



Factsheet

Waste

Note: the objective of this factsheet is to clarify the circumstances under which a substance may or may not be regarded as a waste.

If a substance is already registered under REACH and the registrant decides it is actually a waste and thus exempted from REACH registration obligations, please refer to the factsheet on REACH & ceasing manufacture.

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1. Definitions in the Waste Framework Directive (WFD) Article 3

1.1. Waste

Waste is defined by the WFD as 'any substance or object which the holder discards or intends or is required to discard.'

- 'Discard' applies to both recovery and disposal of waste. However, it should be noted that this does not mean that any substance which undergoes a recovery/disposal operation as listed in the WFD Annexes is a waste *per se*, but it might be regarded as evidence for being waste;
- Discard can involve a positive, neutral, or negative commercial value. No distinction is made based on whether the substance/object is marketable or not;
- Discard can be intentional/deliberate on the part of the holder or unintentional / involuntary / accidental or even can occur with or without the knowledge of the holder;
- The storage location of a material does not influence whether it is a waste or not.

1.2. Waste prevention

- **Prevention** is defined by the WFD as *'measures taken before a substance, material or product has become waste, that reduce:*
 - *the quantity of waste, including through the re-use of products or the extension of the life span of products;*
 - *the adverse impacts of the generated waste on the environment and human health; or*
 - *the content of harmful substances in materials and products.'*

Technically, 'prevention' is not a waste management operation because it concerns substances or objects before they become waste. Consequently, obligations under waste management legislation (permits and registration, inspections, requirements for transfrontier shipments) do not apply.

- **Re-use** is defined by the WFD as *'any operation by which products or components that are not waste are used again for the same purpose for which they were conceived.'* Re-use is a means of waste prevention; it is not a waste management operation.

1.3. Waste treatment: recovery & disposal

- **Waste treatment** is defined by the WFD as *'recovery or disposal operations, including preparation prior to recovery or disposal.'*
- **Recovery** is defined by the WFD as *'any operation the principal result of which is waste serving a useful purpose by replacing other materials which would otherwise have been used to fulfil a particular function, or waste being prepared to fulfil that function, in the plant or in the wider economy.'* Annex II of the WFD sets out a non-exhaustive list of recovery operations:

R1	Use principally as a fuel or other means to generate energy
R2	Solvent reclamation/regeneration



R3	Recycling/reclamation of organic substances which are not used as solvents (incl. composting and other biological transformation processes)
R4	Recycling/reclamation of metals and metal compounds
R5	Recycling/reclamation of other inorganic materials
R6	Regeneration of acids or bases
R7	Recovery of components used for pollution abatement
R8	Recovery of components from catalysts
R9	Oil re-refining or other reuses of oil
R10	Land treatment resulting in benefit to agriculture or ecological improvement
R11	Use of waste obtained from any of the operations numbered R1 to R10
R12	Exchange of waste for submission to any of the operations numbered R1 to R11
R13	Storage of waste pending any of the operations numbered R1 to R12 (excl. temporary storage, pending collection, on the site where the waste is produced)

[Note: Clearly from R4, recycling and recovery of metals and metal compounds from wastes is permitted, without affecting the initial classification of those substances as wastes. R4 recognises that what metals are reclaimed from is waste. R11 recognises that waste arises in the recycling of metals and metal compounds. Such wastes might be flue dust and slags.]

Recovery is divided into 3 sub-categories: preparing for re-use, recycling, and other recovery.

- **Preparing for re-use** is defined by the WFD as *‘checking, cleaning or repairing recovery operations, by which products or components of products that have become waste are prepared so that they can be re-used without any other pre-processing.’* By definition, preparing for re-use is a specific case of recovery.
The key difference between ‘re-use’ and ‘preparing for re-use’ is that in the former case the material or object has not become a waste, whereas in the case of ‘preparing for re-use’, the material in question has become waste in the meaning of the waste definition (because previously discarded by the holder).
- **Recycling** is defined by the WFD as *‘any recovery operation by which waste materials are reprocessed into products, materials or substances whether for the original or other purposes. It includes the reprocessing of organic material but does not include energy recovery and the reprocessing into materials that are to be used as fuels or for backfilling operations.’*
- **Other recovery** is not mentioned in the definition section but is any operation meeting the definition of ‘recovery’ under the WFD but failing to comply with the specific requirements for preparation for re-use or for recycling.
- **Disposal** is defined by the WFD as *‘any operation which is not recovery even where the operation has as a secondary consequence the reclamation of substances or energy.’* Annex I of the WFD sets out a non-exhaustive list of disposal operations:

