Guidance document on the definition and classification of waste

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Foreword

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Notice

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List of Abbreviations

ABANDA	Database on waste analyses ('Abfallanalysendatenbank')
AH	Absolute Hazardous Entry
ANH	Absolute Non-Hazardous Entry
ATP	Adaption to Technical Progress
BDE	Brominated diphenyl ethers
BREF	Best Available Techniques Reference Document
BTEX	Benzene, Toluene, Ethylbenzene and Xylene
CaO	Calcium oxide
$Ca(OH)_2$	Calcium hydroxide
CEN	European Committee for Standardization
CJEU	Court of Justice of the European Union
C&L	Classification & Labelling
CLP	Classification, Labelling and Packaging
CLRTAP	Convention on Long-Range Transboundary Air Pollution
ECHA	European Chemicals Agency
EEA	European Environmental Agency
ELV	End of life vehicles
ETDS	Environmental Terminology and Discovery Service
EU	European Union
GHS	Globally Harmonised System
HP	Hazardous Property
ICP-MS	Inductively Coupled Plasma Mass Spectrometry
LANUV	Environment Agency of North Rhine-Westphalia ('Landesamt für Natur, Umwelt und Verbraucherschutz' Nordrhein-Westfalen')
LoW	List of Waste (Decision 2000/532/EC, as amended)
MH	Mirror Hazardous Entry
MNH	Mirror Non-Hazardous Entry
MS	(EU) Member State
ODS	Ozone depleting substances
OSHA	Occupational Safety & Health Administration
PAH	Polycyclic Aromatic Hydrocarbons
SDS	Safety Data Sheet
TOC	Total Organic Carbon

UN	United Nations
UNECE	United Nations Economic Commission for Europe
UNEP	United Nations Environment Programme
US	United States
WEEE	Waste electrical and electronic equipment
WFD	Waste Framework Directive (2008/98/EC)
WHO	World Health Organization

Glossary

Cut-off value	Where a substance is present in the waste at a concentration below a given numerical value (i.e. its cut-off value), it shall not be considered towards the calculations for comparison against the specific thresholds (concentration limits) for assigning the relevant hazard properties, indicated in Annex III to the WFD. Cut-off values to be applied for certain HP codes are indicated in this same annex.
M-factor	M-factor means a multiplying factor. It is applied to the concentration of a substance classified as hazardous to the aquatic environment acute category 1 or chronic category 1, and is used to derive by the summation method the classification of a mixture in which the substance is present.
Chapter (LoW)	The LoW contains 20 chapters categorising wastes according their source (chapters 01 to 12 and 17 to 20), type (chapters 13 to 15) and not otherwise specified (chapter 16). The chapter numbering in the LoW has two digits.
Sub-chapter (LoW)	Chapters of the LoW are further divided into sub-chapters with four digits. Sub-chapters group wastes based on common origins or properties.
Entry (LoW)	Entries of the LoW show a six digit code and cover different type of wastes. Wastes assigned to entries with an asterisk (*) shall be considered hazardous. All other entries of the LoW are considered non-hazardous. Thereby a waste has to be either hazardous or non-hazardous. There are different types of entries: AH, ANH, MNH, MH (see below).
Absolute Hazardous (AH) entry	AH entries are entries with six digits from the LoW. Wastes which are assigned to AH entries cannot be allocated to alternative non-hazardous entries and are hazardous without any further assessment.

Absolute non-hazardous (ANH) entry	ANH entries are entries with six digits from the LoW. Wastes which are assigned to ANH entries cannot be allocated to alternative hazardous entries and are non-hazardous without any further assessment.
Mirror entry	Mirror entries are a group of at least two alternative entries with six digits on the LoW. In contrast to AH or ANH entries, if waste is to be allocated to a group of alternative entries (namely Mirror non-hazardous (MNH) entries and mirror hazardous (MH) entries, further steps in the assessment for allocation have to be undertaken.
Harmonised classification	For some substances the decision on the classification of the chemical is officially taken at EU level. This classification can be found in Table 3.1 of Part 3 of Annex VI to the CLP Regulation. It is mandatory to apply this harmonised classification.
Self-classification	In absence of a harmonised classification, manufacturers, importers and downstream users have to self-classify the chemicals according to the CLP Regulation.
Hazardous waste	Hazardous waste means waste which displays one or more of the hazardous properties listed in Annex III to the WFD. The LoW includes hazardous waste and takes into account the origin and composition of the waste and, where necessary, the limit values of concentration of hazardous substances. The LoW shall be binding as regards determination of the waste which is to be considered as hazardous waste.
Hazardous property (HP)	HPs are properties of waste which render it hazardous. There are 15 HPs described in Annex III to the WFD. In some cases hazardous properties of waste are assessed based on the properties and concentrations of the hazardous substances contained in the waste.
Substance	Substance means according to the definition of the REACH Regulation a chemical element and its compounds in the natural state or obtained by any

	manufacturing process, including any additive necessary to preserve its stability and any impurity deriving from the process used, but excluding any solvent which may be separated without affecting the stability of the substance or changing its composition.
Mixture	Mixture means according to the definition of the REACH Regulation a mixture or solution composed of two or more substances.
Article	Article means according to the definition of EU REACH Regulation an object which during production is given a special shape, surface or design which determines its function to a greater degree than does its chemical composition.
Hazardous substance	A substance or a mixture fulfilling the criteria relating to physical hazards, health hazards or environmental hazards, laid down in Parts 2 to 5 of Annex I to the CLP regulation is hazardous and shall be classified in relation to the respective hazard classes provided for in that Annex.
Hazard statement code	A hazard statement code is a phrase assigned to a hazard class and category that describes the nature of the hazards of a hazardous substance or mixture, including, where appropriate, the degree of hazard. For example a carcinogenic substance could be assigned with 'H350' or 'H351'.
Hazard Class	Hazard class means the nature of the hazard. For example a carcinogenic substance is defined by 'Carc.'
Hazard Category	Hazard category means a sub-category of the hazard class that describes the severity of the hazard. For example a carcinogen could be '1A'. '1B' or '2'.

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1. Introduction

1.1. Background

Waste management is becoming increasingly sophisticated and complex. In the same time, the knowledge on waste generation, waste properties and waste management has been vastly improved during the last 15 years, when the EU first developed a consolidated list of waste (the then so-called 'European Waste Catalogue') bringing together two separate lists as they were applied before (since 1994).

Further, the waste management industry today is a fast-growing innovative sector, developing new treatment technologies or using existing technologies (including pre-treatment) much more efficiently. These changes provide many specific solutions, enabling the use of waste as a resource as well as the ability to recover raw materials from waste on many occasions. In this respect, the management of waste, including hazardous waste, offers many opportunities for society as a whole.

At the same time, waste management is a sector where impacts for health and the environment are of particular concern, and this is indeed specifically recognised for hazardous wastes by EU waste law. The question if the advantages of recycling are outweighed by unwanted transfers and perpetuation of hazardous substances in the material cycle needs to be carefully considered and offers difficult challenges for regulators, authorities and economic actors.

Against this background, the classification of waste as hazardous or non-hazardous, and, in particular, understanding at what point and under what circumstances waste is to be considered hazardous is a crucial decision in the entire chain of waste management from generation to final treatment (indeed, it goes even beyond this, since the knowledge about what makes waste hazardous also is relevant in the case of waste prevention). At the point where a waste is correctly classified as hazardous, a number of important obligations are triggered, for instance on labelling and packaging, but also in terms of the available compliant treatment.

The EU has learned lessons from the application of previous waste legislation and has taken the scientific and economic progress into account when the framework for classification of waste and the list of properties that render waste hazardous have been modified in 2014. This update of legislation, which also takes into consideration the fundamental changes in EU chemicals legislation during the last years, again sets out challenges for authorities and industry.

1.2. To whom is the guidance addressed?

This document aims at assisting national authorities and businesses with guidance on how to understand and correctly apply the relevant EU legislation regarding the classification of waste, in particular the Waste Framework Directive and the List of Waste.

1.3. How to read the guidance?

The overall background and the specific legislative framework are presented in chapters 1 and 2.

Chapter 3 guides through the basic steps of the classification process. It does not contain specific information on how to perform the necessary steps for classification but rather mentions a general overview. For certain steps, reference is made to the corresponding Annex, where more detailed information can be found.

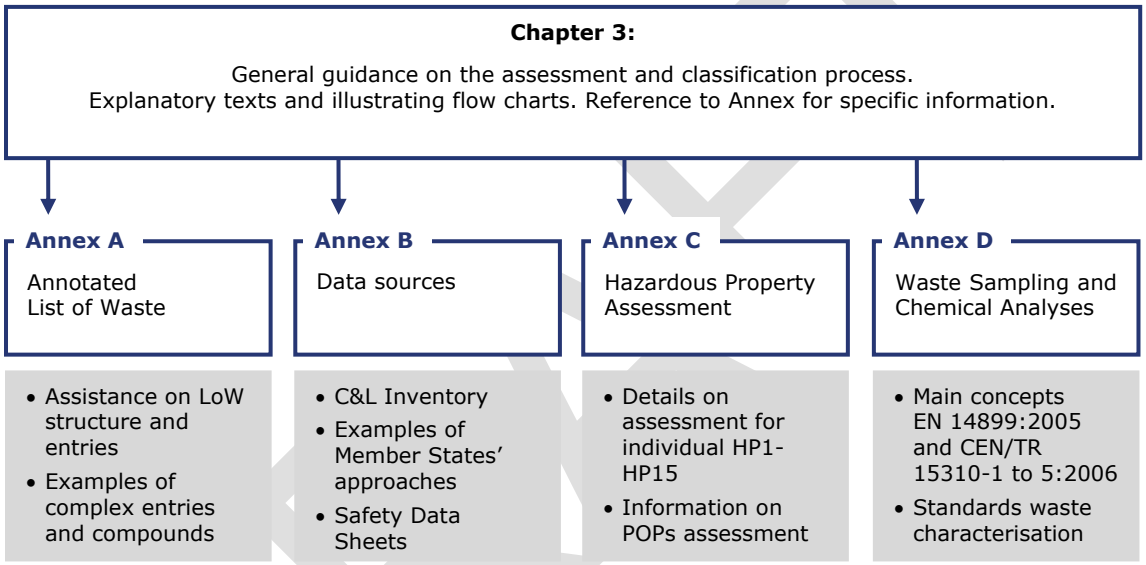

Figure 1: Overview structure of this guidance document

2. Legislative Framework

2.1. Waste Legislation

2.1.1. Waste Framework Directive (WFD)

The WFD sets out what waste is and how it should be managed. It considers some wastes to be hazardous waste.

A hazardous waste is defined as a waste that displays one or more of the fifteen hazardous properties listed in Annex III to the WFD. Article 7 of the WFD sets the basis for the LoW.

Box 1: The Waste Framework Directive

The Waste Framework Directive 2008/98/EC (hereinafter WFD) is the key legislative document on waste at the EU level, containing general definitions, fundamental principles, and basic obligations of different relevant actors. Being a Directive, the WFD is transposed into the national legislation of the MS by means of separate legal acts.

The scope of the Directive focuses on 'waste' as defined in Article 3(1) WFD, i.e.

> *'any substance or object which the holder discards or intends or is required to discard'.*

Any substance or object is either waste or non-waste (non-waste including products, industrial by-products and substances or objects which have reached the 'end-of-waste'-status). Whereas in many cases the decision whether a substance or an object is 'waste' in the sense of the WFD is easy to determine, some other cases are difficult. Extensive guidance on the term 'waste' and its understanding, including on certain exclusions from the scope of WFD, and examples from the binding jurisprudence of the CJEU, can be found in the document [EC 2012]. If the substance or object fulfils the criteria for being waste, it is subject to the waste legislation including waste classification (unless it is specifically excluded from the scope of WFD).

The WFD also defines 'hazardous waste' in its Article 3(2):

> *'waste which displays one or more of the hazardous properties listed in Annex III'.*

Just as the question whether something is 'waste', the question whether it is 'hazardous waste' is a crucial decision, following a binary test: waste is always either hazardous or non-hazardous. For the case that waste is hazardous, a number of specific obligations apply, e.g.

- labelling and packaging obligations (Article 19);
- the obligation to provide evidence for the tracking of the waste according to the system put by the relevant Member State (Article 17);
- a mixing ban (Article 18, see for details on mixing ban [EC 2012]).

The EU legislation further determines that hazardous waste must only be treated in specially designated treatment facilities that have obtained a special permit.

The criteria of Annex III to the WFD have been recently adapted to scientific progress. The act amending Annex III is Commission Regulation 1357/2014, which being a regulation is directly applicable in the Member States without transposition to national legislation. The new Hazardous Properties (HP) are to be applied as of 1 June 2015. The hazardous properties are discussed in detail in Annex C of this document.

In the context of waste classification, further note that Article 7 WFD sets the basis for the List of Waste (the 'LoW', Decision 2000/532/EC, see below) and its application. Member States may introduce additional entries in the national documents reflecting the LoW.

Article 7 of the WFD

Article 7(2) and (3) WFD set out provisions for the case that a Member considers a waste as hazardous which is listed in the LoW as non-hazardous, and vice versa. The two paras read as follows:

"2. A Member State may consider waste as hazardous waste where, even though it does not appear as such on the list of waste, if it displays one or more of the properties listed in Annex III. The Member State shall notify the Commission of any such cases without delay. It shall record them in the report provided for in Article 37(1) and shall provide the Commission with all relevant information. In the light of notifications received, the list shall be reviewed in order to decide on its adaptation.

3. Where a Member State has evidence to show that specific waste that appears on the list as hazardous waste does not display any of the properties listed in Annex III, it may consider that waste as non-hazardous waste. The Member State shall notify the Commission of any such cases without delay and shall provide the Commission with the necessary evidence. In the light of notifications received, the list shall be reviewed in order to decide on its adaptation."

Article 7(2) and (3) do not prescribe the competent authority or the relevant procedure for such decisions; this is a question left to the internal legal and administrative organisation of each Member State (however, economic operators or other private entities are not considered "the Member States" and are not entitled to take a decision pursuant to Article 7(2) and 7(3) WFD).

Box 2: Further information on Article 7 of the WFD

2.1.2. European List of Waste (LoW)

The LoW provides further provisions for the assessment of hazardous properties and the classification of waste.

It provides the list of wastes, categorised into chapters, sub-chapters and entries. The entries in the LoW can be categorised into 'absolute hazardous entries', 'absolute non-hazardous entries' and 'mirror entries'.

Box 3: The European List of Waste

Commission Decision 2000/532/EC establishes the European List of Waste (LoW). The LoW is the key document for classification of waste. A consolidated version of the LoW has existed since 2000 and has been revised by EU Decision 2014/955/EU, in order to adapt the LoW and its associated definitions and methodologies, to scientific progress and align it with developments in chemicals legislation. Legally, the LoW is an EU Decision addressed to the Member States; Member States often publish legal documents substantially reflecting the LoW. Note that these national documents are the relevant reference documents for businesses and national authorities.

Classification according to the LoW firstly means that each waste is to be classified by a six digit number (see in detail chapter A.1).

Full and compliant classification enables businesses and competent authorities for a decision in terms of the question whether the waste is hazardous or not (see in detail 3.1). In this respect, the LoW recognises three types of entries:

- 'Absolute hazardous entries': Wastes which are assigned to absolute hazardous entries cannot be allocated to alternative non-hazardous entries and are hazardous without any further assessment;
- 'Absolute non-hazardous entries': Wastes which are assigned to absolute non-hazardous entries cannot be allocated to alternative hazardous entries and are hazardous without any further assessment;

- 'Mirror entries', where waste from the same source might under the LoW be allocated to a hazardous entry or to a non-hazardous entry depending on the specific case and on the composition of the waste.

2.1.3. Waste Shipment Regulation (WSR)

The WSR implements into EU law the provisions of the Basel Convention and OECD Decision C(2001)107/Final.

Shipments procedures depends on the type of waste, its destination and its treatment operation.

Box 4: The Waste Shipment Regulation

Regulation (EC) No 1013/2006 on shipment of waste (Waste Shipment Regulation or WSR) implements into EU law the provisions of the Basel Convention and OECD Decision C(2001)107/Final. The WSR, which is directly applicable in all Member States, establishes the procedures, conditions and requirements to be fulfilled in the course of transboundary shipments of waste, including shipments between Member States. According to Articles 34 and 36 of the WSR, the export of waste for a disposal operation outside the EU/EFTA area is prohibited, as well as the export of hazardous wastes from the EU to any non-OECD Decision country.

