever the material is lumpy punched waste.

Detailed description:
- Germanium components (without housings) from the electronics industry and infrared technology (waste from lens systems and optical glass with diathermic properties – night vision devices)
- Light-alloy scrap

Demarcation from other, similar Green List wastes:
- Electronic scrap (without hazardous characteristics) with germanium components, e.g. transistors – see GC 020

Demarcation from other Amber List wastes or unlisted waste (notification):
- Waste from fluorescent tubes with coating (e.g. phosphor) – see A2010
- Waste of phosphors and pigments – see A4070
- Germanium-containing leaching residues from zinc processing, dust and sludges such as jarosite, hematite, etc. – see A1070
- Germanium-containing waste of zinc residues containing lead and cadmium in concentrations sufficient to exhibit hazardous characteristics – see A1080
- Germanium-containing fly dust, fly ash, sludge (primary raw material source for germanium production) – see A4100
- Electrical and electronic assemblies or scrap containing germanium components (e.g. transistors) that also contain hazardous components such as batteries, PCB components, electrolytic capacitors, etc. – see A1180
- Germanium-containing catalysts (manufacture of certain polyesters) – see A2030

Vanadium scrap

Designation: Green List B1010
Metal and metal alloy wastes in metallic, non-dispersible form: Vanadium scrap

Physical properties: solid, in metallic non-dispersible form

Other designations: wastes and scrap of vanadium (V)

LoW designation:
12 01 03 non-ferrous metal filings and turnings**
16 01 18 non-ferrous metal
19 10 02 non-ferrous waste
19 12 03 non-ferrous metal
20 01 40 metals

** For lack of a different code and owing to the identical material quality, this LoW code is to be used whenever the material is lumpy punched waste.

Detailed description:
- Waste ferrovanadium (alloy of 50% iron and 50% vanadium – special steels)
- Vanadium-containing steel scrap from shafts, crankshafts, gears in transmission construction
- Waste of vanadium-gallium (superconducting magnets)

Demarcation from other, similar Green List wastes:
- Slags from the iron and steel production (without hazardous characteristics) that are used to manufacture vanadium – see B1210
- Vanadium-containing catalysts (cleaned) – see B1120

Demarcation from other Amber List wastes or unlisted waste (notification):
- Vanadium-containing catalysts (contaminated) – see A2030
- Vanadium-containing dust and ashes (including vanadium-containing ash from oil firing) – see AA 060
- Vanadium-containing sewage sludge from petroleum processing – see AC 270

Note:
Vanadium dust is highly flammable. Vanadium compounds are highly toxic. Inhaling vanadium-containing dust can cause lung cancer.
### Hafnium scrap

**Designation:** Green List B1010

**Metal and metal alloy wastes in metallic, non-dispersible form:**

- Hafnium scrap

**Physical properties:** solid, in metallic non-dispersible form

**Other designations:** wastes and scrap of hafnium (Hf)

**LoW designation:**
- 12 01 03 non-ferrous metal filings and turnings**
- 16 01 18 non-ferrous metal
- 19 10 02 non-ferrous waste
- 19 12 03 non-ferrous metal
- 20 01 40 metals

**For lack of a different code and owing to the identical material quality, this LoW code is to be used whenever the material is lumpy punched waste.**

**Detailed description:**
- Various wastes of hafnium alloys

**Demarcation from other, similar Green List wastes:**
- Hafnium is usually present in hard metals in the form of hafnium carbide (residues containing refractory metals) - see B1030
- Spent hafnium-containing catalysts (cleaned) – see B1120

**Demarcation from other Amber List wastes or unlisted waste (notification):**
- Dispersible hafnium waste (dust and ash) – unlisted waste
- Spent hafnium-containing catalysts (contaminated) – see A2030

**Note:**
Hafnium is pyrophoric. Shavings and dust of metallic hafnium ignite when exposed to air. Radioactive contaminated hafnium waste and activated hafnium – observe radiation protection requirements!

### LoW designation:
- 12 01 03 non-ferrous metal filings and turnings**
- 16 01 18 non-ferrous metal
- 19 10 02 non-ferrous waste
- 19 12 03 non-ferrous metal
- 20 01 40 metals

**Detailed description:**
- Indium solder waste (e.g. indium/tin alloys)

**Demarcation from other, similar Green List wastes:**
- Lead solders and Babbitt metal (with indium as alloy component) – see B1020

**Demarcation from other Amber List wastes or unlisted waste (notification):**
- Phosphors and pigments – see A4070
- Indium compounds (salts), provided they occur as waste chemical substances – see A4140, otherwise unlisted waste
- Wastes from wafers (= thin metallic discs/plates of varying size used in semiconductor technology, photography and micromachinery) of indium phosphate (harmful to health) – unlisted
- Radioactive contaminated scrap and activated indium – observe radiation protection requirements!

### Niobium scrap

**Designation:** Green List B1010

**Metal and metal alloy wastes in metallic, non-dispersible form:**

- Niobium scrap

**Physical properties:** solid, in metallic non-dispersible form

**Other designations:** wastes and scrap of niobium (=columbium) (Nb)

**LoW designation:**
- 12 01 03 non-ferrous metal filings and turnings**
- 16 01 18 non-ferrous metal
- 19 10 02 non-ferrous waste
- 19 12 03 non-ferrous metal
- 20 01 40 metals

**For lack of a different code and owing to the identical material quality, this LoW code is to be used whenever the material is lumpy punched waste.**

**Detailed description:**
- Niobium alloy waste (such as special high-grade steel and non-ferrous alloys), e.g. from pipeline construction

### Indium scrap

**Designation:** Green List B1010

**Metal and metal alloy wastes in metallic, non-dispersible form:**

- Hafnium scrap

**Physical properties:** solid, in metallic non-dispersible form

**Other designations:** wastes and scrap of indium (In)
- Ferroniobium and nickel niobium waste (super alloys), e.g. waste of gas turbines, rocket parts and heat-resistant components

**Demarcation from other, similar Green List wastes:**
- Metallic niobium waste in dispersible form – see B1031
- Niobium carbide (refractory metals containing residues) – see B1030

**Demarcation from other Amber List wastes or unlisted waste (notification):**
- Niobium waste contaminated with hazardous substances- unlisted waste
- Waste of components from high-powered sodium vapour-discharge lamps – unlisted waste

Note:
Applications of niobium in nuclear technology! Pure niobium may come from nuclear reactors (cladding material) or from nuclear submarines – radioactively contaminated niobium waste is subject to radiation protection requirements

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**Rhenium scrap**

**Designation:** Green List B1010

**Metal and metal alloy wastes in metallic, non-dispersible form:** Rhenium scrap

**Physical properties:** solid, in metallic non-dispersible form

**Other designations:** wastes and scrap of rhenium (Re)

**LoW designation:**
- 12 01 03 non-ferrous metal filings and turnings**
- 16 01 18 non-ferrous metal
- 19 10 02 non-ferrous waste
- 19 12 03 non-ferrous metal
- 20 01 40 metals

**Physical properties:** solid, in metallic non-dispersible form

Gallium has a melting point of 29.76°C and melts in one's hands

**Other designations:** Waste and scrap of gallium (Ga); “Galistan” waste (=alloy of gallium, indium and tin)

**LoW designation:**
- 12 01 03 non-ferrous metal filings and turnings**
- 16 01 18 non-ferrous metal
- 19 10 02 non-ferrous waste
- 19 12 03 non-ferrous metal
- 20 01 40 metals

**Detailed description:**
- Metallic gallium waste (= non-toxic substitute for mercury in thermometers, heating baths) and gallium alloy waste

**Demarcation from other, similar Green List wastes:**
- Rhenium catalysts (cleaned) – see List B1120
- Metallic rhenium waste and alloys in dispersible form – see B1031 (usually traded in the form of this metal powder)

**Demarcation from other Amber List wastes or unlisted waste (notification):**
- Rhenium catalysts from the petroleum industry (contaminated), e.g. rhenium catalysts from the production of lead-free high-octane petrol - see A2030
- Dross, ash, slag, press cake, filter cake (metal hydroxide) containing rhenium – unlisted waste

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**Gallium scrap**

**Designation:** Green List B1010

**Metal and metal alloy wastes in metallic, non-dispersible form:** Gallium scrap

**Detailed description:**
- Waste wire and wire mesh (from mass spectrometers, hot cathodes)
- Super alloy waste, e.g. certain gas turbine parts
- Waste from the sintering of rhenium powder in a vacuum or in hydrogen atmosphere (compact pieces with a density up to 90% of the metallic element)

**Demarcation from other, similar Green List wastes:**
- There are no relevant similar entries on the Green List

**Demarcation from other Amber List wastes or unlisted waste (notification):**
- Gallium solder (gallium arsenide amalgams) – see A1010 or A1030
Gallium arsenide in the form of disassembled infrared applications (electronics industry) or waste from wafers (= thin metallic discs/plates of varying size used in the semiconductor technology, photography or micromachinery) of gallium arsenide (gallium arsenide is toxic) – unlisted waste

Thorium scrap

- Designation: Green List B1010
- Metal and metal alloy wastes in metallic, non-dispersible form

Physical properties: solid, in non-dispersible form

Other designations: wastes and scrap of thorium (Th)
Thorium as a pure metal is a radioactive element and is subject to the relevant radiation protection provisions!

LoW designation:
Metal waste in the form of alloys with low thorium content below the limit values of the radiation protection provisions:
- 12 01 03 non-ferrous metal filings and turnings**
- 16 01 18 non-ferrous metal
- 19 10 02 non-ferrous waste
- 19 12 03 non-ferrous metal
- 20 01 40 metals

** For lack of a different code and owing to the identical material quality, this LoW code is to be used whenever the material is lumpy punched waste.

Detailed description:
- Alloy waste with low quantities of thorium (e.g. jet engine waste)
- Thorium-copper-silver alloy waste (electrical contacts)

Demarcation from other, similar Green List wastes:
- There is no relevant similar waste on the Green List

Demarcation from other Amber List wastes or unlisted waste (notification):
- Thorium compounds that accumulate in the form of waste chemical substances – see A4140, otherwise unlisted waste
- Thorium-containing waste from electron tubes and mercury lamps – see A2010 or A1030

Note:
Thorium, in the form of oxides and dicarbides, in combination with those of uranium, is used as a fertile material in high-temperature reactors. Together with beryllium targets, thorium serves as neutron source – the relevant radiation protection requirements must be observed!

Rare earth metal scrap

- Designation: Green List B1010
- Metal and metal alloy wastes in metallic, non-dispersible form

Physical properties: solid, in metallic non-dispersible form

Other designations:
rare earth metal scrap; scrap of lanthanum (La), cerium (Ce), praseodymium (Pr), neodymium (Nd), samarium (Sm), europium (Eu), gadolinium (Gd), terbium (Tb), dysprosium (Dy), holmium (Ho), erbium (Er), thulium (Tm), ytterbium (Yb), lutetium (Lu) and radioactive promethium (Pm)

LoW designation:
12 01 03 non-ferrous metal filings and turnings**
16 01 18 non-ferrous metal
19 10 02 non-ferrous waste
19 12 03 non-ferrous metal
20 01 40 metals

** For lack of a different code and owing to the identical material quality, this LoW code is to be used whenever the material is lumpy punched waste.

Detailed description:
Rare earth metals or lanthanides include the following elements:
- Lanthanum, cerium, praseodymium, neodymium, samarium, europium, gadolinium, terbium, dysprosium, holmium, erbium, thulium, ytterbium, lutetium and radioactive promethium
- Waste of permanent magnets based on cobalt-samarium
- Mixed cerium metal waste

Demarcation from other, similar Green List wastes:
- Spent catalysts excluding liquids used as catalysts containing any of: lanthanides (rare earth metals):
  - lanthanum, cerium, praseodymium, neodymium, samarium, europium, gadolinium, terbium, dysprosium, holmium, erbium, thulium, ytterbium, lutetium – see B1120
Demarcation from other Amber List wastes or unlisted waste (notification):

- Rare earth metal compounds that accumulate in the form of waste chemical substances – see A4140, otherwise unlisted waste
- Rare-earth-metal-containing fluorescent tubes – see A2010 or A1030 (Hg)
- Phosphors from monitors and gas-discharge lamps – see A4070
- Waste from the manufacture, preparation and use of inks, dyes, pigments, paints, lacquers and varnishes – see A4070
- Slag, dust, ash that contain rare earth metal–unlisted waste
- Fly ash and dust that contain rare earth metals – see A4100

Note:
Promethium is a radioactive rare earth metal, relevant radiation protection requirements must be observed!

Antimony scrap

Designation: Green List B1020
Clean, uncontaminated metal scrap, including alloys, in bulk finished form (sheet, plate, beams, rods, etc.): Antimony scrap

Physical properties: solid, lumpy (in metallic non-dispersible form)

Other designations: wastes and scrap of antimony (Sb), lead-antimony alloys: antimonial lead, type metal, Babbitt metal; Tin-antimony alloys: Britannia metal, lead-antimony solder waste in metallic form

LoW designation:
12 01 03 non-ferrous metal filings and turnings**
15 01 04 metallic packaging
16 01 18 non-ferrous metal
17 04 03 lead (Note: classification if alloy has lead)
19 10 02 non-ferrous waste
19 12 03 non-ferrous metal
20 01 40 metals

** For lack of a different code and owing to the identical material quality, this LoW code is to be used whenever the material is lumpy punched waste.

Detailed description:
Antimony and antimony alloy scrap (e.g. antimony-lead)
Alloys:
- Lead-antimony alloys: antimonial lead, type metal, Babbitt metal
- Tin-antimony alloys: Britannia metal, Babbitt metal

Chromium scrap

Designation: Green List B1010
Metal and metal alloy wastes in metallic, non-dispersible form: Chromium scrap

Physical properties: solid, in metallic non-dispersible form

Other designations: wastes and scrap of chromium (Cr); chromium shavings

LoW designation:
12 01 03 non-ferrous metal filings and turnings**
16 01 18 non-ferrous metal
19 10 02 non-ferrous waste
19 12 03 non-ferrous metal
20 01 40 metals

** For lack of a different code and owing to the identical material quality, this LoW code is to be used whenever the material is lumpy punched waste.

Detailed description:
Chrome-plated metal waste (chrome-plating = galvanic application of wear- and rust-resistant coating with a thickness of up to 500 μm directly to steel, cast iron, copper or chrome-plated aluminium cylinders) in engine construction and rustproof and heat-resistant chromium alloys

Demarcation from other, similar Green List wastes:
- Chrome-plated plastic parts- see Category: solid plastic waste B3010
- Chromium catalysts (cleaned) – see B1120
Demarcation from other, similar Green List wastes:
- Antimony alloys should be classified according to the main alloy component (e.g. antimony-copper) – see B1010

Demarcation from other Amber List wastes or unlisted waste (notification):
- Antimony compounds (salts etc.) that occur as chemicals – see A4140, otherwise see A1020
- Dispersible metallic waste containing antimony such as antimony-containing ash, sludge and dust – see A1020
- Antimony-containing galvanic sludges – see A1050
- Antimony-containing filter dust, ash – see A4100
- Waste of antimony-containing pigments – see A4070
- Lead-antimony alloys from batteries and accumulators – see A1160 and for a mixture of lead-acid batteries with other batteries – see A1170
- Electrodes from lead-acid batteries – see A1010 or A1020

Beryllium scrap
Designation: Green List B1020
Clean, uncontaminated metal scrap, including alloys, in bulk finished form (sheet, plate, beams, rods, etc.):
Beryllium scrap

Physical properties: solid, lumpy, in bulk (non-dispersible) form

Other designations: wastes and scrap of beryllium (Be)

LoW designation:
12 01 03 non-ferrous metal filings and turnings**
16 01 18 non-ferrous metal
19 10 02 non-ferrous waste
19 12 03 non-ferrous metal
20 01 40 metals

** For lack of a different code and owing to the identical material quality, this LoW code is to be used whenever the material is lumpy punched waste.

Detailed description:
Metallic beryllium scrap and waste of beryllium-containing alloys in bulk finished form

Demarcation from other, similar Green List wastes:
- Beryllium alloy waste should be classified according to the main alloy component (e.g. beryllium bronze of 90% copper and more) – see B1010

Demarcation from other Amber List wastes or unlisted waste (notification):
- Beryllium and beryllium oxide waste in dispersible form (e.g. beryllium metal powder and dust or beryllium-containing ash, sludge) – see A1010 and A1020
- Beryllium-containing filtration dust – see A4100

Note:
Beryllium and its compounds are classified as carcinogenic (the limit value for beryllium compounds is 0.1% max.). Beryllium scrap should therefore contain practically no oxidic or dispersible content. Beryllium-containing vapours and aerosols (atomised) are harmful to the lungs.

Cadmium scrap
Designation: Green List B1020
Clean, uncontaminated metal scrap, including alloys, in bulk finished form (sheet, plate, beams, rods, etc.):
Cadmium scrap

Physical properties: solid, lumpy, in bulk (non-dispersible) form

Other designations: waste and scrap of cadmium (Cd)

LoW designation:
12 01 03 non-ferrous metal filings and turnings**
16 01 18 non-ferrous metal
19 10 02 non-ferrous waste
19 12 03 non-ferrous metal
20 01 40 metals

** For lack of a different code and owing to the identical material quality, this LoW code is to be used whenever the material is lumpy punched waste.

Detailed description:
Lumpy solid cadmium and cadmium alloy waste

Note:
The cadmium oxide content (= dispersible portion) must not exceed 0.1% (cadmium oxide is considered carcinogenic; limit value for carcinogen: 0.1%).
Demarcation from other, similar Green List wastes:
Cadmium-plated scrap, cadmium alloys (Babbit metals and solder) shall be classified under the entry of the type of scrap that constitutes the main component – see B1010

Demarcation from other Amber List wastes or unlisted waste (notification):
- Cadmium-containing galvanic sludge – see A1050
- Cadmium hydroxide sludge, dispersible cadmium waste – see A1020 and A1010
- Waste zinc residues containing lead and cadmium in hazardous concentrations – see A1080
- Cadmium-containing filter dust – see A4100
- Cadmium-based plastic stabilisers – see A1020
- Cadmium pigments – see A4070
- Waste of nickel-cadmium batteries – see A1170
- Cadmium electrodes removed from accumulators – see A1010 or if dispersible A1020
- Electronic scrap with cadmium accumulators as main component (e.g. battery-powered drills) – A1180 (or unlisted waste, as the case may be)
- All cadmium-containing catalysts (cleaned or contaminated) – see A2030

** Lead scrap**
<table>
<thead>
<tr>
<th>Designation:</th>
<th>Green List B1020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clean, uncontaminated metal scrap, including alloys, in bulk finished form (sheet, plate, beams, rods, etc.):</td>
<td></td>
</tr>
<tr>
<td>Lead scrap (not including spent lead-acid batteries)</td>
<td></td>
</tr>
</tbody>
</table>

**Physical properties:** solid, lumpy, in metallic (non-dispersible) form

**Other designations:** wastes and scrap of lead (Pb), lead solder/ tin solder, type metal, Pb scrap, Pb waste (metallic)

**LoW designation:**
- 02 01 10 waste metal
- 12 01 03 non-ferrous metal filings and turnings**
- 15 01 04 metallic packaging
- 16 01 18 non-ferrous metal
- 17 04 03 lead
- 19 10 02 non-ferrous waste
- 19 12 03 non-ferrous metal
- 20 01 40 metals

* For lack of a different code and owing to the identical material quality, this LoW code is to be used whenever the material is lumpy punched waste.

** Detailed description:**
- Lead pipes, cast parts, tubes (pure), foils, sheets
- Lead alloys (lead solder*, tin-lead alloys)
- Type metal
- Production waste from spoiled castings of accumulator grids
- Metallic soldering tin (more lead than tin in the alloy) with negligible lead oxide contamination (below 0.5%)

* Note: Only slight contamination with lead oxide or lead compounds is permissible (cf. lead – teratogen – from 0.5% lead compounds – hazardous waste)

Demarcation from other, similar Green List wastes:
- There is no similar waste on the Green List

Demarcation from other Amber List wastes or unlisted waste (notification):
- Lead-acid batteries, whole or crushed, electrodes (accumulator grids) from lead-acid batteries (also cleaned electrodes since it cannot be guaranteed that the limit value 0.5% (teratogenic) for lead sulphate and lead oxide is never exceeded) – see A1160
- Lead-acid batteries as a mixture with other batteries – see A1170
- Lead compounds and dispersible metallic lead waste, lead dust, lead sludge, lead dross, lead slag, lead oxide – see A1010 and A1020
- Lead pigments – see A4070
- Wastes of leaded anti-knock compound sludges – see A3030
- Lead-bearing galvanic sludge – see A1050
- Lead-bearing fly ash, filtration dust – see A4100
- Soldering tin with lead oxide content higher than 0.5% – see A1020

**Selenium scrap**
<table>
<thead>
<tr>
<th>Designation:</th>
<th>Green List B1020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clean, uncontaminated metal scrap, including alloys, in bulk finished form (sheet, plate, beams, rods, etc.):</td>
<td></td>
</tr>
<tr>
<td>Selenium scrap</td>
<td></td>
</tr>
</tbody>
</table>

**Physical properties:** solid, lumpy, in metallic non-dispersible form

**Other designations:** wastes and scrap of selenium (Se)

**LoW designation:**
- 12 01 03 non-ferrous metal filings and turnings**
- 16 01 18 non-ferrous metal
- 19 10 02 non-ferrous waste
**For lack of a different code and owing to the identical material quality, this LoW code is to be used whenever the material is lumpy punched waste.

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 Detailed description:
Refractory metals are metals of the 4th subgroup (titanium, zirconium and hafnium), 5th subgroup (vanadium, niobium and tantalum) and 6th subgroup (chromium, molybdenum and tungsten).
Refractory metals are characterised by a particularly high melting point.
The strict set of refractory metals includes tungsten, titanium, tantalum, molybdenum and niobium.
Refractory metals are used in furnace construction (e.g. for protective atmosphere furnaces or vacuum furnaces) to make resistance heating or induction heating elements. Molybdenum is also used for smelting electrodes, nozzles and for the manufacture of pipes.

Demarcation from other, similar Green List wastes:
- Metal scrap in non-dispersible metallic form: titanium scrap, zirconium scrap, hafnium scrap, chromium scrap, molybdenum scrap, tungsten scrap, vanadium scrap, niobium scrap, tantalum scrap, rhenium scrap – see B1010
- Scrap refractory metals such as molybdenum, tungsten, titanium, tantalum, niobium and rhenium as metals and metal alloys in metallic dispersible form – see B1031
- Catalysts (cleaned) containing molybdenum, tungsten, titanium, tantalum, niobium and rhenium or hafnium, zirconium or chromium – see B1120
- Furnace linings from metallurgical and non-metallurgical processes, proven to have no hazardous characteristics – ceramic wastes – see GF010

Demarcation from other Amber List wastes or unlisted waste (notification):
- Dross, slag, ash, press cake, filter cake (metal hydroxide) containing refractory metals and refractory metal compounds – unlisted waste
- Refractory metal-containing filter dust or fly ash from off-gas cleaning – see A4100
- Refractory metal-containing furnace linings from metallurgical and non-metallurgical processes with hazardous characteristics – unlisted waste or listed according to the contaminants on list A (Amber List)
- Refractory metal-containing galvanic sludge – see A1050
- Catalysts containing refractory metals (contaminated) – see A2030

 Refractory metals (dispersible)
Designation: Green List B1031
Molybdenum, tungsten, titanium, tantalum, niobium and rhenium metals and metal alloy wastes in metallic dispersible form (metal powder), not including such wastes as specified on list A under entry A1050
Galvanic sludges

Physical properties: solid, in metallic non-dispersible form

Other designations:
Refractory metal scrap or metallic waste and scrap of: titanium (Ti), niobium (Nb), tantalum (Ta), molybdenum (Mo), tungsten (W), rhenium (Re)

LoW designation:
10 08 04 particulates and dust
12 01 03 non-ferrous metal filings and turnings**
12 01 04 non-ferrous metal dust and particulates
16 01 18 non-ferrous metal
19 10 02 non-ferrous waste
19 12 03 non-ferrous waste
20 01 40 metals
** For lack of a different code and owing to the identical material quality, this LoW code is to be used whenever the material is lumpy punched waste.

Detailed description:
Metallic dispersible wastes such as fine particulates and powder of molybdenum, tungsten, titanium, tantalum, niobium and rhenium should be subsumed under this category, but not waste that contains the above metals in the form of compounds.

Demarcation from other, similar Green List wastes:
- Refractory metals residues (=metals with a high melting point) in non-dispersible form – see B1030
- Metal scrap in non-dispersible metallic form: titanium scrap, molybdenum scrap, tungsten scrap, niobium scrap, tantalum scrap, rhenium scrap – see B1010
- Catalysts (cleaned) containing molybdenum, tungsten, titanium, tantalum, niobium, and rhenium – see B1120
- Furnace linings from metallurgical and non-metallurgical processes, proven to have no hazardous characteristics – ceramic wastes – see GF010
Demarcation from other Amber List wastes or unlisted waste (notification):
- Dross, slag, ash, press cake, filter cake (metal hydroxide) containing refractory metals and refractory metal compounds – unlisted waste
- Refractory metal-containing filter dust or fly ash from off-gas cleaning – see A4100
- Refractory metal-containing furnace linings from metallurgical and non-metallurgical processes with hazardous characteristics – unlisted waste
- Refractory metal-containing galvanic sludge – see A1050
- Refractory metal-containing chromium catalysts (contaminated) – see A2030

Power plant scrap

**Designation:** Green List B1040
Scrap assemblies from electrical power generation not contaminated with lubricating oil, PCBs or PCTs to an extent that renders them hazardous

**Physical properties:** solid

**Other designations:** scrap from power plant installations; power plant scrap; turbine scrap

**LoW designation:**
- 16 02 14 discarded equipment other than those mentioned in 16 02 09* to 16 02 13*
- 16 02 16 components removed from discarded equipment other than those mentioned in 16 02 15*
- 16 01 17 ferrous metal
- 16 01 18 non-ferrous metal
- 17 04 01 copper, bronze, brass
- 17 04 02 aluminium
- 17 04 05 iron and steel
- 17 04 07 mixed metals
- 19 10 01 iron and steel waste
- 19 10 02 non-ferrous waste
- 19 12 02 ferrous metal
- 19 12 03 non-ferrous metal
- 17 04 03 lead
- 17 04 04 zinc
- 17 04 06 tin
- 20 01 36 discarded electrical and electronic equipment other than those mentioned in 20 01 21*, 20 01 23* and 20 01 35*
- 20 01 40 metals

**Detailed description:** Waste from power plant installations, such as waste turbines, pumps, generators, motors. Regarding any contamination, the limit values of current version of the Waste List Ordinance must be observed.

The PCB/PCT content (polychlorinated biphenyl/polychlorinated terphenyl) must not exceed 30 mg/kg dry mass relative to the fuel (oil) (to be determined according to EN 12766-1 and EN 12766-2). The residual mineral oil content must not exceed 2%. Any stricter limit values in other countries must be observed.

Demarcation from other, similar Green List wastes:
- Electrical assemblies consisting only of metals or alloys – see GC 010

Demarcation from other Amber List wastes or unlisted waste (notification):
- Power plant installations whose PCB/PCT content relative to the fuel (oil) exceeds 30 mg/kg (to be determined according to EN 12766-1 and EN 12766-2) – see A1180
- Complete devices with environmentally-relevant percentages of hazardous substances (e.g. components containing mineral oil) – see A1180
- Full or drained PCB-transformers- see A3180 or A1180
- Engines with PCB-starting capacitors or electrolytic capacitors – see A1180

Non-ferrous metals, mixed

**Designation:** Green List B1050
Mixed non-ferrous metals, heavy fraction (shredder scrap) not containing Annex I substances in concentrations sufficient to exhibit Annex III characteristics

**Physical properties:** solid, in metallic non-dispersible form

**Other designations:** heavy fraction of shredder scrap, non-ferrous metal shredder scrap, heavy fraction of non-ferrous metal

**LoW designation:**
- 16 01 18 non-ferrous metals
- 17 04 07 mixed metals
- 19 10 02 non-ferrous metals
- 19 10 06 other fractions other than those mentioned in 19 10 05*
- 19 12 03 non-ferrous metals

**Detailed description:** The heavy fraction of non-ferrous metal scrap is a mixture of non-ferrous metals such as copper, aluminium, zinc, left-over cables, other non-ferrous metal scrap, but also – depending on the sorting method – greater or lesser amounts of non-metallic...
components such as slices of waste tyres, plastic waste, left-over fabric/textile wastes, glass, gravel and soil.

To be classifiable in the Green List, the waste must have no high percentage of lead compounds (limit value: 0.5% – teratogenic), PCBs (30 mg/kg) or hydrocarbons (e.g. no more than 2% petroleum) (see Green List waste classification criteria).

The metal content must be at least 90% in order to assume that the majority of the waste is recyclable and that environmentally sound recovery is ensured, especially by taking into account the treatment method for the light fraction of the shredder scrap (see also shipments of waste listed in Annex III to non-OECD countries). This means, non-ferrous metals must not exhibit more than 10% of non-hazardous, non-metallic components that do not disrupt the discovery process.

**Demarcation from other, similar Green List wastes:**
- Homogeneous scrap – see the specific entries B1010 and B1020
- Annex IIIA – see also the related explanations of the following entries:
- Mixtures of wastes that are classified as B1010 (iron and non-ferrous metals) and B1050 Mixed non-ferrous metals, heavy fraction scrap of the Basel Convention.
- Mixtures of wastes that are classified as B1010 (iron and non-ferrous metals) and B1070 (waste of copper and copper alloys in dispersible form) of the Basel Convention.