D1	Deposit into or on to land (e.g. landfill, etc.)
D2	Land treatment (e.g. biodegradation of liquid or sludgy discards in soils, etc.)
D3	Deep injection (e.g. injection of pumpable discards into wells, salt domes or naturally occurring repositories, etc.)
D4	Surface impoundment (e.g. placement of liquid or sludgy discards into pits, ponds or lagoons, etc.)
D5	Specially engineered landfill (e.g. placement into lined discrete cells which are capped and isolated from one another and the environment, etc.)
D6	Release into a water body except seas/oceans
D7	Release to seas/oceans including sea-bed insertion
D8	Biological treatment not specified elsewhere in this Annex which results in final compounds or mixtures which are discarded by means of any of the operations numbered D1 to D12
D9	Physico-chemical treatment not specified elsewhere in this Annex which results in final compounds or mixtures which are discarded by means of any of the operations numbered D1 to D12 (e.g. evaporation, drying, calcination, etc.)
D10	Incineration on land
D11	Incineration at sea (prohibited by EU legislation and international conventions)
D12	Permanent storage (e.g. emplacement of containers in a mine, etc.)
D13	Blending or mixing prior to submission to any of the operations numbered D1 to D12
D14	Repackaging prior to submission to any of the operations numbered D1 to D13
D15	Storage pending any of the operations numbered D1 to D14 (excluding temporary storage, pending collection, on the site where the waste is produced)



2. Waste hierarchy

WFD Article 4(1) states that ‘the following waste hierarchy shall apply as a priority order in waste prevention and management legislation and policy:

- (a) Prevention;
- (b) Preparing for re-use;
- (c) Recycling;
- (d) Other recovery, e.g. energy recovery; and
- (e) Disposal.’



3. When does waste cease to be waste: the concept of ‘end-of-waste’

- WFD Article 6(1) states that ‘certain specified waste shall cease to be waste within the meaning of Article 3(1) when it has undergone a recovery, including recycling, operation and complies with specific criteria to be developed in accordance with the following conditions:

- (a) the substance or object is commonly used for specific purposes;
- (b) a market or demand exists for such a substance or object;
- (c) the substance or object fulfills the technical requirements for the specific purposes and meets the existing legislation and standards applicable to products; and
- (d) the use of the substance or object will not lead to overall adverse environmental or human health impacts.

These ‘end-of-waste’ criteria shall include limit values for pollutants where necessary and shall take into account any possible adverse environmental effects of the substance or object.’ Such criteria will be set for specific materials by the Commission as delegated acts under the Comitology procedure. For each waste stream different factors need to be considered.

- Where criteria have not been set at Community level, Member States may decide case by case whether certain waste has ceased to be waste taking into account the applicable case law.
- Thus waste ceases to be waste when it has been sufficiently refined to have a downstream use without further processing and is capable of replacing a substance or preparation of substances manufactured from primary sources. E.g. partially refined scrap metal has been through sufficient steps in the recovery process to separate it from tramp material and enable it to replace material from primary sources. Although not fully refined, its use for one or more specific purposes is certain. Some less exacting uses may not require further refining. It is, in any case, in a form in which it can no longer contaminate humans or the environment.

4. The concept of ‘by-product’

- A **production residue** is a material that is not deliberately produced in a production process but may or may not be a waste.
- Article 5(1) of the WFD sets out the following four conditions that a production residue must meet in order to be considered a **by-product**:
 - (a) Further use of the substance or object is certain¹;
 - (b) The substance or object can be used directly without any further processing other than normal industrial practice²;
 - (c) The substance or object is produced as an integral part of a production process³; and
 - (d) Further use is lawful, i.e. the substance or object fulfills all relevant product, environmental and health-protection requirements for the specific use and will not lead to overall adverse environmental or human health impacts. (i.e. or e.g. REACH)

¹ If further use were not certain, there would be a risk of the material being disposed of as waste. If the holder of the material in question is storing it for an indefinite time period, further use is not certain.