There are two control procedures for the shipment of waste, namely:

- the **general information requirements** of Article 18 which is normally applicable to shipments for **recovery** of wastes listed in Annex III ('green' listed wastes) or IIIA, and
- the procedure of **prior written notification and consent** for any other type of shipment of wastes.

In the context of identification of waste for the purpose of correct procedure and documentation, first note that the classification according to the lists contained in Annex III-IV of the WSR (the incorporated lists of international agreements) is relevant. These lists provide for a classification approach different to the one of the LoW.

However, classification according to WFD and LoW is also relevant in the context of the WSR, for instance as a criterion whether the waste may be exported for certain non-EU non-OECD countries (Article 36(1) WSR). The classification of waste in accordance with the entries listed in Annexes III-IV (i.e. Basel Convention and OECD codes) as well as the entries of the LoW (Part2 of Annex V) is to be indicated on the notification and movement document used in the framework of the notification procedure and in accordance with the instructions under point 25 of Annex IC. Likewise, the identification of waste is to be made on the Annex VII document in the case of shipments subject to the general information requirements of Article 18.

Regarding the case of shipments of waste subject to the procedure of prior written notification and consent, the codes to be used for the hazardous characteristics (H codes) and treatment operations (D and R codes) on the notification and movement documents (Annexes IA and IB) are those set out in Annexes III and IV to the Basel Convention, respectively.

2.1.4. Landfill Directive

The Landfill Directive contains rules on the management, permit conditions, closure, and after-care of landfills. The WAC specifies acceptance criteria for waste for the different classes of landfills as recognised by the Landfill Directive.

Analyses made in the frame of WAC usually cannot be used for the classification of waste according the LoW.

Box 5: The Landfill Directive

Directive 1999/31/EC on landfill of waste (the 'Landfill Directive') contains rules on the management, permit conditions, closure, and after-care of landfills. Council Decision 2003/33/EC, specifies waste acceptance criteria (WAC) for acceptance of waste in the different classes of landfills as recognised by the Landfill Directive.

The classification of waste as hazardous according to LoW and Annex III to the WFD is important also for the purposes of the Landfill Directive since hazardous waste shall as a general rule be disposed of at landfills for hazardous waste, and non-hazardous waste shall be disposed of at landfills for non-hazardous waste or inert waste. Stable, non-reactive hazardous wastes may be disposed of at landfills for non-hazardous wastes if the conditions set out in Annex II of the Landfill Directive and the WAC are fulfilled. It should be recalled that Appendix B to the Council Decision 2003/33/EC clearly states the role of "basic characterisation" and the resulting conclusions on hazardousness, on the landfill admission of waste and illustrates this approach in its Figure 1.

However, classification of waste as hazardous or not, according to the principles of the WFD and pursuant to the LoW must not be confused with the assessment of waste in order to determine compliance with the criteria for acceptance of waste as set out by Annex II to the Landfill Directive and as laid down in Council Decision 2003/33/EC (WAC Decision).

2.1.5. Directive on waste from the extractive industries (Extractive Waste Directive or Mining Waste Directive)

The Extractive Waste Directive sets up the framework for proper management of wastes resulting from extractive industries.

The hazardousness of wastes from the extractive industries has to be classified in line with the LoW.

Box 6: The Extractive Waste Directive

Directive 2006/21/EC on the management of waste from extractive industries ('Extractive Waste Directive' or 'Mining Waste Directive') aims at ensuring that waste from the extractive industries is managed without endangering human health and without using processes or methods which could harm the environment. Although extractive waste is explicitly excluded from the scope of the WFD (Article 2(2)(d) WFD),to the extent that it is covered by Directive 2006/21/EC,classification according to the LoW nevertheless remains relevant.

Key obligations established by the Directive (e.g.preparation of waste management plans, classification of the waste management facility, etc.) cannot be properly fulfilled unless the hazardousness of the waste has been established.

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ANNEX III of the Directive, which lists the criteria for determining the classification of waste facilities, establishes that the hazardousness of the waste concerned has to be determined in line with the procedures defined by EU legislation on hazardous waste.

The Commission has ensured the development of a number of methodologies and standards needed for the technical implementation of the Directive.[1] The use of these technical standards and methodologies may supplement the procedures to determine the hazardousness of the extractive waste concerned.

2.1.6. REACH Regulation

The REACH regulation lays down the registration, evaluation, authorization and restriction of chemicals in the EU.

Waste is not a substance, article or mixture within the meaning of REACH. Nevertheless, information generated in the framework of REACH may be relevant for waste classification.

Box 7: The REACH Regulation

Regulation (EC) 1907/2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals ('REACH Regulation') entered into force in 2007. REACH is the general chemicals law at EU level, applying to substances (as such, in mixtures or in articles). The purpose of the REACH Regulation is to ensure a high level of protection of human health and the environment, including the promotion of alternative methods for assessment of hazards of substances, as well as the free circulation of substances on the internal market while enhancing competitiveness and innovation. REACH defines and operates a number of processes with the overarching aim of ensuring the safe use of chemicals:

- registration of substances (requires the submission of information on the properties and uses of substances, subject to certain conditions, to the European Chemicals Agency ECHA);
- improved communication in the supply chain by means of extended Safety Data Sheets (eSDS);
- evaluation of substances by public authorities with the aim of providing certainty s regards the proper functioning of the registration process and to further clarify concern regarding certain substances;
- restriction of use of substances for which an unacceptable risk has been determined;
- authorisation – applicable to certain substances of very high concern (SVHC) which can only be placed on the market and used subject to the granting of a specific and time-limited authorisation, subject to certain conditions.

It is important to note that according Article 2(2) of the REACH Regulation waste (as defined by the WFD) is not considered a substance or a mixture or an article under

[1] See for instance

EN 15875:2011 Characterization of waste - Static test for determination of acid potential and neutralisation potential of sulfidic waste

CEN/TR 16363:2012 Characterization of waste - Kinetic testing for assessing acid generation potential of sulfidic waste from extractive industries

CEN/TS 16229:2011 Characterization of waste - Sampling and analysis of weak acid dissociable cyanide discharged into tailings ponds

CEN/TR 16365:2012 Characterization of waste - Sampling of waste from extractive industries

REACH; no direct obligations apply under REACH for producers or holders of waste (although the waste stage has to be considered in the chemical safety report to be presented as part of the registration dossier for substances manufactured or imported in the EU in quantities above 10 t/y).

However, information about chemical substances generated and communicated in the framework of REACH, particularly hazard information, and its subsequent use in classification according to CLP, is essential (see Annex B) for the classification of waste.

Note that test methods to be used for the purpose of REACH Regulation are indicated in Regulation (EC) 440/2008 ('Test Methods Regulation'). Some test methods laid down in this regulation, or adaptations thereof, may be applied in the framework of waste classification.

2.1.7. CLP Regulation

The CLP Regulation sets out criteria for the hazard classification of substances and mixtures.

Waste is not considered as a substance, mixture or article under CLP. However, the hazardous properties applicable for waste are related to CLP criteria. Further, classification of substances under CLP may also be relevant for waste classification.

Box 8: The CLP Regulation

Regulation (EC) 1272/2008 on classification, labelling and packaging of substances and mixtures ('CLP Regulation') adapts for the EU the UN international chemicals classification system (Globally Harmonised System - GHS). In this context, it sets out detailed criteria for assessing substances and determining their hazard classification.

Similarly to REACH, Article 1(3) of the CLP Regulation lays down that waste is not considered a substance, mixture or article; consequently, obligations under CLP do not apply for producers or holders of waste.

Although Annex III to the WFD is based on the CLP Regulation, it does not contain a full 'one to one' transposition of the criteria as laid down in CLP. Instead, in terms of the classification of waste, it should be noted that some of the HP criteria of Annex III to the WFD directly make reference to CLP hazard classes and categories and to hazard statements and associated criteria for classification. Many mirror entries specifically refer to 'hazardous substances'. The classification of substances is done according CLP whereas the presence of hazardous substances contained in waste has to be evaluated in line with Annex III to the WFD (see in detail 3.2 and Annex C). Further, Table 3.1 of Part 3 of Annex VI to the CLP Regulation provides a set of official harmonised classification of substances. Where such harmonised classification is available, it has to be used in the classification of waste (see for this particular aspect chapter B.1.1).

2.1.8. POP Regulation

The POP regulation aims to protect environment and human health from persistent organic pollutants (POPs).

Waste containing certain POPs as indicated in the Annex to the LoW (point 2, indent 3) above the relevant threshold of the POP regulation have to be classified as hazardous.

Box 9: The POP Regulation

Regulation (EC) 850/2004 on persistent organic pollutants (POP Regulation) aims among others at protecting the environment and human health from certain specified substances that are transported across international boundaries far from their sources, persist in the environment, and can bioaccumulate in living organisms, by implementing relevant international agreements. The Regulation's scope is restricted to the substances listed in the Annexes of the Regulation.

Following Article 7 of the POP Regulation, wastes consisting of POPs, containing or contaminated with them above specific limit values (concentration limit referred to in Article 7(4)(a) – the so called 'low POP-content limit value')[2], must be disposed of or recovered, without undue delay and in accordance with the provisions laid down in the POP Regulation in such a way as to ensure that the persistent organic pollutant content is destroyed or irreversibly transformed so that the remaining waste does not exhibit the characteristics of persistent organic pollutants. Disposal or recovery operations that may lead to recovery, recycling, reclamation or re-use of the POPs are prohibited.

With the revision of LoW that becomes applicable in June 2015, it is now considered that in the case of mirror entries, waste containing certain POPs (as indicated in the Annex to the LoW (point 2, indent 3)[3]) above the relevant thresholds of POPs Regulation are considered hazardous without further consideration (see example A.5.10).

Note that

- Wastes containing POPs listed in the Annexes of the POP Regulation other than those specifically mentioned in the Annex to the LoW (point 2, indent 3) do not automatically classify as hazardous. Classification would depend on the hazard classification of the substance and to the application of the general rules of Annex III to the WFD, i.e. assessment of HP1 to HP15;
- Regardless of the classification of POP wastes as hazardous or non-hazardous, all obligations set out for the producers and holders of POPs waste according to POP Regulation shall apply.

2.1.9. Seveso III Directive

The Seveso III Directive aims to prevent major accidents involving dangerous substances and a limitation of their consequences for the environment and human health.

It also applies to waste. Operators handling dangerous substances present in waste above certain thresholds must classify waste on the basis of its properties as a mixture. Relevant sources of information may include classification according EU waste legislation.

Box 10: The Seveso III Directive

Directive 2012/18/EU on the control of major-accident hazards involving dangerous substances ('Seveso III Directive') has as main objective the prevention of major accidents which involve dangerous substances, and the limitation of their consequences for human health and the environment, with the goal of ensuring a high level of protection throughout the Union in a consistent and effective manner.

[2] It should be mentioned that some EU Member States apply more stringent limit values for specific POPs.

[3] The POPs listed in the LoW are the so called "old POPs". Thus only wastes containing "old POPs" in concentrations which exceed the low POP content limit value shall be classified as hazardous.

Operators handling dangerous substances above certain thresholds must regularly inform the public likely to be affected by an accident, providing safety reports, a safety management system and an internal emergency plan. Member States must ensure that emergency plans are in place for the surrounding areas and that mitigation actions are planned. The Seveso III Directive also applies to waste. Note 5 to Annex I of the Seveso III Directive makes reference to CLP Regulation (EC) No 1272/2008 and mentions waste explicitly:

> *'In the case of dangerous substances which are not covered by Regulation (EC) No 1272/2008, including waste, but which nevertheless are present, or are likely to be present, in an establishment and which possess or are likely to possess, under the conditions found at the establishment, equivalent properties in terms of major-accident potential, these shall be provisionally assigned to the most analogous category or named dangerous substance falling within the scope of this Directive.'*

3. Procedures for the classification of waste

3.1. General approach to the classification of waste

The assessment and classification of waste is applied to each distinct waste stream generated by a producer, if appropriate, following the obtainment of a representative sample. Where more than one waste type is present, each would need to be assessed separately. This ensures that any items or batches of hazardous waste

- are not erroneously classified as non-hazardous by mixing (diluting) it with other wastes (see Article 7 (4) of the WFD);
- are identified in time to prevent being mixed with other wastes, e.g. in a bin, bag, stockpile or skip (see Article 18 of the WFD).

Only mixed municipal waste from domestic households is exempt from these requirements.

The following chapter and flowchart (cf. Figure 2) guide through the general approach for classification of waste. The flowchart indicates a reference both

- to the respective chapter of this document, where the classification step is generally explained and;
- to the respective Annex to this document, where detailed information is provided.

Having completed the first two steps it should be known whether:

- the substance or object in question is subject to the WFD and LoW and;
- either an 'absolute' (hazardous or non-hazardous) LoW entry applies or a 'mirror entry' applies and thus performing a further assessment is necessary.

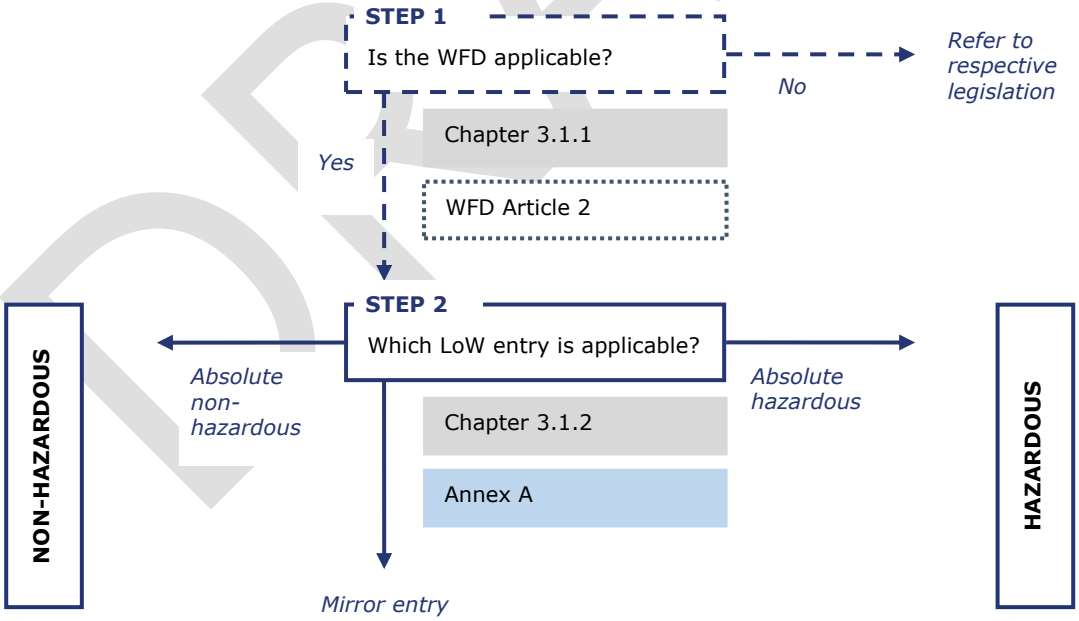

Figure 2: Flow chart for determination of applicable LoW entries

3.1.1. Step 1: Is the WFD applicable?

Before waste can be classified, it should be checked whether WFD and LoW are applicable at all:

- first, it has to be assessed whether the substance or object in question is waste (as defined in the WFD);
- second, it has to be assessed whether certain specified waste streams are excluded from the scope of the WFD.

Determining whether the object or substance in question is considered waste in the sense of the WFD is a precondition for a further assessment regarding its hazardousness. For this particular assessment, the document [EC 2012] provides guidance on the key definition of 'discarding' under the WFD, and related concepts under the WFD such as 'by-product' and 'end-of-waste'.

Second, even if the substance or object is considered waste, it has to be assessed whether one of the exclusions from the scope laid down in Article 2 WFD applies. The text of Article 2 WFD is provided in the box below. Detailed guidance on selected exclusions is provided for in [EC 2012].

In case an assessment leads to the result that an exclusion applies, neither the WFD nor the LoW apply (a special case is the Extractive Waste Directive as described in chapter 2.1.5; the text of the Directive refers to general legislation on hazardous waste as regards the determination of the hazardousness of the waste concerned). .

All waste streams not explicitly excluded by the WFD are to be classified according to WFD and LoW, and thus according to the approach outlined in this guidance document. This includes cases where additional legislation exists for a particular waste stream (such as for waste electrical and electronic equipment (WEEE) in the case of the WEEE Directive 2012/19/EU or for waste batteries in the case of the Batteries Directive 2006/66/EC), as mentioned in Article 2(4) WFD.