**Demarcation from other Amber List wastes or unlisted waste (notification):**
- “Flavoured shredder wastes”, which mainly consist of the light fraction from shredding (fluff) with low metal content – see A3120 Fluff (or unlisted waste, as the case may be)
- Non-ferrous metal shredder fractions with less than 90% metal content and the rest is fluff – unlisted waste
- Contaminated shredder fractions (e.g. with oil or PCB) – unlisted waste or listed according to the main contaminants on list A (Amber List)
- Light shredder fraction (Fluff) – see A3120

**Selenium and tellurium (dispersible)**

**Designation:** Green List B1060
Waste selenium and tellurium in metallic elemental form, including powder

**Physical properties:** solid, dispersible, in metallic elemental form

**Other designations:** selenium and tellurium powder (metallic); powder selenium (Se) or tellurium (Te)

**LoW designation** (depends on the type of dispersible Se and Te wastes and their origin):
- 10 08 04 particulates and dust
- 12 01 04 non-ferrous metal dust and particles
- 12 01 15 machining sludges other than those mentioned under 12 01 14*
- 19 10 06 other fractions other than those mentioned in 19 10 05* (Note: limited to a metallic fraction with selenium- or tellurium-containing wastes in metallic dispersible form)
- 19 12 13 non-ferrous waste
- 20 01 40 metals

**Detailed description:**
- Metallic selenium and tellurium dust

**Demarcation from other, similar Green List wastes:**
- Selenium and tellurium scrap, in non-dispersible form such as waste of tellurium-hardened lead scrap (by no means battery scrap) – see B1020
- Wastes of tellurium-containing steel, cast iron, copper – classified according to the main component of the relevant metal – see B1010

**Demarcation from other Amber List wastes or unlisted waste (notification):**
- Selenium-containing pesticides (some applications are banned) – see A4030
- Tellurium-containing anode sludge is the main source of industrial tellurium production – see A1020 (in case lead compounds are present in the anode sludge) or unlisted waste (e.g. if nickel content is over 0.1%)
- Selenium and tellurium-containing fly ash and dust – see A4100 or A1020
- Leaching residues of cyanide leaching – see A4050
- Selenium pigments (e.g. toner for black-and-white photographs to heighten contrast) and tellurium pigments – see A4070 or AD 090
- Toxic selenium compounds – see A1020
- Selenium compounds that occur in the form of chemicals – see A4140
- All selenium-containing catalysts (cleaned or contaminated) – see A2030
Dispersible selenium wastes consisting not only of metals but also of metal compounds such as dust, sludge, ash – see A1020

**Copper (dispersible)**

Designation: Green List B1070
Waste of copper and copper alloys in dispersible form, unless they contain Annex I constituents to an extent that they exhibit Annex III characteristics

**Physical properties:** solid, highly viscous, dispersible

**Other designations:** copper, brass, gunmetal, bronze scrap, dispersible; copper, brass, bronze, gunmetal dust or powder; copper, brass, bronze, gunmetal dross or ashes; sludge; dispersible copper refinement materials

**LoW designation** (depends on the type of dispersible copper wastes and their origin):
10 06 01 slags from primary and secondary production
10 06 02 dross and skimmings from primary and secondary production
10 06 04 other particulates and dust
12 01 03 non-ferrous metal filings and turnings
12 01 04 non-ferrous metal dust and particles
12 01 15 machining sludges other than those mentioned under 12 01 14*
19 12 03 non-ferrous metal
20 01 40 metals

**Detailed description:**
- Metallic copper dust, brass dust, bronze dust
- Copper refinement materials with oxide copper components and copper discharges
- Copper and copper alloys dross, ash, slag, provided they have no hazardous characteristics

**Demarcation from other, similar Green List wastes:**
- Copper sintering materials (copper oxide mill scale), provided they have low lead oxide content (0.5% limit value) and are free of other contamination – see B1240

**Demarcation from other Amber List wastes or unlisted waste (notification):**
- Copper-containing filter dust – see A1100 or A4100
- Copper arsenate, copper salts, pigments – see A4140 chemicals and A4070
- Copper and copper alloy dross, ash, slag with hazardous characteristics – unlisted waste

**Copper(II)-chloride and copper cyanide catalysts** – see A1140

**Zinc ash and residues**

Designation: Green List B1080
Zinc ash and residues including zinc alloy residues in dispersible form unless containing Annex I constituents in such concentrations that they exhibit Annex III characteristics or they exhibit hazardous characteristic H4.3

**Physical properties:** solid, also in dispersible form

**Other designations:** zinc alloy ash, fine zinc ash, zinc oxide waste

**LoW designation:**
06 03 16 metallic oxides other than those mentioned in 06 03 15*
10 05 04 other particulates and dust
11 05 02 zinc ash

**Detailed description:**
- Zinc ash (also dispersible, i.e. with a particle size under 100 micrometers), provided that it has no hazardous characteristics (heavy metals such as cadmium, lead – see the respective limit values to be satisfied with respect to hazardous characteristics under chemicals law) and does not exhibit hazardous property H 4.3.
- Zinc residues and ash from spray galvanising (galvanising steel wire) that mainly consist of zinc oxide, some iron and zinc and do not exhibit any hazardous characteristics (e.g. due to metals and heavy metals such as As, Cd, Ni or Pb).

**Demarcation from other, similar Green List wastes:**
- Zinc dross, zinc-containing top dross – see B1100

**Demarcation from other Amber List wastes or unlisted waste (notification):**
- Ash with elevated heavy metal content (e.g. Cd, Pb, or Ni, as the case may be – cf. see the required limit values for hazardous characteristics under chemicals law) and/or hazardous property H 4.3 and ash that does not have the minimum required zinc content – see A1080 or unlisted waste
Batteries

**Designation:** Green List B1090

Notification is required for all types of batteries!

The Green List entry “Waste batteries conforming to a specification, excluding those made with lead, cadmium or mercury” is not applicable for shipments to and from Austria, especially since in accordance with the information currently available, all battery types common on the market exhibit at least one hazardous characteristic (see also nickel compounds, organic solvents, acids or alkaline substances in electrolytes), even if they do not include (significant) amounts of lead, cadmium or mercury.

The Austrian List of Waste Ordinance classifies all battery types ex lege as hazardous and non-declassifiable waste. According to the EC Waste Shipment Regulation No 1013/2006, Article 3 (3), Green List waste shall be treated as Amber List waste if it exhibits hazardous characteristics. Therefore, the shipment of all batteries is subject to the notification duty.

This has been notified to the Commission in accordance with Article 3 (3) of the EC Waste Shipment Regulation (Ref.: BMLFUW-UW.2.1.7/0039-V/2/2007 - Application to set all batteries on the Amber List). The Commission will carry out an evaluation in the course of revising the European Waste List.

**Physical properties:** solid

**Other designations:** spent batteries; battery scrap; sorted waste batteries; alkaline manganese, zinc carbon, nickel metal hydride; lithium battery waste; spent nickel-iron accumulators, mixed waste batteries

**LoW designation:**

- 16 02 16 components removed from discarded equipment other than those mentioned in 16 02 15*
- 16 06 04 alkaline batteries (except 16 06 03*)
- 16 06 05 other batteries and accumulators
- 20 01 34 batteries and accumulators other than those mentioned in 20 01 33*

**Detailed description:**

Note: All types of batteries and accumulators should be classified as hazardous wastes because of their electrolytes so that notification is required.

For transboundary shipment of batteries, only entry A1170 shall be used.

Demarcation from other, similar Green List wastes:

There is no relevant similar entry on the Green List.

Note:

The Green List entry B4030 “Used single-use cameras, with batteries not included on list A” is not applicable – see A1180 (perhaps unlisted waste) – notification.

Demarcation from other Amber List wastes or unlisted waste (notification):

- All waste batteries except for lead-acid batteries – see A1170
- Waste lead-acid batteries, whole or crushed – see A1160
- Used single-use cameras with all types of batteries – see A1180 (perhaps unlisted waste)

**Hard zinc spelter**

**Designation:** Green List B1100

Metal-bearing wastes arising from melting, smelting and refining of metals:

**Hard zinc spelter**

**Physical properties:** solid

**Other designations:** hard zinc waste; hard zinc from hot-dip galvanising

**LoW designation:**

11 05 01 hard zinc

**Detailed description:**

Hard zinc is a zinc-iron alloy with approx. 90–95% zinc (spelter) that originates from hot-dip galvanising.

Demarcation from other, similar Green List wastes:

- Zinc ash and residues, including residues of zinc alloys in a dispersible form, provided they do not exhibit hazardous characteristic H 4.3 and do not contain components mentioned in Annex I (especially lead, cadmium) in such concentrations that they exhibit one of the properties defined in Annex III – see B1080
- Zinc dross, zinc-containing top dross – see B1100
- Zinc skimmings containing less than 45% metallic zinc (or less than 40.5% in the case of individual batches) require notification and authorisation in case of transboundary shipment.

Demarcation from other Amber List wastes or unlisted waste (notification):

Hard zinc waste exhibiting a hazardous characteristic – see A1080 in case of higher lead and/or cadmium content or unlisted waste
**Federal Waste Management Plan 2011**

### Zinc slag/dross

**Designation:** Green List B1100  
**Metal-bearing wastes arising from melting, smelting and refining of metals:**  
**Zinc-containing drosses**
- Galvanising slab zinc top dross (> 90% Zn)
- Galvanising slab zinc bottom dross (> 92% Zn)
- Zinc die casting dross (> 85% Zn)
- Hot dip galvanisers slab zinc dross (batch) (> 92% Zn)
- Zinc skimmings

**Physical properties:** solid

**Other designations:** zinc dross/skimmings, zinc slag, zinc-containing residues from hot-dip galvanising, galvanising slab zinc top dross, galvanising slab zinc bottom dross, zinc die casting dross

**LoW designation:**  
10 05 11 dross and skimmings other than those mentioned in 10 05 10*  
10 05 01 slags from primary and secondary production

**Detailed description:**  
**Galvanising slab zinc top dross (> 90% Zn)**
- Galvanising slab zinc top dross from the planetary rolling mill process, skimmed off the top during continuous galvanising, in regular slabs, free of ash and powder, non-incinerated goods; approx. 10% fragments
- Zinc die cast top dross from continual slab galvanising, free from slag; approx. 10% fragments

**Galvanising slab zinc bottom dross (> 92% Zn)**
- Galvanising slab zinc top dross from the planetary rolling mill process, skimmed off the bottom during continuous galvanising, in regular slabs, free of ash and powder, non-incinerated goods; fragments constitute approx. 10%
- Zinc die cast bottom dross from continuous slab galvanising, free from slag; approx. 10% fragments

**Zinc die casting dross (> 85% Zn)**
- Zinc die cast dross, drawn (skimmed) from the top, smooth, metallic, and as free as possible from corrosion or oxidation

**Hot dip galvanisers slab zinc dross (batch) (> 92% Zn)**
- Galvanising dross in slabs, blocks from hot exchange galvanising (batch process), free from iron fragments, approx. 10% fragments

**Zinc skimmings**
- The zinc skimmings must have a metallic zinc content of at least 45% (with a maximum allowable deviation of 10% of this limit), i.e. individual batches with a minimum content of 40.5% zinc are still considered Green List waste. The cadmium content must by no means exceed 0.1% (cadmium oxide is considered to be a category 2 carcinogen; limit value for classification as carcinogen: 0.1%). The limit value of 0.1% is applicable also to any nickel oxide contents. Such waste must contain no more than 0.5% of lead compounds (limit value for teratogenic lead compounds). The residues must not be inflammable or release flammable gases in hazardous quantities when exposed to water (criterion H 4.3).

**Demarcation from other, similar Green List wastes:**
- Zinc ash and residues including zinc alloy residues in a dispersible form that exhibit no hazardous properties – see B1080

**Demarcation from other Amber List wastes or unlisted waste (notification):**
- Zinc dross, skimmings and ash that are inflammable or release flammable gases in hazardous quantities upon contact with water or contain high amounts of lead and cadmium compounds are classifiable as hazardous – see A1080 or in the case of criterion H 4.3 or higher contents of other heavy metals – unlisted waste
- Zinc-containing filter dust – see A4100
- What is termed “zinc foam” (slag/dross/ashes) (from wet galvanising), containing ammonium chloride (characterised by a strong smell of ammonia) – see A1080 (in case of elevated lead or cadmium contents) or unlisted waste
- Dross, slag with less than 45% (or 40.5% in individual batches) of metallic zinc and/or higher heavy metal content (Cd, Ni, Pb) – see A1080 (in case of elevated lead and cadmium contents) or unlisted wastel

### Aluminium skimmings

**Designation:** Green List B1100  
**Metal-bearing wastes arising from melting, smelting or refining:**  
**Aluminium skimmings (or skims) not including salt slag**

**Physical properties:** solid

**Other designations:** aluminium skims, (Al) skimmings, aluminium skimmings except salt slag; metal-rich aluminium dross
LoW designation:
10 03 16 skimmings other than those mentioned in 10 03 15* (thermal aluminium metallurgy)

Detailed description:
Aluminium skimmings, provided they exhibit no hazardous properties and contain at least 45% (or at least 40.5% in individual batches) metallic aluminium.

Note:
Black aluminium dross from secondary melting (thermal aluminium metallurgy) and aluminium skimmings/dross that are flammable or release flammable gases in hazardous quantities upon contact with water are classifiable as hazardous waste under the European Waste List. Relevant hazardous characteristics are the release of flammable gasses when brought into contact with water (limit value of hazardous characteristic H 4.3: release of more than 1 litre of hydrogen/kg/h) or inflammable properties.

Aluminium skimmings must exhibit a metallic aluminium content of at least 45% (with a maximum allowable deviation of 10% of this limit), i.e. individual batches with a minimum content of 40.5% metallic aluminium are still considered Green List waste, if they do not exhibit hazardous characteristic H4.3. However, if drosses with this minimum aluminium content of 45% (or 40.5% in individual batches) still meet criterion H4.3 they are always considered waste subject to the notification requirement.

Demarcation from other, similar Green List wastes:
- Aluminium oxide abrasives (provided they are not contaminated with hazardous substances) – see B2040 Carborundum (= corundum, silicon carbide, boron carbide, aluminium oxide)
- Waste hydrates of aluminium (= aluminium hydroxide) and waste alumina and residues from alumina production, excluding such materials used for gas cleaning, flocculation and filtration processes – see B2100

Demarcation from other Amber List wastes or unlisted waste (notification):
- Aluminum skimmings and dross that meet the classification criteria: they are inflammable or emit inflammable gases as defined under chemical laws or have a metallic aluminium content of less than 45% by mass (or 40.5% in individual batches) – unlisted waste
- Ball-mill dust – unlisted waste
- Fine dust, filter dust – see A4100
- Waste hydrates of aluminium, alumina and residues from alumina production used for gas cleaning, flocculation and filtration processes or other contaminated waste hydrates of aluminium or alumina – unlisted waste
- Aluminium salt slag – unlisted waste

Refractory linings

| Designation | Green List B1100 Waste of refractory linings, including crucibles, from copper smelting |

Physical properties: solid

Other designations: refractory materials from copper smelting; crucible fragments from copper (Cu) smelting

LoW designation:
16 11 04 other linings and refractories from metallurgical processes other than those mentioned in 16 11 03*

Detailed description:
Classification as a Green List entry is possibly only for non-hazardous waste refractory linings, including crucibles, from copper smelting. Analysis is required to determine whether it is non-hazardous.

Demarcation from other, similar Green List wastes:
- Furnace linings from metallurgical and non-metallurgical processes, proven to have no hazardous properties (e.g. furnace linings from steel production) – ceramic wastes – see GF 010

Demarcation from other Amber List wastes or unlisted waste (notification):
- Furnace linings, other linings and refractory materials from metallurgical processes containing hazardous substances – unlisted waste or listed according to the contaminants on list A (Amber List)
- Furnace linings from non-metallurgical processes – unlisted waste or listed according to the contaminants on list A (Amber List)
- Contaminated crucibles from the smelting of copper that exhibit a hazardous characteristic – unlisted waste or listed according to the contaminant on list A (Amber List)
- Crucible linings from aluminium smelting containing inorganic cyanides – see A4050
- Heat storage stones from night-storage heaters (often containing chromate) – see A1040 (Cr VI)
Note:
After destruction of the cyanides, crucible linings from aluminium smelting should be classified under AB 120 (Amber List), since they contain inorganic fluoride compounds, excluding calcium fluoride.

**Tantalum-bearing tin slags**

**Designation:** Green List B1100

Metal-bearing wastes arising from melting, smelting and refining of metals:

Tantalum-bearing tin slags with less than 0.5% tin

**Physical properties:** solid

**Other designations:**

- Tantalum-bearing tin slags; non-ferrous metal slag (tantalum-bearing)

**LoW designation:**

- 10 08 09 other slags (from other thermal non-ferrous metallurgy)

**Detailed description:**

- Only non-hazardous tantalum-bearing tin slag may be subsumed under this category. Analysis is required to determine whether it is non-hazardous.

**Demarcation from other, similar Green List wastes:**

- Tantalum catalysts, cleaned – see B1120
- Waste tantalum and tantalum alloys (metal powder) in metallic dispersible form – see B1031
- Lithium – tantalum glass scrap – see B2040
- Refractory metals containing residues (tantalum) – see B1030

**Demarcation from other Amber List wastes or unlisted waste (notification):**

- Tantalum-containing tin slags classifiable as hazardous – unlisted waste or listed according to the contaminant on list A (Amber List)
- Tantalum catalysts, contaminated – see A2030

**Waste cables**

**Designation:** Green List B1115

Waste metal cables coated or insulated with plastics, not included on list A, A1190, excluding those destined for Annex IV*, Section A, operations (= disposal operations) or any other disposal operations involving, at any treatment stage, uncontrolled thermal processes, such as open-burning

**Physical properties:** solid (highly viscous)

**Other designations:**

- Spent catalysts or waste catalysts containing the following transition metals: scandium, vanadium, manganese, cobalt, copper, yttrium, niobium, hafnium, tungsten, titanium, chromium, iron, nickel, zinc, zirconium, molybdenum, tantalum, rhenium

**Catalysts (transition metals)**

**Designation:** Green List B1120

Spent catalysts, excluding liquids used as catalysts, containing any of:

- Transition metals, excluding waste catalysts (spent catalysts, liquid used catalysts or other catalysts) on list A:
  - scandium, vanadium, manganese, cobalt, copper, yttrium, niobium, hafnium, tungsten, titanium, chromium, iron, nickel, zinc, zirconium, molybdenum, tantalum, rhenium
  - Lanthanides (rare earth metals): lanthanum, praseodymium, samarium, gadolinium, dysprosium, erbium, ytterbium, cerium, neodymium, europium, terbium, holmium, thulium, lutetium

- Lanthanides (rare earth metals): lanthanum, praseodymium, samarium, gadolinium, dysprosium, erbium, ytterbium, cerium, neodymium, europium, terbium, holmium, thulium, lutetium
8. Guidelines for the Shipment of Waste

zinc, zirconium, molybdenum, tantalum and rhenium.

Spent catalysts containing lanthanides (rare earth metals): lanthanum, praseodymium, samarium, gadolinium, dysprosium, erbium, ytterbium, cerium, neodymium, europium, terbium, holmium, thulium and lutetium.

**Low designation:****
16 08 02 spent catalysts containing dangerous transition metals** or dangerous transition metal compounds
16 08 03 spent catalysts containing transition metals or transition metal compounds not otherwise specified
** These metals and their compounds are considered hazardous if they are classified as hazardous substances. Thus, the classification as a hazardous substance determines which transition metals and transition-metal-containing compounds constitute hazardous waste.

Note:
The European Waste List has no specific entry for catalysts that contain lanthanides (rare earth metals). Therefore, such catalysts are classified under LoW code 16 08 03.

Detailed description:
If catalysts are not classifiable under the Amber List because of contamination (e.g. mineral oil residues), they are subject to the provisions for Green List waste, even if they would be classifiable as hazardous because of the intrinsic (i.e. substance-specific) properties of the catalyst (e.g. carcinogenic nickel content of a nickel catalyst).

In the European Waste List, spent catalysts containing hazardous transition metals or transition metal compounds are considered hazardous waste. Nevertheless, such catalysts are classifiable as Green List waste if they are not further contaminated with other hazardous substances (e.g. mineral oil, tar residues, etc.).

Examples:
- Nickel catalysts from edible oil hydration
- Cleaned catalysts mixed with iron(II)-(III) oxides from Haber Bosch synthesis (synthetic manufacture of ammonia)
- Samarium oxide catalysts from the hydrogenation and dehydrogenation of alcohol
- Cleaned lanthanum catalysts from petroleum and petrol cracking (the mineral oil content must by no means exceed 2%; regarding other hazardous contents such as PAHs, etc., the limit values of the List of Waste Ordinance as amended are applicable)

Demarcation from other, similar Green List wastes:
- Cleaned, spent precious-metal-bearing catalysts – see B1130
- Spent fluid catalytic cracking catalysts (e.g. aluminium oxide, zeolites) – see GC 050

Demarcation from other Amber List wastes or unlisted waste (notification):
- Liquids used as catalysts (e.g. sulphuric acid or metallic organic compounds) – see A2030 or more specific entries for the relevant liquids on list A (Amber List)
- Cadmium- and mercury-bearing catalysts – see A2030
- Spent metal-containing catalysts of all types, provided they have hazardous contamination (e.g. with hydrocarbons or polycyclic aromatic hydrocarbons [PAHs]) – see A2030

### Catalysts (precious metals)

<table>
<thead>
<tr>
<th>Designation</th>
<th>Green List B1130</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cleaned, spent precious-metal-bearing catalysts</td>
<td></td>
</tr>
</tbody>
</table>

Physical properties: solid, highly viscous

Other designations: precious-metal catalyst waste

**Low designation:****
16 08 01 spent catalysts containing gold, silver, rhenium, rhodium, palladium, iridium or platinum (except 16 08 07*)

Detailed description:
If catalysts are not classifiable under the Amber List because of hazardous contamination (e.g. from the process for which they were used), they are subject to the provisions for Green List waste, even if they would be classifiable as hazardous because of the intrinsic (i.e. substance-specific) properties of the catalyst (e.g. carcinogenic nickel content of a nickel catalyst).

- Automotive catalytic converters
- Hydrogenation catalysts for heterogeneous catalysis based on a precious metal, without hazardous contamination
- Precious-metal-bearing conversion catalysts
- Cleaned platinum-rhodium catalysts from nitric acid synthesis (Ostwald process)
Demarcation from other, similar Green List wastes:
- Precious-metal-bearing waste in a dispersible form – see B1150
- Spent fluid catalytic cracking catalysts (e.g. aluminium oxide, zeolites) without hazardous contamination – see GC 050
- Cleaned, used transition-metal-containing or rare-earth-containing catalysts – see B1120

Demarcation from other Amber List wastes or unlisted waste (notification):
- Liquids used as catalysts – see A2030 or more specific entry for the liquids on list A (Amber List)
- Mercury- and cadmium-containing catalysts – see A2030
- Spent precious-metal-bearing catalysts, provided they exhibit hazardous contamination (e.g. with high quantities of hydrocarbons, polycyclic aromatic hydrocarbons [PAHs]) – see A2030
- Spent transition-metal-containing or rare-earth-containing catalysts with hazardous contamination – see A2030

Precious-metal-bearing residues (solid)

<table>
<thead>
<tr>
<th>Designation:</th>
<th>Green List B1140</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solid precious-metal residues containing traces of inorganic cyanides</td>
<td></td>
</tr>
</tbody>
</table>

Physical properties: solid

Other designations: solid precious-metal residues containing traces of inorganic cyanides

LoW designation:
- 01 03 06 tailings other than those mentioned in 01 03 04* and 01 03 05*
- 11 01 10 sludge and filter cakes other than those mentioned in 11 01 09*
- 19 02 06 sludges from physico/chemical treatment other than those mentioned in 19 02 05*

Detailed description:
Such precious metal residues must by no means contain mercury or other heavy metals or toxic compounds (cyanide) in quantities that trigger a hazardous characteristic. Analysis is required to determine whether it is non-hazardous.

Demarcation from other, similar Green List wastes:
- Precious-metal wastes in a dispersible, non-liquid form – see B1150
- Precious-metal ash from the incineration of printed circuit boards, without hazardous properties – see B1160
- Precious-metal ash from the incineration of photographic film – see B1170

Demarcation from other Amber List wastes or unlisted waste (notification):
- Precious metal residues containing higher quantities of cyanides – see A4050
- Precious metal residues with hazardous properties (e.g., elevated heavy metal content) – unlisted waste or listed according to the contaminants of list A (Amber List)
- Anode slime – see A1020 (if the sludge has elevated lead contents), otherwise unlisted waste
- Amalgam waste and mercury waste – see A1010 or if dispersible A1030

Precious metals (dispersible)

<table>
<thead>
<tr>
<th>Designation:</th>
<th>Green List B1150</th>
</tr>
</thead>
<tbody>
<tr>
<td>Precious metals and alloy wastes (gold, silver, platinum group, but not mercury), in a dispersible, non-liquid form with appropriate packaging and labelling</td>
<td></td>
</tr>
</tbody>
</table>

Physical properties: solid, highly viscous; in a dispersible, non-liquid form

Other designations: precious-metal waste (dispersible); dispersible precious-metal scrap of silver (Ag), platinum (Pt) and gold (Au). The following are designated as platinum metals: ruthenium (Ru), osmium (Os), rhodium (Rh), iridium (Ir), palladium (Pd) and platinum (Pt)

LoW designation:
- 09 01 06* wastes containing silver from on-site treatment of photographic wastes
- 09 01 99 wastes not otherwise specified
- 10 04 01 slags from primary and secondary production
- 10 07 02 dross and skimmings from primary and secondary production
- 10 07 03 solid wastes from gas treatment (silver, gold, platinum thermal metallurgy)
- 10 07 04 other particulates and dust
- 10 07 05 sludges and filter cakes from gas treatment
Detailed description:
- Silver-containing precipitate residues from photo-development solutions
- Precious-metal-containing metallic dust, e.g. from the processing of precious metals
- Precious-metal-containing skimmings/dross without hazardous components

Note:
Precious-metal-containing wastes that contain mercury as a contaminant or alloy component, as well as amalgams, are by no means classifiable as Green List waste.

Demarcation from other, similar Green List wastes:
- Precious-metal ash from the incineration of printed circuit boards without hazardous properties – see B1160
- Precious-metal-bearing residues in solid form that contain traces of inorganic cyanides – see B1140
- Slags from precious metal recycling, without hazardous components – see GB 040

Demarcation from other Amber List wastes or unlisted waste (notification):
- Amalgam waste and mercury waste – see A1010 or if dispersible A1030
- Anode slime – see A1020 (in case of elevated lead content) or unlisted waste
- Precious-metal dust with hazardous contaminants, hazardous ash and dross containing precious metals – unlisted waste or listed according to the contaminants on list A (Amber List)
- Precious-metal residues containing higher quantities of cyanides – see A4050
- Photographic and fixing chemicals – see AD 090
- Slags from precious-metal extraction with hazardous properties – unlisted waste
- Liquids containing precious metal salts, e.g. silver nitrate (chemicals) – see A4140
- Filter dust with hazardous properties that contains traces of precious metals – see A4100 or A1100, provided they come from copper smelting

Precious-metal ash (printed circuit boards)

Physical properties: solid

Other designations: ash containing precious metals from the incineration of printed circuit boards;

LoW designation:
10 07 04 other particulates and dust (thermal silver, gold and platinum metallurgy)

Detailed description:
Precious-metal-containing ash from the incineration of printed circuit boards without hazardous properties. Analysis is required to determine whether it is non-hazardous.

Demarcation from other, similar Green List wastes:
- Precious metals and alloy waste (gold, silver, platinum group, but no mercury) in a dispersible, non-liquid form with appropriate packaging and labelling – see B1150

Demarcation from other Amber List wastes or unlisted waste (notification):
- Precious-metal ash from the incineration of printed circuit boards (without hazardous properties) – see B1160

Precious-metal ash (film)

Designation: Green List B1170
Precious-metal ash from the incineration of photographic film

Physical properties: solid

Other designations: photographic film ash (containing precious metals)

LoW designation:
09 01 99 wastes not otherwise specified
10 07 04 other particulates and dust

Detailed description:
This is silver-containing ash from the incineration of photographic film.

Demarcation from other, similar Green List wastes:
- Waste photographic film containing silver halides and metallic silver – see B1180
- Precious-metal ash from the incineration of printed circuit boards (without hazardous properties) – see B1160
Demarcation from other Amber List wastes or unlisted waste (notification):
- Precious-metal ash from the incineration of printed circuit boards, with hazardous properties / contamination – see A1150

Film (silver)

<table>
<thead>
<tr>
<th>Designation:</th>
<th>Green List B1180</th>
</tr>
</thead>
<tbody>
<tr>
<td>Waste photographic film containing silver halides and metallic silver</td>
<td></td>
</tr>
</tbody>
</table>

Physical properties: solid

Other designations: film waste, silver-containing (= Ag-containing)

LoW designation:
09 01 07 photographic film and paper containing silver or silver compounds

Detailed description:
From photographic film that contains silver halide or metallic silver, both the plastic layer and silver can be reclaimed.

Demarcation from other, similar Green List wastes:
- Waste photographic paper containing silver halides and metallic silver - see B1190
- Precious-metal ash from the incineration of photographic film – see B1170

Demarcation from other Amber List wastes or unlisted waste (notification):
- Photographic and fixing chemicals – see AD 090
- Liquids containing precious metal salts, e.g. silver nitrate (chemicals) – see A4140

Waste photographic paper (silver)

<table>
<thead>
<tr>
<th>Designation:</th>
<th>Green List B1190</th>
</tr>
</thead>
<tbody>
<tr>
<td>Waste photographic paper containing silver halides and metallic silver</td>
<td></td>
</tr>
</tbody>
</table>

Physical properties: solid

Other designations: silver-containing or (Ag-containing) waste photographic paper

LoW designation:
09 01 07 photographic film and paper containing silver or silver compounds

Detailed description:
- Waste photographic paper containing silver halides and metallic silver

Demarcation from other, similar Green List wastes:
- Ash from the incineration of photographic film – see B1170
- Waste photographic film containing silver halides and metallic silver – see B1180
- Precious metals (e.g. silver) and alloy waste in a dispersible, non-liquid form with appropriate packaging and labelling (e.g. silver-containing precipitation residues from photo development solutions) – see B1150

Demarcation from other Amber List wastes or unlisted waste (notification):
- Photographic and fixing chemicals – see AD 090
- Liquids containing precious metal salts, e.g. silver nitrate (chemicals) – see A4140

Granulated slag (manufacture of iron and steel)

<table>
<thead>
<tr>
<th>Designation:</th>
<th>Green List B1200</th>
</tr>
</thead>
<tbody>
<tr>
<td>Granulated slag arising from the manufacture of iron and steel</td>
<td></td>
</tr>
</tbody>
</table>

Physical properties: solid

Other designations: iron slag, granulated; “blast-furnace slag”, slag sand

LoW designation: (if classified as waste):
10 02 02 unprocessed slag
10 02 01 waste from the processing of slag

Detailed description:
This category includes granulated slag from the manufacture of iron and steel without any hazardous properties that is submitted to a permitted method of recovery. Granulated blast furnace slag from the production of iron and steel (non-hazardous waste) is considered a product in Austria and in many OECD member countries, provided it is manufactured according to national or international standards using process control designed for a specific application. The “product/waste” status must be checked in the importing country (and, if applicable, in the country of transit) in the case of transboundary shipment out of Austria, especially since if there are any differences in the classification, the stricter procedure should be applied pursuant to Article 28 of the EU Waste Shipment Regulation (therefore, the Annex
VII form must accompany Green List waste and a recovery contract must have been concluded).

If the granulated slag is ground further, it is designated as ground granulated blast-furnace slag and may be used as an aggregate for concrete or precast concrete parts or mortar.

National and international standards stipulate the required chemical and physical properties of and the required quality monitoring procedure for ground granulated blast-furnace slag.

Examples of Green List wastes (no products)
Granulated electric arc furnace slag (EAF) exhibiting no hazardous properties
Granulated converter slags (LD slags) exhibiting no hazardous properties

Standards and norms applicable to the recovery of granulated slags from the manufacture of iron and steel:
EN 15167-1: Ground granulated blast-furnace slag for use in concrete, mortar and grout – Part 1: Definitions, specifications, and conformity criteria
EN 15167-2: Ground granulated blast-furnace slag for use in concrete, mortar and grout – Part 2: “Conformity evaluation”;
EN 197-1 Cement; the delivered slag products must comply with the parameters agreed to with the cement industry.
EN ISO 11126-6 Preparation of steel substrates before application of paints and related products – Specifications for non-metallic blast-cleaning abrasives – Part 6 Iron furnace slag
ÖNORM B 3313 Blast furnace slags, general aspects
ÖNORM B 3314 Expanded blast furnace slag (foamed blast furnace slag) and porous blast furnace slag aggregates
ÖNORM B 3317 Blast furnace slag aggregates for concrete
CE designation according to: EN 12620 Aggregates for concrete
EN 13242 construction product standard – when granulated slag is used as construction material, however, assessment of the total content of hazardous substances and the leachate behaviour with reference to the relevant requirements according to the state-of-the-art (Federal Waste Management Plan 2011 – Chapter 7.14.) and the Landfill Ordnance, Federal Law Gazette II No 39/2008 as amended.