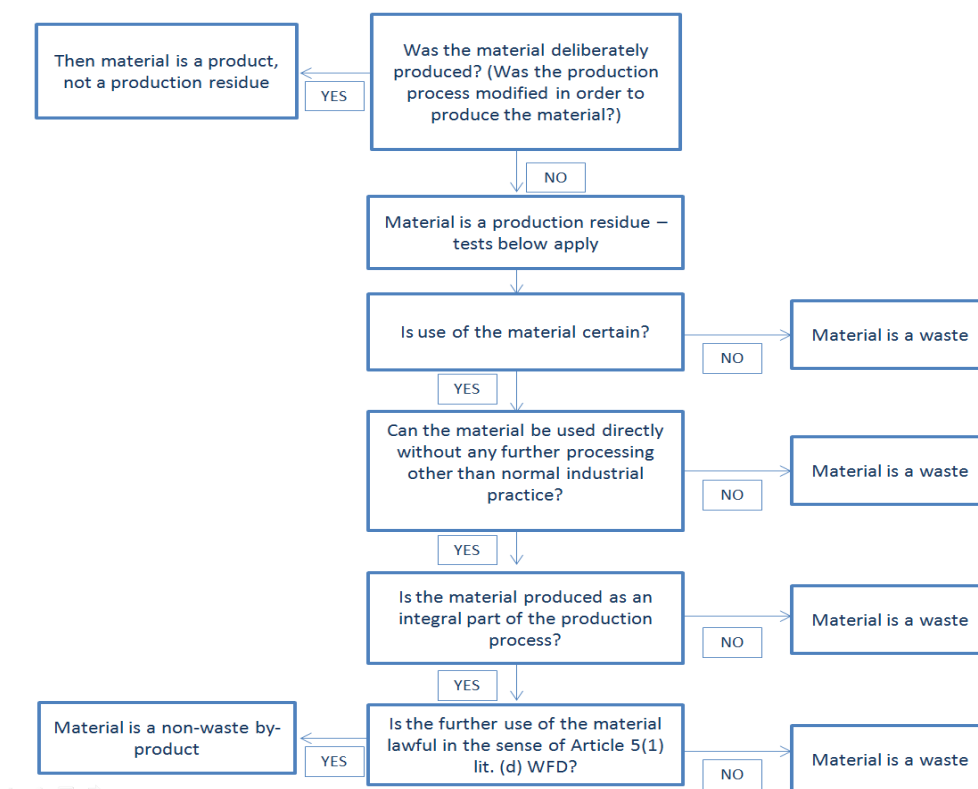
² If a production residue has to be treated before it can be used, this may indicate a waste treatment operation. On the other hand, it has to be considered that primary raw materials usually also require some processing before they can be used in production processes.

³ If a material leaves the site or factory where it is produced in order to undergo further processing, this may be evidence that such tasks are no longer part of the same production process, thus disqualifying it as a by-product. However, following the cumulative test principle, Article 5(1)(b) must also be taken into account: further treatment operations which are normal industrial practice do not exclude the classification of a production residue as a by-product, irrespective of where such industrial treatment is carried out – on the site of the generator of the material, on the site of the industrial facility using the material, or on an intermediate site.



These tests are cumulative, meaning that all four conditions must be met.