Directive 2008/98/EC

Article 2 – Exclusions from the scope

1. The following shall be excluded from the scope of this Directive:
   a. gaseous effluents emitted into the atmosphere;
   b. land (in situ) including unexcavated contaminated soil and buildings permanently connected with land;
   c. uncontaminated soil and other naturally occurring material excavated in the course of construction activities where it is certain that the material will be used for the purposes of construction in its natural state on the site from which it was excavated;
   d. radioactive waste;
   e. decommissioned explosives;
   f. faecal matter, if not covered by paragraph 2(b), 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.
2. The following shall be excluded from the scope of this Directive to the extent that they are covered by other Community legislation:
   a. waste waters;
   b. animal by-products including processed products covered by Regulation (EC) No 1774/2002, except those which are destined for incineration, landfilling or use in a biogas or composting plant;
   c. 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 1774/2002;
   d. waste resulting from prospecting, extraction, treatment and storage of mineral resources and the working of quarries covered by Directive 2006/21/EC of the European Parliament and of the Council of 15 March 2006 on the management of waste from extractive industries.
3. Without prejudice to obligations under other relevant Community legislation, 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 shall be excluded from the scope of this Directive if it is proved that the sediments are non-hazardous.
4. Specific rules for particular instances, or supplementing those of this Directive, on the management of particular categories of waste, may be laid down by means of individual Directives.

Box 11: WFD Article 2 - Exclusions from the scope

3.1.2. Step 2: Which entry of the List of Waste is applicable?

The LoW contains 20 *chapters* (two digit codes), further divided into *sub-chapters* (four digit codes) and *entries* (six digit codes).

The assignment of a specific entry needs to be done according a predefined order of precedence in sequentially consulting the aforementioned chapters. An annotated version of the LoW, more information on the list's structure, a guidance on how to identify the most appropriate entry for any given waste and specific examples can be found in Annex A.

Any waste which can be identified by an entry marked with an asterisk (*) shall be considered as hazardous. Wastes defined by all other entries are considered non-hazardous. To complete Step 2 and identify the applicable entry or entries of the LoW,

- the appropriate entry or entries of the LoW need to be assessed for the waste in question, taking into account that specific entries at Member States level may have been introduced in the national legislation reflecting the EU LoW;
- subsequently, it needs to be assessed to which of the following entry types the waste under consideration needs to be assigned:
    - Absolute hazardous (AH) entry (marked with an asterisk (*))

      Wastes which are assigned to AH entries cannot be allocated to alternative non-hazardous entries and are hazardous without any further assessment.

      In case an AH entry is assigned, the waste will be classified as hazardous and no further assessment is needed in order to decide whether the waste has to be classified as hazardous. However, it will still be necessary to proceed with steps 3-5 (see chapter 3.2) in order to determine which hazardous properties are displayed by the waste in question as this information may be required for the fulfilment of the provisions laid down in Article 19 of the WFD on correct labelling of hazardous waste (e.g. for filling a consignment note for waste movements).. Please see Box 13 in chapter A.1 for information on AH entries displaying no hazardous properties.
    - Absolute non-hazardous (ANH) entry

      Wastes which are assigned to ANH entries cannot be allocated to alternative hazardous entries and shall be classified as non-hazardous without any further assessment.

      In case an ANH entry is assigned, the waste will be classified as non-hazardous and no further assessment is needed in order to decide whether the waste has to be classified as non-hazardous. Please see Box 13 in chapter A.1 for information on ANH entries displaying hazardous properties.
    - Mirror entry

      Mirror entries can be defined as a pair of related entries where one is hazardous and the other is not. Sometimes a member of a mirror entry can be the pair of several possible related alternative entries. In contrast to AH or ANH entries, if waste is to be allocated to a group of alternative entries, further steps in the assessment for allocation have to be undertaken. The alternative entries consist at least of the following entries:
        - Mirror hazardous (MH) entry (marked with an asterisk (*))
        - Mirror non-hazardous (MNH) entry

      In case there is the choice to assign a MH entry or a MNH entry, it is necessary to proceed with steps 3-5 (see chapter 3.2) of the classification

871 *process in order to determine, based on the results of these*
872 *investigations, whether to assign the MH entry or the MNH entry.*

873 Further assistance on the definition of ANH, AH, MH and MNH is given in chapter A.1.

874

875

3.2. Assignment of MH or MNH entry

The following chapters are applicable for the determination of whether a MH entry or a MNH entry is to be assigned to the waste under consideration. Additionally, the following chapters can be regarded in order to determine the hazardous properties of a waste assigned with an AH entry, as this information may be required for the fulfilment of the provisions laid down in Article 19 of the WFD on correct labelling of hazardous waste (e.g. for filling a consignment note for waste movements).

After having completed steps 3-5, it should be finally known whether the waste under consideration contains hazardous components and displays one or more hazardous properties (HP1 to HP15), and/or whether it contains any relevant POPs. Hence it can be decided whether the waste is hazardous or non-hazardous. The following flowchart displays the necessary steps and refers to the following chapters (and respective Annexes for further details).

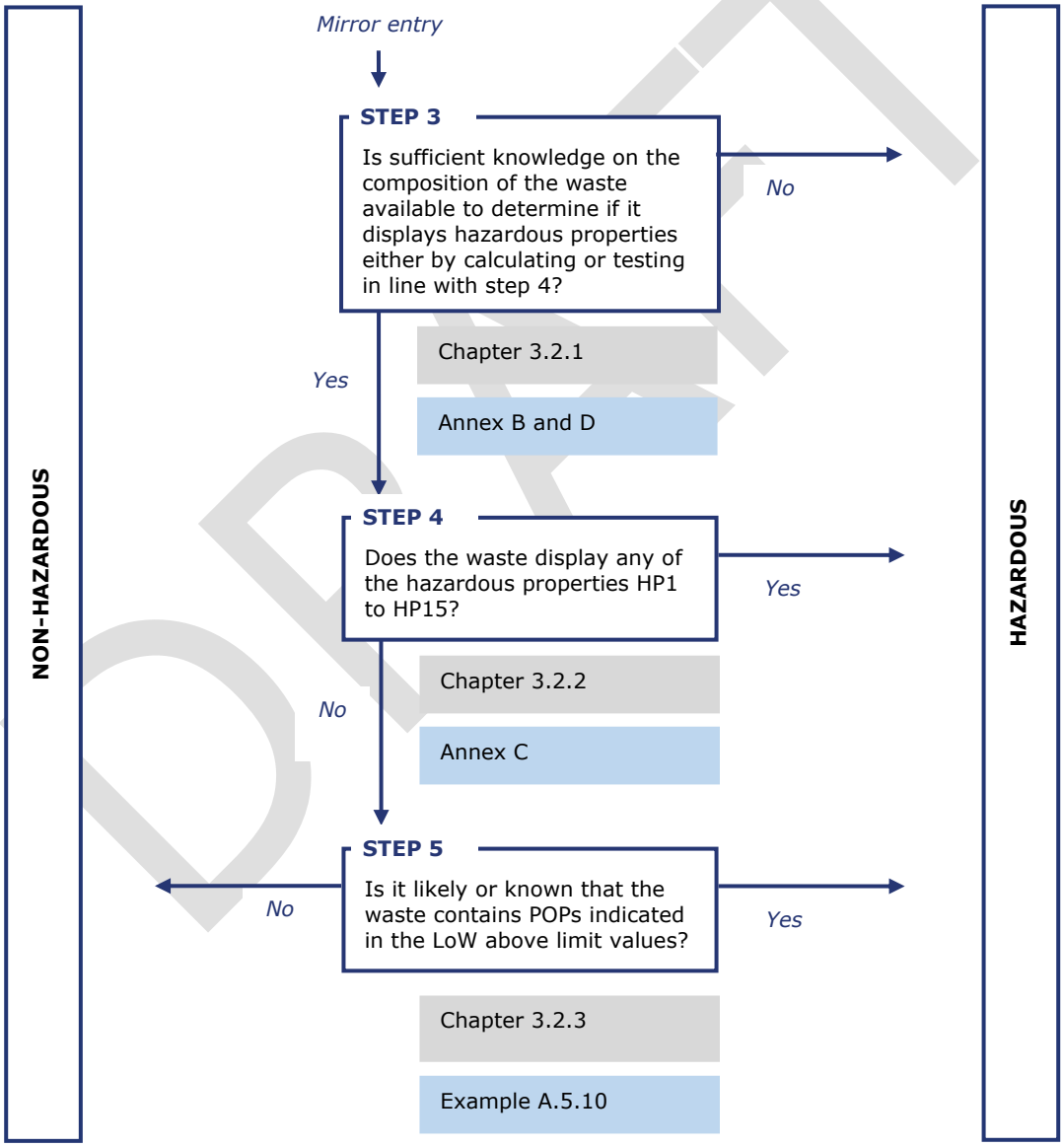

Figure 3: Flow chart for determining whether MH or MNH entry is to be assigned

3.2.1. Step 3: Is sufficient knowledge on the composition of the waste available to determine if it displays hazardous properties either by calculating or testing in line with Step 4?

Obtaining sufficient information about the presence and content of hazardous substances in the waste, in order to be able to determine if the waste might display any of the hazardous properties HP1 to HP15, is an important step in waste classification. Certain information on the composition of the waste is required, independent from the chosen method of assessing the hazardous properties (calculation or testing) as it is described in Step 4. There are several ways to gather information on the relevant composition of the waste, the hazardous substances present and potential hazardous properties displayed:

- information on the 'waste-generating' manufacturing process/chemistry and its input substances and intermediates including expert judgments (useful sources may be BREF reports, industrial process handbooks, process descriptions and lists of input materials provided by the producer, etc.);
- information from the original producer of the substance or object before it became waste, e.g. Safety Data Sheets (SDS) or GHS pictograms, product fiches (see in more detail Annex B);
- databases on waste analyses available on MS level;
- sampling and chemical analysis of the waste (see Annex D).

Once information has been established on the composition of the waste, it becomes possible to assess if the identified substances are classified as hazardous, i.e. if they are assigned a hazard statement code (see Box 12). In order to determine if the contained substances are classified as hazardous and to learn more about the specific hazard classes and categories the substances may be attributed according the CLP Regulation, please refer to the guidance given by Annex B.

Hazard statement codes

Whether substances identified as constituents of the relevant waste are considered hazardous substances, needs to be assessed in line with CLP criteria. For useful information tools in this context, consult Annex B of this document.

Note that according to CLP Regulation, 'hazard statements' are introduced defined as follows:

> *'hazard statement' means a phrase assigned to a hazard class and category that describes the nature of the hazards of a hazardous substance or mixture, including, where appropriate, the degree of hazard;*

An example for a hazard statement code and assigned hazard class and category from Table 3.1 of Part 3 of Annex VI to the CLP Regulation is:

Hazard statement:	Description:	Hazard class and category:
H330	Fatal if inhaled	Acute Tox. 2

Thereby the first digit after the 'H' represents the categorisation of the hazard (2 – physical hazards, 3 – health hazards, 4 – environmental hazards), the second and third digit are consecutive numbers clustering hazard codes. Information on hazard statement codes assigned to substances can be found in Annex B.

Box 12: Remark on CLP criteria: Hazard Statement Codes

Please note that if direct testing of hazardous properties (as it is typically conducted for the physical hazardous properties, see Step 4) is considered, sampling and chemical analysis of the waste under consideration may not be necessary. Instead the other information sources as mentioned above may already indicate whether a targeted direct testing on certain hazardous properties may be reasonably performed.

If sampling and chemical analysis of the waste under consideration are considered in order to determine its chemical composition (e.g. in order to carry out the calculation approach in the assessment of hazardous properties as described in Step 4), please refer to Annex D.

Finally, if the gathered information on the composition of the waste (taking into consideration all above displayed options) does not allow to conclude on or assess the hazardous properties displayed by the waste, neither by calculation nor by testing of the waste in line with the following step 4, the waste is to be classified as hazardous.

Please note that although direct testing methods are available for some hazardous properties as it is described in Step 4, they are not available for all hazardous properties. As a consequence, direct testing cannot be used to fully classify a waste of unknown composition as non-hazardous (see also [UK EA 2015]).

3.2.2. Step 4: Does the waste display any of the hazardous properties HP1 to HP15?

As indicated in chapter 2.1.1 and further described in Annex C of this document, Annex III to the WFD describes 15 properties (HP1 to HP15) of waste which render it hazardous. Table 1 provides an overview on the aforementioned hazardous properties.

Table 1: Properties of waste which render it hazardous (description taken from WFD, Annex III)

Hazardous Properties	
HP1	Explosive
HP2	Oxidising
HP3	Flammable
HP4	Irritant – skin irritation and eye damage
HP5	Specific Target Organ Toxicity (STOT)/ Aspiration Toxicity
HP6	Acute Toxicity
HP7	Carcinogenic
HP8	Corrosive
HP9	Infectious
HP10	Toxic for reproduction
HP11	Mutagenic
HP12	Release of an acute toxic gas
HP13	Sensitising
HP14	Ecotoxic
HP15	Waste capable of exhibiting a hazardous property listed above not directly displayed by the original waste

As soon as step 3 is completed, sufficient information on the relevant composition of the waste under consideration should be available. This means sufficient knowledge of the hazardous substances contained in the waste and how they are classified (e.g. if they are attributed any relevant hazard statement codes according the CLP Regulation) should be available to the extent, that at least one of the following methods to determine if the waste displays hazardous properties, can be applied:

- **Calculation** if threshold limits based on hazard statement codes (individually depending on the properties HP4 to HP14, see Annex C) are equalled or exceeded by the substances that are present in the waste under consideration;
- **Testing** if the waste displays hazardous properties or not.

Annex C provides a detailed description and guidelines on how to assess the individual hazardous properties HP1 to HP15 via **calculation** or **testing**.

Regarding the **calculation** method, it should be noted that hazardous substance content values in waste as they have been determined, e.g. by sampling and chemical analysis of the waste under consideration, have to be compared against the concentration limits listed in Annex III of the WFD. These concentration limits refer to the state of the waste as it is when the classification of the waste is undertaken, i.e. the fresh weight of the waste. However, many analytical methods specify results on a dry weight basis. As a consequence, analytical values expressed on the basis of dry matter have to be corrected for the moisture content of the waste in order to determine the concentration of the substance in the original waste, as it will be subsequently managed. Waste classifiers should be aware that the laboratories often express results based on dry weight and should therefore be attentive to ensure that they are aware on what basis the analytical results are provided. Classification of waste has to be carried out on the basis of wet weights (either as originally tested or converted from the dry weight figures). Additionally, it should be noted explicitly that Article 7 (4) of the WFD does not allow a dilution or mixing of the waste to lower the initial concentrations of hazardous substances.

Please further note that the concentration limits defined in Annex III to the WFD do not apply to pure metal alloys in their massive form as long as they are not contaminated with hazardous substances. Further information on the classification of metal alloys can be found in chapter A.5.6.

Additional guidance regarding sampling and chemical analyses of waste in order to make use of the calculation method can be found in Annex D.

Direct testing to determine whether a specific hazard property is displayed may be appropriate in some cases, for some hazard properties (e.g. the physical properties such as HP 1 'Explosive', HP 2 'Oxidising' and HP 3 'Flammable').

If a hazardous property has been assessed by a test and by calculating concentrations of hazardous substances as indicated in Annex III to the WFD, the results of the test shall prevail.

Finally, if the waste displays one or more of the 15 hazardous properties, the corresponding MH entry has to be assigned. Whereas, if the waste displays no hazardous property, step 5 has to be undertaken to check whether the waste contains specific POPs above the respective limit values. This is the final step before the waste under consideration can be assigned to the MH or MNH entry.

3.2.3. Step 5: Is it likely or known that the waste contains any of the POPs indicated in in the Annex to the LoW (point 2, indent 3)?

The last step in the classification of waste as hazardous or non-hazardous is to determine whether its content of specific POPs (as listed in the Annex to the LoW,

point 2, indent 3) exceeds the relevant limit values of the POP Regulation. A detailed overview, including a list of POPs to be considered and the respective concentration limits, is provided in chapter A.5.10.

In case the waste does not contain relevant POPs or its POP content is below the concentration limits, the MNH entry is assigned. Otherwise the MH entry is assigned.

4. Annex

Annex A: Annotated List of Waste

A.1. Structure of the LoW

The LoW, in the version as established by Decision 2000/532/EC and as amended by Decision 2014/955/EU, applies from 1 June 2015.