Demarcation from other, similar Green List wastes:
- Slag arising from the manufacture of iron and steel including slag as a source of TiO₂ and vanadium – see B1210

Demarcation from other Amber List wastes or unlisted waste (notification):
- Slag arising from the manufacture of iron and steel with hazardous properties (e.g. elevated concentrations of stainless steel alloy parts such as nickel and chromium, chromate or calcium sulphide, both in total content and in the leachate) – see AA 010

<table>
<thead>
<tr>
<th>Slag arising from the manufacture of iron and steel</th>
</tr>
</thead>
<tbody>
<tr>
<td>Designation</td>
</tr>
<tr>
<td>Slag arising from the manufacture of iron and steel including slag as a source of TiO₂ and vanadium</td>
</tr>
</tbody>
</table>

Physical properties: solid

Other designations: iron and steelworks slag; iron and steelworks slag for titanium dioxide or vanadium production

LoW designation:
10 02 01 waste from the processing of slag
10 02 02 unprocessed slag
10 02 99 wastes not otherwise specified (waste from the iron and steel industry) – in special cases

Detailed description:
These slags from the manufacture of iron and steel, especially waste from slag processing and unprocessed slag, are classifiable in the Green List if suitable for admissible recovery operations (e.g. recovery in the construction industry or use as sandblasting product) and if they in no way constitute hazardous waste (e.g. because of contamination, especially in the case of many slags from stainless steel production).

Examples of Green List slags:
- Basic slag suitable for use as phosphate fertiliser (Thomas slag), subject to compliance with provisions under fertiliser law
- Slag from ferrovanadium production (iron metallurgy), provided it exhibits no hazardous properties (appropriate proof required)
Converter slag (AOD converter) and electric arc furnace slag (EAF steelworks slag) from the production of special steels without hazardous properties (e.g. destined for metal reclamation and the recovery of the arising mineral fraction), crucible slag as well as LD slag without any hazardous properties

Cupola furnace slag occurring in the operation of iron, steel and temper foundries

The following standards and norms can be applied to the recovery of the above-referenced slags:
EN 197-1 Cement; the delivered slag products must comply with the parameters agreed to with the cement industry.
EN 13242 construction product standard: however, if used as construction material, assessment of the total content of hazardous substances and the leachate behaviour with reference to the relevant requirements according to the state-of-the-art (Federal Waste Management Plan 2011 – Chapter 7.14.) and the Landfill Ordinance, Federal Law Gazette II No 39/2008 as amended

CE designation according to: EN 12620 Aggregates for concrete

Requirements for shipments to Switzerland
In Switzerland (an OECD country), the following provisional reference values have been established for the evaluation of low-pollutant slag arising from the manufacture of iron and steel that may be imported without notification from other OECD member countries for recovery as building materials following the Green List procedure:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Reference value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antimony</td>
<td>5 mg/kg</td>
</tr>
<tr>
<td>Arsenic</td>
<td>30 mg/kg</td>
</tr>
<tr>
<td>Lead</td>
<td>75 mg/kg</td>
</tr>
<tr>
<td>Cadmium</td>
<td>1 mg/kg</td>
</tr>
<tr>
<td>Chromium (total)</td>
<td>200 mg/kg</td>
</tr>
<tr>
<td>Chromium(VI) (soluble)</td>
<td>2 mg/kg</td>
</tr>
<tr>
<td>Copper</td>
<td>200 mg/kg</td>
</tr>
<tr>
<td>Nickel</td>
<td>200 mg/kg</td>
</tr>
<tr>
<td>Mercury</td>
<td>0.5 mg/kg</td>
</tr>
<tr>
<td>Thallium</td>
<td>2 mg/kg</td>
</tr>
<tr>
<td>Zinc</td>
<td>400 mg/kg</td>
</tr>
<tr>
<td>Tin</td>
<td>30 mg/kg</td>
</tr>
<tr>
<td>Barium</td>
<td>1,000 mg/kg</td>
</tr>
<tr>
<td>Beryllium</td>
<td>10 mg/kg</td>
</tr>
<tr>
<td>Cobalt</td>
<td>100 mg/kg</td>
</tr>
<tr>
<td>Selenium</td>
<td>5 mg/kg</td>
</tr>
<tr>
<td>Vanadium</td>
<td>300 mg/kg</td>
</tr>
</tbody>
</table>

Demarcation from other, similar Green List wastes:
➤ Granulated slag arising from the manufacture of iron and steel (non-hazardous waste) – see B1200

Note:
Granulated slag (blast-furnace slag) arising from the manufacture of iron and steel (non-hazardous waste) can, provided it is manufactured in compliance with national or international standards for a specific application, be considered equivalent to a product (for further details, see B1200).

Demarcation from other Amber List wastes or unlisted waste (notification):
➤ Slag from the manufacture of iron and steel and the production of ferrous alloys with hazardous properties (e.g. increased concentrations of stainless steel alloy components, chromate or calcium sulphide) – see AA 010

Iron-containing slag (zinc production)

Designation: Green List B1220
Slag from zinc production, chemically stabilised, having a high iron content (above 20%) and prepared to industrial specifications (e.g. DIN 4301) mainly for the construction trade

Physical properties: solid

Other designations: chemically stabilised slag from zinc production with high iron content; “iron silicate” slag

LoW designation:
10 05 01 slags from primary and secondary production

Detailed description:
➤ Chemically stabilised slag from zinc production with high iron content (> 20%), prepared to industrial specifications (e.g. DIN 4301) mainly for the construction sector. Analysis is necessary to assess the composition.

Demarcation from other, similar Green List wastes:
➤ There is no relevant similar waste on the Green List

Demarcation from other Amber List wastes or unlisted waste (notification):
➤ Used blasting grit – see AB 130
➤ Iron-containing slags (from zinc production) with hazardous properties – unlisted waste or listed
8. Guidelines for the Shipment of Waste

Mill scaling (manufacture of iron and steel)

<table>
<thead>
<tr>
<th>Designation:</th>
<th>Green List B1230</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mill scaling arising from the manufacture of iron and steel</td>
<td></td>
</tr>
</tbody>
</table>

Physical properties: solid

Other designations: iron scaling; forge scaling; scaling, Fe forge scaling

LoW designation:
10 02 10 mill scales

Detailed description:
Scaling means the oxide layers on the surface formed through high temperatures in combination with an oxidising atmosphere.

Mill cinder or mill scaling can be classified in the Green List only if the total hydrocarbon content does not exceed 2% (possibly stricter limit values in other countries must be taken into account) and no other hazardous characteristic (e.g. due to excessive heavy metal content such as chromium(VI) or nickel, etc.) is exhibited. Analysis is required to determine whether it is non-hazardous.

Demarcation from other, similar Green List wastes:
- There is no relevant similar waste on the Green List

Demarcation from other Amber List wastes or unlisted waste (notification):
- Mill cinder (iron scale or forge scaling) that is contaminated with hazardous substances (e.g. higher quantities of mineral oil) or has a higher content of heavy metals – see AA 010

Copper oxide mill-scale

<table>
<thead>
<tr>
<th>Designation:</th>
<th>Green List B1240</th>
</tr>
</thead>
<tbody>
<tr>
<td>Copper oxide mill-scale</td>
<td></td>
</tr>
</tbody>
</table>

Physical properties: solid

Other designations: copper scale material; copper scaling; mixture of copper and copper oxide; "copper forge scaling"

LoW designation:
06 03 16 metallic oxides other than those mentioned in 06 03 15
10 06 04 other particulates and dust
10 06 99 wastes not otherwise specified
12 01 99 wastes not otherwise specified

Detailed description:
Scaling means the oxide layers on the surface of the copper formed through high temperatures in combination with an oxidising atmosphere. Copper oxide-mill scaling is a mixture of copper, copper oxide as well as lesser quantities of other oxides (such as aluminium, iron and zinc oxide) and traces of oil and water.

Copper oxide residues or copper cinder (copper scale) from the milling of copper at red heat may be classified in the Green List to the extent that they exhibit no hazardous characteristics. This means that the waste must not contain elevated amounts of heavy metals, beryllium oxide or oil contamination (limit value: max. 2% hydrocarbons); possibly stricter limit values in other countries must be observed. Analysis is required to determine whether it is non-hazardous.

Demarcation from other, similar Green List wastes:
- waste of dispersible copper and copper alloy, unless they contain Annex I constituents to an extent that they exhibit Annex III properties – see B1070

Demarcation from other Amber List wastes or unlisted waste (notification):
- Wastes from copper-based wood-preserving chemicals – see A4040
- Copper-containing galvanic sludge – see A1050
- Copper-containing filtration dust – see A1100 or A4100
- Contaminated copper refinery material (e.g. with dispersible waste copper with elevated heavy metal oxide constituents) and contaminated copper oxide mill scales (e.g. with elevated oil contents) – unlisted waste or, as the case may be, classified according to the respective contaminants on list A (Amber List)
- Copper arsénate or other copper salts (waste chemical substances) – see A4140
- Copper-containing paints and pigment waste with hazardous properties – see A4070
- Copper-containing dross, ash, slags with hazardous properties – unlisted waste
Waste end-of-life motor vehicles

**Designation:** Green List B1250

Waste end-of-life motor vehicles, containing neither hazardous liquids nor other hazardous components

**Physical properties:** solid

**Other designations:** drained waste end-of-life motor vehicles; old cars, scrap motor vehicles, waste end-of-life motor vehicles with hazardous substances removed

**LoW designation:**
16 01 06 end-of-life vehicles, containing neither liquids nor other hazardous components
(for car body parts: 16 01 22 components not otherwise specified)

**Detailed description:**
- Car body parts (without hazardous contamination or constituents)
- Waste end-of-life motor vehicles should be classified as Green List waste if at least the following liquids and hazardous constituents have been removed in accordance with the requirements of the End-of-Life Vehicles Ordinance, Federal Law Gazette II No 407/2002 as amended:
  - Air-bags and belt tighteners (they contain explosives)
  - Fuels such as gasoline, diesel
  - Motor oil, power transmission fluids, gear lubricant oil, hydraulic oil (also from oil-containing shock absorbers)
  - Oil filters, oil-contaminated air filters and fuel filters
  - Brake fluid
  - Coolants
  - Batteries/storage batteries
  - Coolant from air-conditioners
  - PCB-containing capacitors
  - Liquid gas systems
  - Mercury-containing components (lamps)
  - Adsorption-based refrigerators from motor homes
- Hazardous products or waste not attached to the motor vehicle (e.g., fire extinguishers) must be removed in any case.

**Note:**
Waste end-of-life motor vehicles intended for cannibalisation (disassembly and removal of spare parts), shredding, reduction, pressing and so on, are still waste (or hazardous waste to the extent that the hazardous substances have not been removed) and should never be considered “second hand” products (see also: National Guideline to Differentiate between End-of-Life Vehicles/Used Vehicles and Vehicle Parts – waste or product in the legal part – Section 8.2.2.3.; B).

Waste end-of-life motor vehicles that are sealed by welding or with foam or have been cut up are always classified as waste!

**Demarcation from other, similar Green List wastes:**
- Non-ferrous metal, heavy fraction scrap, from shredding of waste end-of-life motor vehicles without hazardous contamination (mixed materials) and a metal content in excess of 90% – see B1050
- Vessels and other floating structures for breaking up, properly emptied of any cargo and other materials arising from the operation of the vessel which may have been classified as a dangerous substance or waste – see GC 030

**Demarcation from other Amber List wastes or unlisted waste (notification):**
- Residues from vehicle scrapping operations (light component of shredder waste; fluff) – see A3120
- Mixed non-ferrous metal, heavy fraction scrap, from the shredding of end-of-life vehicles with hazardous contamination such as oil, PCBs (mixed materials) or high non-metallic components such as rubber, plastic, textiles (metal content less than 90%) – unlisted waste
- End-of-life motor vehicles and old car parts still containing hazardous liquids – unlisted waste
- Scrap car bales (compacted in the scrap baling press) without providing evidence of removal of hazardous substances – unlisted waste

**Note:**
In the case of compacted end-of-life vehicles, environmentally sound recovery of the compacted scrap (without prior disassembly according to the abovementioned requirements) is made significantly more difficult (introduction of undesirables [non-ferrous heavy metals] in the steel, resulting in increased off-air emissions).

**B2 Waste containing principally inorganic constituents, which may contain metals or organic materials**

**Wastes from mining operations**

**Designation:** Green List B2010

Wastes from mining operations in non-dispersible form:
- Natural graphite waste, slate waste, mica waste, leucite, nepheline and nepheline syenite waste, feldspar waste, fluorspar waste, silicon dioxide in solid form (silica, quartz sand) excluding those used in foundry operations
**Physical properties:** solid, in non-dispersible form

**Other designations:** 
wastes from mineral excavation

**LoW designation:**
01 01 01 wastes from mineral metalliferous excavation
01 01 02 wastes from mineral non-metalliferous excavation
01 03 06 tailings other than those mentioned in 01 03 04* and 01 03 05*
01 04 08 waste gravel and crushed rocks other than those mentioned in 01 04 07*
01 04 09 waste sand and clays (Note: Green List waste is limited to sand)
01 04 12 tailings and other wastes from washing and cleaning of minerals other than those mentioned in 01 04 07* and 01 04 11*

**Detailed description:**
- Natural graphite waste
- Slate waste, whether or not roughly trimmed or merely cut, by sawing or otherwise
- Mica waste
- Leucite, nepheline and nepheline syenite waste
- Feldspar waste
- Fluorspar waste
- Solid silicon dioxide (pure quartz sand), no sands used in foundry operations

**Demarcation from other, similar Green List wastes:**
- Calcium fluoride sludge – see B2070
- Bauxite residue (“red mud”), pH moderated to less than 11.5 – see AB 2110

**Demarcation from other Amber List wastes or unlisted waste (notification):**
- Sands used in foundry operations (foundry sand, core sand) – see AB 070
- Quartz sand, graphite waste, waste of slate, mica, waste of leucite, nepheline and nepheline syenite feldspar waste, fluorspar waste with hazardous contamination – unlisted waste or classification according to contaminants on list A (Amber List)
- Used blasting grit, in which case a-priori contamination can be assumed – see AB 130
- Contaminated or non-contaminated excavated soil, humus (part of the overall organic soil substance), excavated soil from landfill sites, hazardous waste from abandoned contaminated sites, building debris or fire debris – unlisted waste

**Physical properties:** solid

**Other designations:** waste glass, cullet, colourless glass, coloured glass, glass shards, flat glass, broken bottle glass, broken flat glass

**LoW designation:**
10 11 12 waste glass other than those mentioned in 10 11 11 *
15 01 07 glass packaging
16 01 20 glass (Note: such flat glass must not be mixed with bottle glass)
17 02 02 glass
19 12 05 glass
20 01 02 glass

**Detailed description:**
- waste glass, cullet, including waste float glass and automotive glass (laminated glass)
  Note: Bottle glass must not be mixed in with the flat glass or ceramic waste, because otherwise it is impossible to recover.
- Cullet from fluorescent lamps, if the bodies of the tubes are separated from the ends of the tubes (lead glass and electrodes), the phosphor is completely removed and appropriate mercury decontamination is performed using state-of-the-art technology (e.g. the MRT process)
  Note: Mere immobilisation of the mercury contamination (e.g. using sulphur or sulphide) is not enough in order to subsume cullet from gas discharge lamps under the Green List – see A2010.
- Strontium and barium glass cleaned using state-of-the-art technology (= cleaned screen glass from cathode-ray tubes, free from any lead oxide-containing cone glass or funnel glass) after complete separation of the lead oxide-contain-
ing components (see also Correspondents’ Guidelines No 7 on classification of glass waste originating from cathode ray tubes (CRT): ec.europa.eu/environment/waste/shipments/index.htm).

- Waste from packaging glass (separate collection), free from hazardous contaminations; the total content of undesirables in the form of plastics, metal, paper, wood and mineral contaminations must not exceed a reference value of 8%. Due to the heterogeneous nature of the waste, a tolerance value of 2% (content of undesirables in individual determination therefore at most 10%) is permitted for the analytical examination.

Demarcation from other, similar Green List wastes:
- Fibre-glass wastes – see GE 020

Demarcation from other Amber List wastes or unlisted waste (notification):
- Waste from (physically intact) cathode-ray tubes – see A2010
- Glass waste from cathode-ray tubes (coated cathode-ray tube glass/glass from monitors, also cleaned glass, provided it contains lead, such as mixed glass, core glass) – see A2010 (see also Correspondents’ Guidelines No 7 on classification of glass waste originating from cathode ray tubes (CRT): ec.europa.eu/environment/waste/shipments/index.htm)
- Cleaned glass waste from monochrome CRTs (these always contain lead oxide) – see A2010
- Glass waste from other activated (coated) glass (such as liquid crystal displays (LCDs), intact or broken) – see A2010
- Waste from (physically intact) plasma monitors and glass waste from plasma monitors – see A2010
- Particulates and dust from glass containing heavy metals – see A1020 (e.g. lead, antimony glass waste) or perhaps A2010
- Fluorescent lamps, energy saving lamps and gas discharge lamps as well as fragments thereof and insufficiently decontaminated glass components from the processing of such lamps – see A1030 (mercury) or A2010
- Lead glass waste, lead glass sludge – see A1020 or possibly A2010
- Silver-coated glass waste (e.g. from the production of Christmas tree decoration) – A2010 (glass waste from other coated glass)
- Waste from mirrors – A2010 (glass waste from other coated glass)
- Glass sorting residues with a generally high content of undesirables such as plastic, metal, ceramic – unlisted (mixture)

### Ceramic wastes (cermets)

**Designation:** Green List B2030

**Cermet wastes and scrap (metal ceramic composites)**

**Physical properties:** solid

**Other designations:** cermet wastes and scrap (metal ceramic composites)

**LoW designation:**
- 06 03 16 metallic oxides other than those mentioned in 06 03 15*
- 06 08 99 wastes not otherwise specified (waste from the manufacture, formulation, supply and use of silicon and silicon compounds in the case of silicon carbide)
- 12 01 03 non-ferrous metal filings and turnings**
- 12 01 99 wastes not otherwise specified
- 16 03 04 inorganic wastes other than those mentioned in 16 03 03* (off-specification batches and unused products)

**Detailed description:**
Cermet is the designation of a group of materials with two separate phases, a metallic and a ceramic component. The ceramic part gives it great hardness, a high melting point, significant heat-resistance and scaling resistance. The metallic part improves the resistance to temperature changes, the toughness and resistance to impact.

Examples of cermet components:
- Aluminium oxide, magnesium oxide, chromium(III) oxide, silicon dioxide, zirconium oxide components (ceramic component) with metallic components of aluminium, beryllium, cobalt, chromium, iron, chromium-nickel-iron, magnesium, silicon and molybdenum.
- Chromium, silicon, tantalum, titanium, tungsten carbide (ceramic component) with metallic components of nickel, aluminium, cobalt, chromium, silicon, iron, nickel, tungsten, super-alloy, nickel-aluminium.
- Chromium boride, titanium boride, zirconium boride (ceramic component) with metallic components of nickel, aluminium, cobalt, iron.
- Molybdenum silicide (ceramic component) with metallic components of cobalt, chromium, iron, nickel, platinum or titanium nitride (ceramic component) with metallic component of nickel.
The following should be subsumed under the Green List entry:

- Waste of special tools (hard metals such as tungsten carbide, etc.), metal ceramics (Zirconium ceramics, etc.) and welding electrodes

Demarcation from other, similar Green List wastes:

- Waste of refractory linings, including crucibles from the copper smelting (not contaminated) – see B1100
- Refractory metals containing residues (metals with high melting point) – see B1030
- Furnace linings from metallurgical and non-metallurgical processes, proven to have no hazardous properties – ceramic wastes – see GF010

Demarcation from other Amber List wastes or unlisted waste (notification):

- Furnace lining (combustion chamber linings) from metallurgical or non-metallurgical processes as well as crucibles with hazardous contamination – unlisted waste

Ceramic fibres (non-dispersible)

Designation: Green List B2030
Ceramic-based fibres in non-dispersible form: Ceramic-based fibres not elsewhere specified or included

Physical properties: solid

Other designations: rock wool; ceramic wool

LoW designation:
10 12 99 wastes not otherwise specified
17 06 04 insulation materials other than those mentioned in 17 06 01* and 17 06 03*

Detailed description:
Ceramic fibres such as rock wool, ceramic wool
Note:
Artificially produced ceramic mineral fibres are used especially for thermal insulation because of their high temperature stability. Since 1997, ceramic fibres have been classified as category 2 or 3 carcinogens in the European Union. It has been proven that the artificially produced mineral fibres on the market since the 1990s have no carcinogenic properties. They are classified as irritating (“R38”), however, and therefore technically hazardous, but may nevertheless be classified under the Green List (risk-based approach).

Demarcation from other, similar Green List wastes:

- Fibre-glass wastes in non-dispersible form – see GE 020
- Ceramic wastes which have been fired after shaping, including ceramic vessels (before and/or after use), in non-dispersible form – see GF 010

Demarcation from other Amber List wastes or unlisted waste (notification):

- Asbestos fibres and modified asbestos fibres – see A2050
- Ceramic-based fibres with physicochemical properties similar to those of asbestos – see RB 020
- Ceramic fibres contaminated with hazardous substances – unlisted waste or classified according to the contaminants in list A (Amber List)

Partially refined waste gypsum

<table>
<thead>
<tr>
<th>Designation:</th>
<th>Green List B2040</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other wastes containing principally inorganic constituents:</td>
<td>Partially refined calcium sulphate produced from flue-gas desulphurisation (FGD)</td>
</tr>
</tbody>
</table>

Physical properties: solid

Other designations: partially refined flue-gas desulphurisation gypsum; partially refined calcium sulphate or gypsum produced from flue-gas desulphurisation (contaminated with calcium sulphite, for example);

LoW designation:
06 06 99 wastes not otherwise specified
10 01 05 calcium-based reaction wastes from flue-gas desulphurisation in solid form
10 02 08 solid wastes from gas treatment other than those mentioned in 10 02 07* (gypsum from the iron and steel industry)
10 06 99 wastes not otherwise specified (gypsum from copper thermal metallurgy)

Detailed description:
Partially refined flue-gas desulphurisation gypsum (FGD gypsum) and mixtures of gypsum (CaSO₄) with calcium sulphite may be used as secondary raw material or substitute for natural gypsum or anhydrite plaster in various areas of the gypsum industry thanks to its chemical and mineralogical composition, provided it meets the quality requirements of the gypsum industry.
Demarcation from other, similar Green List wastes:
Waste gypsum arising from chemical industry processes without hazardous contamination – see B2080

Demarcation from other Amber List wastes or unlisted waste (notification):
- Other sulphate- and sulphite-containing flue-gas desulphurisation products, e.g. from additive desulphurisation – see A4100
- Gypsum with hazardous contamination arising from chemical industry processes – see A2040
- Unrefined calcium sulphite and calcium sulphate from flue-gas desulphurisation (not conforming to specifications) – see AB 150

Demarcation from products:
FGD gypsum is gypsum arising from the off-gases of flue-gas desulphurisation plants (abbreviated as “FGD”). In modern flue-gas desulphurisation plants, the gypsum is of high quality (more than 95% calcium sulphate dihydrate) and purity and contaminated so little that, with the exception of a few special applications, it can be used to replace natural gypsum for the most part or completely. FGD gypsum that meets certain quality requirements and exhibits no hazardous contamination is to be considered a by-product (subject to registration pursuant to the REACH Regulation). The requirements of the gypsum industry concerning the ingredients of FGD gypsum have been set forth by the European umbrella organisation Eurogypsum (www.eurogypsum.org “gypsum fact sheets”).

### Requirements of the gypsum industry for FGD gypsum

<table>
<thead>
<tr>
<th>Property</th>
<th>Requirement (% by mass)</th>
</tr>
</thead>
<tbody>
<tr>
<td>free moisture</td>
<td>&lt; 10%</td>
</tr>
<tr>
<td>CaSO₄ x 2H₂O</td>
<td>&gt; 95% *</td>
</tr>
<tr>
<td>Mg salts, water soluble</td>
<td>&lt; 0.1%</td>
</tr>
<tr>
<td>chloride</td>
<td>&lt; 0.01%</td>
</tr>
<tr>
<td>Na-salts, water soluble</td>
<td>&lt; 0.06%</td>
</tr>
<tr>
<td>CaSO₄ x ½ H₂O</td>
<td>&lt; 0.5%</td>
</tr>
<tr>
<td>pH value</td>
<td>5 to 9</td>
</tr>
<tr>
<td>colour</td>
<td>white **</td>
</tr>
<tr>
<td>odour</td>
<td>neutral</td>
</tr>
<tr>
<td>toxic constituents</td>
<td>none</td>
</tr>
</tbody>
</table>

* The reduction of calcium sulphate dihydrate contents through inert constituents has no adverse effects on various applications.
** Colours other than the white colour of the FGD gypsum are acceptable, depending on the application of the FGD gypsum.

### Waste gypsum wallboard or plasterboard

<table>
<thead>
<tr>
<th>Designation: Waste gypsum wallboard or plasterboard arising from the demolition of buildings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical properties: solid</td>
</tr>
<tr>
<td>Other designations: wastes of gypsum wallboard</td>
</tr>
<tr>
<td>LoW designation: 17 08 02 gypsum-based construction materials other than those mentioned in 17 08 01*</td>
</tr>
<tr>
<td>Detailed description: Waste plasterboard, free from hazardous contamination</td>
</tr>
</tbody>
</table>

### Demarcation from other, similar Green List wastes:
- Partially refined calcium sulphate produced from flue-gas desulphurisation – see B2040
- Waste gypsum arising from chemical industry processes not included on list A (Amber List) – see B2080

### Demarcation from other Amber List wastes or unlisted waste (notification):
- Plasterboard with PCB-containing coatings – see A3180
- Waste gypsum arising from chemical industry processes with hazardous properties – see A2040
- Plasterboard waste with wood wool lightweight building panels as supporting material (consisting of chipped wood / straw and mineral binders, mainly cement) – unlisted (composite material)

### Iron-containing slag (copper production)

<table>
<thead>
<tr>
<th>Designation: Iron-containing slag (from copper production); Fe-containing slag chemically stabilised for use as construction material or abrasive; “silicate of iron” from copper production</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical properties: solid</td>
</tr>
<tr>
<td>Other designations: iron-containing slag (from copper production); Fe-containing slag chemically stabilised for use as construction material or abrasive; “silicate of iron” from copper production</td>
</tr>
</tbody>
</table>
LoW designation:
10 06 01 slags from primary and secondary production

Detailed description:
Slag from copper production, chemically stabilized, having a high iron content (above 20%) and prepared to industrial specifications (e.g., DIN 4301 and DIN 8201) mainly for construction and abrasive applications. Analysis is necessary to assess the composition.

Demarcation from other, similar Green List wastes:
- Slag from zinc production, chemically stabilized, having a high iron content (above 20%) and prepared to industrial specifications (e.g., DIN 4301) mainly for the construction trade – see B1220

Demarcation from other Amber List wastes or unlisted waste (notification):
- Residues of roasted iron pyrites – unlisted waste
- Sulphur with hazardous contamination (mineral oil, etc.) – unlisted waste or listed according to the contaminants in list A (Amber List)
- Sulphides (salts), if waste chemical substance – see A4140, otherwise unlisted waste
- Sulphuric acid and sulphuric acid – see A4090

**Sulphur (solid)**

| Designation: | Green List 2040 |
|----------------------------------|
| Other wastes containing principally inorganic constituents: | sulphur in solid form |

Physical properties: solid

Other designations: sulphur plastic wastes; waste sulphur

LoW designation:
05 01 16 sulphur-containing wastes from petroleum desulphurisation (Note: the petroleum content must not exceed 2%)
05 07 02 wastes containing sulphur

Detailed description:
Solid sulphur from natural gas desulphurisation, for example, should be subsumed under this category. The sulphur must not have any contamination, e.g., hydrocarbons in amount that makes it hazardous waste.

Demarcation from other, similar Green List wastes:
- There is no relevant similar waste on the Green List

Limestone (calcium cyanamide production)

| Designation: | Green List B2040 |
|----------------------------------|
| Other wastes containing principally inorganic constituents: |
| Limestone from the production of calcium cyanamide (having a pH less than 9) |

Physical properties: solid

Other designations: limestone from calcium cyanamide or fertiliser production

LoW designation:
06 03 14 solid salts and solutions other than those mentioned in 06 03 11* and 06 03 13*
06 10 99 wastes not otherwise specified

Detailed description:
Calcium carbonate (limestone) from the production of calcium cyanamide (pH<9)

Demarcation from other, similar Green List wastes:
- There is no relevant similar waste on the Green List

Demarcation from other Amber List wastes or unlisted waste (notification):
- Calcium carbonate from the production of calcium cyanamide with hazardous contamination or having a pH greater than 9 – unlisted waste or listed according to the contaminants in list A (Amber List)

**Waste salt**

| Designation: | Green List B2040 |
|----------------------------------|
| Other wastes containing principally inorganic constituents: |
| Sodium, potassium and calcium chlorides |

Physical properties: solid – highly viscous – liquid

Other designations: salt waste; NaCl (sodium chloride) wastes; KCl (potassium chloride) wastes;
CaCl₂ (calcium chloride) wastes; rock salt wastes (sodium chloride with potassium chloride components);

**Low designation:**
01 04 11 wastes from potash and rock-salt processing other than those mentioned in 01 04 07*
06 03 14 solid salts and solutions other than those mentioned in 06 03 11* and 06 03 13*

**Detailed description:**
- Calcium chloride forms hygroscopic (water-attracting) crystals and is irritating
- Sodium chloride waste and potassium chloride waste

**Demarcation from other, similar Green List wastes:**
- There is no relevant similar waste on the Green List

**Demarcation from other Amber List wastes or unlisted waste (notification):**
- Waste snow or street cleaning residues mixed with road salt – unlisted waste
- Salt-contaminated excavated soil – unlisted waste
- Hardening salt waste from the metal industry – unlisted waste
- Waste of other salts or sodium, potassium and calcium chloride waste contaminated with hazardous substances – see A4140, provided they accumulate in the form of chemicals or unlisted waste or listed according to the contaminants in list A (Amber List)

Carborundum

**Designation:**
Green List B2040

**Other wastes containing principally inorganic constituents: carborundum (silicon carbide)**

**Physical properties:**
- solid

**Other designations:**
- corundum; silicon carbide, boron carbide, aluminium oxide

**Low designation:**
06 03 16 metallic oxides other than those mentioned in 06 03 15*
10 03 05 waste alumina
12 01 21 spent grinding bodies and grinding materials other than those mentioned in 12 01 20*

**Detailed description:**
Carborundum is a brand name for the synthetic hard material silicon carbide. The name is a combination of the words “carbon” and “corundum” (a well-known hard material made of alumina).
Carborundum is used to refer to corundum, silicon carbide, but boron carbide and alumina may also be included in this category. The solid form of corundum is used industrially as a grinding material and for tool-making (abrasive paper, abrasive cut-off wheels, etc.). The category therefore includes grinding wheel fragments made of carborundum, for example.