- ‘Normal industrial practice’ can include all steps which a producer would take for a product, such as the material being filtered, washed, or dried; or adding materials necessary for further use; or carrying out quality control. However, treatments usually considered as a recovery operation (treatment techniques that address typical waste-related characteristics of the production residue) cannot, in principle, be considered as normal industrial practice in this sense. Some of such processing tasks can be carried out on the production site of the manufacturer, some on the site of the next user, and some by intermediaries, as long as they also meet the criterion of being ‘produced as an integral part of a production process’



- Bearing in mind that any substance or object can be either waste or non-waste, by-products are regarded by definition as non-waste. This means that by-products should be subject, where applicable, to legislation which excludes waste from its scope, such as REACH.
- An object considered a by-product under the WFD is in principle subject to REACH Regulation, since the exclusion provisions of [Article 2\(2\) of REACH Regulation](#) apply to ‘waste’ only. All REACH requirements (e.g. registration and communication obligations) have to be fulfilled where applicable. It should be noted that [Annex V of REACH Regulation](#) includes an exemption from the registration obligation concerning ‘by-products’. Note that the term ‘by-products’ is not defined in REACH Regulation itself. The Guidance Document for Annex V of the REACH Regulation issued by ECHA refers to article 5 of the WFD for the definition of ‘by-product’. However, it should be stressed that the exemption set out in Annex V of REACH Regulation applies only on the condition that by-products are not imported or placed on the market themselves (i.e. by-products which are transported do not benefit from the exemption).

5. Which regulations apply to waste/non-waste?

- Within the EU, the national regulations implementing the WFD will apply and must be observed for waste. The WFD is a Directive, so each Member State is obliged to enact a law which implements the Directive, thus each Member State will have laws which can be different from each other.
- As described in the exclusion provisions of [Article 2\(2\)](#), the REACH Regulation exempts waste from it, but it does not define waste, as this is covered by the WFD. This does not, however, mean that substances in waste are totally exempted from REACH. Manufacturers or importers of a substance subject to registration under REACH are obliged to take the waste life-cycle stage



of the substance into account, where relevant, according to [Annex I, section 5.2.2](#) of REACH, when undertaking the appropriate assessments under Title II, REACH. In particular, according to [Article 3\(37\)](#) of REACH, exposure scenarios are defined as ‘*set of conditions, including operational conditions and risk management measures, that describe how the substance is manufactured or used during relevant parts of its life-cycle and how the manufacturer or importer controls, or recommends downstream users to control, exposures of humans and the environment. [...]*’. The waste, in which a substance may be contained, includes waste from manufacture of the substance, waste occurring as a consequence of the use of the substance and waste formed at the end of service life of articles in which the substance is contained.

The status of waste in the context of exposure scenarios and the interaction between REACH and waste legislation in that respect are described in section R 13.2.6 and R 18.2 of the guidance on information requirements and chemical safety assessment.

- As soon as a material ‘ceases to be waste’, REACH requirements apply in principle in the same way as to any other material, unless the material is covered by an exemption.
- Recovery processes often take place in several steps, and sometimes only the last step will result in a material that will no longer be classified as waste under the EU waste legislation. Additionally, there may be cases where only a fraction of the material resulting from the recovery process will be non-waste.
- Therefore, all recovery steps which do not result in a non-waste material are parts of the waste treatment process which is subject to waste legislation. Wastes that arise during recovery processes, are exempt from REACH. For the purpose of REACH, recovered substances should only be understood as substances that, after having been part of waste materials, have ceased to be waste according to the WFD.
- A recovery operator may be able to benefit from the exemption under [Article 2\(7\)\(d\)](#) of REACH: ‘*The following shall be exempted from Titles II, V and VI: [...] (d) Substances, on their own, in mixtures or in articles, which have been registered in accordance with Title II and which are recovered in the Community if:*
 - (i) *the substance that results from the recovery process is the same as the substance that has been registered in accordance with Title II; and*
 - (ii) *the information required by [Articles 31 or 32](#) relating to the substance that has been registered in accordance with Title II is available to the establishment undertaking the recovery.*’

6. How to decide whether a material is a waste?

Whether a material is a waste or not depends on the specific factual circumstances, and therefore the decision must be taken on a case-by-case basis, taking into account above definitions and regulations. In addition, the following aspects should be taken into account when defining whether or not a material can be considered a waste:

- The full detailed life cycle of a material stream should be considered in determining the status of the material.
- Similar material streams can be and have been named differently by different companies (by-products, intermediates, waste, etc.).
- Similar material streams can be and have been looked at differently by local, regional, Member State and international competent authorities responsible for waste legislation or for waste transport legislation. It is therefore important to consider national/local legislation when deciding on the status of a material.
- When companies decide that their material is a waste, they should make sure they have sufficient arguments to clearly demonstrate this to authorities if needed.
- The European Commission has drawn up a list of wastes (the “European Waste Catalogue” - <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2000:226:0003:0024:EN:PDF>) and reviews and revises it from time to time. This is however not an exhaustive list of wastes, but the inclusion of a substance or object in it is indicative that it may be waste. It can therefore be a helpful starting point in assessing whether a substance or object is waste or not.