The LoW contains 20 *chapters* (two digit codes, cf. Table 2). These chapters are further divided into *sub-chapters* (four digit codes) and *entries* (six digit codes). Examples for chapter, sub-chapters and entries are provided below:

Chapter:	20 MUNICIPAL WASTES (HOUSEHOLD WASTE AND SIMILAR COMMERCIAL, INDUSTRIAL AND INSTITUTIONAL WASTES) INCLUDING SEPARATELY COLLECTED FRACTIONS
Sub-chapter:	20 01 Separately collected fractions (except 15 01)
Entry:	20 01 02 Glass

Classification of waste needs to be done in line with the wording of the respective chapter, sub-chapter and entry.

For the aforementioned example of waste classified with entry 20 01 02 this means that the waste:

- must consist of glass;
- must be collected separately;
- must stem from households or household-like commercial, industrial or institutional waste;
- must not be glass packaging because packaging waste is excluded from chapter 20 and has to be assigned with an entry of chapter 15 for packaging waste

Order of precedence for LoW chapters as laid down in the LoW

The chapters (two digit codes) can be categorized into three different sets that need to be considered, following a predetermined sequence as laid down in the Annex to the LoW, when trying to identify the absolute entry or mirror entry which best corresponds to a waste under investigation:

A. 01 to 12 and 17 to 20
chapters related to waste source

B. 13 to 15
chapters related to waste type

C. 16
chapter for waste not otherwise specified in the list

First, it is important to consider the chapters 01 to 12 and 17 to 20 (excluding their general entries ending with 99) which identify a waste by referring to its source or industrial sector of origin. Instead of considering the general type of industry where the waste arises, one should rather consider the specific industrial process. One example is waste from the automotive industry: depending on the process, waste can be classified in chapter 12 (wastes from shaping and physical and mechanical surface treatment of metals and plastic), chapter 11 (wastes from chemical surface treatment and coating of metals and other materials; non-ferrous hydro-metallurgy) or 08 (wastes from the manufacture, formulation, supply and use (MFSU) of coatings (paints, varnishes and vitreous enamels), adhesives, sealants and printing inks). The 99 code from these chapters must not be used at this stage.

If no appropriate waste code can be found in chapters 01 to 12 or 17 to 20, the next chapters to be checked, according to the defined order of precedence are chapters 13 to 15 (excluding their general entries ending with 99). These chapters are related to the nature of the waste itself, e.g. waste packaging.

If none of these waste codes apply, the waste must be identified according to chapter 16 (excluding its general entries ending with 99) which represents a miscellaneous set of waste streams which cannot be otherwise specifically related to a given processes or sector, e.g. WEEE or end-of life vehicles.

If the waste cannot be reasonably allocated to any of the entries in chapter 16 either, a suitable 99 code (wastes not otherwise specified) must be found in the section of the list corresponding to the waste source identified in the first step.

Identifying the most appropriate entry is an important step in the classification of waste and requires a sound and honest judgement by the operator, based on his knowledge of the origin and process generating the waste, as well as its potential composition. Chapter A.2 provides more detailed information on how to apply the list and its pre-defined order of precedence and summarizes the information already provided in a flow chart (see Figure 4).

Table 2: Chapters LoW

CODE	CHAPTER DESCRIPTION	PRECEDENCE
01	WASTES RESULTING FROM EXPLORATION, MINING, QUARRYING, PHYSICAL AND CHEMICAL TREATMENT OF MINERALS	A
02	WASTES FROM AGRICULTURE, HORTICULTURE, AQUACULTURE, FORESTRY, HUNTING AND FISHING, FOOD PREPARATION AND PROCESSING	
03	WASTES FROM WOOD PROCESSING AND THE PRODUCTION OF PANELS AND FURNITURE, PULP, PAPER AND CARDBOARD	
04	WASTES FROM THE LEATHER, FUR AND TEXTILE INDUSTRIES	
05	WASTES FROM PETROLEUM REFINING, NATURAL GAS PURIFICATION AND PYROLYTIC TREATMENT OF COAL	
06	WASTES FROM INORGANIC CHEMICAL PROCESSES	
07	WASTES FROM ORGANIC CHEMICAL PROCESSES	
08	WASTES FROM THE MANUFACTURE, FORMULATION, SUPPLY AND USE (MFSU) OF COATINGS (PAINTS, VARNISHES AND VITREOUS ENAMELS), ADHESIVES, SEALANTS AND PRINTING INKS	
09	WASTES FROM THE PHOTOGRAPHIC INDUSTRY	
10	WASTES FROM THERMAL PROCESSES	
11	WASTES FROM CHEMICAL SURFACE TREATMENT AND COATING OF METALS AND OTHER MATERIALS; NON-FERROUS HYDRO-METALLURGY	
12	WASTES FROM SHAPING AND PHYSICAL AND MECHANICAL SURFACE TREATMENT OF METALS AND PLASTICS	
13	OIL WASTES AND WASTES OF LIQUID FUELS (EXCEPT EDIBLE OILS, 05 AND 12)	B
14	WASTE ORGANIC SOLVENTS, REFRIGERANTS AND PROPELLANTS (EXCEPT 07 AND 08)	
15	WASTE PACKAGING; ABSORBENTS, WIPING CLOTHS, FILTER MATERIALS AND PROTECTIVE CLOTHING NOT OTHERWISE SPECIFIED	
16	WASTES NOT OTHERWISE SPECIFIED IN THE LIST	C
17	CONSTRUCTION AND DEMOLITION WASTES (INCLUDING EXCAVATED SOIL FROM CONTAMINATED SITES)	A
18	WASTES FROM HUMAN OR ANIMAL HEALTH CARE AND/OR RELATED RESEARCH (EXCEPT KITCHEN AND RESTAURANT WASTES NOT ARISING FROM IMMEDIATE HEALTH CARE)	

CODE	CHAPTER DESCRIPTION	PRECEDENCE
19	WASTES FROM WASTE MANAGEMENT FACILITIES, OFF-SITE WASTE WATER TREATMENT PLANTS AND THE PREPARATION OF WATER INTENDED FOR HUMAN CONSUMPTION AND WATER FOR INDUSTRIAL USE	
20	MUNICIPAL WASTES (HOUSEHOLD WASTE AND SIMILAR COMMERCIAL, INDUSTRIAL AND INSTITUTIONAL WASTES) INCLUDING SEPARATELY COLLECTED FRACTIONS	

Types of LoW entries

Any entry marked with an asterisk (*) is considered as hazardous waste. As already indicated in chapter 3.1.2, the overall 842 entries of the LoW can be divided into absolute hazardous (AH), absolute non-hazardous (ANH), mirror hazardous (MH) and mirror non-hazardous (MNH) entries (cf. Table 3). Thereby each waste is either hazardous or non-hazardous.

Table 3: Number of entries in the LoW

842 entries in the List of Waste			
408 Hazardous entries		**434 Non-hazardous entries**	
228 AH	**180 MH**	**198 MNH**	**236 ANH**

- **Absolute hazardous (AH) entry**

  Wastes which are assigned to AH entries cannot be allocated to alternative non-hazardous entries and are hazardous without any further assessment.

  AH entries are marked in dark red colour in the Annotated List of Waste (cf. Table 4 in chapter A.3).

  In case an AH entry is assigned, the waste will be classified as hazardous and no further assessment is needed in order to decide whether the waste has to be classified as hazardous. However, it will still be necessary to proceed with steps 3-5 (see chapter 3.2) in order to determine which hazardous properties are displayed by the waste in question as this information may be required for the fulfilment of the provisions laid down in Article 19 of the WFD on correct labelling of hazardous waste (e.g. for filling a consignment note for waste movements).

- **Absolute non-hazardous (ANH) entry**

  Wastes which are assigned to ANH entries cannot be allocated to alternative hazardous entries and are classified as non-hazardous without any further assessment.

  ANH entries are marked in black colour in the Annotated List of Waste (cf. Table 4 in chapter A.3).

  In case an ANH entry is assigned, the waste will classified as non-hazardous and no further assessment is needed in order to decide whether the waste has to be classified as non-hazardous.

- Mirror entry

  Mirror entries can be defined as a pair of related entries where one is hazardous and the other is not. Sometimes a member of a mirror entry can be the pair of several possible related alternative entries. In contrast to AH or ANH entries, if waste is to be allocated to a group of alternative entries, further steps in the assessment for allocation have to be undertaken. The alternative entries consist at least of the following entries:

- **Mirror hazardous (MH) entry**

  MH entries are marked in orange colour in the Annotated List of Waste (cf. Table 4 in chapter A.3).

- **Mirror non-hazardous (MNH) entry**

  MNH entries are marked in dark blue colour in the Annotated List of Waste (cf. Table 4 in chapter A.3).

Mirror entries can be divided into the following sub-categories:

- The decision between alternative MH and MNH entry is determined by a general reference to hazardous substances, e.g.:

10 12 09*	solid wastes from gas treatment containing hazardous substances	MH
10 12 10	solid wastes from gas treatment other than those mentioned in 10 12 09	MNH

- The decision between alternative MH and MNH entry is determined by a specific reference to particular hazardous substances, e.g.:

16 01 11*	brake pads containing asbestos	MH
16 01 12	brake pads other than those mentioned in 16 01 11	MNH

- For entries with references to multiple entries, the assignment of an entry may depend on the origin or certain properties of the waste in question as well as its potentially contained hazardous substances, e.g.:

17 06 01*	insulation materials containing asbestos	MH
17 06 03*	insulation materials consisting of or containing hazardous substances	MH
17 06 04	Insulation materials other than those mentioned in 17 06 01 and 17 06 03	MNH

Often, but not necessarily, corresponding mirror entries can be recognized via the referencing words 'other than those mentioned in…' between MH and MNH entries.

In case there is the choice to assign a MH entry or a MNH entry, it is necessary to proceed with steps 3-5 (cf. chapter 3.2) of the classification process in order to determine the presence and content of hazardous substances in relevant concentrations, or to determine if the waste directly displays hazardous properties, so as to adequately assign the MH entry or the MNH entry to the waste stream under consideration.

Remark

Absolute non-hazardous entry displaying hazardous properties

Please note that a waste assigned with an ANH entry is classified as non-hazardous, without any further assessment of its hazardous properties. The only exception to this principle is described in Article 7 (2) of the WFD, whereby if the competent authority of the MS concerned considers that, based on adequate evidence, a given waste to which a ANH code is attributed, is in reality to be classified as hazardous, the waste in question will be classified as hazardous. This should be communicated to the Commission with a view to possible future amendments of the LoW.

Absolute hazardous entry displaying no hazardous properties

In case only an AH entry can be assigned to the waste in question, the waste is classified as hazardous, The only exception to this principle is if the relevant MS considers the waste in question as non-hazardous, based on the submission of adequate evidence to the contrary, in line with Article 7(3) of the WFD. This should be communicated to the Commission with a view to possible future amendments of the LoW.

Determination between mirror entries – Assessment of hazardous properties

The steps as described in chapter 3.2 are only necessary in case the waste in question is to be assigned to a MH entry or a MNH entry or if the hazardous properties of an waste assigned with an AH entry need to be assessed, e.g. for filling a consignment note.

Box 13: Remark on ANH entries displaying HPs and vice versa

A.2. Identifying the appropriate entry

Selecting the most appropriate entry for the waste from the overall available 842 entries on the LoW is a complex exercise and requires the use of sound judgement. First, the whole list must be considered entirely and the waste must fit to the finally selected entry, sub-chapter and chapter as described in the example for entry 20 01 02 in the previous chapter.

The following flow chart (cf. Figure 4) may clarify the process of identifying the most appropriate entry. The blue framed boxes describe the decisive questions for the actual execution of the step, whereas the grey boxes provide further explanatory remarks on these questions.

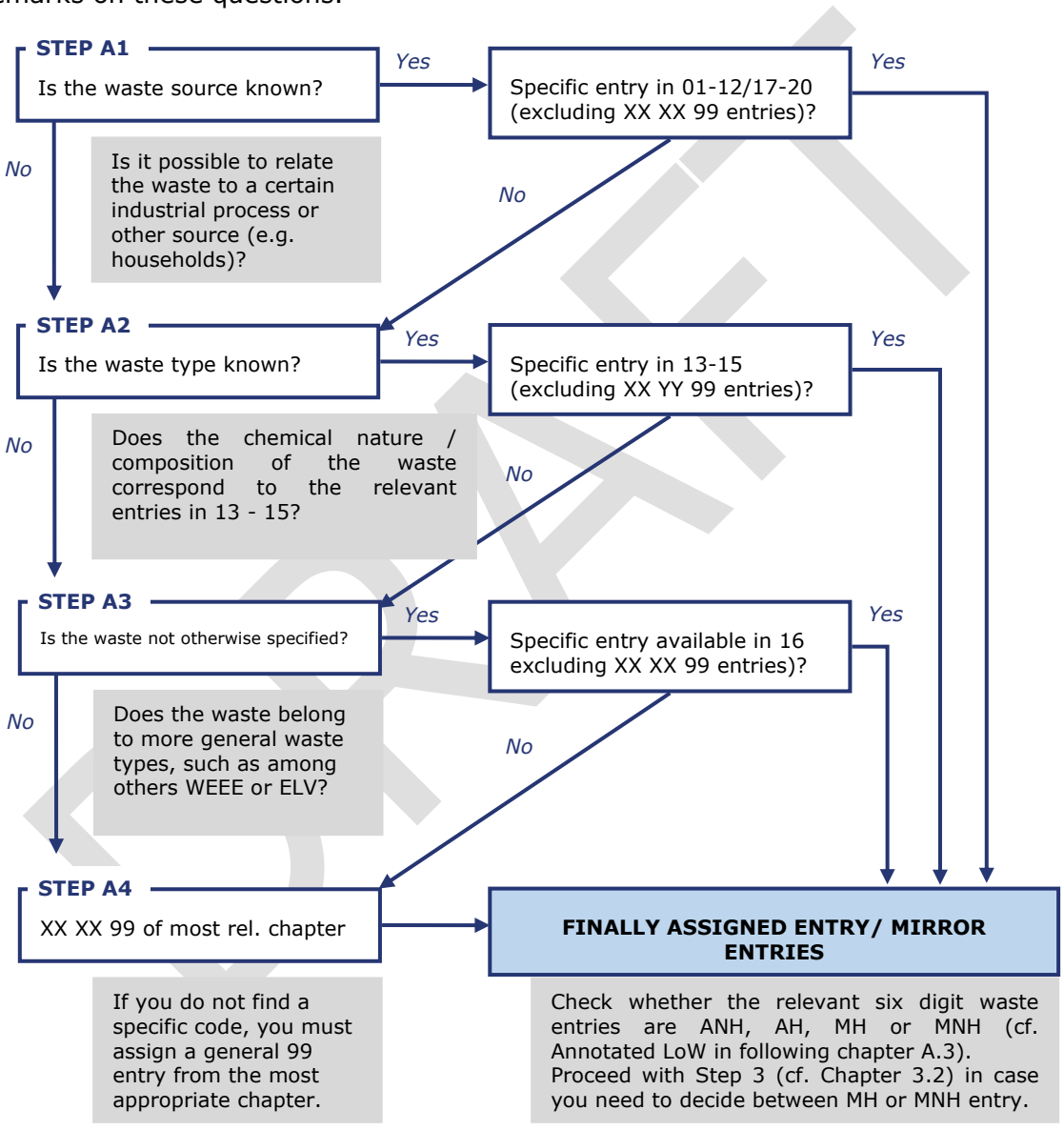

Figure 4: Process for identifying the most appropriate entry

- Within Step A1, initially chapters 01 to 12 and 17 to 20 have to be checked to identify an appropriate entry for the relevant waste according its origin / sector, e.g. according the process where the waste was generated.

At this stage, the general entry XX XX 99 of the respective sub-chapters for waste not otherwise specified shall not be used. Instead, Step A2 should be taken.

- Step A2 consists of assessing whether an entry according to the waste type (as defined by the nature of its constituents or materials) can be found in chapters 13 to 15. In this step, it should be checked whether the waste in question exclusively contains packaging waste (for an example see A.4.1). In this case the only possibility is to choose an entry out of chapter 15.
- If the appropriate entry can still not be found, the general chapter 16 within Step A3 for wastes not otherwise specified (cf. chapter A.4.2 and A.4.3) should be consulted.
- If the appropriate waste entry could still not be identified, a general XX XX 99 entry from the most appropriate chapters and sub-chapters must be chosen from the chapters already screened (cf. step A4). The assignment of such an general XX XX 99 code have to be the last resort and should be avoided as far as possible.