**Demarcation from other, similar Green List wastes:**
- Waste hydrates of aluminium and waste alumina and residues from alumina production excluding such materials used for gas cleaning, flocculation or filtration processes – see B2100

**Demarcation from other Amber List wastes or unlisted waste (notification):**
- Contaminated grinding material made of carborundum – unlisted waste or listed according to the contaminants in list A (Amber List)
- Used blasting grit made of carborundum – see AB 130
- Grinding bodies bound with phenolic polymer, not hardened – see A3070 (phenols)

**Broken concrete**

**Designation:**
Green List B2040

**Other wastes containing principally inorganic constituents: broken concrete**

**Physical properties:**
- solid

**Other designations:**
- waste concrete; concrete fragments

**Low designation:**
10 13 14 waste concrete and concrete sludge
17 01 01 concrete

**Detailed description:**
- Concrete fragments, concrete demolition waste, concrete rubble
- Pre-cast concrete blocks (e.g. cast stone, concrete roofing tiles, terrace surfaces, coloured natural stone)
- Waste from cement-bonded wood chip concrete (e.g. Heraklith®)
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- Waste from the production of new fibre concrete (pure waste from production within the EU which are proven to be asbestos-free!)
- Reinforced concrete (concrete equipped with steel inserts/reinforcements)

Demarcation from other, similar Green List wastes:
- Tiles, roofing tiles, bricks, glazed tiles – see GF 010
- Plasterboard waste – see B2040

Demarcation from other Amber List wastes or unlisted waste (notification):
- Untreated demolition material or mixed building debris or building debris mixed with construction site waste (plastics, wood, etc.) – unlisted waste
- Debris (with hazardous contamination) – unlisted waste
- Asbestos-contaminated concrete waste, asbestos cement or asbestos cement slabs (Eternit) – see A2050
- Hazardous waste that was solidified with concrete – unlisted waste or listed according to the contaminants on list A (Amber List)
- Excavated soil and earth (contaminated or uncontaminated) – unlisted
- Tunnel debris (contaminated or uncontaminated) – unlisted
- Track ballast (contaminated or uncontaminated) – unlisted
- Waste gravel and crushed rock (contaminated or uncontaminated) – unlisted (pure gravel from gravel plant – product)
- Sand (contaminated or mixed with excavated earth, etc.) – unlisted
- Soil sludge, sand sludge, diaphragm wall excavation, drilling sludge – unlisted
- Used blasting grit – see AB 130
- Excavated material from wet excavations – unlisted
- Waste from construction sites (no building debris) – Y46 “household waste” or, as the case may be, unlisted

**Li-Ta and Li-Nb glass waste**

**Designation:** Green List B 2040  
**Other wastes containing principally inorganic constituents:**  
Lithium-tantalum- and lithium-niobium-containing glass scrap

**Physical properties:** solid

**Other designations:** cullet and shards of lithium-tantalum/niobium glass; special glass waste; waste optical glass

**LoW designation:**
- 10 11 12 waste glass other than those mentioned in 10 11 11 *
- 17 02 02 glass
- 19 12 05 glass
- 20 01 02 glass

**Detailed description:**
- Typical composition of lithium-niobium glass scrap: 60-90% Ta2O5, 1-20% Nb2O5, 1-20% SiO2, 5-10% Li2O
- Typical composition of lithium-niobium glass scrap: 60-90% Nb2O5, 1-15% Ta2O5, 1-10% SiO2, 5-10% Li2O

Tantalum oxide is used for special glass with a high index of refraction, e.g. for camera lenses.

Demarcation from other, similar Green List wastes:
- Glass waste in non-dispersible form (except glass from cathode-ray tubes) – see B2020

Demarcation from other Amber List wastes or unlisted waste (notification):
- Glass waste from cathode-ray tubes (including cleaned glass from cathode-ray tubes, provided it contains lead) and other activated glass (such as liquid crystal displays (LCDs), intact or broken), plasma monitors and small particulates and dust from glass containing heavy metals – see A2010 or (in the case of lead-bearing glass – see A1020)
- Fluorescent tubes and gas discharge lamps as well as the fragments thereof and insufficiently decontaminated glass from fluorescent tubes and gas discharge lamps – see A2010 or A1030 (mercury)
- Lead glass waste, lead glass sludge – see A1020 or possibly A2010
- Other waste of special glass and vitrified waste (for the purpose of waste treatment) – unlisted waste
- Lithium batteries (like all other types of batteries not on the Green List) – see A1170

**Activated carbon**

**Designation:** Green List B2060  
**Spent activated carbon not containing any Annex I constituents to an extent they exhibit Annex III properties, for example, carbon resulting from the purification of potable water and processes of the food industry and vitamin production**
Physical properties: solid

Other designations: filter carbon, filter substances made of activated carbon

LoW designation:
15 02 03 absorbents, filter materials, wiping cloths and protective clothing other than those mentioned in 15 02 02
19 09 04 spent activated carbon
19 13 02 solid wastes from soil remediation other than those mentioned in 19 13 01 (Note: limited exclusively to activated carbon)

Detailed description:
Spent activated carbon can, for instance, come from potable water purification, food processing and vitamin production and must not have any hazardous contamination. Analysis is required to determine whether it is non-hazardous.

Demarcation from other, similar Green List wastes:
There is no relevant similar waste on the Green List

Demarcation from other Amber List wastes or unlisted waste (notification):
▶ Spent activated carbon from processes of the inorganic and organic chemicals industry, the pharmaceuticals industry, sewage treatment, gas or off-gas cleaning, and similar applications that prevent the emission of hazardous substances into the environment (e.g. activated carbon from flue gas cleaning, from chemical processes, distilling plants, etc.) – see A4160
▶ Spent activated carbon from the treatment of potable water, food and vitamin production and similar applications, to the extent contaminated with hazardous substances – see A4160
▶ Spent activated carbon from waste water and landfill leachate treatment, even if a biological cleaning phase was implemented prior to filtration with activated coal (without presentation of appropriate analytical results proving the non-hazardousness of the waste pursuant to the Austrian List of Waste Ordinance as amended, a priori hazardous waste) – see A4160

Calcium fluoride sludge

Designation: Green List B2070

Physical properties: solid – highly viscous

Other designations: CaF₂ sludge

LoW designation:
06 03 14 solid salts and solutions other than those mentioned in 06 03 11* and 06 03 13*
06 09 04 calcium-based reaction wastes other than those mentioned in 06 09 03*

Detailed description:
The waste can arise from the neutralisation of hydrofluoric acid or from phosphor chemicals.

Demarcation from other, similar Green List wastes:
▶ Flourspar – see B2010

Demarcation from other Amber List wastes or unlisted waste (notification):
▶ In case of hazardous contamination of the calcium fluoride sludge or other waste of inorganic fluoride compounds in the form of liquids or sludges – see A2020

Note:
Strong acids release hydrogen fluoride. Caustic hazard!

Gypsum (chemicals industry)

Designation: Green List B2080

Waste gypsum arising from chemical industry processes not included on list A (Note = Amber List) (note the related entry on list A, A2040)

Physical properties: solid

Other designations: industrial gypsum; gypsum from industrial processes

LoW designation:
06 09 04 calcium-based reaction wastes other than those mentioned in 06 09 03*
07 01 12 sludges from on-site effluent treatment other those mentioned in 07 01 11*
07 01 99 wastes not otherwise specified

Detailed description:
This category concerns gypsum waste that has no hazardous or disruptive contamination and arises from processes other than flue gas desulphurisation.

Examples:
▶ Gypsum that accumulates as a by-product from the production of citric acid, tartaric acid and oxalic acid
▶ Gypsum that accumulates from caprolactam production or the recovery of dilute acid from titanium dioxide production or phosphor chemistry.
Demarcation from other, similar Green List wastes:
- Waste plasterboard – see B2040
- Partially refined gypsum from flue-gas desulphurisation (FGD gypsum) – see B2040

Demarcation from other Amber List wastes or unlisted waste (notification):
- Other sulphate- and sulphite-containing flue-gas desulphurisation products, e.g. from aggregate desulphurisation – see A4100
- Gypsum with hazardous contamination arising from chemical industry processes – see A2040
- Unrefined calcium sulphite and calcium sulphate from flue-gas cleaning – see AB 150
- Plasterboard with hazardous contamination such as PCB-containing coatings – unlisted waste or classified according to the contaminants (e.g. A3180) on list A (Amber List)

Anode scrap (steel/aluminium production)

<table>
<thead>
<tr>
<th>Designation</th>
<th>Green List B2090</th>
</tr>
</thead>
<tbody>
<tr>
<td>Waste anode butts from steel or aluminium production made of petroleum coke or bitumen and cleaned to normal industry specifications (excluding anode butts from chlor-alkali electrolysis and from the metallurgical industry)</td>
<td></td>
</tr>
</tbody>
</table>

Physical properties: solid

Other designations: petroleum coke anodes, bitumen anodes, anode scrap from the steel and aluminium industry; anode coke waste

LoW designation:
10 03 02 anode scraps (aluminium industry)
10 03 18 carbon-containing wastes from anode manufacture other than those mentioned in 10 03 17*
10 02 99 wastes not otherwise specified

Detailed description:
Special types of coke are used to produce Soderberg electrodes (unburned electrodes) and block anodes for electrodes used in electro-metallurgy (aluminium, magnesium, stainless steel, etc.). Only cleaned, spent electrodes from the aluminium or steel industry are classifiable under the Green List.

Note:
Petroleum coke that is produced intentionally or arises from the simultaneous production of other combustible petroleum derivatives in a petroleum refinery and is definitely intended for use as a fuel for the refinery's energy needs and those of other businesses does not constitute waste as defined by EC Directive on waste (see ECJ Decision C-235/02 of 15 January 2004)

Demarcation from other, similar Green List wastes:
There are no relevant similar entries on the Green List.

Demarcation from other Amber List wastes or unlisted waste (notification):
- Uncleaned, spent electrodes from the aluminium industry (fluoride content) – unlisted waste or classified according to hazardous inorganic fluoride compounds – see A2020
- Anodes from the chlorine-alkali electrolysis – see A4110 (because of its dioxin content)
- Anodes with hazardous contaminants other than fluoride compounds – unlisted waste or classified according to the relevant contaminant component of list A (Amber List)
- Residues from the production and treatment of petroleum coke and bitumen from mineral oil as well as coke-like residues from maintenance procedures at refineries and pyrolytic treatment of organic materials – see A3190
- Used crucible linings from aluminium smelting (cyanide-containing) – see A4050
- Carbon/graphite residues – unlisted waste

Aluminium oxide/hydroxide

<table>
<thead>
<tr>
<th>Designation</th>
<th>Green List B2100</th>
</tr>
</thead>
<tbody>
<tr>
<td>Waste hydrates of aluminium and waste alumina and residues from alumina production excluding such materials used for gas cleaning, flocculation or filtration processes</td>
<td></td>
</tr>
</tbody>
</table>

Physical properties: solid

Other designations: waste aluminium hydroxide, waste aluminium oxide

LoW designation:
06 03 16 metallic oxides other than those mentioned in 06 03 15*
10 03 05 waste alumina
11 01 10 sludge and filter cakes other than those mentioned in 11 01 09*
19 02 06 sludges from physico/chemical treatment other than those mentioned in 19 02 05*
10 03 22 other particulates and dust (including ball-mill dust) other than those mentioned in 10 03 21*

Detailed description:
This category includes alumina and hydrates of aluminium (=hydroxide) and residues from alumina...
Production excluding substances that were used for gas cleaning or flocculation and filtration processes, because such substances must be assumed to be contaminated.

This may be alumina from wet dross reprocessing (e.g., > 80% aluminium oxide with the remainder mainly consisting of Si-oxide, Mg-oxide, Fe-oxide) if this waste does not have any hazardous properties, especially H 4.3, and is destined for material recovery in a cement plant, for example.

If applicable, in special cases, ball-mill dust that is suitable for a material recovery (limit: chlorine content) may also be classified as Green List waste if it can be proven that it does not exhibit any hazardous characteristics, especially not H4.3.

Demarcation from other, similar Green List wastes:

- Bauxite residue ("red mud") (pH moderated to less than 11.5) – see B2110
- Carborundum (incl. aluminium oxides) – see B2040
- Catalysts on alumina basis (zeolites), to the extent not contaminated – see GC 050
- Light-alloy skimmings, aluminium-containing (aluminium and aluminium oxide) without hazardous properties (metallic aluminium content of at least 45%, bottom limit in individual batches: 40.5%) – see B1100

Demarcation from other Amber List wastes or unlisted waste (notification):

- Aluminium oxide dross (with little metallic aluminium, aluminium content below the reference value of 45% or below 40.5% in individual batches) or aluminium dross or aluminium skimmings with hazardous characteristics (e.g., H4.3) – unlisted waste
- Alumina-containing filter dust and fly ash from the cleaning of industrial off-gases – see A4100
- Aluminium hydroxides and oxides that were used for gas cleaning, or flocculation and filtration processes or alumina and hydrates of aluminium (=hydroxides) contaminated through other processes – unlisted waste or listed according to the contaminants in list A (Amber List)
- Aluminium salt slag – unlisted waste
- Ball-mill dust from dross recovery with hazardous properties – unlisted waste

**Physical properties:** solid- sludge-like

**Other designations:** red mud from aluminium production

**LoW designation:** 01 03 09 red mud from alumina production other than those mentioned in 01 03 07*

**Detailed description:** Red mud is a waste of alumina production that may be classified under the Green List if the pH is less than 11.5. The characteristic red colour comes from iron(III) oxide. Such waste is used in road construction or as raw material for ceramics, for example.

Demarcation from other, similar Green List wastes:

- Waste hydrates of aluminium (aluminium hydroxide) and waste alumina (aluminium oxide) and residues from alumina production (uncontaminated) excluding materials used for gas cleaning, flocculation or filtration processes – see B2100

Demarcation from other Amber List wastes or unlisted waste (notification):

- Red mud without sufficient reduction of the pH (i.e., pH greater than 11.5) – unlisted waste

**Acids and alkalines (not hazardous)**

**Designation:** Green List B2120

Waste acidic or basic solutions with a pH greater than 2 and less than 11.5, which are not corrosive or otherwise hazardous (note the related entry on list A A4090)

**Physical properties:** liquid or solid

**Other designations:** waste of basic or acidic solutions

**Examples:**

Acidic solutions: waste of highly diluted hydrochloric acid, citric acid, diluted acetic acid, lactic acid waste, mineral water waste, sour milk waste, distilled water with non-hazardous contaminants

Basic solutions: waste of soap lye, diluted ammonia solution or highly diluted caustic potash solution or sodium hydroxide solution

**LoW designation:** 06 01 06* other acids (Note: pH must be taken into account)

06 01 99 wastes not otherwise specified

06 02 05* other bases (Note: pH must be taken into account)
8. Guidelines for the Shipment of Waste

06 02 99 wastes not otherwise specified
20 01 14*acids (Note: pH must be taken into account)
20 01 15*alkalines (Note: pH must be taken into account)

Detailed description:
This category includes only acids or alkalines within the specified pH range that exhibit low contamination (e.g. “technically pure”) and are intended for neutralisation purposes, for example.

Examples
- Waste of highly diluted hydrochloric acid, citric acid (waste lemon juice), diluted acetic acid waste (vinegar waste) or lactic acid, mineral water waste, distilled water with non-hazardous contaminants
- Waste of soap lye, diluted ammonia solution or highly diluted sodium hydroxide solution

Demarcation from other, similar Green List wastes:
There is no demarcation from a relevant similar category on the Green List.

Demarcation from other Amber List wastes or unlisted waste (notification):
- Copper etching solutions and/or pickling liquors – see A1060 or A1130
- Chromosulphuric acid (hexavalent highly toxic chromium) – see A1040 or A4090
- Acid tar – see A3190
- Waste acidic or basic solutions with a pH greater than 2 but less than 11.5 and with hazardous contamination – see A4090
- Acids with a pH under 2 (e.g. battery acid = sulphuric acid, undiluted hydrochloric acid, nitric acid, “aqua regia” = mixture of hydrochloric acid and nitric acid) and alkaline solutions with a pH greater than 11.5 (e.g. caustic potash or sodium hydroxide solutions, liquid or in the form of pellets) – see A4090

Note:
The pH can be determined using indicator paper.

Asphalt waste (free from tar)

<table>
<thead>
<tr>
<th>Designation:</th>
<th>Green List B2130</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bituminous material (asphalt waste) from road construction and maintenance, not containing tar</td>
<td></td>
</tr>
</tbody>
</table>

Physical properties: solid

Other designations: road rubble (free from tar)

LoW designation:
17 03 02 bituminous mixtures other than those mentioned in 17 03 01*

Detailed description:
Asphalts are mixtures of bitumen or bitumen-containing binders and mineral substances, as well as other aggregates or supplements. Formerly, tarry residues from carbon distillation were used for similar purposes as bitumen. Such tars contain carcinogenic polycyclic aromatic hydrocarbons (PAHs) and cannot be categorised as Green List waste. What needs to be observed is that recycling (e.g. joint smelting of asphalts and tarry road surface materials) may also cause asphalts to be contaminated with PAHs. As a result they would not be classifiable under the Green List.

- Asphalt waste containing no tar (the content of the primary substance benz(o)pyrene must not exceed 50 mg/kg dry mass (50 ppm), the PAH content (16 PAH according to EPA) must not be higher than 300 mg/kg dry mass (cf. requirements of ÖNORM B3580-1). Analysis (especially of the PAH content) is required in order to determine whether it is non-hazardous.

Note: National stricter PAH limit values in the country of destination must be observed in any case (cf. for instance in Lower Saxony, in Germany: content < 25 mg/kg PAH (EPA) is considered tar-free. www.ngsmbh.de/bin/pdfs/Merkblatt_teerhaltiger_Strassenaufbruch.pdf)

Demarcation from other, similar Green List wastes:
- Waste anode butts from steel or aluminium production made of petroleum coke or bitumen and cleaned to normal industry specifications (excluding anode butts from chlor-alkali electrolysis and from the metallurgical industry) – see B2090

Demarcation from other Amber List wastes or unlisted waste (notification):
- Tar-containing asphalt in which the content of the primary substance benz(o)pyrene exceeds 50 mg/kg dry mass (=50 ppm) or which shows a PAH-content (16 PAH according to EPA) higher than 300 mg/kg dry mass is nevertheless classifiable as hazardous waste – see A3200
- Waste tarry residues arising from refining, distillation or any pyrolytic treatment of organic materials – see A3190
- Bitumen roofing felt (e.g. bitumen-aluminium felt) – unlisted waste
- Roofing paper (very high PAH contamination) – unlisted waste
Asbestos-containing demolition asphalt (with asbestos-containing filling or aggregate material) – A2050

B3 wastes containing principally organic constituents, which may contain metals and inorganic materials

<table>
<thead>
<tr>
<th>Plastic waste</th>
</tr>
</thead>
<tbody>
<tr>
<td>Designation: Green List B3010</td>
</tr>
<tr>
<td>Plastic or mixed plastic materials, provided they are not mixed with other wastes and are prepared to a standard:</td>
</tr>
<tr>
<td>Scrap plastic of non-halogenated polymers and co-polymers</td>
</tr>
</tbody>
</table>

Physical properties: solid (except for paraffin C10-C13, which can usually not be polymerised and is used as a plasticiser)

Other designations:
- waste plastics, scrap plastic, mixed plastic waste, scrap plexiglass, scrap acrylic glass, scrap polyethylene (scrap PE), scrap polypropylene (scrap PP), polycarbonate (PC), polyamides, polyphenylene sulphides (PPS), acrylates, alkanes (C10-C13), polystyrene (PS), polypropylene (PP), polyethylene terephthalate (PET), polyacrylonitrile (PAN), polybutadiene, polyacylates (POM), polyurethane (PU), polyethylene terephthalate (PET), polyvinyl alcohol (PVA), polyvinyl butyral (PVB), polyvinyl acetate (PVAC)

LoW designation:
- 02 01 04 waste plastics (except packaging)
- 07 02 13 waste plastic
- 07 02 17 waste containing silicones other than those mentioned in 07 02 16*
- 12 01 05 plastics shavings and turnings
- 15 01 02 plastics packaging
- 16 01 19 plastics
- 17 02 03 plastic
- 17 06 04 insulation material other than those mentioned in 17 06 01* and 17 06 03*
- 19 12 04 plastic and rubber (Note: Green List entry limited to plastic)
- 20 01 39 plastics

Detailed description:
Ground material and granulate of plastic waste are considered equivalent to Green List waste, even if these commercial forms are of low quality, provided that environmentally sound recovery is possible. Granulate of homogeneous plastics (especially production waste) may be considered equivalent to raw materials (not waste) because they can be used directly without further processing.

The list of plastic wastes contained herein is essentially open-ended. This means that plastic waste other than that explicitly mentioned may be classified as Green List waste, if appropriate. Generally, only hardened, solid plastics that are free from hazardous contamination should be included in this category.

The Green List entry also covers mixtures of various plastic types, excluding non-plastic materials (such as metals, wood, paper, composite cartons (“Tetrabricks”)) and contaminated types of plastic, provided that environmentally sound recovery of the plastic mixture is possible (e.g. polyethylene waste mixed with polypropylene waste) or it can be used for energy recovery (in industrial plants such as cement factories, power plants limiting factors: heavy metals, halogen content).

Scrap waste of non-halogenated polymers and copolymers, including but not limited to the following substances:
- polyethylene (PE)
- polypropylene (PP)
- polyurethane (PU) (free from CFCs***)
- polyethylene terephthalate (PET)
- polyacrylonitrile (PAN)
- butadiene
- polyacetals (POM)
- polycarbonates (PC)
- nylon
- polyethylene sulphides (PPS)
- acrylic polymers
- polyethylene terephthalate (PET)
- polypropylene (PP)
- polystyrene (PS)
- polyvinyl alcohol (PVA)
- polyvinyl butyral (PVB)
- polyvinyl acetate (PVAC)

* The paraffins C 10-C13 can usually not be polymerised and are used as plasticisers.
*** The waste must not contain any HCFCs, HFCs or FCs (> compliance with the limit values to meet the criterion for eco-toxicity according to the List of Waste Ordinance: 2,000 mg/kg DS).
**** Waste containing hazardous silicones is classified as hazardous waste in the European Waste List and must not be classified as Green List waste.
Polyethylene (PE)
- PE film waste, PE wastes
- Waste from composite pipes made of HDPE and aluminium (PE-ALU-PE or silane-grafted polyethylene PEX-ALU-PEX).

Polypropylene (PP)
- Recoverable mixtures of plastic waste composed of polypropylene (PP) and polyethylene (PE)
- Collected polypropylene bumpers, cleaned car battery cases

Polyurethane (PU)
- Polyurethane waste (not CFC-foamed; not foamed with HCFCs, HFCs or FCs), such as scrap PU shoe soles, PU hoses (bulk freight transport), waste dashboards and cast compounds made of PU; ground polyurethane degased acc. to the state of the art

Polycarbonate (PC)
- Waste lamp covers, aircraft windows, protective helmets and visors
- Homogeneous compact disc waste (CDs, DVDs), insulating film
- Homogeneous packaging and plastic flasks made of polycarbonates

Polymethyl methacrylate (PMMA)
- Waste of plexiglass windows (glazing)
- Waste of plexiglass lamp covers
- Waste of eyeglass lenses, sanitary facility parts, dental prostheses (pink plastics)

Plastic packaging made of PE/PA/PP
- that has been partly vaporised with aluminium (aluminium parts approx. 3 – 5%) in the form of off-specification prints/batches without food contamination

Plastic fractions from the collection (or also similar fractions) after appropriate sufficient post-sorting
The tolerated total content of non-hazardous undesirable materials or other Green List wastes must not exceed 10%, with PVC also being considered an undesirable material; however, the total content of 10% in undesirables must in no case include higher contents of non-hazardous wastes classifiable under the Amber List (e.g. content of treated waste wood) or hazardous waste to an extent that it gives rise to a hazardous characteristic (e.g. > 0.5% lead compounds). In the last few cases mentioned, the wastes should be assumed to be subject to notification (mixture of Green List waste with content of Amber List waste)! (see also the applicable specifications in Germany for specific fractions below*)

Polyethylene terephtalate waste
Waste from the light packaging fraction (No 325*) (with at least 98% purity) PET bottles, undesirable transparent non-plastic materials 2% maximum; non-plastic materials such as metals below 0.5% and other residue materials below 2%.

Plastic film waste
Wastes from the light packaging fraction (No 310*) (with at least 92% purity), total undesirables: 8%; however, non-plastic undesirables no more than 5%; non-plastic materials such as metals below 0.5% and other residue materials below 4%; [other plastic articles below 4%]

Mixed plastic waste
Waste from the light packaging fraction (No 320*) (with at least 95% purity), total undesirables: 5%; however, non-plastic undesirables no more than 5%; non-plastic materials such as metals below 0.5% and other residue materials below 3%; [other plastic articles below 3%]

Polyolefin PO plastic bottle waste
Waste from the light packaging fraction (No 0321-0*) (with at least 94% purity), total undesirables: 6%; however, non-plastic undesirables no more than 3.5%; non-plastic materials such as metals below 0.5% and other residue materials below 3%; [other plastic articles below 3%]

Specific mixed plastic wastes from sorting facilities
Fraction of mixed plastic waste from sorting facilities for packaging (No 350*): at least 90% purity, total amount of undesirables 10%, metallic ferrous undesirables with a unit weight of >100 g must not be included; paper, cardboard <5%, other metallic articles < 2%; transparent PET bottles <4%, PVC articles that are not packaging <0.5%, other residuals materials <3%

Plastic waste from the processing of electrical and electronic wastes
- Plastics from the processing of electrical and electronic wastes which are proven to originate only from telephone housings (no mobile phones), vacuum cleaner housings, housings of kitchen appliances (e.g. coffee machine) or larger appliances (e.g. washing machine, refrigeration...
Mixed plastic housing fractions from waste household electrical/electronic equipment if the total content of polybrominated diphenyl does not exceed 0.1% (see requirements of the RoHS Directive)

Note:
Plastic material fractions of processed waste electrical and electronic equipment whose total content of polybrominated diphenyl ethers exceeds 0.1% and/or whose content of polybrominated biphenyls exceeds 50 ppm (= 0.005%) in accordance with the Basel Convention are subject to notification (unlisted waste or in the case the PBB limit value is exceeded: A3180 Amber List), irrespective of the subsequent recovery method used.

In the presence of higher contents of the aforementioned flame retardants, especially if the octabromo-diphenyl content exceeds 0.5%, a hazardous characteristic (teratogenic) is met (hazardous wastes; export ban into non-OECD countries).

According to the WEEE Ordinance, plastics with bromated flame retardants must be separated and subject to appropriate disposal; mixing these fractions with other plastics for the purposes of diluting pollutant contents is prohibited.

In accordance with the Treatment Obligations Ordinance as amended, the recovery of waste plastic from waste electrical/electronic equipment containing halogenated flame retardants is only permitted in production areas where these flame retardants are added out of technical necessity.
8. Guidelines for the Shipment of Waste

Fragments of polypropylene-lead-acid battery cases, to the extent uncleaned – see A1160 or A1020
Polyurethane(PU) foam insulating waste (e.g. from refrigerators) or other PU foam that was foamed with CFCs or with HCFCs, HFCs or FCs – unlisted waste
Poly(methyl methacrylate) (PMMA) lacquer – see A4070
Polycarbonate waste (from CDs, DVDs) mixed with paper waste (shredded covers, booklets) – unlisted waste
Waste mixture of fibre-reinforced poly(methyl methacrylate) (PMMA) coated with polyester resin and having wooden components (furniture industry waste) – unlisted waste (unlisted waste mixture)

Non-recoverable plastic mixtures, e.g. plastic mixtures of PET and contaminating PVC, that can neither be used for recycling nor energy recovery in industrial plants require notification and authorisation in the case of transboundary shipment.

Note:
The use of plastic waste as cover material for sludge ponds, landfills, etc., does not constitute recovery (subject to notification duty – disposal).

<table>
<thead>
<tr>
<th>Resins (cured)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Designation:</strong> Green List B3010</td>
</tr>
<tr>
<td>Plastic or mixed plastic materials, provided they are not mixed with other wastes and are prepared to a specification:</td>
</tr>
<tr>
<td>Cured waste resins or condensation products</td>
</tr>
</tbody>
</table>

**Physical properties:** solid

**Other designations:** resin waste, epoxy resin waste, melamine resin waste, urea formaldehyde resins (UF), phenol formaldehyde resins (PF), melamine formaldehyde resins (MF), epoxy resins (EP), alkyd resins, polyamides (PA)

**LoW designation:**
02 01 04 waste plastics (except packaging)
07 02 13 waste plastic
08 04 10 waste adhesives and sealants other than those mentioned in 08 04 09*
12 01 05 plastics shavings and turnings
15 01 02 plastic packaging
16 01 19 plastics
16 03 06 organic wastes other than those mentioned in 16 03 05*;
17 02 03 plastic
19 09 05 saturated or spent ion exchange resins
19 12 04 plastic and rubber

20 01 39 plastics
20 01 28 paints, inks, adhesives and resins other than those mentioned in 20 01 27*

**Detailed description:**
The above list of waste resins and condensation products is open-ended. This means that waste resins other than those explicitly mentioned may be classified as Green List waste, if appropriate. The waste resin must not have any hazardous contamination. Only cured, solid resins (polymer waste) or condensation products, including the following substances:
- urea formaldehyde resins (UF)
- phenol formaldehyde resins (PF)
- melamine formaldehyde resins (MF)
- epoxy resins (EP)
- alkyd resins
- polyamides (PA)

**Demarcation from other, similar Green List wastes:**
- Fluorinated plastic waste and plastic waste of non-halogenated polymers and copolymers – see B3010
- Wastes from production, formulation and use of resins, latex, plasticizers, glues/adhesives, if not on list A, free from solvents and other contaminants to an extent that they do not exhibit Annex III characteristics, e.g. water based, or glues based on casein starch, dextrin, cellulose ethers, polyvinyl alcohols (note the related entry on list A A3050) – see B4020

**Demarcation from other Amber List wastes or unlisted waste (notification):**
- Waste resin and polymers from the collection of “commercial waste” (without post-sorting and separation of undesirables) or commercial waste similar to household waste (waste mixtures) – see Y 46 (waste collected from households)
- Resins that are not fully cured and other wastes from production, formulation and use of latex, plasticizers or glues/adhesives (excluding such wastes specified list B, B4020) – see A3050
- Waste plastic or resin with hazardous contamination – unlisted waste or classified according to the relevant contaminants on list A (Amber List), in the case of contaminated packages/containers – see A4130
- Ion exchange resins with hazardous contamination – see AD 120

Note:
The use of plastic waste as cover material for sludge ponds, landfills, etc., does not consti-
Plastic wastes (fluorinated)

**Designation:** Green List B3010

The following plastic or mixed plastic materials, provided they are not mixed with other wastes and are prepared to a specification:

Fluorinated polymer wastes*

* – Post-consumer wastes are excluded from this entry.
– Wastes must not be mixed.
– Problems arising from open-burning practices to be considered.