7. Examples waste / non-waste

7.1. Slags and dusts from iron and steel production (from “Guidelines on the interpretation of key provisions of Directive 2008/98/EC on waste” - European Commission, June 2012)

- Blast furnace slag is produced in parallel with hot iron in a blast furnace. The production process of the iron is adapted to ensure that the slag has the requisite technical qualities. A technical choice is made at the start of the production process that determines the type of slag that is produced. Moreover, use of the slag is certain in a number of clearly defined end uses, and evidence of a demand can be provided. Blast furnace slag can be used directly at the end of the production process, without further processing that is not an integral part of this production process (such as crushing to get the appropriate particle size). This material can therefore be considered a by-product and fall outside the definition of waste.
- In contrast, de-sulphurisation slag is produced due to the need to remove sulphur prior to the processing of iron into steel. The resulting slag is rich in sulphur, cannot be used or recycled in the metallurgical circuit and is therefore usually disposed of in a landfill.
- Another type of example is dust extracted from the steel production process when cleaning the air inside the plant. This is captured in filters via an extraction process. These filters can be cleaned and the metallic content returned to the economic cycle via a recycling operation. Both of these production residues are therefore wastes at the point of production with the iron content extracted from the filters ceasing to be waste once it has been recycled.

7.2. Spent catalyst (from “Guidelines for the management of spent catalysts” - ECMA, February 2012)

- If spent catalyst is being sent for regeneration and the ownership of the catalyst does not change then some national authorities do not consider the material as a waste. In such a situation the regulations pertaining to the transport/transfer of wastes do not apply.
- If, however, the generator of the spent catalyst consigns a spent catalyst to a recovery or disposal facility then the spent catalyst will be classified as a waste (WFD: “any substance or object which the holder discards or intends or is required to discard”).
[Note: Indeed, whereas some sites have operational permits for refining activities, some PM refiners are actually ‘registered’ with their permitting authorities as waste incinerators; it is much more difficult to claim non-waste status of feed material for waste incinerators than it is for PM refiners.]
- Since the definition of “waste” and “hazardous waste” can give rise to considerable discussion and different interpretations or understandings between different authorities, it may be necessary for the owner of a spent catalyst to obtain a clear understanding of the requirements of the various national or international authorities who may have jurisdiction over the spent catalyst while it is in transit through or being received in any particular country. In this case, there should also be a general understanding of which documents and permits will be required, within which timeframe, when the spent catalyst is sent for processing.

8. Further reading

- Waste Framework Directive (Directive 2008/98/EC):
<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:312:0003:0030:EN:PDF>
- Guidelines on the interpretation of key provisions of Directive 2008/98/EC on waste:
http://ec.europa.eu/environment/waste/framework/pdf/guidance_doc.pdf
- Communication from COM to EC and EP on waste and by-products:
http://eur-lex.europa.eu/LexUriServ/site/en/com/2007/com2007_0059en01.pdf
- ECHA Guidance on waste and recovered substances:
http://echa.europa.eu/documents/10162/13632/waste_recovered_en.pdf
- EU end-of-waste regulations and technical reports
 - <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2011:094:0002:0011:EN:PDF>
 - <http://ftp.jrc.es/EURdoc/JRC53238.pdf>
 - <http://ftp.jrc.es/EURdoc/JRC64207.pdf>
- European Waste Catalogue (Commission Decision 2000/532/EC):
<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2000:226:0003:0024:EN:PDF>
- Guidelines for the management of spent catalysts :



<http://www.cefic.org/Documents/About%20us/Industry%20sectors/ECMA/ECMA%20GUIDELINES%20FOR%20THE%20MANAGEMENT%20OF%20SPENT%20CATALYSTS-201202.pdf>