When completing the steps A1 to A4, either an AH or ANH entry or the most appropriate mirror entries should be assigned to the waste in question. In the latter case it is necessary proceeding with step 3 (cf. chapter 3.2) of the classification procedure in order to finally decide whether to assign the MH or the MNH entry.

The flow chart provided in Figure 4 is only meant to give support in assigning the most appropriate entry or mirror entry pair to a given waste stream, it should be noted that the process of classification should be seen as a step wise process that may require several iterations.

The following chapters aim at providing further assistance in this context:

- in chapter A.3, an annotated version of the LoW is enclosed;
- chapter A.4 contains specific examples of complex entries that serve to illustrate the classification procedure;
- chapter A.5 shows examples of the classification of specific constituents of certain waste types.

A.3. Annotated List of Waste

The following chapter consists of Table 4 which comprises all entries of the LoW clearly stating which entries are ANH, AH, MNH and MH entries.

Please note that the interpretation of the entry types in the following annotated List of Waste is one possible interpretation balancing the views from different MS. There are different interpretations on MS level which may be checked as well.

Table 4: Annotated List of Waste

CODE	CHAPTER DESCRIPTION	ENTRY TYPE
1	WASTES RESULTING FROM EXPLORATION, MINING, QUARRYING, AND PHYSICAL AND CHEMICAL TREATMENT OF MINERALS	
01 01	**wastes from mineral excavation**	
01 01 01	wastes from mineral metalliferous excavation	**ANH**
01 01 02	wastes from mineral non-metalliferous excavation	**ANH**
01 03	**wastes from physical and chemical processing of metalliferous minerals**	
01 03 04*	acid-generating tailings from processing of sulphide ore	**MH**[B]
01 03 05*	other tailings containing hazardous substances	**MH**
01 03 06	tailings other than those mentioned in 01 03 04 and 01 03 05	**MNH**
01 03 07*	other wastes containing hazardous substances from physical and chemical processing of metalliferous minerals	**MH**
01 03 08	dusty and powdery wastes other than those mentioned in 01 03 07	**MNH**
01 03 09[4]	red mud from alumina production other than the wastes mentioned in 01 03 10	**MNH**
01 03 10*[5]	red mud from alumina production containing hazardous substances other than the wastes mentioned in 01 03 07	**MH**[A]
01 03 99	wastes not otherwise specified	**MNH**
01 04	**wastes from physical and chemical processing of non-metalliferous minerals**	
01 04 07*	wastes containing hazardous substances from physical and chemical processing of non-metalliferous minerals	**MH**
01 04 08	waste gravel and crushed rocks other than those mentioned in 01 04 07	**MNH**
01 04 09	waste sand and clays	**ANH**
01 04 10	dusty and powdery wastes other than those mentioned in 01 04 07	**MNH**
01 04 11	wastes from potash and rock salt processing other than those mentioned in 01 04 07	**MNH**
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	**MNH**
01 04 13	wastes from stone cutting and sawing other than those mentioned in 01 04 07	**MNH**
01 04 99	wastes not otherwise specified	**MNH**
01 05	**drilling muds and other drilling wastes**	
01 05 04	freshwater drilling muds and wastes	**ANH**
01 05 05*	oil-containing drilling muds and wastes	**MH**[B]
01 05 06*	drilling muds and other drilling wastes containing hazardous substances	**MH**
01 05 07	barite-containing drilling muds and wastes other than those mentioned in 01 05 05 and 01 05 06	**MNH**

[4] Entry newly added by Decision 2014/955/EU

[5] Entry newly added by Decision 2014/955/EU

01 05 08	chloride-containing drilling muds and wastes other than those mentioned in 01 05 05 and 01 05 06	**MNH**
01 05 99	wastes not otherwise specified	**MNH**
2	WASTES FROM AGRICULTURE, HORTICULTURE, AQUACULTURE, FORESTRY, HUNTING AND FISHING, FOOD PREPARATION AND PROCESSING	
02 01	**wastes from agriculture, horticulture, aquaculture, forestry, hunting and fishing**	
02 01 01	sludges from washing and cleaning	**ANH**
02 01 02	animal-tissue waste	**ANH**
02 01 03	plant-tissue waste	**ANH**
02 01 04	waste plastics (except packaging)	**ANH**
02 01 06	animal faeces, urine and manure (including spoiled straw), effluent, collected separately and treated off-site	**ANH**
02 01 07	wastes from forestry	**ANH**
02 01 08*	agrochemical waste containing hazardous substances	**MH**
02 01 09	agrochemical waste other than those mentioned in 02 01 08	**MNH**
02 01 10	waste metal	**ANH**
02 01 99	wastes not otherwise specified	**ANH**
02 02	**wastes from the preparation and processing of meat, fish and other foods of animal origin**	
02 02 01	sludges from washing and cleaning	**ANH**
02 02 02	animal-tissue waste	**ANH**
02 02 03	materials unsuitable for consumption or processing	**ANH**
02 02 04	sludges from on-site effluent treatment	**ANH**
02 02 99	wastes not otherwise specified	**ANH**
02 03	**wastes from fruit, vegetables, cereals, edible oils, cocoa, coffee, tea and tobacco preparation and processing; conserve production; yeast and yeast extract production, molasses preparation and fermentation**	
02 03 01	sludges from washing, cleaning, peeling, centrifuging and separation	**ANH**
02 03 02	wastes from preserving agents	**ANH**
02 03 03	wastes from solvent extraction	**ANH**
02 03 04	materials unsuitable for consumption or processing	**ANH**
02 03 05	sludges from on-site effluent treatment	**ANH**
02 03 99	wastes not otherwise specified	**ANH**
02 04	**wastes from sugar processing**	
02 04 01	soil from cleaning and washing beet	**ANH**
02 04 02	off-specification calcium carbonate	**ANH**
02 04 03	sludges from on-site effluent treatment	**ANH**
02 04 99	wastes not otherwise specified	**ANH**
02 05	**wastes from the dairy products industry**	
02 05 01	materials unsuitable for consumption or processing	**ANH**
02 05 02	sludges from on-site effluent treatment	**ANH**
02 05 99	wastes not otherwise specified	**ANH**
02 06	**wastes from the baking and confectionery industry**	
02 06 01	materials unsuitable for consumption or processing	**ANH**
02 06 02	wastes from preserving agents	**ANH**
02 06 03	sludges from on-site effluent treatment	**ANH**
02 06 99	wastes not otherwise specified	**ANH**
02 07	**wastes from the production of alcoholic and non-alcoholic beverages (except coffee, tea and cocoa)**	
02 07 01	wastes from washing, cleaning and mechanical reduction of raw	**ANH**

	materials	
02 07 02	wastes from spirits distillation	**ANH**
02 07 03	wastes from chemical treatment	**ANH**
02 07 04	materials unsuitable for consumption or processing	**ANH**
02 07 05	sludges from on-site effluent treatment	**ANH**
02 07 99	wastes not otherwise specified	**ANH**
3	WASTES FROM WOOD PROCESSING AND THE PRODUCTION OF PANELS AND FURNITURE, PULP, PAPER AND CARDBOARD	
03 01	**wastes from wood processing and the production of panels and furniture**	
03 01 01	waste bark and cork	**ANH**
03 01 04*	sawdust, shavings, cuttings, wood, particle board and veneer containing hazardous substances	**MH**
03 01 05	sawdust, shavings, cuttings, wood, particle board and veneer other than those mentioned in 03 01 04	**MNH**
03 01 99	wastes not otherwise specified	**ANH**
03 02	**wastes from wood preservation**	
03 02 01*	non-halogenated organic wood preservatives	**AH**
03 02 02*	organochlorinated wood preservatives	**AH**
03 02 03*	organometallic wood preservatives	**AH**
03 02 04*	inorganic wood preservatives	**AH**
03 02 05*	other wood preservatives containing hazardous substances	**AH**[B]
03 02 99	wood preservatives not otherwise specified	**ANH**[B]
03 03	**wastes from pulp, paper and cardboard production and processing**	
03 03 01	waste bark and wood	**ANH**
03 03 02	green liquor sludge (from recovery of cooking liquor)	**ANH**
03 03 05	de-inking sludges from paper recycling	**ANH**
03 03 07	mechanically separated rejects from pulping of waste paper and cardboard	**ANH**
03 03 08	wastes from sorting of paper and cardboard destined for recycling	**ANH**
03 03 09	lime mud waste	**ANH**
03 03 10	fibre rejects, fibre-, filler- and coating-sludges from mechanical separation	**ANH**
03 03 11	sludges from on-site effluent treatment other than those mentioned in 03 03 10	**ANH**
03 03 99	wastes not otherwise specified	**ANH**
4	WASTES FROM THE LEATHER, FUR AND TEXTILE INDUSTRIES	
04 01	**wastes from the leather and fur industry**	
04 01 01	fleshings and lime split wastes	**ANH**
04 01 02	liming waste	**ANH**
04 01 03*	degreasing wastes containing solvents without a liquid phase	**AH**[B]
04 01 04	tanning liquor containing chromium	**ANH**
04 01 05	tanning liquor free of chromium	**ANH**
04 01 06	sludges, in particular from on-site effluent treatment containing chromium	**ANH**
04 01 07	sludges, in particular from on-site effluent treatment free of chromium	**ANH**
04 01 08	waste tanned leather (blue sheetings, shavings, cuttings, buffing dust) containing chromium	**ANH**
04 01 09	wastes from dressing and finishing	**ANH**
04 01 99	wastes not otherwise specified	**ANH**[B]
04 02	**wastes from the textile industry**	
04 02 09	wastes from composite materials (impregnated textile, elastomer,	**ANH**

	plastomer)	
04 02 10	organic matter from natural products (for example grease, wax)	**ANH**
04 02 14*	wastes from finishing containing organic solvents	**MH**
04 02 15	wastes from finishing other than those mentioned in 04 02 14	**MNH**
04 02 16*	dyestuffs and pigments containing hazardous substances	**MH**
04 02 17	dyestuffs and pigments other than those mentioned in 04 02 16	**MNH**
04 02 19*	sludges from on-site effluent treatment containing hazardous substances	**MH**
04 02 20	sludges from on-site effluent treatment other than those mentioned in 04 02 19	**MNH**
04 02 21	wastes from unprocessed textile fibres	**ANH**
04 02 22	wastes from processed textile fibres	**ANH**
04 02 99	wastes not otherwise specified	**ANH**
5	WASTES FROM PETROLEUM REFINING, NATURAL GAS PURIFICATION AND PYROLYTIC TREATMENT OF COAL	
05 01	**wastes from petroleum refining**	
05 01 02*	desalter sludges	**AH**
05 01 03*	tank bottom sludges	**AH**
05 01 04*	acid alkyl sludges	**AH**
05 01 05*	oil spills	**AH**
05 01 06*	oily sludges from maintenance operations of the plant or equipment	**AH**
05 01 07*	acid tars	**AH**
05 01 08*	other tars	**AH**
05 01 09*	sludges from on-site effluent treatment containing hazardous substances	**MH**
05 01 10	sludges from on-site effluent treatment other than those mentioned in 05 01 09	**MNH**
05 01 11*	wastes from cleaning of fuels with bases	**AH**
05 01 12*	oil containing acids	**AH**
05 01 13	boiler feedwater sludges	**ANH**
05 01 14	wastes from cooling columns	**ANH**
05 01 15*	spent filter clays	**AH**
05 01 16	sulphur-containing wastes from petroleum desulphurisation	**ANH**
05 01 17	Bitumen	**ANH**
05 01 99	wastes not otherwise specified	**ANH**
05 06	**wastes from the pyrolytic treatment of coal**	
05 06 01*	acid tars	**AH**
05 06 03*	other tars	**AH**
05 06 04	waste from cooling columns	**ANH**
05 06 99	wastes not otherwise specified	**ANH**
05 07	**wastes from natural gas purification and transportation**	
05 07 01*	wastes containing mercury	**AH**[B]
05 07 02	wastes containing sulphur	**ANH**
05 07 99	wastes not otherwise specified	**ANH**[B]
6	WASTES FROM INORGANIC CHEMICAL PROCESSES	
06 01	**wastes from the manufacture, formulation, supply and use (MFSU) of acids**	
06 01 01*	sulphuric acid and sulphurous acid	**AH**
06 01 02*	hydrochloric acid	**AH**
06 01 03*	hydrofluoric acid	**AH**
06 01 04*	phosphoric and phosphorous acid	**AH**
06 01 05*	nitric acid and nitrous acid	**AH**

06 01 06*	other acids	**AH**
06 01 99	wastes not otherwise specified	**ANH**
06 02	**wastes from the MFSU of bases**	
06 02 01*	calcium hydroxide	**AH**
06 02 03*	ammonium hydroxide	**AH**
06 02 04*	sodium and potassium hydroxide	**AH**
06 02 05*	other bases	**AH**
06 02 99	wastes not otherwise specified	**ANH**
06 03	**wastes from the MFSU of salts and their solutions and metallic oxides**	
06 03 11*	solid salts and solutions containing cyanides	**MH**
06 03 13*	solid salts and solutions containing heavy metals	**MH**
06 03 14	solid salts and solutions other than those mentioned in 06 03 11 and 06 03 13	**MNH**
06 03 15*	metallic oxides containing heavy metals	**MH**
06 03 16	metallic oxides other than those mentioned in 06 03 15	**MNH**
06 03 99	wastes not otherwise specified	**ANH**
06 04	**metal-containing wastes other than those mentioned in 06 03**	
06 04 03*	wastes containing arsenic	**AH**[B]
06 04 04*	wastes containing mercury	**AH**[B]
06 04 05*	wastes containing other heavy metals	**AH**[B]
06 04 99	wastes not otherwise specified	**ANH**[B]
06 05	**sludges from on-site effluent treatment**	
06 05 02*	sludges from on-site effluent treatment containing hazardous substances	**MH**
06 05 03	sludges from on-site effluent treatment other than those mentioned in 06 05 02	**MNH**
06 06	**wastes from the MFSU of sulphur chemicals, sulphur chemical processes and desulphurisation processes**	
06 06 02*	wastes containing hazardous sulphides	**MH**
06 06 03	wastes containing sulphides other than those mentioned in 06 06 02	**MNH**
06 06 99	wastes not otherwise specified	**ANH**
06 07	**wastes from the MFSU of halogens and halogen chemical processes**	
06 07 01*	wastes containing asbestos from electrolysis	**AH**[B]
06 07 02*	activated carbon from chlorine production	**AH**
06 07 03*	barium sulphate sludge containing mercury	**AH**[B]
06 07 04*	solutions and acids, for example contact acid	**AH**
06 07 99	wastes not otherwise specified	**ANH**[B]
06 08	**wastes from the MFSU of silicon and silicon derivatives**	
06 08 02*	waste containing hazardous chlorosilanes	**MH**
06 08 99	wastes not otherwise specified	**MNH**
06 09	**wastes from the MSFU of phosphorous chemicals and phosphorous chemical processes**	
06 09 02	phosphorous slag	**ANH**
06 09 03*	calcium-based reaction wastes containing or contaminated with hazardous substances	**MH**
06 09 04	calcium-based reaction wastes other than those mentioned in 06 09 03	**MNH**
06 09 99	wastes not otherwise specified	**ANH**
06 10	**wastes from the MFSU of nitrogen chemicals, nitrogen chemical processes and fertiliser manufacture**	