**Physical properties:** solid

**Other designations:** plastic wastes; pieces of plastic; fluorinated plastic waste

**LoW designation:**
- 02 01 04 waste plastics (except packaging)
- 07 02 13 waste plastic
- 12 01 05 plastics shavings and turnings
- 15 01 02 plastic packaging (Note: only scraps or production waste)
- 16 01 19 plastics
- 17 02 03 plastic
- 19 12 04 plastic and rubber (Note: Green List entry limited to plastic)
- 20 01 39 plastics

**Detailed description:**
The fluorinated plastic wastes mentioned below must by no means be waste that is accumulated by consumers. The entry therefore covers production waste, scraps, etc. or fluorinated polymer waste recovered from products.

The following fluorinated polymer waste:
- perfluoro-ethylene/propylene (FEP)
- perfluoro alkoxyl alkane
- tetrafluoroethylene/perfluoro vinyl ether (PFA)
- tetrafluoroethylene/perfluoro methyl vinyl ether (MFA)
- polyvinyl fluoride (PVF)
- polyvinylidene fluoride (PVDF)

**Note:**
This category of fluorinated polymer wastes also includes polymers and co-polymers of fluorinated ethylene (PTFE).

**Demarcation from other similar Green List wastes:**
- Polymers of vinyl chloride (e.g. PVC or PVDC) – see GH 013
- Cured resins and condensation products and non-halogenated plastics – see B3010

**Demarcation from other Amber List wastes or unlisted waste (notification):**
- Waste accumulated by consumers made of fluorinated plastics such as plastic packaging – see Y46 (waste collected from households) or, as the case may be, unlisted waste
- Fluorinated plastic waste with hazardous contamination – unlisted waste or classified according to the relevant contaminants on list A (Amber List)
- Plastic packages with hazardous residual contents or fully emptied plastic packages that contained substances and preparations that under chemicals law are required to be labelled with a skull and crossbones or the hazard symbol “E” (explosive) – see A4130

**Paper and cardboard waste**

**Designation:** Green List B3020

**Paper, paperboard (cardboard) and paper product wastes, provided they are not mixed with hazardous wastes**

**Physical properties:** solid

**Other designations:** paperboard waste, scraps of paper and paperboard, cardboard articles, Tetrabricks, Tetrapacks, scrap paper, scrap paperboard

**LoW designation:**
- 15 01 01 paper and cardboard packaging
- 15 01 05 composite packaging
- 19 12 01 paper and cardboard
- 20 01 01 paper and cardboard (Note: to the extent that it is clean for the Green List and with few improperly sorted materials!)

**Detailed description:**

Wastes and scrap of paper and paperboard:
- Unbleached paper and corrugated paper and unbleached paperboard and corrugated paperboard
Other paper or paperboard, made mainly of bleached chemical pulp, not coloured in the mass
Paper or paperboard made mainly of mechanical pulp (e.g. newspapers, journals and similar printed matter)
Clean, separated beverage boxes ("tetra cartons", known as "Tetra Paks") with metallic and/or plastic coatings
Unsorted waste (e.g. misprints)
Laminated paper (but only if the paper content is higher in comparison to the plastic or aluminium content), e.g. waste silicone paper from the production of label based paper

Demarcation from other, similar Green List wastes:
Printable plastic label waste ("tear-resistant paper") – see B3010

Demarcation from other Amber List wastes or unlisted waste (notification):
Non-separated composite cardboard waste (tetra brick packs) and waste paper in the form of municipally collected household garbage, commercial waste or household waste – see Y46 (waste collected from households)
Oil- and bitumen-impregnated paper, tar roofing paper, thermal paper (fax paper, etc.) – unlisted waste
Carbonless copy paper – see AD 090
Carbon paper – see AD 090
Rejects from the paper industry (waste paper treatment) – mixture of plastic, paper, metal components, etc. – unlisted waste
Paper fibre sludge or sludges from the dissolution of tetra bricks (mixture of paper fibres, plastic and aluminium or mixture of paper fibres and plastic) – unlisted waste
Paper dust (explosive) – unlisted waste
De-inking sludge – unlisted waste
Tall soap from pulp production (mixture of resin acids, fatty acids and sterols – "black liquor") for the production of raw tall oil and subsequently of tall oil or destined for energy recovery – unlisted waste

Textile wastes
Designation: Green List B3030

Physical properties: solid

Other designations: silk waste, wool waste, waste of animal hair, cotton waste, flax tow and waste, hemp tow and waste, jute and bast textile fibres, sisal hemp and other agave textile fibres, coconuts, abaca, ramie and other vegetal textile fibres, chemical fibres, worn textile articles, rags, scrap twine, cordage, rope and cables, and other used textile products

Low designation:
04 02 09 wastes from composite materials (impregnated textiles, elastomers, plastomers)
04 02 15 waste from finishing other than those mentioned in 04 02 14*
04 02 21 wastes from unprocessed textile fibres
04 02 22 wastes from processed textile fibres
15 01 09 textile packaging
19 12 08 textiles
20 01 11 textiles

Detailed description:
Sorted textiles in the form of second-hand goods are products are not waste.
Note:
Scrap yarn from weaving mills, spinning mills, etc., are to be classified under the relevant item of the Green List according to the type of fibre.

The following materials, provided they are not mixed with other wastes and are prepared to a specification:
Silk waste (including cocoons unsuitable for reeling, yarn waste and garnetted stock):
– neither carded nor combed
– other
Waste of wool or of fine or coarse animal hair (including yarn waste but excluding garnetted stock):
– noils of wool or fine animal hair
– other waste of wool or fine animal hair
– waste of coarse animal hair
Cotton waste (including yarn waste and garnetted stock):
– yarn waste
– garnetted stock
– other
Flax tow and waste
Tow and waste (including yarn waste and garnetted stock) of jute and other textile bast fibres (excluding flax, hemp and ramie)
Tow and waste (including yarn waste and garnetted stock) of sisal and other textile fibres of the genus Agave
Tow and waste (including yarn waste and garnetted stock) of coconut
Tow and waste (including yarn waste and garnetted stock) of Abaca (Manila hemp or Muse textiles Nee)

Tow and waste (including yarn waste and garnetted stock) of Ramie and other vegetal textile fibres, not elsewhere specified or included

Waste (including noils, yarn waste and garnetted stock) of man-made fibres

Note:
Rags are classifiable under the Green List if they were not used for absorbing or wiping up hazardous materials/waste or as packaging materials for hazardous waste.

Synthetic textile fibres, such as fluff balls, that exclusively originate from the processing of tyres, without any rubber

Demarcation from other, similar Green List wastes:
Waste textile floor coverings, carpets – see B3035

Demarcation from other Amber List wastes or unlisted waste (notification):
Contaminated cleaning rags or wiping rags with harmful organic or inorganic residues (e.g. contaminated with oil, solvents or heavy metals) that are not intended for re-use (cf. textile rental services) – unlisted waste or listed according to the contaminants on list A (Amber List)
Waste textile floor coverings and carpets with hazardous contamination (e.g. asbestos, PCB, higher PFOS levels) – listed according to the contaminants on list A (Amber List) or, as the case may be, unlisted waste
Textile fibrous material from end-of-life vehicle processing (mixture) – unlisted waste
Textile fibrous material from the tyre processing mixed with rubber wastes – unlisted waste
Used mattresses (material mixture) – see Y46 waste collected from households (“bulky waste”)

Other designations: left-over carpet, waste of floor coverings, textile floor coverings

LoW designation:
- 04 02 09 wastes from composite materials (impregnated textiles, elastomers, plastomers)
- 04 02 99 wastes not otherwise specified
- 16 01 22 components not otherwise specified
- 19 12 08 textiles
- 20 01 11 textiles

Detailed description:
- Waste floor coverings and carpets (preferably production waste, parings) with no hazardous contamination (such as residual adhesives, residual tar, asbestos fibres, PCB, etc.)

Demarcation from other, similar Green List wastes:
Carpet fibres or textile fibres – see B3030

Demarcation from other Amber List wastes or unlisted waste (notification):
- Textile floor covering waste with asbestos fibres – see A2050 or unlisted waste
- Textile floor covering waste with PCB-contamination in the plastic – see A3180 or unlisted waste
- Textile floor covering with residues of tar, adhesives and other hazardous residues – classified according to the contaminants on list A (Amber List) or unlisted waste
- Textile floor covering containing higher levels of perfluorooctane sulfonate (PFOS) (= chemical that makes grease-, oil- and water-resistant) or compounds derived therefrom – in the event of material recovery, see restrictions resulting from classification under the POP list – unlisted waste
- Used mattresses (material mixture) – see Y46 waste collected from households (“bulky waste”)

Rubber wastes

Designation: Green List B3040
Rubber wastes, provided they are not mixed with other wastes
- Waste and scrap of hard rubber (e.g. ebonite)
- Other rubber wastes (excluding such wastes specified elsewhere)

Physical properties: solid

Other designations: hard rubber (ebonite) wastes; soft rubber wastes;
LoW designation:
07 02 99 wastes not otherwise specified
16 01 22 components not otherwise specified
19 12 04 plastic and rubber (Note: limited to rubber; no mixed rubber and plastic waste)

Detailed description:
Soft natural rubber waste; coarse meal (=powder resulting from the wear-down of the tread of waste pneumatic tyres), provided it meets no specifications and is not subject to any quality check; waste from synthetic rubber (butyl rubber; abbreviated as IIR), also isobutene-isoprene rubber), hard natural rubber waste (hard rubber – ebonite, e.g. used piano keys), as well as rubber gaskets from car windows that are intended for material recovery (e.g. production of crumb-rubber low-noise asphalt, rubber mats) or energy recovery in industrial combustion plants (e.g. in the cement industry, brickworks, power plants).

Note:
The use of rubber wastes as covering material for sludge ponds, landfills, etc., is not considered a recovery operation (subject to notification requirements).
The incineration of rubber wastes in a waste incineration facility whose purpose is to treat solid municipal waste is to be considered a recovery process as of 12 December 2010 (= deadline for the implementation of EC Framework Directive on Waste No 98/2008), provided the stipulated energy efficiency coefficients are complied with.

Demarcation from other, similar Green List wastes:
- Waste pneumatic tyres (for recovery) without rims – see B3140
- Waste parings and scrap of rubber or old tyre scrap (shredded waste pneumatic tyres) – see B3080

Demarcation from other Amber List wastes or unlisted waste (notification):
- Crumb rubber that is used as oil binders – unlisted waste or listed according to the contaminants on list A (Amber List)
- Rubber asbestos – see A2050
- Mixtures of plastic and rubber – unlisted waste

Physical properties: solid

Other designations: untreated cork and wood waste

LoW designation:
03 01 01 waste bark and cork
03 01 05 sawdust, shavings, cuttings, wood, particle board and veneer other than those mentioned in 03 01 04 (Note: chipboards are chemically treated wood and must not be classified as Green List waste, since the Green List category is limited to mechanically treated scrap wood)
03 03 01 waste bark and wood
15 01 03 wooden packaging
17 02 01 Wood
19 12 07 wood other than that mentioned in 19 12 06*
20 01 38 wood other than that mentioned in 20 01 37*

Detailed description:
Wood classifiable as Green List waste must only be (pre)-treated mechanically but not chemically. In this context, please also refer to EU Correspondents’ Guidelines No 5 – Classification of wood waste under entries B3050 or AC170 (ec.europa.eu/environment/waste/shipments/index.htm)

- Untreated cork waste such as crushed, granulated or ground cork
- Wood shavings from wood proven not to have been treated
- Tree and shrub cuttings
- Standard EPAL pallet made of solid wood (as a rule in natural wood, “A1 quality”)
- Wood waste and scrap from chemically untreated fresh wood (saw chips or wood chips from clean wood that has not been chemically treated are considered sawing by-products**)
- Wood waste not subject to chemical treatment which is pressed into pellets, briquettes or similar forms (by applying pressure without the addition of chemical binders; if need be, with the addition of natural binders such as starch or molasses) is not considered waste in the event of specific manufacturing as solid fuel** (particularly, in the event of compliance with product standards, such as ÖNORM M 7135 concerning the requirements and specifications for pellets of wood, DIN 51731 Testing of solid fuels - Compressed untreated wood - Requirements and testing or DINplus certification scheme and future fuel specifications in the standards of the European pellet norm EN 14961 series)

Wood waste

<table>
<thead>
<tr>
<th>Designation</th>
<th>Green List B3050</th>
</tr>
</thead>
<tbody>
<tr>
<td>Untreated cork and wood waste:</td>
<td></td>
</tr>
<tr>
<td>- Wood waste and scrap, whether or not agglomerated in logs, briquettes, pellets or similar forms</td>
<td></td>
</tr>
<tr>
<td>- Cork waste: crushed, granulated or ground cork</td>
<td></td>
</tr>
</tbody>
</table>
Waste bark and fresh wood from forestry are considered products**
** At all events, the status in the country of destination must be verified prior to any transboundary shipment.

Note: With bark, phytosanitary requirements must be taken into account.

Demarcation from other, similar Green List wastes:
There is no relevant similar waste on the Green List.

Demarcation from other Amber List wastes or unlisted waste (notification):
- (Chemically) treated cork and wood waste – see AC 170
- Chipboard waste or mixtures of non-chemically treated wood with chipboard waste – see AC 170
- Railway sleepers as well as salt- and oil-impregnated poles – see AC 170
- Lacquered and impregnated wood (e.g. old wooden windows and window parts) – see AC 170
- Wood shavings from chemically treated wood – see AC 170
- Wood pellets or wood briquettes from wood treated with, for instance, chemical binders, glue or lacquer residues – see AC 170
- Pallet waste, particularly of composite materials or with pressure impregnation, and such that contains prohibited wood preservation products (cf. production in third countries) – see AC170

### Wine lees

**Designation:** Green List B3060

Wastes arising from agro-food industries provided they are not infectious:
- Wine lees

**Physical properties:** solid

**Other designations:** wine sediments

**LoW designation:**
- 02 07 02 waste from spirits distillation
- 02 07 04 materials unsuitable for consumption or processing

**Detailed description:** Wine lees are the lees that accumulate when the wine is drawn off for the first time; they consist mainly of yeast and tartaric acid salts such as potassium hydrogen tartrate (tartar) and calcium hydrogen tartrate (recovery in the making of tartaric acid and as a leavening agent)

**Demarcation from other, similar Green List wastes:**
- There is no relevant similar waste on the Green List.

**Demarcation from other Amber List wastes or unlisted waste (notification):**
- There is no relevant similar waste on the Amber List.

**Food waste (vegetable)**

<table>
<thead>
<tr>
<th>Designation:</th>
<th>Green List B3060</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wastes arising from agro-food industries provided they are not infectious:</td>
<td></td>
</tr>
<tr>
<td>Dried and sterilized vegetable waste, residues and by-products, whether or not in the form of pellets, of a kind used in animal feeding, not elsewhere specified or included</td>
<td></td>
</tr>
</tbody>
</table>

**Physical properties:** solid, highly viscous

**Other designations:** oil seed press residues, beet-pulp, vegetable waste from the canning industry and frozen food manufacture

**LoW designation:**
- 02 01 03 plant-tissue waste
- 02 03 04 materials unsuitable for consumption or processing
- 02 03 99 wastes not otherwise specified
- 02 04 99 wastes not otherwise specified
- 02 07 04 materials unsuitable for consumption or processing
- 02 07 01 wastes from washing, cleaning and mechanical reduction of raw materials
- 20 02 01 compostable wastes

**Detailed description:**
- Dried and sterilized vegetable waste, including pellets or animal feed, such as oil seed press residues, beet-pulp
- Residues from the vegetable canning and frozen food industry (waste from production only)

**Demarcation from other, similar Green List wastes:**
- Waste edible fats and oils of animal or vegetable origin (e.g. frying oils), provided they do not exhibit a hazardous characteristic – see B3065
- Other wastes from the agro-food industry excluding by-products which meet national and international requirements and standards for human or animal consumption – see B3060
Tree and shrub cuttings – B3050

Vegetables foodstuffs (fruit, vegetable) past the expiration date from markets and food retailers in unpackaged form – B3060 (other waste from the agro- and food industry)

Demarcation from other Amber List wastes or unlisted waste (notification):

- Waste from the collection of biological waste, vegetable food waste originating from can- teens, industrial kitchens, food- and drink- serving industry, etc. (with or without packaging) – see Y 46 (waste collected from house- holds)
- Garden and park wastes (if not exclusively tree and shrub cuttings) – unlisted waste
- Tobacco waste – unlisted

### Degras

**Designation:** Green List B3060

Wastes arising from agro-food industries provided they are not infectious:

Degras: residues resulting from the treatment of fatty substances or animal or vegetable waxes

**Physical properties:** liquid/solid

**Other designations:** stuffing from chamoising

**LoW designation:**

04 01 09 wastes from dressing and finishing
04 01 99 wastes not otherwise specified
04 02 10 organic matter from natural products (e.g. grease, wax)
07 06 99 wastes not otherwise specified

**Detailed description:**

Degras is the designation for excess fish oil that cannot be absorbed by the leather at chamois tanneries using auto-oxidising fish oil and is therefore washed out with alkalis (e.g., soda solutions); it is recovered as partially oxidised waste fat precipitated out of the emulsion using sulphuric acid.

Demarcation from other, similar Green List wastes:

- Waste edible fats and oils – see B3065

Demarcation from other Amber List wastes or unlisted waste (notification):

- Degras with mineral oil contamination or mineral oil – see A3020

### Waste of bones and horns

**Designation:** Green List B3060

Wastes arising from agro-food industries provided they are not infectious:

Waste of bones and horn-cores, unforced, defatted, simply prepared (but not cut to shape), treated with acid or degelatinised

**Physical properties:** solid

**Other designations:** waste of bones and horn parts

**LoW designation:**

02 02 02 animal-tissue waste
02 02 03 materials unsuitable for consumption or processing

**Detailed description:**

Bones (but never cattle skull bones or skull bones of goats and sheep that constitute specific risk material or category-1 material and whose shipment requires an approval as stipulated by Regulation (EC) No 1069/2009 and does not fall within the scope of the EC Waste Shipment Regulation) and horn parts that are intended for recovery.

Note: EC Waste Shipment Regulation No 1013/2006 generally does not apply to the shipment of waste that is subject to the approval requirements according to Regulation (EC) No 1069/2009 (category-1 and -2 material).

Processed animal protein (bone meal, horn meal, hoof meal) in categories 1, 2 and 3 (from rendering plants) requires a veterinary permit according to EC Animal By-product Regulation No 1069/2009 and is therefore exempted from the provisions of EC Waste Shipment Regulation No 1013/2006.

Note:

**Product line**

Bones* (marrowbones) that belong exclusively to category 3 of EC Animal By-product Regulation No 1069/2009 should be classified as products (not waste) if used in the animal feed or food line for the manufacture of gelatine and bone glue.

* Note: Cattle skull bones and skull bones of goats and sheep are never included in this category because they constitute specific risk material

Demarcation from other, similar Green List wastes:

- Other wastes arising from the agro-food industry excluding by-products which meet national and international requirements and standards for human or animal consumption, such as carcass
parts in category 3 of the Animal By-product Regulation (EC) No 1069/2009 – see **B3060**

**Demarcation from other Amber List wastes or unlisted waste (notification):**

- There are no relevant categories in the Amber List. Animal waste that requires approval under the Regulation (EC) No 1069/2009 does not fall within the scope of EC Waste Shipment Regulation No1013/2006.

### Fish waste

**Designation:** Green List B3060

**Wastes arising from agro-food industries provided they are not infectious:**

- Fish waste

**Physical properties:** solid

**Other designations:** wastes of fish; (fish meal)

**LoW designation:**

- 02 01 02 animal-tissue waste
- 02 02 02 animal-tissue waste
- 02 02 03 materials unsuitable for consumption or processing

**Detailed description:**

- Various waste of edible fish, for example, but not infectious or contaminated with hazardous substances or waste

**Note:**

EC Waste Shipment Regulation No 1013/2006 generally does not apply to the shipment of waste that is subject to the approval requirements according to Regulation (EC) No 1069/2009 (category-1 and -2 material). Fish meal (= processed animal protein: dried and ground fish or fish parts) of category 3 also requires approval under EC Animal By-product Regulation No 1069/2009 and therefore is exempt from the provisions of EC Waste Shipment Regulation No 1013/2006.

**Demarcation from other, similar Green List wastes:**

There is no relevant similar waste on the Green List.

**Demarcation from other Amber List wastes or unlisted waste (notification):**

- Fish waste or fish meal with hazardous contamination such as PCB, mineral oil – unlisted waste or listed according to the contaminants on list A (Amber List)

### Cocoa waste

**Designation:** Green List B3060

**Wastes arising from agro-food industries provided they are not infectious:**

- Cocoa shells, husks and other cocoa waste

**Physical properties:** solid

**Other designations:**

Cocoa waste

**LoW designation:**

- 02 03 04 materials unsuitable for consumption or processing
- 02 03 99 wastes not otherwise specified

**Detailed description:**

- Cocoa shells, husks and other cocoa waste, cocoa scrap

**Comment:**

For further processing, the cocoa beans are toasted just like coffee until the outer husk becomes brittle and easy to remove. The full aroma is able to unfold due to the toasting process. The lighter husk is then removed from the core using a fan, similar to corn cleaning machines (recovery for manufacturing coffee surrogate, etc.).

**Demarcation from other, similar Green List wastes:**

Dried and sterilised vegetable waste, residues and by-products, whether or not in the form of pellets, of a kind used in animal feeding, not elsewhere specified or included – see **B3060**

**Demarcation from other Amber List wastes or unlisted waste (notification):**

- Cocoa waste contaminated with hazardous substances and other contaminated vegetal waste – unlisted waste or classified according to the contaminants on list A (Amber List)

### Food waste

**Designation:** Green List B3060

**Wastes arising from agro-food industries provided they are not infectious:**

**Other wastes from the agro-food industry excluding by-products which meet national and international requirements and standards for human or animal consumption**

**Physical properties:** solid/sludge-like, liquid

**Other designations:** food waste (exclusively limited to off-specification batches from production),
waste from the milk industry and dairy farms, parts of slaughtered animals (category 3 of EC Regulation No 1069/2009) that are not intended for human consumption, waste food products

**LoW designation:**
02 01 02 animal-tissue waste
02 01 03 plant-tissue waste
02 02 02 animal-tissue waste
02 02 03 materials unsuitable for consumption or processing
02 03 04 materials unsuitable for consumption or processing
02 03 99 wastes not otherwise specified
02 04 99 wastes not otherwise specified
02 05 01 materials unsuitable for consumption or processing
02 05 99 wastes not otherwise specified
02 06 01 materials unsuitable for consumption or processing
02 06 99 wastes not otherwise specified
02 07 01 wastes from washing, cleaning and mechanical reduction of raw materials
02 07 04 materials unsuitable for consumption or processing
02 07 99 wastes not otherwise specified

**Detailed description:**
Apart from the provisions of the EC Waste Shipment Regulation, veterinary regulations apply to such waste.

The Green List includes waste from the agro-food industry (limited to production waste), but exclusively waste of category 3 within the meaning of EC Animal By-product Regulation No 1069/2009, such as:

- Food waste exclusively from production (off-specification batches), such as pizza dough slices (with toppings or without toppings) from manufacturing; off specification batches of beer, cheese waste from manufacturing, etc.
- Vegetables foodstuffs (fruit, vegetable) past the expiration date from markets and food retailers in unpackaged form
- Animal parts that are edible (but not intended for human consumption for commercial reasons) and body parts of slaughtered animals (which do not show clinical signs of disease communicable to humans or animals and originating from bodies of slaughtered animals that are suitable for consumption under Community law), but which are unfit for human consumption
- Blood from animals other than ruminants
- Waste from the reclamation of products intended for human consumption, including milk and dairy products as well as eggs
- Food products of animal origin, but only production waste (excluding catering waste from kitchens, canteens, food- and drink-serving industry, or organic waste containers, food past the expiration date such as tinned meat that was already placed on the market), which, due to manufacturing problems or defects, are no longer intended for human consumption but which do not constitute a health hazard to humans or animals
- Spoiled raw milk from animals
- Waste eggshells and eggs from animals that do not show clinical signs of disease communicable by such products to humans or animals
- Animal fat in category 3 (Note: animal fat of categories 1 and 2 and mixtures thereof require approval according to EC Animal By-product Regulation No 1069/2009 and do not fall within the scope of EC Waste Shipment Regulation No 1013/2006)

Note: Examples of animal by-products in the non-waste range (product)

- Processed animal proteins (meat-and-bone meal, bone meal, blood meal, etc.) and animal fat that is derived exclusively from material of category 3 and has been processed according to the requirements of the Animal By-product Regulation in such a way that it can be used directly as raw material for manufacturing animal feed, or in animal feed in any other way in permissible, including food for pets and animals raised for their precious furs or for chewing toys (edible material) or for the pharmaceutical and cosmetics industry and gelatine production.
- Feather meal of category 3 that is used as a starting material for hydrolyzates, which serves as strewing material in dancing schools
- Animal fat exclusively from category 3-material for the manufacture of technical lubricants
- Secondary raw materials of animal origin, in accordance with Annex 1 of the Fertiliser Ordinance as amended, Federal Law Gazette II No 100/2004 as amended, that are intended for the manufacture of permissible fertiliser according to the provisions of the Animal By-product Regulation (EC) No 1069/2009
- Bones’ (marrowbones’) used in the animal feed or food line for the manufacture of gelatine and bone glue

*Note: in no case cattle skull bones or skull bones of goats and sheep

- Offal of category 3 that, for instance, is not typically intended for human consumption in any given country (e.g. bull testicles, udders, etc.) but usable in the pet food industry.
Raw milk, milk and dairy products, eggs, greaves intended for animal feed production
Note:
Processed animal proteins (such as meat-and-bone meal, animal fat, hydrolyzates of animal proteins, blood meal) of categories 1 through 3 (from rendering facilities) are subject to the veterinary approval requirements according to EC Animal By-product Regulation No 1069/2009 as amended and are therefore exempt from the provisions of EC Waste Shipment Regulation No 1013/2006.

Demarcation from other, similar Green List wastes:
- Dried and sterilised vegetable waste, residues and by-products, whether or not in the form of pellets, of a kind used in animal feeding, not elsewhere specified or included – see B3060
- Waste edible fats and oils of animal or vegetable origin (e.g. frying oils), provided they do not exhibit a hazardous characteristic – see B3065
- Fish waste – see B3060
- Tree and shrub cuttings – may be subsumed under B3050

Demarcation from other Amber List wastes or unlisted waste (notification):
- Leftover food, catering waste from restaurants, catering establishments and kitchens, including industrial and household kitchens (category-3 material according to EC Animal By-product Regulation No 1069/2009 as amended) – see Y46 (waste collected from households)
- Waste from organic waste containers (biological waste) as well as food past the expiration date packed or without packaging (e.g. from food retailers, fast-food chains), which has already been placed on the market – see Y46 (waste collected from households)
- Grease trap contents, flotation substances, and sewage sludge – see AC 270
- Separated animal fats and oils from sewage treatment (fat separation) – unlisted waste
- Other biogenic garden and park wastes (with the exception of tree and shrub cuttings) – unlisted waste
- Tobacco waste – unlisted

Note:
Offal, carcasses, confiscated goods and animal fat of categories 1 and 2 according to EC Animal-By-product Regulation No 1069/2009, are exempt from the provisions of the EC Waste Shipment Regulation, especially since such waste is already subject to the strict approval requirements of the EC Animal-By-product Regulation.

The exemption from the provisions of the EC Waste Shipment Regulation applies also to catering wastes or leftover food from international transport (= category-1 material).
Gastro-intestinal contents (category-2 material) and infectious waste (according to veterinary law) do not fall within the scope of EC Waste Shipment Regulation No 1013/2006, especially since such waste is already subject to the strict requirements of EC Animal By-product Regulation No 1069/2009 as amended.
Faeces, solid and liquid manure (category-2 material) are subject to the veterinary approval requirements of EC Animal By-product Regulation No 1069/2009 as amended rather than to the EC Waste Shipment Regulation.
The same is true of faeces, solid and liquid manure from farms that are recovered in agriculture, since such waste is exempted from the scope of EC Directive on waste and thus from the EC Waste Shipment Regulation, as well.

Waste edible fats/oils

<table>
<thead>
<tr>
<th>Designation: Waste edible fats and oils of animal or vegetable origin (e.g. frying oils), provided they do not exhibit any Annex III1 characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green List B3065</td>
</tr>
</tbody>
</table>

Physical properties: solid, highly viscous, liquid

Other designations:
waste fat from canteens and restaurants; cooking fats, frying fats and oils

LoW designation:
20 01 25 edible oil and fat

Detailed description:
- Waste edible oil and fat of animal or vegetal origin (e.g. frying oils), provided they are not contaminated with hazardous foreign matter (such as waste mineral oils, PCB, polychlorinated dibenzodioxins, etc.)
- Refined and pre-treated waste edible fats and oils (e.g. through filtration, sedimentation, centrifugation, separation of water)

Note: There are recovery options in loss lubricant and biodiesel production as well as in soap production, for instance.

Demarcation from other, similar Green List wastes:
- Animal fat (no edible fat) from slaughter, to the extent that it is category-3 material according to EC Animal By-product Regulation No 1069/2009
8. Guidelines for the Shipment of Waste

Demarcation from other Amber List wastes or unlisted waste (notification):

> Waste edible fats/oils with hazardous contamination (such as waste mineral oils, PCBs, polychlorinated dibenzodioxins, etc.) – unlisted waste or listed according to the hazardous component of list A (Amber List)
> Waste edible oil/fats from fat separators – see AC 270
> Separated animal fats and oils from sewage treatment (fat separation) – unlisted waste
> Waste mineral oils – see A3020
> Glycerine phase from biodiesel production** (consisting of glycerine, free fatty acids, water, methanol and potassium hydroxide solution) – see A3140

** Glycerine phase is to be classified as hazardous in Austria and is subject to notification acc. to Art. 28 EC Waste Shipment Regulation even then when the importing country classifies it as "by-product".

Note:
Animal fat from slaughter that is subject to the veterinary approval requirements of EC Animal Byproduct Regulation No 1069/2009 (categories 1 and 2) is outside the scope of EC Waste Shipment Regulation No 1013/2006.

Horsehair waste, whether or not put up as a layer with or without supporting material – see GN 020

Demarcation from other Amber List wastes or unlisted waste (notification):

> Fellmongery waste with hazardous contamination (hexavalent chromium, biocides, infectious substances) – see A3110

Waste straw

<table>
<thead>
<tr>
<th>Designation:</th>
<th>Green List B3070</th>
</tr>
</thead>
<tbody>
<tr>
<td>Waste straw</td>
<td></td>
</tr>
</tbody>
</table>

Physical properties: solid

Other designations: waste of straw

LoW designation:
02 01 03 plant-tissue waste
20 02 01 compostable wastes

Detailed description:
Waste straw is used as a general term for waste stems and stalks that have been threshed and then dried; in the strict sense of the term, it refers to waste grains only. Only uncontaminated leftover straw is classified as Green List waste.

Demarcation from other, similar Green List wastes:
There is no relevant similar waste on the Green List.

Demarcation from other Amber List wastes or unlisted waste (notification):
Veterinary regulations:
Faeces, solid and liquid manure (category-2 material) that is mixed with waste bedding straw from non-agricultural holdings or from agricultural holdings, provided they are not intended for agricultural use, are theoretically mentioned in the Amber List under AC 260 "Liquid pig manure, faeces" but are subject to the veterinary approval requirements of EC Regulation No 1069/2009 and thus exempted from EC Waste Shipment Regulation No 1013/2006.
The same is true of faeces, solid and liquid manure from farms that are recovered in agriculture and forestry or for the generation of energy from such biomass, since such waste is by definition exempted from the scope of EC Directive on Waste No 98/2008 and thus also from the EC Waste Shipment Regulation.

Hair waste (human)

<table>
<thead>
<tr>
<th>Designation:</th>
<th>Green List B3070</th>
</tr>
</thead>
<tbody>
<tr>
<td>Waste of human hair</td>
<td></td>
</tr>
</tbody>
</table>

Physical properties: solid

Other designations: hair waste; human hair

LoW designation:
There is no specific entry for human hair in the European Waste List

Detailed description:
Human hairs are long filaments consisting mainly of keratin.

Demarcation from other, similar Green List wastes:
> Waste of wool or fine or coarse animal hair – see B3030
> Waste of pigs’, hogs’ or boars’ bristles and hair or of badger hair and other brush making hair – see GN 010
> Fellmongery wastes (furs) – see B3110
Infectious wastes (faeces) are subject to the veterinary approval requirements of EC Regulation No 1069/2009 rather than to the EC Waste Shipment Regulation.

**Fungus mycelium**

**Designation:** Green List B3070
**Deactivated fungus mycelium from penicillin production to be used as animal feed**

**Physical properties:** solid, highly viscous

**Other designations:** mould filaments from antibiotics production

**LoW designation:**
- 07 05 14 solid wastes other than those mentioned in 07 05 13*
- 07 05 99 wastes not otherwise specified

**Detailed description:**
Mycelium refers to all the thread-like cells of a fungus. Such waste must be intended for animal feed.

**Demarcation from other, similar Green List wastes:**
- Dried and sterilized vegetable waste, residues and by-products, whether or not in the form of pellets, of a kind used in animal feeding, not elsewhere specified or included – see B3060

**Demarcation from other Amber List wastes or unlisted waste (notification):**
- Residues from penicillin production or fungus mycelium with hazardous contamination – see A4010

**Rubber wastes**

**Designation:** Green List B3080
**Waste parings and scrap of rubber**

**Physical properties:** solid

**Other designations:** rubber scrap, rubber crumbs, rubber meal, rubber wastes (no crumb rubber), old tyre scrap

**LoW designation:**
- 07 02 99 wastes not otherwise specified
- 16 01 03 end-of-life tyres (Note: only old tyre scrap)
- 16 01 22 components not otherwise specified
- 19 12 04 plastic and rubber (Note: limited to rubber; no rubber wastes mixed with plastics)

**Detailed description:**
This category includes rubber wastes, crumbs and scraps as well as shredded end-of-life tyres (though not rubber and raw meal – entry B3040) for material recovery or energy recovery in industrial plants (such as cement factories, power plants).

**Note:**
The use of old tyre scrap or other rubber wastes as covering material for sludge ponds, landfills, etc., is not considered a recovery operation (subject to notification – disposal).

The incineration of rubber wastes and old tyre scrap in a waste incineration facility whose purpose is to treat solid municipal waste is to be considered a recovery process as of 12 December 2010 (= deadline for the implementation of EC Framework Directive No 98/2008 regarding waste), provided the stipulated energy efficiency coefficients are complied with.

**Demarcation from other, similar Green List wastes:**
- Whole waste pneumatic tyres (without rims), to the extent not intended for operations defined in Annex IVA of the Basel Convention (Note: Disposal) – see B3140
- Hard rubber waste (ebonite) and other rubber wastes – see B3040
- Crumb rubber or coarse meal (=powder resulting from the wear-down of the tread of waste pneumatic tyres), provided it meets no specifications and is not subject to any quality check – see B3040
- Wastes from synthetic rubber – see B3040

**Demarcation from other Amber List wastes or unlisted waste (notification):**
- Contaminated rubber wastes that were used as absorbents for hazardous chemicals or wastes are classifiable according to the contaminants on list A (Amber List) or unlisted waste
- Mixtures of plastic and rubber wastes – unlisted waste
- Mixtures of textile fibrous material and rubber wastes from end-of-life tyre processing – unlisted waste
- Light fraction from shredding – see A3120
**Wastes of leather**

**Designation:** Green List B3090

Paring and other wastes of leather or of composition leather not suitable for the manufacture of leather articles, excluding leather sludges, not containing hexavalent chromium compounds and biocides (Note the related entry on list A, A3100)

**Physical properties:** solid

**Other designations:** waste of raw skived leather, glue leather, vegetable-tanned leather; chrome leather (chromium-(III)-tanned)

**LoW designation:**
- 04 01 01 fleshings and lime split wastes
- 04 01 02 liming waste
- 04 01 08 waste tanned leather (blue sheetings, shavings, cuttings, buffing dust) containing chromium
- 04 01 09 wastes from dressing and finishing
- 16 01 22 components not otherwise specified (Note: waste of leather seats)

**Detailed description:**

Leather is a material obtained by tanning the skin of animals (cow, calf, goat, pig, crocodile, horse, etc.). Leather should be tanned only with chromium (III) salts, never with the highly toxic and carcinogenic hexavalent chromium compounds. Tanning with hexavalent chromium compounds is now extremely rare in Europe but still practiced in developing nations.

Wastes of the following materials should be subsumed under the Green List entry:

- Raw skived leather
- Liming waste
- Waste leather that was tanned with vegetal tanning agents
- Chrome leather (chrome leather trimmings) tanned with chrome (III) salts

**Product line:**

Glue leather, raw gelatine leather and raw skived leather to be processed into collagen-based skins (“artificial sausage skins”), split leather processing and manufacture of edible gelatine or photo gelatine

**Demarcation from other, similar Green List wastes:**

- Paring and other wastes of leather or of composition leather – see B3090

**Wastes of leather (dispensible)**

**Designation:** Green List B3100

Leather dust, ash, sludges or flours not containing hexavalent chromium compounds or biocides (note the related entry on list A, A3090)

**Physical properties:** solid, highly viscous

**Other designations:** dispersible leather wastes; fine particles of leather

**LoW designation:**
- 04 01 08 waste tanned leather (blue sheetings, shavings, cuttings, buffing dust) containing chromium
- 04 01 09 wastes from dressing and finishing

**Detailed description:**

Leather is a material obtained by tanning the skin of animals (cow, calf, goat, pig, crocodile, horse, etc.). Leather dust, ash, sludges or flours not containing hexavalent chromium compounds or biocides is classifiable in the Green List. Tanning with the highly toxic and carcinogenic hexavalent chromium compounds is now extremely rare in Europe but still practiced in developing nations.

**Demarcation from other, similar Green List wastes:**

- Paring and other wastes of leather or of composition leather – see B3090

**Demarcation from other Amber List wastes or unlisted waste (notification):**

- Leather dust, ash, sludges, flours containing hexavalent chromium compounds or biocides – see A3090
- Paring and other waste of leather or of composition leather not suitable for the manufacture of leather articles and containing hexavalent chromium compounds or biocides – see A3100

**Fellmongery wastes**

**Designation:** Green List B3110

Fellmongery wastes not containing hexavalent chromium compounds or biocides

**Demarcation from other, similar Green List wastes:**

- Paring and other wastes of leather or of composition leather – see B3090

**Demarcation from other Amber List wastes or unlisted waste (notification):**

- Waste leather dust, ash, sludges or flours containing hexavalent chromium compounds or biocides – see A3090
- Tanning sludge and ashing sludge – unlisted waste
Physical properties: solid

Other designations: fur wastes, hide wastes

LoW designation:
02 02 99 wastes not otherwise specified
02 03 04 materials unsuitable for consumption or processing
02 03 99 wastes not otherwise specified
02 04 99 wastes not otherwise specified
02 05 99 wastes not otherwise specified
02 06 01 materials unsuitable for consumption or processing
02 06 99 wastes not otherwise specified
02 07 99 wastes not otherwise specified

Detailed description:
A pelt is the hide removed from a slaughtered mammal, generally with short but very dense hair. Fellmongery wastes containing no hexavalent chromium compounds or biocides (pelt scraps).

Demarcation from other, similar Green List wastes:
- Paring and other wastes of leather or of composition leather – see B3090
- Leather dust, ash, sludges or flours not containing hexavalent chromium compounds or biocides – B3100
- Waste of pigs’, hogs’ or boars’ bristles and hair or of badger hair and other brush-making hair – see GN 010
- Waste of wool or fine or coarse animal hair – see B3030
- Horsehair waste, whether or not put up as a layer with or without supporting material – see GN 020
- Waste of human hair – see B3070

Demarcation from other Amber List wastes or unlisted waste (notification):
- Fellmongery wastes containing hexavalent chromium compounds or biocides or infectious substances – see A3110
- Chemicals used for fellmongery – unlisted waste or classified according to the chemicals on list A (Amber List)

Note:
Wastes of categories 1+2 according to EC Animal By-product Regulation No 1069/2009, are exempt from the provisions of EC Waste Shipment Regulation No 1013/2006, especially since such wastes are already subject to the strict approval requirements of the EC Animal-By-product Regulation.

Food dye wastes

| Designation: Wastes consisting of food dyes | Green List B3120 |

Physical properties: solid, liquid, highly viscous

Other designations: food dye wastes

LoW designation:
02 02 99 wastes not otherwise specified
02 03 04 materials unsuitable for consumption or processing
02 03 99 wastes not otherwise specified
02 04 99 wastes not otherwise specified
02 05 99 wastes not otherwise specified
02 06 01 materials unsuitable for consumption or processing
02 06 99 wastes not otherwise specified
02 07 99 wastes not otherwise specified

Detailed description:
Only few dyes (such as beta-carotene and chlorophyll) come from plants. The dyes used are generally synthetic imitations of substances found in nature (nature-identical substances) or wholly synthetic compounds.

Overview of food dyes:
- Allura red AC (E 129), aluminium (E 173), amaranth (E 123), anthocyanins (E 163), azorubine (E 122), betanin (E 162), Brown FK (E 154), Brown HT (E 155), Brilliant Blue FCF (E 133), Brilliant Black BN (E 151), calcium carbonate (E 170), canthaxanthin (E 161g), carotene (E 160a), annatto (E 160b), capsanthin (E 160c), lycopene (E 160d), beta-apo-8’-carotenal (C30) E 160e, beta-apo-8’-carontenic acid (C30), ethyl ester (E 160f), quinoline yellow (E 104), chlorophyll (E 140), cochineal (E 120), cochineal red A (E 124), iron oxide (E 172), erythrosine (E 127), orange yellow S (E 110), gold (E 175), green S (E 142), indigo (E 132), copper complexes of chlorophylls and chlorophyllins (E 141), curcumin (E 100), lactoflavin (E 101), latholubine BK (E 180), lutein (E 161b), Patent Blue V (E 131), vegetable carbon (E 153), riboflavin (vitamin B2) (E 101), riboflavin-5-phoshate (E 101a), Red 2G (E 128), silver (E 174), tartrazine (E 102), titanium dioxide (E 171), plain caramel (E 150a), caustic sulphite caramel (E 150b), ammonia caramel (E 150c), sulphite ammonia caramel (E 150d)

Demarcation from other, similar Green List wastes:
- Wastes consisting mainly of water-based/latex paints, inks and hardened varnishes not containing organic solvents, heavy metals or biocides to an extent to render them hazardous – see B4010
Demarcation from other Amber List wastes or unlisted waste (notification):

- Waste dyes and lacquer with hazardous characteristics (due to heavy metal contents, solvent contents, extreme pH levels, biocide additives, etc.) – see A4070

**Ethers (polymers)**

Designation: Green List B3130

Waste polymer ethers and waste non-hazardous [long-chained] monomer ethers incapable of forming peroxides

**Physical properties:** solid (except for ethylene diglycol)

**Other designations:** polyether; synthetic resin; ethylene diglycol (off-specification batches)

**LoW designation:**

Classification of ethylene diglycol:

16 03 06 organic wastes other than those mentioned in 16 03 05* (note: off-specification batches)

Classification of polymer ether

02 01 04 waste plastics (except packaging)
07 02 13 waste plastic
08 04 10 waste adhesives and sealants other than those mentioned in 08 04 09*
12 01 05 plastics shavings and turnings
15 01 02 plastic packaging
16 01 19 plastics
16 03 06 organic wastes other than those mentioned in 16 03 05*
17 02 03 plastic
19 12 04 plastic and rubber
20 01 39 plastics
20 01 28 paints, inks, adhesives and resins other than those mentioned in 20 01 27*

**Detailed description:**

Polyethers are polymers whose organic repeating units are joined together by ether links. According to this definition, the term “polyether” covers a large number of polymers with very different structures.

The Green List category was intended to refer to “formal” ethers, e.g.:

- polyalkylene glycol (polyethylene glycol, polypropylene glycol and polyepichlorhydrine)
- epoxy resin, phenoxy resin
- polytetrahydrofuran (polytetramethylene glycol)
- polyoxetane
- polyphenylene ether (polyyary ether)
- polyetheretherketone
- polyvinyl acetal: important are formaldehyde-based polyvinyl acetal (= polyvinyl formaldehyde) and butyraldehyde (=polyvinyl butyral) for technical foils
- polycrolein
- perfluoroether
- “etherised” hydroxy compounds, such as methylated cellulose (used for biodegradable plates, for example)
- ethylene diglycol (liquid)

That category was intended to make clear that such “ethers” were not hazardous despite the formal category Y 40 in the Basel Convention.

Demarcation from other, similar Green List wastes:

- Cured resins such as epoxy resin, etc. – see B3010
- Fluorinated polymer wastes (FEP, PFA, MFA, PVF, PVDF) – see B3010
- Scrap plastic of non-halogenated polymers and copolymers – see B3010

Demarcation from other Amber List wastes or unlisted waste (notification):

- Ethers (monomers) except for those in list B (Green List) – see A3080
- Non-polymerised ethers (ether as solvent wastes and in solvent mixtures) – see A3140, A3150, A3160, A3170
- Ether-containing wastes paint and lacquer – see A4070
- Pharmaceutical wastes containing ether – see A4010

**Waste pneumatic tyres**

**Designation:** Green List B3140

Waste pneumatic tyres, excluding those destined for Annex IVA1 operations (note: disposal)

**Physical properties:** solid

**Other designations:** tyre waste; scrap tyres, old or end-of-life tyres, old motor vehicle tyres, old motorcycle wheels, old bicycle wheels, solid rubber tyres

**LoW designation:**

16 01 03 end-of-life tyres

**Detailed description:**

These are waste pneumatic tyres without rims. The supporting element of the tyre (the so-called “carcass”) consists of several layers of woven textiles (wool, rayon, polyester, etc.) that are looped about a steel-cord core.
This category includes, in particular:
- tyres from motor vehicles
- bicycle tyres
- solid rubber tyres

The old tyres must either be intended for material recovery (e.g. for the manufacture of rubber crumbs as a raw material for rubber mats, rubber wheels, retreading1) or energy recovery processes (e.g. recovery in industrial combustion plants2).

Note:
With summer tyres that are older than 10 years and winter tyres that are older than 6 years, the probability that these tires will be disposed and eligible as waste is high (watch out for cracks!). It should be noted that even used tyres that comply with the minimum tread required for further use in Austria, but which are intended for recovery (e.g. retreading) constitute waste.

In any case, used pneumatic tyres are waste whenever they are transported in such a manner that damage to them can be assumed (e.g. three inserted into each other) or they do not meet the minimum tread requirement in Austria. Measurements are done at the mid-section of the tread of the tyre, which constitutes about 3/4 of the overall bearing surface. In the event of irregular wear, the tread should be measured in accordance with the law, i.e. at the site exhibiting the strongest wear.

Limit values (minimum tread requirements) for Austria:
- Summer tyres: 1.6 mm minimum
- Winter tyres (diagonal structure): 5 mm minimum
- Winter tyres (radial structure): 4 mm minimum
- Tyres with spikes: 4 mm minimum
- Motorcycles: 1.6 mm minimum
- Mopeds: 1 mm minimum

Note: According to the Motor Vehicles Act, winter tyres may be used as summer tyres until they have a tread measuring 2 mm.

The production date of tyres is marked on the tyre side as a four-digit DOT number (DOT = Department of Transportation). The first two digits indicate the calendar week and the third digit is the last number of the year of production. Since production year 1990, a triangle has been placed after the number. Since 2000, the DOT number has been a 4-digit number.

A tyre with DOT number 347 was produced in calendar week 34 in 1987. A tyre with DOT number 489 (followed by a triangle) was produced in calendar week 48 in 1999.

A tyre with DOT number 4801 was produced in calendar week 48 in 2001.

Note:
The use of end-of-life tyres or tyre parings as covering material for sludge ponds, landfills, etc., is not considered a recovery operation (= disposal – subject to notification)

Note:
End-of-life tyres – retreading
Tyres and treads produced after 1 January 2010 for treading may not be placed on the market if they contain extender oils that exceed the values set forth under EC Directive No 2005/69 (> 1 mg BaP (benzo-a-pyrene) per kg or all listed PAHs together > 10 mg/kg). Treaded tyres may be placed on the market only if their treading surface contains no extender oils that exceed the specified limit values.

Demarcation from other, similar Green List wastes:
- Rubber wastes (including hard rubber) – see B3040
- Waste parings and scrap of rubber (e.g. old tyre parings) – see B3080
- Crumb rubber or coarse meal (powder resulting from the wear-down of the tread of waste pneumatic tyres, provided it meets no specifications and is not subject to any quality check) – see B3040
- Wastes from synthetic rubber – see B3040

Demarcation from other Amber List wastes or unlisted waste (notification):
- End-of-life tyre rubber crumbs used as absorbents, for example, and contaminated with hazardous substances – listed according to the contaminants on list A (Amber List) or unlisted waste
- Whole end-of-life tyres with rims – unlisted waste

1 Retreading means that the old tread of a worn tyre is mechanically abraded (or peeled off with blades), and new tread is applied, and then vulcanised.
2 The incineration of waste pneumatic tyres in a waste incineration facility whose purpose is to treat solid municipal waste is to be classified a recovery process as of 12 December 2010 (= deadline for the implementation of EC Framework Directive No 98/2008 on Waste), provided the stipulated energy efficiency coefficients are complied with.
B4 Wastes which may contain either inorganic and organic constituents

Waste paints (not containing solvents)

**Designation:** Green List B4010

Wastes consisting mainly of water-based/latex paints, inks and hardened varnishes not containing organic solvents, heavy metals or biocides to an extent to render them hazardous

**Physical properties:** solid, highly viscous, liquid

**Other designations:** latex paint waste, ink waste, toner waste, cured varnish

**LoW designation:**
- 08 01 12 waste paint and varnish other than those mentioned in 08 01 11*
- 08 01 14 sludges from paint and varnish other than those mentioned in 08 01 13*
- 08 01 16 aqueous sludges containing paint or varnish other than those mentioned in 08 01 15*
- 08 01 18 wastes from paint or varnish removal other than those mentioned in 08 01 17*
- 08 01 20 aqueous suspensions containing paint or varnish other than those mentioned in 08 01 19*
- 08 03 07 aqueous sludges containing ink
- 08 03 08 aqueous liquid waste containing ink
- 08 03 13 waste ink other than those mentioned in 08 03 12*
- 08 03 15 ink sludges other than those mentioned in 08 03 14*
- 08 03 18 waste printing toner other than those mentioned in 08 03 17*
- 20 01 28 paints, inks, adhesives and resins other than those mentioned in 20 01 27*

**Detailed description:**
- Latex paints waste: the main components are usually water as solvent, synthetic resin or similar plastics, dyes or pigments, extenders, additives such as stabilisers, antifoaming agents, thickening agents, preservatives and small quantities of organic solvents. Emulsion wall paints are sometimes mistakenly called latex paints, although they only contain a high percentage of resin and no latex.
- In addition to liquid resin-latex paint, there are what are called compact paints. Such wastes may be classified as Green List waste only if they exhibit no hazardous characteristics (especially H 4.1, H 3, H 6.1 and, in particular, H 13 leachate).

- Water-soluble ink waste that does not constitute hazardous waste (safety data sheets or product information)
- Leftover toner and completely cured varnishes that demonstrably have no hazardous characteristics (Follow the safety data sheets and the related classification by hazardous characteristics and information on the classification as dangerous goods for transport!)
- Powder coating, free from heavy metals (e.g. on the basis of epoxy resin/polyester or polyester) without hazardous properties

Demarcation from other, similar Green List wastes:
- Wastes consisting of food dyes – see B3120
- Toner and ink cartridges without any residues of hazardous toners and inks (safety data sheets!) as well as photocopy drums with non-hazardous coating (e.g. photocopy drums with unproblematic organic coating (OPC) and drums with a scratch-proof amorphous silicon or zinc oxide coating) – see GC 020

Demarcation from other Amber List wastes or unlisted waste (notification):
- Hazardous toner residues – see AD 090 or, as the case may be, A4070
- Toner cartridges and ink cartridges with (residues of) hazardous toner or ink as well as drum units with coatings containing selenium, tellurium, arsenic or cadmium compounds – see A1180
- Lacquers, paints, inks or similar latex paints with hazardous characteristics (heavy metals, solvents) – see A4070

Resins/Latex/Plasticisers/Glues/Adhesives (not containing solvents)

**Designation:** Green List B4020

Wastes from production, formulation and use of resins, latex, plasticizers, glues/adhesives, not listed on list A, free of solvents and other contaminants to an extent that they do not exhibit Annex III characteristics, e.g. water based, or glues based on casein starch, dextrin, cellulose ethers, polyvinyl alcohols (note the related entry on list A A3050)

**Physical properties:** solid, highly viscous

**Other designations:** glues; waste of water-soluble glue based on casein starch, dextrin, cellulose ethers, polyvinyl alcohols

**LoW designation:**
- 07 02 17 waste containing silicones other than those mentioned in 07 02 16*
08 04 10 waste adhesives and sealants other than those mentioned in 08 04 09*
08 04 12 adhesive and sealant sludges other than those mentioned in 08 04 11*
08 04 14 aqueous sludges containing adhesives or sealants other than those mentioned in 08 04 13*
08 04 16 aqueous liquid wastes containing adhesives or sealants other than those mentioned in 08 04 15*
08 04 99 wastes not otherwise specified
20 01 28 paints, inks, adhesives and resins other than those mentioned in 20 01 27*

Detailed description:
This category concerns non-hazardous waste of resins, latex, plasticisers, glues/adhesives that do not contain any solvents or other hazardous constituents or impurities, such as water-soluble glue waste of plant origin (starch, dextrin, sago or tapioca glue), of synthetic origin (cellulose ether, polyvinyl alcohol) or of animal origin (hide, leather, bone and casein glue).

Demarcation from other, similar Green List wastes:
- Plastic waste and cured waste resins or condensation products – see B3010
- Certain polymer ethers – see B3130

Demarcation from other Amber List wastes or unlisted waste (notification):
- Hazardous wastes from production, formulation and use of resins, latex, plasticisers, glues/adhesives (e.g. varnish sludge, plastic sludge, solvent-containing adhesives, uncured phenol resins) – see A3050

**Physical properties:** solid

**Other designations:** disposable cameras, throw-away cameras

**LoW designation:**
09 01 10 single-use cameras without batteries
[09 01 12 single-use cameras with batteries other than those mentioned in 09 01 11*]
(Note: In Austria, all batteries are considered hazardous, so this category is not applicable)

**Detailed description:**
Single-use cameras are ordinary viewfinder cameras in which the film cannot be replaced. The whole camera is given to the photo lab where the film is developed; the housing can be re-used/recycled. It is a mixture of materials consisting of paper, plastic, electronic components and batteries.
Due to the fact that all batteries have a hazardous characteristic (cf. electrolytes), only single-use cameras without batteries are classifiable as Green List waste.

Demarcation from other, similar Green List wastes:
There is no relevant similar entry on the Green List.
Note:
Entry B1090: “Waste batteries conforming to a specification, excluding those made with lead, cadmium or mercury” is not applicable, since all batteries are hazardous waste.

Demarcation from other Amber List wastes or unlisted waste (notification):
- Single-use cameras with all types of batteries – see A1180 (perhaps unlisted waste)
- All types of waste batteries (sorted or unsorted batteries) – see A1170

**Green List waste according to Part II of Annex III of the EC Waste Shipment Regulation No 1013/2006**

**Slags from precious metals and copper processing**

**Designation:** Green List GB 040
Metal bearing wastes arising from melting, smelting and refining of metals: slags from precious metals and copper processing for further refining

**Physical properties:** solid
Other designations: slags from smelting of non-ferrous metals

LoW designation:
10 06 01 slags from primary and secondary production – wastes from copper thermal metallurgy
10 07 01 slags from primary and secondary production – wastes from silver, gold and platinum thermal metallurgy
10 08 09 other slags – wastes from other thermal non-ferrous metallurgy

Detailed description:
This category may include lead- and zinc-containing slags containing slight amounts of precious metals or copper. Slags from the processing of precious metals and copper are not classifiable under the abovementioned Green List entry unless they are non-hazardous slags (analytical proof is required). Analysis is necessary to assess the composition. In accordance with the EU Correspondents’ Guidelines No 6, slags from the processing of copper alloys can also be subsumed under this entry (see: ec.europa.eu/environment/waste/shipments/index.htm).
The same prerequisites apply as those applicable for the classification of slags from the treatment of copper (non-hazardous waste).

Demarcation from other, similar Green List wastes:
Zinc-containing drosses – see B1100
   ▶ Tantalum bearing tin slags with less than 0.5% tin – see B1100
   ▶ Slag from zinc production, chemically stabilised, having a high iron content
   ▶ (above 20%) and processed according to industrial specifications (e.g. DIN 4301) mainly for construction – see B1220

Demarcation from other Amber List wastes or unlisted waste (notification):
   ▶ Slags classifiable as hazardous (e.g. high lead content) – unlisted waste or listed according to the contaminants on list A (Amber List), e.g. lead slag – see A1020

End-of-life electrical assemblies/components

Designation: Green List GC 010
Electrical assemblies consisting only of metals or alloys

Physical properties: solid

Other designations: metal-containing components, electrical assemblies or components consisting of metals; electronic scrap; e-scrap

LoW designation:
16 02 16 components removed from discarded equipment other than those mentioned in 16 02 15*
20 01 36 discarded electrical and electronic equipment other than those mentioned in 20 01 21*, 20 01 23* and 20 01 35*

Detailed description:
▶ Electrical components/devices if they are made primarily of metals and alloys (e.g. removed electric motors without capacitors, telephone relay scrap) and do not have environmentally relevant quantities of hazardous components or ingredients (especially polyhalogenated, aromatic compounds such as PCB and PCT, mercury switches, batteries, storage batteries or large back-lit LCD-displays using mercury gas discharge lamps).
▶ Refrigerator compressors insofar as it is proven that all the chlorofluorocarbons and partially hydrogenated hydrocarbons (CFCs/HCFCs/HFCs) and compressor oil have been removed by suction using state-of-the-art technology (see provisions in the Waste Treatment Obligations Ordinance as amended).

Demarcation from other, similar Green List wastes:
▶ Electronic scrap (e.g. printed circuit boards, electronic components, wire, etc.) and reclaimed electronic components suitable for base and precious metal recovery (non-hazardous WEEE) – see GC 020
▶ Scrap assemblies from electrical power generation not contaminated with lubricating oil, PCB or PCT to an extent to render them hazardous – see B1040

Demarcation from other Amber List wastes or unlisted waste (notification):
▶ Waste electrical and electronic assemblies containing environmentally relevant levels of hazardous substances (e.g. undrained oil radiators) – see A1180 or perhaps unlisted waste
   ▶ Full or drained PCB transformers – see A1180 or A3180
   ▶ Engines with PCB-starting capacitors or electrolytic capacitors – see A1180
   ▶ Waste compressors containing oil – see A1180
Electronic scrap

**Designation:** Green List GC 020

Electronic scrap (e.g. printed circuit boards, electronic components, wire, etc.) and reclaimed electronic components suitable for base and precious metal recovery

**Physical properties:** solid

**Other designations:**
electronic scrap; waste electrical and electronic equipment and components; electronic components for recovery; waste electrical and electronic equipment; printed circuit boards; waste appliances

**LoW designation:**
- 16 02 14 discarded equipment other than those mentioned in 16 02 09* to 16 02 13*
- 16 02 16 components removed from discarded equipment other than those mentioned in 16 02 15*
- 20 01 36 discarded electrical and electronic equipment other than those mentioned in 20 01 21*, 20 01 23* and 20 01 35*

**Detailed description:**
- Fully or partially depopulated printed circuit boards and racks that do not contain any hazardous components (cf. Waste Treatment Obligations Ordinance, Federal Law Gazette II No 459/2004 as amended and the Austrian WEEE-Ordinance, Federal Law Gazette II No 121/2005 and Directive 2002/96/EC ), such as:
  - Printed circuit boards and racks without batteries, accumulators, mercury-containing components, electrolytic capacitors at least 25 mm in height and 25 mm in diameter and those with a comparable quantity, PCB-containing components (e.g. capacitors), and without any LCD display units having a surface area of more than 100 cm² and/or back-lit display units with gas discharge lamps
  - Populated printed circuit boards without components containing hazardous substances should be considered equivalent to depopulated printed circuit boards, e.g. printed circuit boards containing only ICs (integrated circuits) and resistors
  - Unpopulated circuit boards and copper laminate (even as ground material)
  - Wires (however, in no case those contaminated with oil, PCBs or coal tar) – see the special categories for cables in the Green List – B1115 (or Amber List A1190, to the extent contaminated with PCB or tar)
  - Resistors
  - Electrical/electronic equipment or device components without environmentally relevant quantities of hazardous components or ingredients, e.g. household and kitchen appliances, electrical ovens, washing machines, computer systems (without monitors or LCD displays), audio and video equipment (without monitors based on the principle of cathode-ray tubes, plasma monitors or LCD monitors), fax machines and photocopy machines, provided they contain no photocopy drums with selenium, tellurium, arsenic or cadmium compounds
  - Printers if they do not contain any accumulators or large electrolytic capacitors or toner cartridges with hazardous toners
  - Mobile phones after removal of accumulators (in Austria, all types of accumulators are considered hazardous waste; the LCD display of the mobile phone is only illuminated with LEDs and is very small, therefore not a hazardous fraction)
  - Toner and ink cartridges without any residues of hazardous toner or inks (cf. product information and safety data sheets) as well as photocopy drums with non-hazardous coating (e.g. photocopy drums with unproblematic organic coating (OPC) and drums with a scratch-proof amorphous silicon or zinc oxide coating) – (cf. EU Correspondents’ Guidelines No 8 – ec.europa.eu/environment/waste/shipments/index.htm
  - Wastes from silicon wafers (= thin metallic discs/plates of varying size used in semiconductor technology, photography and micromachinery) of monocrystalline silicon or silicon carbide from microchip production (European Waste List 06 08 99 wastes not otherwise specified – waste from the manufacture, formulation, supply and use of silicon and silicon compounds) with the exception of those consisting of gallium arsenide (toxic) or indium phosphide (harmful to health).
  - Ground electronic scrap, provided it has been pre-treated by removing hazardous substances through state-of-the-art technology (e.g. printed circuit boards that are shredded after removal of any hazardous components) – a written certificate of pre-treatment is required
  - Non-working sockets und plugs (contacts made of steel, brass, sometimes covered with tin, zinc or nickel)
  - Removed X-rax tubes from RFA spectrometers (glass, the main body is the water-cooled rhodium core)
Demarcation from other, similar Green List wastes:
- Electrical assemblies consisting only of metals or alloys – see GC 010
- Scrap assemblies from electrical power generation not contaminated with lubricating oil, PCB or PCT to an extent to render them hazardous – see B1040
- Waste metal cables coated or insulated with plastics, not included in list A (Amber List), excluding those destined for disposal operations involving, at any stage, uncontrolled thermal processes, such as open-burning – see B1115 (this category includes PVC-coated cables, provided they do not contain PCBs)
- Precious-metal ash from the incineration of printed circuit boards, provided it has no hazardous characteristics – see B1160
- Floppy disks – see B3010
- Waste toners (toner residues) and inks containing no organic solvents, heavy metals, etc., to an extent rendering them hazardous – see B4010

Demarcation from other Amber List wastes or unlisted waste (notification):
For the classification of electronic scrap with hazardous characteristics under A1180 or in certain cases as unlisted waste, please refer to the Correspondence Guidelines No 4.
In this regard, see: ec.europa.eu/environment/waste/shipments/index.htm

Electronic scrap with radioactive ingredients
Old ionisation smoke detectors or fire/smoke alarms that operate with a radioactive radiation source (in most cases $^{241}$Am; formerly also radium, xenon, krypton ($^{85}$Kr) and tritium in glass vials) are exempted from the waste definition under the Waste Management Act of 2002 as amended or the EU Waste Framework Directive if they are subject to the provisions of the Radiation Protection Ordinance or the relevant EC Directive.
However, this need not always be the case since the intensity of radiation varies.
Consequently, the transboundary shipment of old fire/smoke alarms and other electronic scrap containing ionising materials is subject to notification and approval in accordance with EC Waste Shipment Regulation No 1013/2006 and the Waste Management Law 2002 as amended if the radiation intensity is below the limit values laid down in the Radiation Protection ordinance (unlisted waste – control procedure of the Amber List).