06 10 02*	wastes containing hazardous substances	**MH**
06 10 99	wastes not otherwise specified	**MNH**
06 11	**wastes from the manufacture of inorganic pigments and opacificiers**	
06 11 01	calcium-based reaction wastes from titanium dioxide production	**ANH**
06 11 99	wastes not otherwise specified	**ANH**
06 13	**wastes from inorganic chemical processes not otherwise specified**	
06 13 01*	inorganic plant protection products, wood-preserving agents and other biocides.	**AH**
06 13 02*	spent activated carbon (except 06 07 02)	**AH**
06 13 03	carbon black	**ANH**
06 13 04*	wastes from asbestos processing	**AH**
06 13 05*	Soot	**AH**
06 13 99	wastes not otherwise specified	**ANH**
7	WASTES FROM ORGANIC CHEMICAL PROCESSES	
07 01	**wastes from the manufacture, formulation, supply and use (MFSU) of basic organic chemicals**	
07 01 01*	aqueous washing liquids and mother liquors	**AH**
07 01 03*	organic halogenated solvents, washing liquids and mother liquors	**AH**
07 01 04*	other organic solvents, washing liquids and mother liquors	**AH**
07 01 07*	halogenated still bottoms and reaction residues	**AH**
07 01 08*	other still bottoms and reaction residues	**AH**
07 01 09*	halogenated filter cakes and spent absorbents	**AH**
07 01 10*	other filter cakes and spent absorbents	**AH**
07 01 11*	sludges from on-site effluent treatment containing hazardous substances	**MH**
07 01 12	sludges from on-site effluent treatment other than those mentioned in 07 01 11	**MNH**
07 01 99	wastes not otherwise specified	**ANH**
07 02	**wastes from the MFSU of plastics, synthetic rubber and man-made fibres**	
07 02 01*	aqueous washing liquids and mother liquors	**AH**
07 02 03*	organic halogenated solvents, washing liquids and mother liquors	**AH**
07 02 04*	other organic solvents, washing liquids and mother liquors	**AH**
07 02 07*	halogenated still bottoms and reaction residues	**AH**
07 02 08*	other still bottoms and reaction residues	**AH**
07 02 09*	halogenated filter cakes and spent absorbents	**AH**
07 02 10*	other filter cakes and spent absorbents	**AH**
07 02 11*	sludges from on-site effluent treatment containing hazardous substances	**MH**
07 02 12	sludges from on-site effluent treatment other than those mentioned in 07 02 11	**MNH**
07 02 13	waste plastic	**ANH**
07 02 14*	wastes from additives containing hazardous substances	**MH**
07 02 15	wastes from additives other than those mentioned in 07 02 14	**MNH**
07 02 16*	waste containing hazardous silicones	**MH**
07 02 17	waste containing silicones other than those mentioned in 07 02 16	**MNH**
07 02 99	wastes not otherwise specified	**ANH**
07 03	**wastes from the MFSU of organic dyes and pigments (except 06 11)**	
07 03 01*	aqueous washing liquids and mother liquors	**AH**
07 03 03*	organic halogenated solvents, washing liquids and mother liquors	**AH**
07 03 04*	other organic solvents, washing liquids and mother liquors	**AH**

07 03 07*	halogenated still bottoms and reaction residues	**AH**
07 03 08*	other still bottoms and reaction residues	**AH**
07 03 09*	halogenated filter cakes and spent absorbents	**AH**
07 03 10*	other filter cakes and spent absorbents	**AH**
07 03 11*	sludges from on-site effluent treatment containing hazardous substances	**MH**
07 03 12	sludges from on-site effluent treatment other than those mentioned in 07 03 11	**MNH**
07 03 99	wastes not otherwise specified	**ANH**
07 04	**wastes from the MFSU of organic plant protection products (except 02 01 08 and 02 01 09), wood preserving agents (except 03 02) and other biocides**	
07 04 01*	aqueous washing liquids and mother liquors	**AH**
07 04 03*	organic halogenated solvents, washing liquids and mother liquors	**AH**
07 04 04*	other organic solvents, washing liquids and mother liquors	**AH**
07 04 07*	halogenated still bottoms and reaction residues	**AH**
07 04 08*	other still bottoms and reaction residues	**AH**
07 04 09*	halogenated filter cakes and spent absorbents	**AH**
07 04 10*	other filter cakes and spent absorbents	**AH**
07 04 11*	sludges from on-site effluent treatment containing hazardous substances	**MH**
07 04 12	sludges from on-site effluent treatment other than those mentioned in 07 04 11	**MNH**
07 04 13*	solid wastes containing hazardous substances	**MH**
07 04 99	wastes not otherwise specified	**MNH**
07 05	**wastes from the MFSU of pharmaceuticals**	
07 05 01*	aqueous washing liquids and mother liquors	**AH**
07 05 03*	organic halogenated solvents, washing liquids and mother liquors	**AH**
07 05 04*	other organic solvents, washing liquids and mother liquors	**AH**
07 05 07*	halogenated still bottoms and reaction residues	**AH**
07 05 08*	other still bottoms and reaction residues	**AH**
07 05 09*	halogenated filter cakes and spent absorbents	**AH**
07 05 10*	other filter cakes and spent absorbents	**AH**
07 05 11*	sludges from on-site effluent treatment containing hazardous substances	**MH**
07 05 12	sludges from on-site effluent treatment other than those mentioned in 07 05 11	**MNH**
07 05 13*	solid wastes containing hazardous substances	**MH**
07 05 14	solid wastes other than those mentioned in 07 05 13	**MNH**
07 05 99	wastes not otherwise specified	**ANH**
07 06	**wastes from the MFSU of fats, grease, soaps, detergents, disinfectants and cosmetics**	
07 06 01*	aqueous washing liquids and mother liquors	**AH**
07 06 03*	organic halogenated solvents, washing liquids and mother liquors	**AH**
07 06 04*	other organic solvents, washing liquids and mother liquors	**AH**
07 06 07*	halogenated still bottoms and reaction residues	**AH**
07 06 08*	other still bottoms and reaction residues	**AH**
07 06 09*	halogenated filter cakes and spent absorbents	**AH**
07 06 10*	other filter cakes and spent absorbents	**AH**
07 06 11*	sludges from on-site effluent treatment containing hazardous substances	**MH**
07 06 12	sludges from on-site effluent treatment other than those mentioned in 07 06 11	**MNH**
07 06 99	wastes not otherwise specified	**ANH**

07 07	**wastes from the MFSU of fine chemicals and chemical products not otherwise specified**	
07 07 01*	aqueous washing liquids and mother liquors	**AH**
07 07 03*	organic halogenated solvents, washing liquids and mother liquors	**AH**
07 07 04*	other organic solvents, washing liquids and mother liquors	**AH**
07 07 07*	halogenated still bottoms and reaction residues	**AH**
07 07 08*	other still bottoms and reaction residues	**AH**
07 07 09*	halogenated filter cakes and spent absorbents	**AH**
07 07 10*	other filter cakes and spent absorbents	**AH**
07 07 11*	sludges from on-site effluent treatment containing hazardous substances	**MH**
07 07 12	sludges from on-site effluent treatment other than those mentioned in 07 07 11	**MNH**
07 07 99	wastes not otherwise specified	**ANH**
8	WASTES FROM THE MANUFACTURE, FORMULATION, SUPPLY AND USE (MFSU) OF COATINGS (PAINTS, VARNISHES AND VITREOUS ENAMELS), ADHESIVES, SEALANTS AND PRINTING INKS	
08 01	**wastes from MFSU and removal of paint and varnish**	
08 01 11*	waste paint and varnish containing organic solvents or other hazardous substances	**MH**
08 01 12	waste paint and varnish other than those mentioned in 08 01 11	**MNH**
08 01 13*	sludges from paint or varnish containing organic solvents or other hazardous substances	**MH**
08 01 14	sludges from paint or varnish other than those mentioned in 08 01 13	**MNH**
08 01 15*	aqueous sludges containing paint or varnish containing organic solvents or other hazardous substances	**MH**
08 01 16	aqueous sludges containing paint or varnish other than those mentioned in 08 01 15	**MNH**
08 01 17*	wastes from paint or varnish removal containing organic solvents or other hazardous substances	**MH**
08 01 18	wastes from paint or varnish removal other than those mentioned in 08 01 17	**MNH**
08 01 19*	aqueous suspensions containing paint or varnish containing organic solvents or other hazardous substances	**MH**
08 01 20	aqueous suspensions containing paint or varnish other than those mentioned in 08 01 19	**MNH**
08 01 21*	waste paint or varnish remover	**AH**
08 01 99	wastes not otherwise specified	**ANH**
08 02	**wastes from MFSU of other coatings (including ceramic materials)**	
08 02 01	waste coating powders	**ANH**
08 02 02	aqueous sludges containing ceramic materials	**ANH**
08 02 03	aqueous suspensions containing ceramic materials	**ANH**
08 02 99	wastes not otherwise specified	**ANH**
08 03	**wastes from MFSU of printing inks**	
08 03 07	aqueous sludges containing ink	**ANH**
08 03 08	aqueous liquid waste containing ink	**ANH**
08 03 12*	waste ink containing hazardous substances	**MH**
08 03 13	waste ink other than those mentioned in 08 03 12	**MNH**
08 03 14*	ink sludges containing hazardous substances	**MH**
08 03 15	ink sludges other than those mentioned in 08 03 14	**MNH**
08 03 16*	waste etching solutions	**AH**
08 03 17*	waste printing toner containing hazardous substances	**MH**
08 03 18	waste printing toner other than those mentioned in 08 03 17	**MNH**

08 03 19*	disperse oil	**AH**
08 03 99	wastes not otherwise specified	**ANH**
08 04	**wastes from MFSU of adhesives and sealants (including waterproofing products)**	
08 04 09*	waste adhesives and sealants containing organic solvents or other hazardous substances	**MH**
08 04 10	waste adhesives and sealants other than those mentioned in 08 04 09	**MNH**
08 04 11*	adhesive and sealant sludges containing organic solvents or other hazardous substances	**MH**
08 04 12	adhesive and sealant sludges other than those mentioned in 08 04 11	**MNH**
08 04 13*	aqueous sludges containing adhesives or sealants containing organic solvents or other hazardous substances	**MH**
08 04 14	aqueous sludges containing adhesives or sealants other than those mentioned in 08 04 13	**MNH**
08 04 15*	aqueous liquid waste containing adhesives or sealants containing organic solvents or other hazardous substances	**MH**
08 04 16	aqueous liquid waste containing adhesives or sealants other than those mentioned in 08 04 15	**MNH**
08 04 17*	rosin oil	**AH**
08 04 99	wastes not otherwise specified	**ANH**
08 05	**wastes not otherwise specified in 08**	
08 05 01*	waste isocyanates	**AH**
9	WASTES FROM THE PHOTOGRAPHIC INDUSTRY	
09 01	**wastes from the photographic industry**	
09 01 01*	water-based developer and activator solutions	**AH**
09 01 02*	water-based offset plate developer solutions	**AH**
09 01 03*	solvent-based developer solutions	**AH**
09 01 04*	fixer solutions	**AH**
09 01 05*	bleach solutions and bleach fixer solutions	**AH**
09 01 06*	wastes containing silver from on-site treatment of photographic wastes	**AH**[B]
09 01 07	photographic film and paper containing silver or silver compounds	**ANH**
09 01 08	photographic film and paper free of silver or silver compounds	**ANH**
09 01 10	single-use cameras without batteries	**ANH**
09 01 11*	single-use cameras containing batteries included in 16 06 01, 16 06 02 or 16 06 03	**MH**[B]
09 01 12	single-use cameras containing batteries other than those mentioned in 09 01 11	**MNH**
09 01 13*	aqueous liquid waste from on-site reclamation of silver other than those mentioned in 09 01 06	**AH**
09 01 99	wastes not otherwise specified	**MNH**
10	WASTES FROM THERMAL PROCESSES	
10 01	**wastes from power stations and other combustion plants (except 19)**	
10 01 01	bottom ash, slag and boiler dust (excluding boiler dust mentioned in 10 01 04)	**ANH**
10 01 02	coal fly ash	**ANH**
10 01 03	fly ash from peat and untreated wood	**ANH**
10 01 04*	oil fly ash and boiler dust	**AH**
10 01 05	calcium-based reaction wastes from flue-gas desulphurisation in solid form	**ANH**
10 01 07	calcium-based reaction wastes from flue-gas desulphurisation in sludge form	**ANH**

10 01 09*	sulphuric acid	**AH**
10 01 13*	fly ash from emulsified hydrocarbons used as fuel	**AH**
10 01 14*	bottom ash, slag and boiler dust from co-incineration containing hazardous substances	**MH**
10 01 15	bottom ash, slag and boiler dust from co-incineration other than those mentioned in 10 01 14	**MNH**
10 01 16*	fly ash from co-incineration containing hazardous substances	**MH**
10 01 17	fly ash from co-incineration other than those mentioned in 10 01 16	**MNH**
10 01 18*	wastes from gas cleaning containing hazardous substances	**MH**
10 01 19	wastes from gas cleaning other than those mentioned in 10 01 05, 10 01 07 and 10 01 18	**MNH**
10 01 20*	sludges from on-site effluent treatment containing hazardous substances	**MH**
10 01 21	sludges from on-site effluent treatment other than those mentioned in 10 01 20	**MNH**
10 01 22*	aqueous sludges from boiler cleansing containing hazardous substances	**MH**
10 01 23	aqueous sludges from boiler cleansing other than those mentioned in 10 01 22	**MNH**
10 01 24	sands from fluidised beds	**ANH**
10 01 25	wastes from fuel storage and preparation of coal-fired power plants	**ANH**
10 01 26	wastes from cooling-water treatment	**ANH**
10 01 99	wastes not otherwise specified	**ANH**
10 02	**wastes from the iron and steel industry**	
10 02 01	wastes from the processing of slag	**ANH**
10 02 02	unprocessed slag	**ANH**
10 02 07*	solid wastes from gas treatment containing hazardous substances	**MH**
10 02 08	solid wastes from gas treatment other than those mentioned in 10 02 07	**MNH**
10 02 10	mill scales	**ANH**
10 02 11*	wastes from cooling-water treatment containing oil	**MH**
10 02 12	wastes from cooling-water treatment other than those mentioned in 10 02 11	**MNH**
10 02 13*	sludges and filter cakes from gas treatment containing hazardous substances	**MH**
10 02 14	sludges and filter cakes from gas treatment other than those mentioned in 10 02 13	**MNH**
10 02 15	other sludges and filter cakes	**MNH**[A]
10 02 99	wastes not otherwise specified	**ANH**
10 03	**wastes from aluminium thermal metallurgy**	
10 03 02	anode scraps	**ANH**
10 03 04*	primary production slags	**AH**
10 03 05	waste alumina	**ANH**
10 03 08*	salt slags from secondary production	**AH**
10 03 09*	black drosses from secondary production	**AH**
10 03 15*	skimmings that are flammable or emit, upon contact with water, flammable gases in hazardous quantities	**MH**[B]
10 03 16	skimmings other than those mentioned in 10 03 15	**MNH**[B]
10 03 17*	tar-containing wastes from anode manufacture	**MH**[B]
10 03 18	carbon-containing wastes from anode manufacture other than those mentioned in 10 03 17	**MNH**[B]
10 03 19*	flue-gas dust containing hazardous substances	**MH**
10 03 20	flue-gas dust other than those mentioned in 10 03 19	**MNH**

10 03 21*	other particulates and dust (including ball-mill dust) containing hazardous substances	**MH**
10 03 22	other particulates and dust (including ball-mill dust) other than those mentioned in 10 03 21	**MNH**
10 03 23*	solid wastes from gas treatment containing hazardous substances	**MH**
10 03 24	solid wastes from gas treatment other than those mentioned in 10 03 23	**MNH**
10 03 25*	sludges and filter cakes from gas treatment containing hazardous substances	**MH**
10 03 26	sludges and filter cakes from gas treatment other than those mentioned in 10 03 25	**MNH**
10 03 27*	wastes from cooling-water treatment containing oil	**MH**
10 03 28	wastes from cooling-water treatment other than those mentioned in 10 03 27	**MNH**
10 03 29*	wastes from treatment of salt slags and black drosses containing hazardous substances	**MH**
10 03 30	wastes from treatment of salt slags and black drosses other than those mentioned in 10 03 29	**MNH**
10 03 99	wastes not otherwise specified	**ANH**
10 04	**wastes from lead thermal metallurgy**	
10 04 01*	slags from primary and secondary production	**AH**
10 04 02*	dross and skimmings from primary and secondary production	**AH**
10 04 03*	calcium arsenate	**AH**
10 04 04*	flue-gas dust	**AH**
10 04 05*	other particulates and dust	**AH**
10 04 06*	solid wastes from gas treatment	**AH**
10 04 07*	sludges and filter cakes from gas treatment	**AH**
10 04 09*	wastes from cooling-water treatment containing oil	**MH**
10 04 10	wastes from cooling-water treatment other than those mentioned in 10 04 09	**MNH**
10 04 99	wastes not otherwise specified	**ANH**
10 05	**wastes from zinc thermal metallurgy**	
10 05 01	slags from primary and secondary production	**ANH**
10 05 03*	flue-gas dust	**AH**
10 05 04	other particulates and dust	**ANH**
10 05 05*	solid waste from gas treatment	**AH**
10 05 06*	sludges and filter cakes from gas treatment	**AH**
10 05 08*	wastes from cooling-water treatment containing oil	**MH**
10 05 09	wastes from cooling-water treatment other than those mentioned in 10 05 08	**MNH**
10 05 10*	dross and skimmings that are flammable or emit, upon contact with water, flammable gases in hazardous quantities	**MH**[B]
10 05 11	dross and skimmings other than those mentioned in 10 05 10	**MNH**[B]
10 05 99	wastes not otherwise specified	**ANH**
10 06	**wastes from copper thermal metallurgy**	
10 06 01	slags from primary and secondary production	**ANH**
10 06 02	dross and skimmings from primary and secondary production	**ANH**
10 06 03*	flue-gas dust	**AH**
10 06 04	other particulates and dust	**ANH**
10 06 06*	solid wastes from gas treatment	**AH**
10 06 07*	sludges and filter cakes from gas treatment	**AH**
10 06 09*	wastes from cooling-water treatment containing oil	**MH**
10 06 10	wastes from cooling-water treatment other than those mentioned in 10 06 09	**MNH**