Ionisation smoke detectors or fire alarms must not be classified Green List waste in any case.
- Capacitors containing PCB – see A3180
- PCB- and PCT-containing electrical appliances (e.g. transformers) – see A3180
- Electrolytic capacitors – see A1180 (perhaps unlisted waste)
- Batteries and accumulators, unsorted or sorted – see A1170 or lead-acid batteries A1160
- Cullet and glass parts of cathode-ray tubes and other activated (coated) glasses, including physically intact cathode-ray tubes, LCDs, plasma monitors and cleaned picture tube cone glass or mixed glass or picture screen glass that still contains lead glass components – see A2010; lead glass waste see A1020
- Gas discharge lamps, fluorescent lamps and other mercury-containing lamps, as cullet or physically intact (hazardous waste) – see A1030 or also A2010 activated glass
- Mercury-containing components (e.g. mercury switches) – see A1030
- LCDs (liquid crystal displays) – see A2010
- Waste asbestos – see A2050
- CFCs and other coolants – see AC 150
- Thermal oil or end-of-life appliances with thermal oils – see A3020 and A1180
- Wastes of liquid and viscous toners and colour toners as well as inks, each with hazardous constituents – see AD 090 (or perhaps AD 070)
- Toner and ink cartridges with (residues of) hazardous toners and inks as well as drum units with coatings of selenium, tellurium, arsenic or cadmium compounds (cf. EU Correspondents’ Guidelines No 8 – ec.europa.eu/environment/waste/shipments/index.htm) – see A1180
- Devices that – relative to their total weight – have large LCDs (liquid crystal displays), such as laptops and other LCD monitor equipment, including miniature LCD televisions or portable DVD players – see A1180
- Electrical and electronic equipment and components with environmentally relevant quantities of hazardous components or ingredients, e.g. asbestos-containing storage ovens, oil radiators, refrigerators and air-conditioners with coolants containing CFCs, FCs, HCFCs, HFCs and hydrocarbons (e.g. propane/butane) as well as refrigerators and air-conditioners with other refrigerants (e.g. ammonia) – see A1180
Note:
Refrigerators, after removal of the CFCs or HCFCs from the cooling circuit, are by no means classifiable as Green List waste, since more than 2/3 of the CFCs or HCFCs in old refrigerators are found in the PU foam.

- Devices whose main component (by weight) is a storage battery or other battery (e.g. cordless drills, electric toothbrushes, mobile telephones) – see A1180 (Note: may be classified under the Green List after removal of the power source)
- Fax machines and photocopiers if they contain photocopy drums with selenium, tellurium, arsenic or cadmium compounds – see A1180
- Printers (especially portable devices) containing accumulators, large electrolytic capacitors or toner cartridges with hazardous toner/ink residues (see safety data sheets!) – see A1180
- Carbonised cables or old metal cables containing or contaminated with oil, coaltar, PCBs or other hazardous substances (e.g. underground cables), as a result of which they exhibit hazardous properties – see A1190
- Carbonized cables or old cables, containing or contaminated with oil, tar, PCB or other hazardous substances (e.g. underground cables) to an extent rendering them hazardous – see A1190
- Ground electronic scrap for which it has not been ascertained that pre-treatment was performed in accordance with the provisions of the Waste Treatment Obligations Ordinance, Federal Law Gazette II No 459/2004 as amended, the Austrian WEEE-Ordinance, Federal Law Gazette II No 121/2005 as amended and Directive 2002/96/EC (e.g. circuit boards not sufficiently depopulated) – unlisted waste
- Precious metal ash from incineration of printed circuit boards (with hazardous characteristics) – see A1150
- Wastes from wafers (= thin metallic discs/plates of varying size used in semiconductor technology, photography and micromachinery) of gallium arsenide (toxic) or indium phosphide (harmful to health) – unlisted
- Single-use cameras with all types of batteries – see A1180 (perhaps unlisted waste)

### End-of-life vessels

<table>
<thead>
<tr>
<th>Designation:</th>
<th>Green List GC 030</th>
</tr>
</thead>
</table>
| Vessels and other floating structures for breaking up, properly emptied of any cargo and other materials arising from the operation of the vessel which may have been classified as a dangerous substance or waste

**Physical properties:** solid

**Other designations:** end-of-life ships; ships intended for dismantling

**LoW designation:**
There is no specific category in the European Waste List; possibly classifiable under 16 01 06 “end-of-life vehicles, containing neither liquids nor other hazardous components”

**Detailed description:**

- Vessels and other floating structures containing hazardous cargoes and hazardous substances (such as oil, PCBs, asbestos, etc.) – unlisted waste
- End-of-life motor vehicles without drainage of all liquids (removal of hazardous substances) – unlisted waste

**Demarcation from other, similar Green List wastes:**

- End-of-life motor vehicles, containing neither hazardous liquids nor other hazardous components (removal of hazardous substances) – see B1250

**Demarcation from other Amber List wastes or unlisted waste (notification):**

- Vessels and other floating structures containing hazardous cargoes and hazardous substances (such as oil, PCBs, asbestos, etc.) – unlisted waste
- End-of-life motor vehicles without drainage of all liquids (removal of hazardous substances) – unlisted waste

### Catalysts (zeolites)

<table>
<thead>
<tr>
<th>Designation:</th>
<th>Green List GC 050</th>
</tr>
</thead>
</table>
| Spent fluid catalytic cracking (FCC) catalysts (e.g. aluminium oxide, zeolites)

**Physical properties:** solid

**Other designations:** aluminium oxide catalysts; zeolite catalysts

**LoW designation:**
16 08 04 spent fluid catalytic cracking catalysts (except 16 08 07)”
8. Guidelines for the Shipment of Waste

Detailed description:
This category includes mainly aluminium silicates (zeolites) or aluminium oxides used as catalysts. They are classifiable as Green List waste on the condition that the catalysts are not contaminated with mineral oil or other hydrocarbons or other hazardous substances to an extent to render them hazardous.

Demarcation from other, similar Green List wastes:
- Cleaned spent catalysts containing transition metals and rare earth metals – see B1120
- Cleaned, spent precious-metal-bearing catalysts – see B1130
- Carborundum (aluminium oxide) – see B2040

Demarcation from other Amber List wastes or unlisted waste (notification):
- Waste catalysts of zeolite- and aluminium-oxide catalysts contaminated with hydrocarbons or other hazardous substances to an extent to render them hazardous – see A2030

Fibre glass wastes

<table>
<thead>
<tr>
<th>Designation:</th>
<th>Green List GE 020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glass waste in non-dispersible form:</td>
<td>Fibre glass wastes</td>
</tr>
</tbody>
</table>

Physical properties: solid

Other designations: fibre-glass waste

LoW designation:
10 12 06 discarded moulds
10 12 08 waste ceramics, bricks, tiles and construction products (after thermal processing)
17 01 02 bricks
17 01 03 tiles and ceramics
16 11 04 other linings and refractories from metallurgical processes other than those mentioned in 16 11 03*
16 11 06 linings and refractories from non-metallurgical processes other than those mentioned in 16 11 05*

Detailed description:
Fibre-glass waste (glass wool), free from substances that are hazardous or prevent recovery

Demarcation from other, similar Green List wastes:
- Cullet and other glass waste in non-dispersible form – see B2020
- Ceramic-based fibres – see B2030
- Glass scraps containing lithium-tantalum and lithium-niobium – see B2040

Demarcation from other Amber List wastes or unlisted waste (notification):
- Fibre glass waste with hazardous contamination – unlisted waste or classified according to contaminants in list A (Amber List)
- Glass grinding sludge or glass dust – unlisted waste
- Lead glass dust, sludge – see A1020 or perhaps A2010
- Ceramic-based fibres with physico-chemical properties similar to those of asbestos – see RB 020
- Waste asbestos (dusts and fibres) – see A2050

Ceramic Wastes

<table>
<thead>
<tr>
<th>Designation:</th>
<th>Green List GF 010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ceramic wastes which have been fired after shaping, including ceramic vessels (before and/or after use)</td>
<td></td>
</tr>
</tbody>
</table>

Physical properties: solid

Other designations: broken ceramics, waste ceramic products (broken crockery), bricks, roofing tiles, wall or floor tiles, terracotta waste

LoW designation:
10 11 03 waste glass-based fibrous materials
17 06 04 insulation material other than those mentioned in 17 06 01* and 17 06 03*

Detailed description:
Broken ceramic products (e.g. crockery)
- Roof tiles, other tiles and bricks, glazed tales, flags
- Furnace linings from metallurgical and non-metallurgical processes, proven to have no hazardous properties (e.g. furnace linings from steel production)

Demarcation from other, similar Green List wastes:
- Waste of refractory linings, including crucibles, originating from copper smelting (without contamination and hazardous properties) – see B1100
Demarcation from other Amber List wastes or unlisted waste (notification):

- Furnace linings from metallurgical or non-metallurgical processes with hazardous contamination – unlisted waste or listed according to the contaminants in list A (Amber List)
- Chromate-containing storage stones from night-storage heaters – see A1040 (hexavalent chromium)
- Any type of mixed building debris (e.g. building debris mixed with excavated earth) or ceramic bricks mixed with hazardous substances (e.g. from industrial demolition) – unlisted waste or, if contaminated, classified according to the contaminants on list A (Amber List)
- Chamotte / chimney bricks with hazardous contamination – unlisted waste or, in the case of contamination, listed according to the contaminants on list A (Amber List)
- Wastes of sand-lime brick, natural stone from construction – unlisted waste

### Ash and slag from coal-fired power plants

| Designation: | Green List GG 030 ex 2621 Bottom ash and slag tap from coal-fired power plants |

**Physical properties:** solid

**Other designations:** bottom ash and slag from coal-fired power plants

**LoW designation:**
10 01 01 bottom ash, slag and boiler dust (excluding boiler dust mentioned in 10 01 04)

**Detailed description:**
This category refers to bottom ash and firing slags from coal-fired combustion plants that may be recovered in the form of construction aggregates, for example.

Demarcation from other, similar Green List wastes:
- Coal-fired power plants fly ash – see GG 040

Demarcation from other Amber List wastes or unlisted waste (notification):

- Bottom ash and slags from waste incineration and pyrolysis plants (including ash from coal-fired power plants that co-incinerate waste) – in the case of ash from municipal or residual waste incineration plants, see Y47 (residues from the incineration of household waste), otherwise unlisted waste or listed according to the hazardous contaminants on list A (Amber List)
- Bottom ash and slags from incineration plants for hazardous waste, from the incineration of paper and wood industry wastes, from biomass combustion plants as well as facilities other than coal-fired power plants – unlisted waste or listed according to the hazardous contaminants on list A (Amber List)

### Coal-fired power plant fly ash

| Designation: | Green List GG 040 ex 2621 Coal-fired power plants fly ash |

**Physical properties:** solid

**Other designations:** power plant fly ash; fly ash (coal-fired power plants)

**LoW designation:**
10 01 02 coal fly ash

**Detailed description:**
The use of fly ash in the Austrian cement and concrete industry is covered, for example, by European Norm EN 450-1, Fly ash concrete, Part 1: Definition, specifications and conformity criteria

**Requirements for shipments to Switzerland**
In Switzerland, the following provisional reference values have been established for fly ash from coal firing (power plants) that, following the Green List procedure, may be imported from OECD member countries without notification for the purposes of recovery as construction material:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Reference value</th>
</tr>
</thead>
<tbody>
<tr>
<td>antimony</td>
<td>10 mg/kg</td>
</tr>
<tr>
<td>arsenic</td>
<td>40 mg/kg</td>
</tr>
<tr>
<td>lead</td>
<td>300 mg/kg</td>
</tr>
<tr>
<td>cadmium</td>
<td>2 mg/kg</td>
</tr>
<tr>
<td>chromium (total)</td>
<td>300 mg/kg</td>
</tr>
<tr>
<td>hexavalent chromium</td>
<td>2 mg/kg</td>
</tr>
<tr>
<td>copper</td>
<td>200 mg/kg</td>
</tr>
<tr>
<td>nickel</td>
<td>200 mg/kg</td>
</tr>
<tr>
<td>mercury</td>
<td>1 mg/kg</td>
</tr>
<tr>
<td>thallium</td>
<td>3 mg/kg</td>
</tr>
<tr>
<td>zinc</td>
<td>1,000 mg/kg</td>
</tr>
<tr>
<td>tin</td>
<td>30 mg/kg</td>
</tr>
<tr>
<td>barium</td>
<td>1,500 mg/kg</td>
</tr>
</tbody>
</table>
### Guidelines for the Shipment of Waste

<table>
<thead>
<tr>
<th>Substance</th>
<th>Limitation</th>
</tr>
</thead>
<tbody>
<tr>
<td>beryllium</td>
<td>10 mg/kg</td>
</tr>
<tr>
<td>cobalt</td>
<td>100 mg/kg</td>
</tr>
<tr>
<td>selenium</td>
<td>5 mg/kg</td>
</tr>
<tr>
<td>vanadium</td>
<td>300 mg/kg</td>
</tr>
</tbody>
</table>

#### Demarcation from other, similar Green List wastes:
- Bottom ash and slag tap from coal-fired power plants – see GG 030

#### Demarcation from other Amber List wastes or unlisted waste (notification):
- Fly ash from municipal waste and residual waste incineration plants – see Y47
- Fly ash from incineration plants for hazardous waste and from pyrolysis plants, from the incineration of paper and wood industry wastes, from biomass combustion plants or oil firing plants (containing vanadium) – see A4100 or AA060 (for ashes containing vanadium)
- Fly ash from coal-fired power plants that co-incinerate other wastes or that exhibits hazardous characteristics – see A2060
- Dusts and residues from gas cleaning systems of copper smelters – see A1100

#### Plastic wastes (polymers of vinyl chloride)

<table>
<thead>
<tr>
<th>Designation:</th>
<th>Green List GH 013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solid plastic wastes: polymers of vinyl chloride</td>
<td></td>
</tr>
</tbody>
</table>

#### Physical properties:
- solid

#### Other designations:
- abbreviation of polyvinyl chloride: PVC
- Well-known trade names for hard PVC include Astralon, Luvitherm, Rhenadur, Rhenalon, Trovidur and Vinidur.
- Soft-PVC is sold by the name of Acela, Adretta, Alkar, Coroplast, Tautex, Koresal, Mipolam, Pegulan and Renolit, among others.
- The abbreviation of polyvinylidene chloride is PVDC, the trade name is Saran.

#### LoW designation:
- 02 01 04 waste plastics (except packaging)
- 07 02 13 waste plastic
- 12 01 05 plastics shavings and turnings
- 15 01 02 plastic packaging
- 16 01 19 plastics
- 17 02 03 plastic
- 19 12 04 plastic and rubber
- 20 01 39 plastics

#### Detailed description:

Polyvinyl chloride (PVC) is a hard and brittle plastic that must be softened by adding plasticisers and stabilisers. PVCs are subdivided into soft PVCs (PVC-P) and hard PVCs (PVC-U).

- PVC blister waste e.g. “tablet packaging waste” (PVC aluminium composites), to the extent not contaminated with hazardous substances
- PVC pipe and profile waste as well as polyvinylidene chloride waste (PVDC wastes) in the form of sheets, pipes, etc.
- Floppy disks: these consist of two types of plastic (PVC and polyester); if the PVC is separated out, classification under GH 013 PVC is possible; if both types of plastic are present, entry B3010 should be used
- Waste of artificial leather (soft PVC)
- Hard foam made of PVC, to the extent that it is demonstrably free of CFCs (and also free from FCs, HCFCs, and HFCs)

Note: In the view of the European Member States, waste PVC windows and parts (also, provided the glass has been separated using state-of-the-art technology) cannot be classified under the Green List due to the high metal component, but are, much rather, unlisted waste subject to the notification requirement.

#### Demarcation from other, similar Green List wastes:
- All other plastic wastes (not halogenated or fluorinated) except polymers of vinyl chloride – see B3010

#### Demarcation from other Amber List wastes or unlisted waste (notification):
- PVC paste – unlisted waste
- PVC separators from lead-acid batteries (usually contaminated with lead compounds) – see A1160
- PVC-aluminium blister packaging that still contains drug waste or mixed
- Medication packages of pharmaceutical products with the contents – see A4010
- PCB-containing cable sheath waste made of PVC (with old cables from unknown origin, it cannot be ruled out that PCB is included) – see A1190
- Waste PVC windows and parts (with or without glass parts) – unlisted

Note:
- The use of plastic wastes as cover material for sludge ponds, landfills, etc., is not considered a recovery operation (subject to notification – disposal).
**Bristles and animal hair**

**Designation:** Green List GN 010 ex 0502 00 Waste of pigs’, hogs’, or boars’ bristles or of badgers hair and other brush-making hair

**Physical properties:** solid

**Other designations:** animal hair; animal bristles

**LoW designation:**
- 02 02 02 animal-tissue waste
- 02 02 03 materials unsuitable for consumption or processing
- 04 01 09 wastes from dressing and finishing
- 04 01 99 wastes not otherwise specified

**Detailed description:**
Bristles are a special form of hair. They are stiff top hair (fur hair) with split ends. Bristles form the coat of hair of porcines.

- Waste of pigs’, hogs’ or boars’ bristles and hair or of badger hair and other brush-making hair

**Demarcation from other, similar Green List wastes:**
- Fellmongery wastes (furs) – see B3110
- Waste of wool or fine or coarse animal hair – see B3030
- Horsehair waste, whether or not put up as a layer with or without supporting material – see GN 020
- Waste of human hair – see B3070

**Demarcation from other Amber List wastes or unlisted waste (notification):**
- Fellmongery waste with hazardous contamination (hexavalent chromium, biocides, etc.) – see A3110

Wastes of categories 1 and 2 according to EC Animal By-product Regulation No 1069/2009, are exempt from the provisions of EC Waste Shipment Regulation No 1013/2006, especially since such wastes are already subject to the strict approval requirements of the EC Animal By-product Regulation.

**Horsehair waste**

**Designation:** Green List GN 020 ex 0503 00 Horsehair waste, whether or not put up as a layer with or without supporting material

**Physical properties:** solid

**Other designations:** horsehair waste

**LoW designation:**
- 02 02 02 animal-tissue waste
- 02 02 03 materials unsuitable for consumption or processing
- 04 01 09 wastes from dressing and finishing
- 04 01 99 wastes not otherwise specified

**Detailed description:**
Horsehair waste (with skin residues, as the case may be), whether or not put up as a layer, with or without supporting material, must contain only material that falls into category 3 of EC Animal By-product Regulation No 1069/2009.

**Demarcation from other, similar Green List wastes:**
- Waste of pigs’, hogs’ or boars’ bristles and hair or of badger hair and other brush-making hair – see GN 010
- Fellmongery wastes (furs) – see B3110
- Waste of wool or fine or coarse animal hair – see B3030
- Waste of human hair – see B3070

**Demarcation from other Amber List wastes or unlisted waste (notification):**
- Fellmongery waste with hazardous contamination (hexavalent chromium, biocides, etc.) – see A3110

Wastes of categories 1 and 2 according to EC Animal By-product Regulation No 1069/2009, are exempt from the provisions of EC Waste Shipment Regulation No 1013/2006, especially since such wastes are already subject to the strict approval requirements of the EC Animal By-product Regulation.

**Parts of birds, feathers**

**Designation:** Green List GN 030 ex 05 05 90 Waste of skins and other parts of birds, with their feathers or down, of feathers and parts of feathers (whether or not with trimmed edges) and down, not further worked than cleaned, disinfected or treated for preservation

**Physical properties:** solid

**Other designations:** down and father waste, waste of parts of birds (feather flour)

**LoW designation:**
- 02 02 02 animal-tissue waste
- 02 02 03 materials unsuitable for consumption or processing
- 04 01 09 wastes from dressing and finishing
04 01 99 wastes not otherwise specified

**Detailed description:**
The trade restrictions under veterinary legislation concerning parts of birds and feathers must be complied with.
This category includes the following items, for example:
- duck, turkey or chicken feathers, etc.
- ground feathers may also be subsumed in this category

**Note:**
Processed animal proteins (feather meal), even of category 3, resulting from rendering facilities, are subject to veterinary approval requirements according to EC Animal By-product Regulation No 1069/2009 as amended and therefore are exempt from the provisions of the EC Waste Shipment Regulation.

**Demarcation from other, similar Green List wastes:**
- Waste of pigs’, hogs’ or boars’ bristles and hair or of badger hair and other brush making hair – see GN 010
- Waste of wool or fine or coarse animal hair – see B3030

**Demarcation from other Amber List wastes or unlisted waste (notification):**
- Fellmongery wastes with hazardous contamination (hexavalent chromium, biocides, etc.) – see A3110

Wastes of categories 1 and 2 according to EC Animal By-product Regulation No 1069/2009, are exempt from the provisions of EC Waste Shipment Regulation No 1013/2006, especially since such wastes are already subject to the strict approval requirements of the EC Animal By-product Regulation.
9. Remediation of Confirmed Contaminated Sites
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By passing the Act on the Remediation of Contaminated Sites (Federal Law Gazette No 299/1989 as amended) on 1 July 1989, Austria became one of the first European countries to implement binding and important steps towards a targeted registration of suspected and confirmed contaminated sites. In addition to setting out the framework for instructing the containment and remediation of sites, the Act provides for a financing basis to support suitable measures.

By international comparison, Austria ranks among the leaders in the management of contaminated waste sites in view of the measures taken to date by all stakeholders to comply with the Act on the Remediation of Contaminated Sites.

The Austrian remediation model, which has been in effect for more than 20 years, is unique in the world and has received much interest from abroad. Nowhere else in the EU is there a comparable financing model that channels fees paid for waste processing exclusively into the remediation of contaminated sites. In Austria, this guarantees a reliable protection of the population and the environment, as well as the speedy mitigation of past environmental pollution.

The Austrian system is solution-oriented. Subsidies are provided for necessary remediation efforts on contaminated sites, speeding up the process and making it possible for stakeholders to voluntarily remediate contaminated sites without running the risk of financial ruin. By contrast, in many EU Member States that do not have such incentive systems in place, large amounts of time and financial resources are devoted to drawn-out legal battles, while the urgently required measures are often frozen for years at a time.

The Austrian system is standardised throughout the country. As it falls under federal jurisdiction, it has been possible to harmonise implementation procedures throughout Austria. In many European countries (e.g. Germany, Spain, Belgium and France) the regions and provinces are responsible for the remediation of contaminated sites. As a result, different programmes for the remediation of contaminated sites are being implemented in those countries. This diversity results in inequalities across the various regions of the country, concerning both the economic aspect and the protection of the populace. Moreover, a number of
EU Member States do not have any system for the remediation of contaminated sites at all (e.g. Poland, Greece, Portugal, Bulgaria, etc.). **ALSAG funds guarantee a reliable implementation of high-quality measures.** In Austria, investigations into the hazard potential are financed from contaminated site contributions. Accurate conclusions can be drawn from these studies on the hazard to human health and the environment. In many EU Member States that are unable to provide these funds, the cost of such investigations is charged to the person seeking to remediate a site or ordered to do so. As this puts a constraint on the financial possibilities, it results in heterogeneous findings and conclusions about the actual hazard levels.

9.1. **From the Suspected Contaminated Site to the Confirmed Contaminated Site**

The process of identifying former disposal or industrial sites (suspected contaminated sites) as sites that require securing and remediation starts with the Provincial Governor (once the relevant data has been recorded) reporting a suspected contaminated site. This notification must contain certain minimum information. If a substantial risk (initial appraisal) is suspected, the information is added to the Register of Suspected Contaminated Sites.

The preliminary assessment also determines whether there is need for additional investigations which can be financed through funds earmarked for contaminated site contributions (commissioned by the Federal Ministry of Agriculture, Forestry, Environment and Water Management through the various Federal Provinces). If the investigations and the subsequent risk assessment indicate substantial risks to human health or the environment, the suspected contaminated site is registered as a contaminated site requiring securing and remediation according to the Ordinance on the Register of Contaminated Sites (since 1 July 2004 by announcement in the Austrian Federal Law Gazette and, previously, by entry in the Register of Contaminated Sites managed in the form of a database by Environment Agency Austria). A (three-stage) priority classification is used to express the degree of risk and the resultant urgency (of funding) for the required remediation.
If the risk assessment indicates no substantial risks, the area is either deleted from the Register of Suspected Contaminated Sites (the data obtained is retained) or it remains in the Register as an area under observation (the existing pollutant potential requires observation that can be funded using AL-SAG funds).

Contaminated sites or confirmed contaminated sites that have been remediated or secured are deleted from the Register of Suspected Contaminated Sites or listed as remediated or secured in the Register of Contaminated Sites.

Overall, it can be assumed that the level of detection of former disposal or industrial sites is very high (60,808 detected areas), of which 2,144 areas are registered in the Register of Suspected Contaminated Sites (as of 1 January 2011). To date, 256 areas have been identified as contaminated sites that need securing or remediation in the Register of Contaminated Sites on the basis of investigations and risk assessments conducted. 108 of these have already been secured or remediated. Securing or cleanup measures are already underway for a further 86 contaminated sites (as of 1 January 2011).

In addition to the Ordinance on the Register of Contaminated Sites, further information on suspected contaminated sites and confirmed contaminated sites can be found at www.umweltbundesamt.at.
9.2. Register of Suspected Contaminated Sites and Ordinance on the Atlas of Contaminated Sites

The environmental hazard emanating from abandoned landfills and industrial sites is assessed by Environment Agency Austria in implementing the Act on the Remediation of Contaminated Sites (see also www.umweltbundesamt.at). With more than 20 years of experience in the remediation of contaminated sites, Austria can look back on a solid track record.

For most of the projects currently underway, the systematic registration of abandoned industrial sites and landfills will be completed in the years to come.

Based on the experience gained to date, only a small proportion of the registered sites (abandoned landfills and industrial sites) will actually be rated as suspected sites and subsequently as contaminated sites.

Successful remediation

By 1 January 2011, a total of 256 sites had been registered as a source of substantial environmental

<table>
<thead>
<tr>
<th>Austrian track record for the remediation of contaminated sites</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Number of sites</strong></td>
</tr>
<tr>
<td>60,808</td>
</tr>
<tr>
<td>30,488</td>
</tr>
<tr>
<td>1,624</td>
</tr>
<tr>
<td>2,144</td>
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<tr>
<td>148</td>
</tr>
<tr>
<td>108</td>
</tr>
<tr>
<td>80</td>
</tr>
<tr>
<td>6</td>
</tr>
<tr>
<td>38</td>
</tr>
</tbody>
</table>
9. Remediation of Confirmed Contaminated Sites

hazard in accordance with the Ordinance on the Atlas of Contaminated Sites, and were rated as contaminated sites requiring securing and/or remediation. In the meantime, 108 of these contaminated sites have been categorised as secured or remediated. For an additional 92 contaminated

### Data – Federal Provinces (as of 1 January 2011)

#### Registered abandoned landfills and industrial sites

<table>
<thead>
<tr>
<th>Federal Province</th>
<th>Abandoned landfills</th>
<th>Industrial sites</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Burgenland</td>
<td>99</td>
<td>3,099</td>
<td>3,198</td>
</tr>
<tr>
<td>Carinthia</td>
<td>472</td>
<td>2,444</td>
<td>2,916</td>
</tr>
<tr>
<td>Lower Austria</td>
<td>1,139</td>
<td>6,243</td>
<td>7,382</td>
</tr>
<tr>
<td>Upper Austria</td>
<td>1,467</td>
<td>9,099</td>
<td>10,566</td>
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<tr>
<td>Salzburg</td>
<td>418</td>
<td>5,603</td>
<td>6,021</td>
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<tr>
<td>Styria</td>
<td>380</td>
<td>7,740</td>
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<tr>
<td>Tyrol</td>
<td>648</td>
<td>4,663</td>
<td>5,311</td>
</tr>
<tr>
<td>Vorarlberg</td>
<td>15</td>
<td>2,435</td>
<td>2,450</td>
</tr>
<tr>
<td>Vienna</td>
<td>343</td>
<td>14,501</td>
<td>14,844</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>4,981</strong></td>
<td><strong>55,827</strong></td>
<td><strong>60,808</strong></td>
</tr>
</tbody>
</table>

#### Suspected contaminated sites

<table>
<thead>
<tr>
<th>Federal Province</th>
<th>Abandoned landfills</th>
<th>Industrial sites</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Burgenland</td>
<td>24</td>
<td>2</td>
<td>26</td>
</tr>
<tr>
<td>Carinthia</td>
<td>31</td>
<td>9</td>
<td>40</td>
</tr>
<tr>
<td>Lower Austria</td>
<td>466</td>
<td>59</td>
<td>525</td>
</tr>
<tr>
<td>Upper Austria</td>
<td>338</td>
<td>243</td>
<td>581</td>
</tr>
<tr>
<td>Salzburg</td>
<td>89</td>
<td>534</td>
<td>623</td>
</tr>
<tr>
<td>Styria</td>
<td>133</td>
<td>15</td>
<td>148</td>
</tr>
<tr>
<td>Tyrol</td>
<td>94</td>
<td>5</td>
<td>99</td>
</tr>
<tr>
<td>Vorarlberg</td>
<td>9</td>
<td>3</td>
<td>12</td>
</tr>
<tr>
<td>Vienna</td>
<td>47</td>
<td>43</td>
<td>90</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1,231</strong></td>
<td><strong>913</strong></td>
<td><strong>2,144</strong></td>
</tr>
</tbody>
</table>

#### Contaminated sites

<table>
<thead>
<tr>
<th>Federal Province</th>
<th>Pc I</th>
<th>Pc II</th>
<th>Pc III</th>
<th>No pc</th>
<th>Total</th>
<th>Remediation underway</th>
<th>Remediated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Burgenland</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>7</td>
</tr>
<tr>
<td>Carinthia</td>
<td>4</td>
<td>10</td>
<td>4</td>
<td>1</td>
<td>19</td>
<td>14</td>
<td>9</td>
</tr>
<tr>
<td>Lower Austria</td>
<td>4</td>
<td>16</td>
<td>14</td>
<td>5</td>
<td>39</td>
<td>21</td>
<td>26</td>
</tr>
<tr>
<td>Upper Austria</td>
<td>11</td>
<td>10</td>
<td>18</td>
<td>2</td>
<td>41</td>
<td>21</td>
<td>34</td>
</tr>
<tr>
<td>Salzburg</td>
<td>0</td>
<td>0</td>
<td>4</td>
<td>0</td>
<td>4</td>
<td>1</td>
<td>10</td>
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<td>Styria</td>
<td>2</td>
<td>9</td>
<td>3</td>
<td>4</td>
<td>18</td>
<td>8</td>
<td>6</td>
</tr>
<tr>
<td>Tyrol</td>
<td>1</td>
<td>2</td>
<td>4</td>
<td>0</td>
<td>7</td>
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<td>Vorarlberg</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Vienna</td>
<td>12</td>
<td>5</td>
<td>1</td>
<td>2</td>
<td>20</td>
<td>17</td>
<td>5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>34</strong></td>
<td><strong>52</strong></td>
<td><strong>48</strong></td>
<td><strong>14</strong></td>
<td><strong>148</strong></td>
<td><strong>86</strong></td>
<td><strong>108</strong></td>
</tr>
</tbody>
</table>

1) Priority classes
sites, securing and remedial measures are currently underway or being planned.

9.2.1. Contaminated sites – eGIS
Members of the public can access the „Altlasten-eGIS“ application, which uses the online maps of the Federal Ministry of Agriculture, Forestry, Environment and Water Management (BMLFUW) to display the precise locations of all contaminated sites registered for Austria in accordance with the Ordinance on the Atlas of Contaminated Sites. In the „Geo-Info“ WEBGIS application, secured or remediated sites can be located by selecting the „Altlasten“ map overlay („Fachkarte“).

„Altlasten-eGIS“ was created in cooperation with Environment Agency Austria and the BMLFUW computing centre for agriculture, forestry and water management. Its role is that of a support tool for the public administration and other institutions actively engaged in the remediation of contaminated sites.

This geographical information system on contaminated sites is freely accessible at: http://geoinfo.lebensministerium.at/.

9.3. Supplementary investigations in suspected and confirmed contaminated sites
Since the Act on the Remediation of Contaminated Sites has been in force, 554 supplementary investigations on risk assessment and priority classification have been commissioned.

240 of these supplementary investigations on hazard assessment and priority classification are currently underway (217 for suspected contaminated
sites and 23 for confirmed contaminated sites). 314 of the investigations commissioned to date have already been completed. The results of these investigations will be used to conduct a hazard assessment (suspected contaminated sites) and to develop a priority classification (confirmed contaminated sites).

To date approx. € 93.62 million has been spent on the investigation of suspected and confirmed contaminated sites as well as for studies on these; of this amount, approx. € 54.74 million have already been paid out and approx. € 38.67 million have been earmarked for ongoing projects (1991-2010).

### 9.4. Contaminated site contribution

A contaminated site contribution is charged to finance the measures necessary for the implementation of a comprehensive management programme for contaminated sites in Austria (this contribution is earmarked primarily for the registration, assessment and remediation of contaminated sites).

The contaminated site contribution introduced by the ALSAG Act in 1989, which has been payable since 1990, is essentially comprised of a charge on the landfilling of waste; it was amended to take into account the latest changes in the Landfill Ordinance during the adjustment period (1996-2004 and 2009), and thereby turned into an effective steering mechanism. (A charge of € 87.00 per tonne was payable for the landfilling of untreated waste that did not conform to the Landfilling Ordinance.) From 2006 onwards, an additional charge was introduced for the incineration of waste and the production of fuel products (while the residues from incineration remained exempt).

#### The current charges payable:

- **Landfilling** of waste:
  - € 8.00/t on excavated soil, inert waste as well as construction and demolition waste landfills
  - € 18.00/t on residual waste landfills
  - € 26.00/t on mass waste landfills

- **Incineration** of waste, production of fuel products from waste, feeding a blast furnace with waste:
  - € 7.00/t

- **Storage** of waste for disposal (> 1 year), for recovery (> 3 years) and **landfilling** with waste (incl. backfill):
  - € 8.00/t for mineral waste (up to the quality of construction and demolition waste)
  - € 87.00/t for all other waste
Export of waste for the above-referenced activities.
Among others, general exemptions apply to

- wastes from mining operations
- excavated earth (up to construction and demolition waste quality and disposal on a landfill)
- excavated soil material for landfilling
- excavated earth and quality-assured recycling materials for landfilling in connection with a construction activity
- waste with high biogenic content as defined by the Green Electricity Act and (non-hazardous) sewage sludges for incineration and the production of fuel products
- residues (wastes) from waste incineration facilities (landfill or backfill)

The amounts, which are determined by self-assessment, are payable in quarterly instalments.

With the expiration of the last transition periods to update the Landfill Ordinance to the state of the art (at the end of 2008), the income generated from the contaminated site contributions went into a steady decline, as had been expected (see fig. „Revenue“). If the current contribution system is maintained, annual income is expected to be lower than € 50 million (approx. € 97 million was earned in 2003, the „best“ year so far).

While no (index) adjustments were made to the contribution amounts in the 2004-11 period, the Budget Implementation Act of 2010 laid down new contributory amounts effective 1 January 2012:

When the Budget Implementation Act of 2010 (Federal Law Gazette I No 111/2010) came into effect on 1 January 2011, the earmark of contaminated site contributions was revoked for an amount of € 48,025,000.00 for the period from 2011 to 14. The following contributions (in euros) were not earmarked in accordance with sec. 11 (3) ALSAG 1989:

- sec. 6 (1) excavated earth, construction and demolition waste or other mineral wastes 9.20
- sec. 6 (4) excavated soil, inert waste or construction and demolition waste landfills 9.20
- sec. 6 (4) residual waste landfills 20.60
- sec. 6 (4) mass waste landfills or landfills for hazardous wastes 29.80
- sec. 6 (4a) incineration of waste, production of fuel products from waste 8,-
- sec. 6 (4b) shipment of waste to an operation outside of Austria 8,-

The revocation of the earmarking (2011–2014) is a one-off measure that is intended to help consolidated the budget and will not be extended.
Revenue from contributions for contaminated sites in euros

<table>
<thead>
<tr>
<th>Year</th>
<th>Revenue (100%)</th>
<th>%</th>
<th>Share accounted for by subsidies, measures by the Federal Government, reimbursements</th>
<th>%</th>
<th>Share accounted for by supplementary investigations, studies</th>
</tr>
</thead>
<tbody>
<tr>
<td>1990</td>
<td>10,365,293.00</td>
<td>90</td>
<td>9,328,763.70</td>
<td>10</td>
<td>1,036,529.30</td>
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<tr>
<td>1991</td>
<td>12,551,956.33</td>
<td>90</td>
<td>11,296,760.69</td>
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<td>1,255,195.63</td>
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<tr>
<td>1992</td>
<td>12,156,281.24</td>
<td>90</td>
<td>10,940,653.12</td>
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<td>1,215,628.12</td>
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<tr>
<td>1993</td>
<td>15,677,087.92</td>
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<td>12,541,670.33</td>
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<td>3,135,417.58</td>
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<td>12,270,168.42</td>
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<td>3,067,542.11</td>
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<tr>
<td>2004</td>
<td>57,109,456.81</td>
<td>85</td>
<td>48,543,038.28</td>
<td>15</td>
<td>8,566,418.53</td>
</tr>
<tr>
<td>2005</td>
<td>45,539,205.56</td>
<td>85</td>
<td>36,786,325.47</td>
<td>15</td>
<td>8,752,880.09</td>
</tr>
<tr>
<td>2006</td>
<td>72,959,663.24</td>
<td>85</td>
<td>61,281,569.19</td>
<td>15</td>
<td>10,814,394.05</td>
</tr>
<tr>
<td>2007</td>
<td>72,916,166.13</td>
<td>85</td>
<td>61,488,741.51</td>
<td>15</td>
<td>10,847,424.62</td>
</tr>
<tr>
<td>2008</td>
<td>64,380,161.98</td>
<td>85</td>
<td>54,706,137.76</td>
<td>15</td>
<td>9,674,024.22</td>
</tr>
<tr>
<td>2009</td>
<td>57,298,683.74</td>
<td>85</td>
<td>48,703,881.16</td>
<td>15</td>
<td>8,594,802.58</td>
</tr>
<tr>
<td>2010</td>
<td>50,880,051.20</td>
<td>85</td>
<td>43,248,043.52</td>
<td>15</td>
<td>7,632,007.68</td>
</tr>
</tbody>
</table>

Total revenue from contributions for contaminated sites currently amounts to some € 1.02 billion (1990–2010) with the individual years accounting for the amounts listed in the above table.

The general context

Experts are in agreement that in order to ensure the continuation of the great successes of the past 20 years in tackling the contaminated-site issue and to achieve the targets set out in the mission statement for the management of contaminated sites („Leitbild Altlastenmanagement“) – i.e. to register historically contaminated sites within one generation and implement measures to remediate heavily contaminated sites within two generations – an annual investment of at least € 70-100 million is required.

According to Environment Agency Austria, the minimum overall financing requirement for the remediation of contaminated sites is € 5 billion (for the implementation of measures on approx. 2,500 sites in application of the „repair principle“, i.e. leaving a certain residual contamination according to site and use-specific criteria; remediation efforts in accordance with the precautionary principle would cost twice as much). Thus far, the public sector has invested approx. € 1 billion. With a total annual investment of approx. € 100 million, it should be possible to attain the target set out in the mission statement to complete the implementation of all necessary measures within two generations (i.e. by 2050).

Apart from fulfilling the top priority of generating revenues, the new contribution model should also provide a clear steering effect for sustainable waste management, taking into account the hierarchy imposed by the new waste management framework directive.

Use of Revenue from Contaminated Site Contributions

Of the funds generated by contaminated site contributions
85% is used for
- the promotion of securing and remediation measures
- securing and remediation measures of the Federal Government in acc. with sec. 18 ALSAG
- reimbursements (limited in time and amount) and 15% is used for
- the implementation of supplementary investigations at suspected and confirmed contaminated sites as well as for studies on these and handling costs.
The above-mentioned revenues of approx. € 1,016 million are offset by outflows of funds amounting to approx. € 752 million. Additional guaranteed subsidies of approx. € 188 million are shown as pre-allocations for the next few years. The above table shows how these funds are put to use in the various areas (as of 1 January 2011).

### 9.5. Subsidising securing and remediation at contaminated sites

To date, the Federal Minister for Agriculture, Forestry, Environment and Water Management has approved 237 subsidisation projects with a total investment volume of approx. € 1,020 million and guaranteed subsidies of a volume of approx. € 774 million.

The subsidies are granted mainly for production and implementation measures (investment costs), ongoing securing and remediation measures over a period of five years (operating costs), as well as planning and construction supervision measures. The subsidies for securing or remediation measures for contaminated sites are managed by Kommunalkredit Public Consulting GmbH (www.public-consulting.at).

A breakdown of the use of funds by year, region, priority class and suspected site (abandoned landfills and industrial sites) is shown in the following tables.

<table>
<thead>
<tr>
<th>Fociuses</th>
<th>Pre-allocations</th>
<th>Payments</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Subsidies:</td>
<td>amount in € million</td>
<td></td>
</tr>
<tr>
<td>for securing/remediation</td>
<td>184.53</td>
<td>558.17</td>
<td>742.70</td>
</tr>
<tr>
<td>for studies</td>
<td>2.57</td>
<td>10.30</td>
<td>12.87</td>
</tr>
<tr>
<td>for immediate measures</td>
<td>0.70</td>
<td>17.78</td>
<td>18.48</td>
</tr>
<tr>
<td>Subsidy total:</td>
<td>187.80</td>
<td>586.25</td>
<td>774.05</td>
</tr>
<tr>
<td>2</td>
<td>Measures taken by the Federal Government in acc. with sec. 18 ALSAG:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Reimbursements/immediate measures:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Supplementary investigations in case of suspected and confirmed contaminated sites, studies (incl. compensation for KPC and additional UBA financing)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>100%</td>
<td>total</td>
<td>510.69</td>
<td>752.44</td>
</tr>
</tbody>
</table>

The earmarked subsidies of approx. € 774 million are distributed across:

- 208 contaminated site projects in the amount of approx. € 743 million
- 29 research projects in the amount of approx. € 13 million
- immediate measures at the contaminated site Fischer-Deponie in the amount of approx. € 18 million
## 9. Remediation of Confirmed Contaminated Sites


In accordance with sec. 18 ALSAG, the Federal Government, as the provider of civil rights, is charged with carrying out the required remedial measures on contaminated sites according to the priority classification („Prioritätenklassifizierung“, PK), if no other person can be obliged to do so; the financial burden thus incurred must not exceed the revenue from the contributions for contaminated sites.

Overall, 13 contaminated sites have so far been recognised as „section 18 sites“, of which the four contaminated sites indicated below have already been secured or remediated:

- N 08 „St. Georgi Stollen“
- S 07 „Arsenikhalde Rothgülden“

### Breakdown of funds used by approval year

<table>
<thead>
<tr>
<th>Year</th>
<th>Number</th>
<th>Investment costs</th>
<th>Subsidy</th>
</tr>
</thead>
<tbody>
<tr>
<td>1991</td>
<td>12</td>
<td>26,853,912</td>
<td>21,753,518</td>
</tr>
<tr>
<td>1992</td>
<td>9</td>
<td>13,719,834</td>
<td>11,240,648</td>
</tr>
<tr>
<td>1993</td>
<td>10</td>
<td>44,191,546</td>
<td>31,954,521</td>
</tr>
<tr>
<td>1994</td>
<td>6</td>
<td>27,325,435</td>
<td>22,208,314</td>
</tr>
<tr>
<td>1995</td>
<td>7</td>
<td>42,567,485</td>
<td>30,337,821</td>
</tr>
<tr>
<td>1996</td>
<td>11</td>
<td>60,455,144</td>
<td>43,203,569</td>
</tr>
<tr>
<td>1997</td>
<td>17</td>
<td>92,040,666</td>
<td>73,732,322</td>
</tr>
<tr>
<td>1998</td>
<td>8</td>
<td>9,424,525</td>
<td>4,407,637</td>
</tr>
<tr>
<td>1999</td>
<td>14</td>
<td>36,440,913</td>
<td>20,674,042</td>
</tr>
<tr>
<td>2000</td>
<td>17</td>
<td>131,805,613</td>
<td>92,995,610</td>
</tr>
<tr>
<td>2001</td>
<td>18</td>
<td>194,284,954</td>
<td>140,705,681</td>
</tr>
<tr>
<td>2002</td>
<td>5</td>
<td>23,013,541</td>
<td>12,517,494</td>
</tr>
<tr>
<td>2003</td>
<td>8</td>
<td>40,552,162</td>
<td>30,532,870</td>
</tr>
<tr>
<td>2004</td>
<td>5</td>
<td>30,198,238</td>
<td>25,868,934</td>
</tr>
<tr>
<td>2005</td>
<td>10</td>
<td>29,982,599</td>
<td>24,775,596</td>
</tr>
<tr>
<td>2006</td>
<td>11</td>
<td>24,788,427</td>
<td>19,797,413</td>
</tr>
<tr>
<td>2007</td>
<td>5</td>
<td>14,460,092</td>
<td>14,004,531</td>
</tr>
<tr>
<td>2008</td>
<td>7</td>
<td>66,172,639</td>
<td>54,249,783</td>
</tr>
<tr>
<td>2009</td>
<td>16</td>
<td>43,675,329</td>
<td>38,031,645</td>
</tr>
<tr>
<td>2010</td>
<td>12</td>
<td>34,392,995</td>
<td>29,708,465</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>208</strong></td>
<td><strong>986,346,050</strong></td>
<td><strong>742,700,416</strong></td>
</tr>
</tbody>
</table>

### Breakdown of funds used by Federal Province

<table>
<thead>
<tr>
<th>FP</th>
<th>Number</th>
<th>Investment costs</th>
<th>Subsidy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Burgenland</td>
<td>8</td>
<td>12,345,678</td>
<td>7,241,055</td>
</tr>
<tr>
<td>Carinthia</td>
<td>22</td>
<td>112,368,014</td>
<td>76,801,544</td>
</tr>
<tr>
<td>Lower Austria</td>
<td>44</td>
<td>247,489,014</td>
<td>205,413,964</td>
</tr>
<tr>
<td>Upper Austria</td>
<td>57</td>
<td>159,489,077</td>
<td>115,236,708</td>
</tr>
<tr>
<td>Salzburg</td>
<td>9</td>
<td>99,378,852</td>
<td>62,289,668</td>
</tr>
<tr>
<td>Styria</td>
<td>12</td>
<td>52,004,088</td>
<td>38,578,084</td>
</tr>
<tr>
<td>Tyrol</td>
<td>17</td>
<td>53,641,499</td>
<td>34,218,212</td>
</tr>
<tr>
<td>Vorarlberg</td>
<td>1</td>
<td>1,603,110</td>
<td>1,122,177</td>
</tr>
<tr>
<td>Vienna</td>
<td>38</td>
<td>248,026,718</td>
<td>201,798,104</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>208</strong></td>
<td><strong>986,346,050</strong></td>
<td><strong>742,700,416</strong></td>
</tr>
</tbody>
</table>

### Breakdown of funds used by priority

<table>
<thead>
<tr>
<th>Priority</th>
<th>Number</th>
<th>Investment costs</th>
<th>Subsidy</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>71</td>
<td>439,399,400</td>
<td>351,544,339</td>
</tr>
<tr>
<td>2</td>
<td>76</td>
<td>317,978,510</td>
<td>228,889,927</td>
</tr>
<tr>
<td>3</td>
<td>61</td>
<td>228,968,139</td>
<td>162,266,150</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>208</strong></td>
<td><strong>986,346,050</strong></td>
<td><strong>742,700,416</strong></td>
</tr>
</tbody>
</table>
For the other contaminated sites
N 16 „Tuttendorfer Breite“, Korneuburg priority class 1
N 55 „Betongrubenfelder Grube 1“, Obereggendorf priority class 3
N 56 „Betongrubenfelder Grube 2“, Obereggendorf priority class 3
N 06 „Aluminiumschlackendeponie“, Wiener Neustadt priority class 2
N 27 „Parkplatz Brevillier Urban“, Neunkirchen priority class 2
ST 1 „Teerfabrik Lederer-Mellitzer“, Stocking priority class 2
T 05 „Dachpappenfabrik Rum“, Rum priority class 2
O 40 „Holzmüllerstraße“, Linz priority class 2
N 46 „Tanklager Mare“, Korneuburg priority class 3

the remediation projects are already underway or in preparation.
The costs for the remediation of these contaminated sites are estimated to amount to approx. € 300 million.
The necessary remediation activities are implemented and handled by Bundesaltlastensanierungsges.m.b.H. (BALSA GmbH, as fully-owned subsidiary of Umweltbundesamt GmbH), which was founded in 2004 with the main object of remediating contaminated sites in acc. with sec. 18 ALSAG (cf. www.balsa-gmbh.at).

9.7. Reimbursement of required expenses and immediate measures

As a result of the transfer of competencies for administrative enforcement from the Federal Ministry of the Interior to the Federal Ministry of Agriculture, Forestry, Environment and Water Management on 1 April 2000, the latter is responsible for the financial management of the administrative enforcement.
Since 2000, approx. € 179 million have been paid out in the form of reimbursements as part of the administrative enforcement; of this amount, approx. € 130 million were accounted for by the payment obligations for the remediation of the contaminated site „Fischer-Deponie“. 
Other exceptional reimbursements were instal-
ments for the remediation of the „Berger-Deponie“
site totalling approx. € 33.6 million and the clearing
of the „Recycling-Point-Blumau“ for approx. € 9.7
million.
For the expenditure of approx. € 179 million hith-
erto incurred, approx. € 89 million were covered by
contaminated site contributions and approx. € 90
million came from the federal budget.
For the following years, the financing requirement
for existing known projects will amount to a mini-
mum of approx. € 16 million, mainly for clearing the
„ABS-Gelände Stockerau“ and the „Semax-De-
ponie“ sites.

9.8. Success in remediating
contaminated sites for
groundwater, soil and
climate protection

The Act on the Remediation of Contaminated Sites
(ALSAG) and the Environmental Support Act
(Umweltförderungsgesetz, UFG) have together
made a significant contribution to the remediation
of historical environmental harm. Since 1990, the
Federal Ministry of Agriculture, Forestry, Environ-
ment and Water Management has provided funds
of more than € 770 million in the form of subsidies
for environmental projects to do with the remedia-
tion and containment of contaminated sites. These
measures have improved the state of the environ-
ment and prevented harm to human health.
The remediation of contaminated sites made it pos-
sible to improve the quality of approx. 46 million
cubic metres of groundwater – equivalent to the
annual water consumption of approx. 1.7 million
persons.
A total of 16.5 million tonnes of contaminated site
materials were removed, thus preventing the fur-
ther dispersal of pollutants through seepage wa-
ter.
246 tonnes of solvents were extracted from the
groundwater.
As a direct result of the remedial measures, approx.
145 hectares of fallow land was rehabilitated and
is now used for economic activity.
116 contaminated sites in areas where groundwa-
ter is used have been remediated; at 8 sites, escap-
ing landfill gases were contained.
The implementation of the Austrian Act on the Re-
mediation of Contaminated Sites has contributed
substantially to the reduction of climate-relevant
 greenhouse gases, particularly methane, emanat-
ing from all landfills. In 1990, domestic abandoned
landfills produced 3.4 million tonnes of CO₂-equivalent worth of greenhouse gases (approx. 4.3% of the total Austrian greenhouse gas emissions). Thanks to the measures implemented for the remediation of contaminated sites, these emissions had fallen to 0.7 million tonnes of CO₂-equivalent by 2005.

9.9. Mission statement for the management of contaminated sites

A new mission statement for the management of contaminated sites in Austria

In May 2009, the Federal Ministry of Agriculture, Forestry, Environment and Water Management unveiled a new mission statement for the management of contaminated sites, formulated by a panel of experts from the federal and regional governments in discussions held over the course of one year. The background and point of departure for the preparation of this mission statement was the experience gained over 20 years of remediation of contaminated sites in Austria. This experience is to be used to complement existing strategies and concepts wherever expedient. The authors see the mission statement as a first step towards creating better conditions for the decision-making process in the management of contaminated sites.

From managing contaminated sites to sustainable land management

One of the targets of the Austrian Strategy for Sustainable Development is to reduce the increase of permanently secured areas to a maximum of 10% of the 2002 figure by 2010. The re-use of fallow sites could make a significant contribution to target fulfilment and counteract the rising trend towards the soil-securing of grassland. Together with climate protection, land consumption is one of the most pressing environmental issues in Austria today. Land consumption is currently increasing by approx. 11.5 hectares daily, a figure that substantially exceeds the target figures of the Austrian Strategy for Sustainable Development. Studies have shown that approx. 3 hectares of land used for commercial and industrial activities in Austria are turned into fallow land every day. Revitalising the new and existing brownfield land would make an important contribution to the reduction of land consumption. Moreover, potential financial savings could be realised by initiating measures to cut down on land use and promoting site development on existing but undeveloped building land, as well as by improving coordination in municipal development to counteract the increasing urban sprawl. According to rough estimates, this could result in a 24% reduction in the use of funds for development and infrastructure projects while slowing down urban sprawl.
The mission statement consists of six principles which are presented and explained below. For detailed explanations, please refer to the relevant publication from the Ministry of Agriculture, Forestry, Environment and Water Management.

**Principle 1**
Registering historically contaminated sites within one generation
Contaminated sites are sites where the soil is more than marginally polluted. The qualifier “historical” differentiates these sites from current pollution events and refers to sites which were contaminated prior to 1990. All of these sites will be registered in Austria by 2025.

**Principle 2**
Implementing measures (decontamination, containment, observation, restriction of use) for heavily contaminated sites within two generations
Depending on landfill volume, the dispersal of contaminants into the surrounding area and the type of use, different measures are required in the case of heavily contaminated sites (as by the definition in the mission statement), and can include restrictions on use, monitoring and/or remedial measures (decontamination or securing). It is currently assumed that there are approx. 5,000 abandoned landfills and industrial sites in Austria which bring about “considerable contamination” within the meaning of the mission statement; remediation measures are absolutely essential for approx. 2,500 of these sites (which can be considered “contaminated sites” within the meaning of the Act on the Remediation of Contaminated Sites as last amended). All necessary measures to be carried out on these sites should be completed by 2050.

**Principle 3**
Carrying out customised risk assessments for each site’s location and use
Potential effects of contaminated sites on human health and the environment depend on the type and magnitude of the pollution, but also on other factors specific to the site’s location and use. If the location and use-specific conditions are not sufficiently taken into account, this can result in erroneous assessments of the risk posed by the site, which in turn may lead to a disproportionate response with measures that exceed the risk mitigation requirements or, conversely, that do not sufficiently address the existing risks. To ensure that resources are used efficiently, the risk assessment of each contaminated site needs to take into account the specifics of each individual case.

**Principle 4**
Choosing measures based on location and use while ruling out any intolerable risks for human health or the environment
The selection of measures begins with a definition of targets based on the risk assessment and taking into account the specific requirements of the location and use. The measures can then be adapted to the specifics for each individual case. For instance, residual pollution may be tolerable insofar as it does not impinge upon the site- and use-specific functions of the ecosystem’s soil, subsoil and waters. As a prerequisite or minimum requirement, the measures to be initiated have to ensure that intolerable risks for human health or the environment are ruled out.

**Principle 5**
Remedial measures (decontamination, securing) should be sustainable and lead to a permanent improvement in the environmental situation
One premise is that the choice of remedial measures to be applied must be conducive to the overall aim of the remediation effort for contaminated sites – the improvement of the environmental situation. This overriding aim should generally be pursued with the suitable technical means and in careful consideration of benefits and costs. Contaminated sites should be managed with an eye on minimising the impact on economic resources, while the positive effects on the environment to be brought about by remedial measures should be considered in conjunction with social aspects.

**Principle 6**
Establishing better framework conditions for the subsequent use and reintegration of contaminated sites into the economic system
In order to promote the reintegration of remedi- ated sites (“recycled land”) into the economic system and to facilitate subsequent use of the site, it is necessary to improve some of the technical underpinnings to minimise the risk of contamination and strengthen the legal basis. Existing interfaces with other related technical departments and authorities (e.g. urban and regional planning, water management, building authorities) could be built upon or new ones established. At the same time, a financial incentive system (e.g. subsidies for “recycling” brownfield sites) could be used to jump-start the re-use and revitalisation of contaminated sites.
Outlook
The mission statement for the management of contaminated sites introduced on these pages is intended to serve as a foundation on which to further develop the management of contaminated sites in Austria. It is also intended to provide a stimulus for the creation of new regulations and standards, as well as the further development of existing ones. The „Altlastenmanagement 2010“ initiative of the Federal Ministry of Agriculture, Forestry, Environment and Water Management, coordinated by Environment Agency Austria, made progress in recent years by developing and putting into concrete terms the operational foundations of the management of contaminated sites.

9.10. Advancements in contaminated site law

Building on the experience gained in over 20 years spent implementing the Act on the Remediation of Contaminated Sites and the mission statement on the management of contaminated sites, as well as the results of the „Altlastenmanagement 2010“ project, it is the stated aim of the Federal Ministry of Agriculture, Forestry, Environment and Water Management to implement a procedural law for contaminated sites in the current parliamentary term.

A new federal act governing the implementation and financing of the remediation of contaminated sites will take on board the successful elements of ALSAG 1989, but set out a separate, new procedure. The current practice of approving measures to remediate contaminated sites on the basis of law governing the various materials, particularly water law, must be considered as sub-optimal in light of these laws and regulations that aim to ensure precautionary environmental protection.

Contaminated sites constitute environmental damage that has arisen sometime in the past (according to the current laws in the period prior to 1 July 1989), where decontamination with the aim of re-establishing the original environmental conditions is usually neither technically nor economically feasible or expedient. Both the categorisation as a long-term contaminated site and the definition, based on this categorisation, of remediation targets should not orientate themselves solely on the encountered contaminants, their reaction potential and the site-specific factors, especially geological and hydro-geological factors, but should also include the possibility of dispersion of pollutants as well as the intended future use of the site and the protected assets concerned.

Furthermore, special provisions will ensure that the responsible polluters can be swiftly identified. Experts are in agreement that in order to ensure a successful continuation of the measures set so far and to achieve the overriding aim of completing the remediation of long-term contaminated sites in Austria within the time-frame of two generations (i.e. by 2050), funds of approx. € 100 million from public and private sources must be invested every year. The sourcing of these funds or of part of the public funds of at least € 70 million therefore also necessitates an adaptation of the existing contribution system in the medium term.
Information on agriculture, food, forests, environment and water:  
www.lebensministerium.at

The initiative REGION OF DELIGHT AUSTRIA highlights the importance of regional specialities:  
www.genuss-region.at

The campaign vielfaltleben (livingdiversity) contributes to the fact that Austria belongs in terms of natural areas to the most diverse countries of Europe:  
www.vielfaltleben.at

The action programme of the Ministry of Life on active climate protection:  
www.klimaaktiv.at

The youth platform for awareness raising on water issues:  
www.generationblue.at

The Austrian Eco-label guarantees the environmental soundness of products and services:  
www.umweltzeichen.at

The Ecological Footprint is the easiest way of testing the future viability of your lifestyle. Calculate your personal footprint at:  
www.mein-fussabdruck.at

The internet portal of Austria’s National Parks:  
www.nationalparksaustria.at

“Organic” means healthy, high-quality foodstuffs which do not contain any spraying agents or antibiotics  
www.biolebensmittel.at