10 06 99	wastes not otherwise specified	**ANH**
10 07	**wastes from silver, gold and platinum thermal metallurgy**	
10 07 01	slags from primary and secondary production	**ANH**
10 07 02	dross and skimmings from primary and secondary production	**ANH**
10 07 03	solid wastes from gas treatment	**ANH**
10 07 04	other particulates and dust	**ANH**
10 07 05	sludges and filter cakes from gas treatment	**ANH**
10 07 07*	wastes from cooling-water treatment containing oil	**MH**
10 07 08	wastes from cooling-water treatment other than those mentioned in 10 07 07	**MNH**
10 07 99	wastes not otherwise specified	**ANH**
10 08	**wastes from other non-ferrous thermal metallurgy**	
10 08 04	particulates and dust	**ANH**
10 08 08*	salt slag from primary and secondary production	**AH**
10 08 09	other slags	**ANH**
10 08 10*	dross and skimmings that are flammable or emit, upon contact with water, flammable gases in hazardous quantities	**MH**[B]
10 08 11	dross and skimmings other than those mentioned in 10 08 10	**MNH**[B]
10 08 12*	tar-containing wastes from anode manufacture	**MH**[B]
10 08 13	carbon-containing wastes from anode manufacture other than those mentioned in 10 08 12	**MNH**[B]
10 08 14	anode scrap	**ANH**
10 08 15*	flue-gas dust containing hazardous substances	**MH**
10 08 16	flue-gas dust other than those mentioned in 10 08 15	**MNH**
10 08 17*	sludges and filter cakes from flue-gas treatment containing hazardous substances	**MH**
10 08 18	sludges and filter cakes from flue-gas treatment other than those mentioned in 10 08 17	**MNH**
10 08 19*	wastes from cooling-water treatment containing oil	**MH**
10 08 20	wastes from cooling-water treatment other than those mentioned in 10 08 19	**MNH**
10 08 99	wastes not otherwise specified	**ANH**
10 09	**wastes from casting of ferrous pieces**	
10 09 03	furnace slag	**ANH**
10 09 05*	casting cores and moulds which have not undergone pouring containing hazardous substances	**MH**
10 09 06	casting cores and moulds which have not undergone pouring other than those mentioned in 10 09 05	**MNH**
10 09 07*	casting cores and moulds which have undergone pouring containing hazardous substances	**MH**
10 09 08	casting cores and moulds which have undergone pouring other than those mentioned in 10 09 07	**MNH**
10 09 09*	flue-gas dust containing hazardous substances	**MH**
10 09 10	flue-gas dust other than those mentioned in 10 09 09	**MNH**
10 09 11*	other particulates containing hazardous substances	**MH**
10 09 12	other particulates other than those mentioned in 10 09 11	**MNH**
10 09 13*	waste binders containing hazardous substances	**MH**
10 09 14	waste binders other than those mentioned in 10 09 13	**MNH**
10 09 15*	waste crack-indicating agent containing hazardous substances	**MH**
10 09 16	waste crack-indicating agent other than those mentioned in 10 09 15	**MNH**
10 09 99	wastes not otherwise specified	**ANH**
10 10	**wastes from casting of non-ferrous pieces**	
10 10 03	furnace slag	**ANH**

10 10 05*	casting cores and moulds which have not undergone pouring, containing hazardous substances	**MH**
10 10 06	casting cores and moulds which have not undergone pouring, other than those mentioned in 10 10 05	**MNH**
10 10 07*	casting cores and moulds which have undergone pouring, containing hazardous substances	**MH**
10 10 08	casting cores and moulds which have undergone pouring, other than those mentioned in 10 10 07	**MNH**
10 10 09*	flue-gas dust containing hazardous substances	**MH**
10 10 10	flue-gas dust other than those mentioned in 10 10 09	**MNH**
10 10 11*	other particulates containing hazardous substances	**MH**
10 10 12	other particulates other than those mentioned in 10 10 11	**MNH**
10 10 13*	waste binders containing hazardous substances	**MH**
10 10 14	waste binders other than those mentioned in 10 10 13	**MNH**
10 10 15*	waste crack-indicating agent containing hazardous substances	**MH**
10 10 16	waste crack-indicating agent other than those mentioned in 10 10 15	**MNH**
10 10 99	wastes not otherwise specified	**ANH**
10 11	**wastes from manufacture of glass and glass products**	
10 11 03	waste glass-based fibrous materials	**ANH**
10 11 05	particulates and dust	**ANH**
10 11 09*	waste preparation mixture before thermal processing, containing hazardous substances	**MH**
10 11 10	waste preparation mixture before thermal processing, other than those mentioned in 10 11 09	**MNH**
10 11 11*	waste glass in small particles and glass powder containing heavy metals (for example from cathode ray tubes)	**MH**
10 11 12	waste glass other than those mentioned in 10 11 11	**MNH**
10 11 13*	glass-polishing and -grinding sludge containing hazardous substances	**MH**
10 11 14	glass-polishing and -grinding sludge other than those mentioned in 10 11 13	**MNH**
10 11 15*	solid wastes from flue-gas treatment containing hazardous substances	**MH**
10 11 16	solid wastes from flue-gas treatment other than those mentioned in 10 11 15	**MNH**
10 11 17*	sludges and filter cakes from flue-gas treatment containing hazardous substances	**MH**
10 11 18	sludges and filter cakes from flue-gas treatment other than those mentioned in 10 11 17	**MNH**
10 11 19*	solid wastes from on-site effluent treatment containing hazardous substances	**MH**
10 11 20	solid wastes from on-site effluent treatment other than those mentioned in 10 11 19	**MNH**
10 11 99	wastes not otherwise specified	**ANH**
10 12	**wastes from manufacture of ceramic goods, bricks, tiles and construction products**	
10 12 01	waste preparation mixture before thermal processing	**ANH**
10 12 03	particulates and dust	**ANH**
10 12 05	sludges and filter cakes from gas treatment	**ANH**
10 12 06	discarded moulds	**ANH**
10 12 08	waste ceramics, bricks, tiles and construction products (after thermal processing)	**ANH**
10 12 09*	solid wastes from gas treatment containing hazardous substances	**MH**
10 12 10	solid wastes from gas treatment other than those mentioned in 10 12 09	**MNH**

10 12 11*	wastes from glazing containing heavy metals	**MH**
10 12 12	wastes from glazing other than those mentioned in 10 12 11	**MNH**
10 12 13	sludge from on-site effluent treatment	**ANH**
10 12 99	wastes not otherwise specified	**ANH**
10 13	**wastes from manufacture of cement, lime and plaster and articles and products made from them**	
10 13 01	waste preparation mixture before thermal processing	**ANH**
10 13 04	wastes from calcination and hydration of lime	**ANH**
10 13 06	particulates and dust (except 10 13 12 and 10 13 13)	**MNH**
10 13 07	sludges and filter cakes from gas treatment	**ANH**
10 13 09*	wastes from asbestos-cement manufacture containing asbestos	**MH**
10 13 10	wastes from asbestos-cement manufacture other than those mentioned in 10 13 09	**MNH**
10 13 11	wastes from cement-based composite materials other than those mentioned in 10 13 09 and 10 13 10	**MNH**
10 13 12*	solid wastes from gas treatment containing hazardous substances	**MH**
10 13 13	solid wastes from gas treatment other than those mentioned in 10 13 12	**MNH**
10 13 14	waste concrete and concrete sludge	**ANH**
10 13 99	wastes not otherwise specified	**ANH**
10 14	**waste from crematoria**	
10 14 01*	waste from gas cleaning containing mercury	**AH**[B]
11	WASTES FROM CHEMICAL SURFACE TREATMENT AND COATING OF METALS AND OTHER MATERIALS; NON-FERROUS HYDRO-METALLURGY	
11 01	**wastes from chemical surface treatment and coating of metals and other materials (for example galvanic processes, zinc coating processes, pickling processes, etching, phosphating, alkaline degreasing, anodising)**	
11 01 05*	pickling acids	**AH**
11 01 06*	acids not otherwise specified	**AH**
11 01 07*	pickling bases	**AH**
11 01 08*	phosphatising sludges	**AH**
11 01 09*	sludges and filter cakes containing hazardous substances	**MH**
11 01 10	sludges and filter cakes other than those mentioned in 11 01 09	**MNH**
11 01 11*	aqueous rinsing liquids containing hazardous substances	**MH**
11 01 12	aqueous rinsing liquids other than those mentioned in 11 01 11	**MNH**
11 01 13*	degreasing wastes containing hazardous substances	**MH**
11 01 14	degreasing wastes other than those mentioned in 11 01 13	**MNH**
11 01 15*	eluate and sludges from membrane systems or ion exchange systems containing hazardous substances	**AH**[B]
11 01 16*	saturated or spent ion exchange resins	**AH**
11 01 98*	other wastes containing hazardous substances	**MH**[A]
11 01 99	wastes not otherwise specified	**MNH**
11 02	**wastes from non-ferrous hydrometallurgical processes**	
11 02 02*	sludges from zinc hydrometallurgy (including jarosite, goethite)	**AH**
11 02 03	wastes from the production of anodes for aqueous electrolytical processes	**ANH**
11 02 05*	wastes from copper hydrometallurgical processes containing hazardous substances	**MH**
11 02 06	wastes from copper hydrometallurgical processes other than those mentioned in 11 02 05	**MNH**
11 02 07*	other wastes containing hazardous substances	**MH**[A]
11 02 99	wastes not otherwise specified	**MNH**

11 03	**sludges and solids from tempering processes**	
11 03 01*	wastes containing cyanide	**AH**[B]
11 03 02*	other wastes	**AH**
11 05	**wastes from hot galvanising processes**	
11 05 01	hard zinc	**ANH**
11 05 02	zinc ash	**ANH**
11 05 03*	solid wastes from gas treatment	**AH**
11 05 04*	spent flux	**AH**
11 05 99	wastes not otherwise specified	**ANH**
12	WASTES FROM SHAPING AND PHYSICAL AND MECHANICAL SURFACE TREATMENT OF METALS AND PLASTICS	
12 01	**wastes from shaping and physical and mechanical surface treatment of metals and plastics**	
12 01 01	ferrous metal filings and turnings	**ANH**
12 01 02	ferrous metal dust and particles	**ANH**
12 01 03	non-ferrous metal filings and turnings	**ANH**
12 01 04	non-ferrous metal dust and particles	**ANH**
12 01 05	plastics shavings and turnings	**ANH**
12 01 06*	mineral-based machining oils containing halogens (except emulsions and solutions)	**AH**
12 01 07*	mineral-based machining oils free of halogens (except emulsions and solutions)	**AH**
12 01 08*	machining emulsions and solutions containing halogens	**AH**
12 01 09*	machining emulsions and solutions free of halogens	**AH**
12 01 10*	synthetic machining oils	**AH**
12 01 12*	spent waxes and fats	**AH**
12 01 13	welding wastes	**ANH**
12 01 14*	machining sludges containing hazardous substances	**MH**
12 01 15	machining sludges other than those mentioned in 12 01 14	**MNH**
12 01 16*	waste blasting material containing hazardous substances	**MH**
12 01 17	waste blasting material other than those mentioned in 12 01 16	**MNH**
12 01 18*	metal sludge (grinding, honing and lapping sludge) containing oil	**AH**[B]
12 01 19*	readily biodegradable machining oil	**AH**
12 01 20*	spent grinding bodies and grinding materials containing hazardous substances	**MH**
12 01 21	spent grinding bodies and grinding materials other than those mentioned in 12 01 20	**MNH**
12 01 99	wastes not otherwise specified	**ANH**[B]
12 03	**wastes from water and steam degreasing processes (except 11)**	
12 03 01*	aqueous washing liquids	**AH**
12 03 02*	steam degreasing wastes	**AH**
13	OIL WASTES AND WASTES OF LIQUID FUELS (except edible oils, and those in chapters 05, 12 and 19)	
13 01	**waste hydraulic oils**	
13 01 01*	hydraulic oils, containing PCBs	**AH**[B]
13 01 04*	chlorinated emulsions	**AH**
13 01 05*	non-chlorinated emulsions	**AH**
13 01 09*	mineral-based chlorinated hydraulic oils	**AH**
13 01 10*	mineral based non-chlorinated hydraulic oils	**AH**
13 01 11*	synthetic hydraulic oils	**AH**
13 01 12*	readily biodegradable hydraulic oils	**AH**
13 01 13*	other hydraulic oils	**AH**

13 02	**waste engine, gear and lubricating oils**	
13 02 04*	mineral-based chlorinated engine, gear and lubricating oils	**AH**
13 02 05*	mineral-based non-chlorinated engine, gear and lubricating oils	**AH**
13 02 06*	synthetic engine, gear and lubricating oils	**AH**
13 02 07*	readily biodegradable engine, gear and lubricating oils	**AH**
13 02 08*	other engine, gear and lubricating oils	**AH**
13 03	**waste insulating and heat transmission oils**	
13 03 01*	insulating or heat transmission oils containing PCBs	**AH**[B]
13 03 06*	mineral-based chlorinated insulating and heat transmission oils other than those mentioned in 13 03 01	**AH**
13 03 07*	mineral-based non-chlorinated insulating and heat transmission oils	**AH**
13 03 08*	synthetic insulating and heat transmission oils	**AH**
13 03 09*	readily biodegradable insulating and heat transmission oils	**AH**
13 03 10*	other insulating and heat transmission oils	**AH**
13 04	**bilge oils**	
13 04 01*	bilge oils from inland navigation	**AH**
13 04 02*	bilge oils from jetty sewers	**AH**
13 04 03*	bilge oils from other navigation	**AH**
13 05	**oil/water separator contents**	
13 05 01*	solids from grit chambers and oil/water separators	**AH**
13 05 02*	sludges from oil/water separators	**AH**
13 05 03*	interceptor sludges	**AH**
13 05 06*	oil from oil/water separators	**AH**
13 05 07*	oily water from oil/water separators	**AH**
13 05 08*	mixtures of wastes from grit chambers and oil/water separators	**AH**
13 07	**wastes of liquid fuels**	
13 07 01*	fuel oil and diesel	**AH**
13 07 02*	Petrol	**AH**
13 07 03*	other fuels (including mixtures)	**AH**
13 08	**oil wastes not otherwise specified**	
13 08 01*	desalter sludges or emulsions	**AH**
13 08 02*	other emulsions	**AH**
13 08 99*	wastes not otherwise specified	**AH**
14	WASTE ORGANIC SOLVENTS, REFRIGERANTS AND PROPELLANTS (except 07 and 08)	
14 06	**waste organic solvents, refrigerants and foam/aerosol propellants**	
14 06 01*	chlorofluorocarbons, HCFC, HFC	**AH**
14 06 02*	other halogenated solvents and solvent mixtures	**AH**
14 06 03*	other solvents and solvent mixtures	**AH**
14 06 04*	sludges or solid wastes containing halogenated solvents	**AH**[B]
14 06 05*	sludges or solid wastes containing other solvents	**AH**[B]
15	WASTE PACKAGING; ABSORBENTS, WIPING CLOTHS, FILTER MATERIALS AND PROTECTIVE CLOTHING NOT OTHERWISE SPECIFIED	
15 01	**packaging (including separately collected municipal packaging waste)**	
15 01 01	paper and cardboard packaging	**MNH**[B]
15 01 02	plastic packaging	**MNH**[B]
15 01 03	wooden packaging	**MNH**[B]
15 01 04	metallic packaging	**MNH**[B]
15 01 05	composite packaging	**MNH**[B]

15 01 06	mixed packaging	**MNH**[B]
15 01 07	glass packaging	**MNH**[B]
15 01 09	textile packaging	**MNH**[B]
15 01 10*	packaging containing residues of or contaminated by hazardous substances	**MH**[B]
15 01 11*	metallic packaging containing a hazardous solid porous matrix (for example asbestos), including empty pressure containers	**MH**[B]
15 02	**absorbents, filter materials, wiping cloths and protective clothing**	
15 02 02*	absorbents, filter materials (including oil filters not otherwise specified), wiping cloths, protective clothing contaminated by hazardous substances	**MH**
15 02 03	absorbents, filter materials, wiping cloths and protective clothing other than those mentioned in 15 02 02	**MNH**
16	WASTES NOT OTHERWISE SPECIFIED IN THE LIST	
16 01	**end-of-life vehicles from different means of transport (including off-road machinery) and wastes from dismantling of end-of-life vehicles and vehicle maintenance (except 13, 14, 16 06 and 16 08)**	
16 01 03	end-of-life tyres	**ANH**
16 01 04*	end-of-life vehicles	**AH**[A]
16 01 06	end-of-life vehicles, containing neither liquids nor other hazardous components	**ANH**[A]
16 01 07*	oil filters	**AH**
16 01 08*	components containing mercury	**MH**[A]
16 01 09*	components containing PCBs	**MH**[A]
16 01 10*	explosive components (for example air bags)	**AH**
16 01 11*	brake pads containing asbestos	**MH**
16 01 12	brake pads other than those mentioned in 16 01 11	**MNH**
16 01 13*	brake fluids	**AH**
16 01 14*	antifreeze fluids containing hazardous substances	**MH**
16 01 15	antifreeze fluids other than those mentioned in 16 01 14	**MNH**
16 01 16	tanks for liquefied gas	**ANH**
16 01 17	ferrous metal	**ANH**
16 01 18	non-ferrous metal	**ANH**
16 01 19	Plastic	**ANH**
16 01 20	Glass	**ANH**
16 01 21*	hazardous components other than those mentioned in 16 01 07 to 16 01 11 and 16 01 13 and 16 01 14	**AH**
16 01 22	components not otherwise specified	**MNH**
16 01 99	wastes not otherwise specified	**ANH**
16 02	**wastes from electrical and electronic equipment**	
16 02 09*	transformers and capacitors containing PCBs	**MH**[B]
16 02 10*	discarded equipment containing or contaminated by PCBs other than those mentioned in 16 02 09	**MH**[B]
16 02 11*	discarded equipment containing chlorofluorocarbons, HCFC, HFC	**MH**[B]
16 02 12*	discarded equipment containing free asbestos	**MH**[B]
16 02 13*	discarded equipment containing hazardous components (3) other than those mentioned in 16 02 09 to 16 02 12	**MH**[B]
16 02 14	discarded equipment other than those mentioned in 16 02 09 to 16 02 13	**MNH**[B]
16 02 15*	hazardous components removed from discarded equipment	**MH**[B]
16 02 16	components removed from discarded equipment other than those mentioned in 16 02 15	**MNH**[B]
16 03	**off-specification batches and unused products**	

16 03 03*	inorganic wastes containing hazardous substances	**MH**
16 03 04	inorganic wastes other than those mentioned in 16 03 03	**MNH**
16 03 05*	organic wastes containing hazardous substances	**MH**
16 03 06	organic wastes other than those mentioned in 16 03 05	**MNH**
16 03 07*[6]	metallic mercury	**AH**
16 04	**waste explosives**	
16 04 01*	waste ammunition	**AH**
16 04 02*	fireworks wastes	**AH**
16 04 03*	other waste explosives	**AH**
16 05	**gases in pressure containers and discarded chemicals**	
16 05 04*	gases in pressure containers (including halons) containing hazardous substances	**MH**
16 05 05	gases in pressure containers other than those mentioned in 16 05 04	**MNH**
16 05 06*	laboratory chemicals, consisting of or containing hazardous substances, including mixtures of laboratory chemicals	**MH**
16 05 07*	discarded inorganic chemicals consisting of or containing hazardous substances	**MH**
16 05 08*	discarded organic chemicals consisting of or containing hazardous substances	**MH**
16 05 09	discarded chemicals other than those mentioned in 16 05 06, 16 05 07 or 16 05 08	**MNH**
16 06	**batteries and accumulators**	
16 06 01*	lead batteries	**AH**
16 06 02*	Ni-Cd batteries	**AH**
16 06 03*	mercury-containing batteries	**AH**
16 06 04	alkaline batteries (except 16 06 03)	**ANH**
16 06 05	other batteries and accumulators	**ANH**
16 06 06*	separately collected electrolyte from batteries and accumulators	**AH**
16 07	**wastes from transport tank, storage tank and barrel cleaning (except 05 and 13)**	
16 07 08*	wastes containing oil	**AH**[B]
16 07 09*	wastes containing other hazardous substances	**AH**[B]
16 07 99	wastes not otherwise specified	**ANH**[B]
16 08	**spent catalysts**	
16 08 01	spent catalysts containing gold, silver, rhenium, rhodium, palladium, iridium or platinum (except 16 08 07)	**MNH**
16 08 02*	spent catalysts containing hazardous transition metals or hazardous transition metal compounds	**MH**
16 08 03	spent catalysts containing transition metals or transition metal compounds not otherwise specified	**MNH**
16 08 04	spent fluid catalytic cracking catalysts (except 16 08 07)	**MNH**
16 08 05*	spent catalysts containing phosphoric acid	**AH**[B]
16 08 06*	spent liquids used as catalysts	**AH**
16 08 07*	spent catalysts contaminated with hazardous substances	**MH**
16 09	**oxidising substances**	
16 09 01*	permanganates, for example potassium permanganate	**AH**
16 09 02*	chromates, for example potassium chromate, potassium or sodium dichromate	**AH**
16 09 03*	peroxides, for example hydrogen peroxide	**AH**
16 09 04*	oxidising substances, not otherwise specified	**AH**

[6] Entry newly added by Decision 2014/955/EU

16 10	**aqueous liquid wastes destined for off-site treatment**	
16 10 01*	aqueous liquid wastes containing hazardous substances	**MH**
16 10 02	aqueous liquid wastes other than those mentioned in 16 10 01	**MNH**
16 10 03*	aqueous concentrates containing hazardous substances	**MH**
16 10 04	aqueous concentrates other than those mentioned in 16 10 03	**MNH**
16 11	**waste linings and refractories**	
16 11 01*	carbon-based linings and refractories from metallurgical processes containing hazardous substances	**MH**
16 11 02	carbon-based linings and refractories from metallurgical processes others than those mentioned in 16 11 01	**MNH**
16 11 03*	other linings and refractories from metallurgical processes containing hazardous substances	**MH**
16 11 04	other linings and refractories from metallurgical processes other than those mentioned in 16 11 03	**MNH**
16 11 05*	linings and refractories from non-metallurgical processes containing hazardous substances	**MH**
16 11 06	linings and refractories from non-metallurgical processes others than those mentioned in 16 11 05	**MNH**
17	CONSTRUCTION AND DEMOLITION WASTES (INCLUDING EXCAVATED SOIL FROM CONTAMINATED SITES)	
17 01	**concrete, bricks, tiles and ceramics**	
17 01 01	Concrete	**MNH**[A]
17 01 02	Bricks	**MNH**[A]
17 01 03	tiles and ceramics	**MNH**[A]
17 01 06*	mixtures of, or separate fractions of concrete, bricks, tiles and ceramics containing hazardous substances	**MH**
17 01 07	mixtures of concrete, bricks, tiles and ceramics other than those mentioned in 17 01 06	**MNH**
17 02	**wood, glass and plastic**	
17 02 01	Wood	**MNH**
17 02 02	Glass	**MNH**
17 02 03	Plastic	**MNH**
17 02 04*	glass, plastic and wood containing or contaminated with hazardous substances	**MH**
17 03	**bituminous mixtures, coal tar and tarred products**	
17 03 01*	bituminous mixtures containing coal tar	**MH**
17 03 02	bituminous mixtures other than those mentioned in 17 03 01	**MNH**
17 03 03*	coal tar and tarred products	**AH**
17 04	**metals (including their alloys)**	
17 04 01	copper, bronze, brass	**MNH**[A]
17 04 02	Aluminium	**MNH**[A]
17 04 03	Lead	**MNH**[A]
17 04 04	Zinc	**MNH**[A]
17 04 05	iron and steel	**MNH**[A]
17 04 06	Tin	**MNH**[A]
17 04 07	mixed metals	**MNH**[A]
17 04 09*	metal waste contaminated with hazardous substances	**MH**[A]
17 04 10*	cables containing oil, coal tar and other hazardous substances	**MH**
17 04 11	cables other than those mentioned in 17 04 10	**MNH**
17 05	**soil (including excavated soil from contaminated sites), stones and dredging spoil**	
17 05 03*	soil and stones containing hazardous substances	**MH**
17 05 04	soil and stones other than those mentioned in 17 05 03	**MNH**
17 05 05*	dredging spoil containing hazardous substances	**MH**

17 05 06	dredging spoil other than those mentioned in 17 05 05	**MNH**
17 05 07*	track ballast containing hazardous substances	**MH**
17 05 08	track ballast other than those mentioned in 17 05 07	**MNH**
17 06	**insulation materials and asbestos-containing construction materials**	
17 06 01*	insulation materials containing asbestos	**MH**
17 06 03*	other insulation materials consisting of or containing hazardous substances	**MH**
17 06 04	insulation materials other than those mentioned in 17 06 01 and 17 06 03	**MNH**
17 06 05*	construction materials containing asbestos	**AH**[B]
17 08	**gypsum-based construction material**	
17 08 01*	gypsum-based construction materials contaminated with hazardous substances	**MH**
17 08 02	gypsum-based construction materials other than those mentioned in 17 08 01	**MNH**
17 09	**other construction and demolition wastes**	
17 09 01*	construction and demolition wastes containing mercury	**MH**
17 09 02*	construction and demolition wastes containing PCB (for example PCB-containing sealants, PCB-containing resin-based floorings, PCB-containing sealed glazing units, PCB-containing capacitors)	**MH**
17 09 03*	other construction and demolition wastes (including mixed wastes) containing hazardous substances	**MH**
17 09 04	mixed construction and demolition wastes other than those mentioned in 17 09 01, 17 09 02 and 17 09 03	**MNH**
18	WASTES FROM HUMAN OR ANIMAL HEALTH CARE AND/OR RELATED RESEARCH (except kitchen and restaurant wastes not arising from immediate health care)	
18 01	**wastes from natal care, diagnosis, treatment or prevention of disease in humans**	
18 01 01	sharps (except 18 01 03)	**MNH**[B]
18 01 02	body parts and organs including blood bags and blood preserves (except 18 01 03)	**MNH**[B]
18 01 03*	wastes whose collection and disposal is subject to special requirements in order to prevent infection	**MH**[B]
18 01 04	wastes whose collection and disposal is not subject to special requirements in order to prevent infection (for example dressings, plaster casts, linen, disposable clothing, diapers)	**MNH**[B]
18 01 06*	chemicals consisting of or containing hazardous substances	**MH**
18 01 07	chemicals other than those mentioned in 18 01 06	**MNH**
18 01 08*	cytotoxic and cytostatic medicines	**MH**[B]
18 01 09	medicines other than those mentioned in 18 01 08	**MNH**[B]
18 01 10*	amalgam waste from dental care	**AH**
18 02	**wastes from research, diagnosis, treatment or prevention of disease involving animals**	
18 02 01	sharps (except 18 02 02)	**MNH**[B]
18 02 02*	wastes whose collection and disposal is subject to special requirements in order to prevent infection	**MH**[B]
18 02 03	wastes whose collection and disposal is not subject to special requirements in order to prevent infection	**MNH**[B]
18 02 05*	chemicals consisting of or containing hazardous substances	**MH**
18 02 06	chemicals other than those mentioned in 18 02 05	**MNH**
18 02 07*	cytotoxic and cytostatic medicines	**MH**[B]
18 02 08	medicines other than those mentioned in 18 02 07	**MNH**[B]
19	WASTES FROM WASTE MANAGEMENT FACILITIES, OFF-SITE WASTE WATER TREATMENT PLANTS AND THE PREPARATION OF	

	WATER INTENDED FOR HUMAN CONSUMPTION AND WATER FOR INDUSTRIAL USE	
19 01	**wastes from incineration or pyrolysis of waste**	
19 01 02	ferrous materials removed from bottom ash	**ANH**
19 01 05*	filter cake from gas treatment	**AH**
19 01 06*	aqueous liquid wastes from gas treatment and other aqueous liquid wastes	**AH**
19 01 07*	solid wastes from gas treatment	**AH**
19 01 10*	spent activated carbon from flue-gas treatment	**AH**
19 01 11*	bottom ash and slag containing hazardous substances	**MH**
19 01 12	bottom ash and slag other than those mentioned in 19 01 11	**MNH**
19 01 13*	fly ash containing hazardous substances	**MH**
19 01 14	fly ash other than those mentioned in 19 01 13	**MNH**
19 01 15*	boiler dust containing hazardous substances	**MH**
19 01 16	boiler dust other than those mentioned in 19 01 15	**MNH**
19 01 17*	pyrolysis wastes containing hazardous substances	**MH**
19 01 18	pyrolysis wastes other than those mentioned in 19 01 17	**MNH**
19 01 19	sands from fluidised beds	**ANH**
19 01 99	wastes not otherwise specified	**ANH**
19 02	**wastes from physico/chemical treatments of waste (including dechromatation, decyanidation, neutralisation)**	
19 02 03	premixed wastes composed only of non-hazardous wastes	**ANH**
19 02 04*	premixed wastes composed of at least one hazardous waste	**AH**
19 02 05*	sludges from physico/chemical treatment containing hazardous substances	**MH**
19 02 06	sludges from physico/chemical treatment other than those mentioned in 19 02 05	**MNH**
19 02 07*	oil and concentrates from separation	**AH**
19 02 08*	liquid combustible wastes containing hazardous substances	**MH**
19 02 09*	solid combustible wastes containing hazardous substances	**MH**
19 02 10	combustible wastes other than those mentioned in 19 02 08 and 19 02 09	**MNH**
19 02 11*	other wastes containing hazardous substances	**AH**[B]
19 02 99	wastes not otherwise specified	**ANH**
19 03	**stabilised/solidified wastes**	
19 03 04*	wastes marked as hazardous, partly stabilised other than 19 03 08	**MH**[B]
19 03 05	stabilised wastes other than those mentioned in 19 03 04	**MNH**[B]
19 03 06*	wastes marked as hazardous, solidified	**MH**[B]
19 03 07	solidified wastes other than those mentioned in 19 03 06	**MNH**[B]
19 03 08*[7]	partly stabilised mercury	**AH**
19 04	**vitrified waste and wastes from vitrification**	
19 04 01	vitrified waste	**ANH**
19 04 02*	fly ash and other flue-gas treatment wastes	**AH**
19 04 03*	non-vitrified solid phase	**AH**
19 04 04	aqueous liquid wastes from vitrified waste tempering	**ANH**
19 05	**wastes from aerobic treatment of solid wastes**	
19 05 01	non-composted fraction of municipal and similar wastes	**ANH**
19 05 02	non-composted fraction of animal and vegetable waste	**ANH**
19 05 03	off-specification compost	**ANH**
19 05 99	wastes not otherwise specified	**ANH**

[7] Entry newly added by Decision 2014/955/EU

19 06	**wastes from anaerobic treatment of waste**	
19 06 03	liquor from anaerobic treatment of municipal waste	**ANH**
19 06 04	digestate from anaerobic treatment of municipal waste	**ANH**
19 06 05	liquor from anaerobic treatment of animal and vegetable waste	**ANH**
19 06 06	digestate from anaerobic treatment of animal and vegetable waste	**ANH**
19 06 99	wastes not otherwise specified	**ANH**
19 07	**landfill leachate**	
19 07 02*	landfill leachate containing hazardous substances	**MH**
19 07 03	landfill leachate other than those mentioned in 19 07 02	**MNH**
19 08	**wastes from waste water treatment plants not otherwise specified**	
19 08 01	Screenings	**ANH**
19 08 02	waste from desanding	**ANH**
19 08 05	sludges from treatment of urban waste water	**ANH**
19 08 06*	saturated or spent ion exchange resins	**AH**
19 08 07*	solutions and sludges from regeneration of ion exchangers	**AH**
19 08 08*	membrane system waste containing heavy metals	**MH**
19 08 09	grease and oil mixture from oil/water separation containing only edible oil and fats	**MNH**[B]
19 08 10*	grease and oil mixture from oil/water separation other than those mentioned in 19 08 09	**MH**[B]
19 08 11*	sludges containing hazardous substances from biological treatment of industrial waste water	**MH**
19 08 12	sludges from biological treatment of industrial waste water other than those mentioned in 19 08 11	**MNH**
19 08 13*	sludges containing hazardous substances from other treatment of industrial waste water	**MH**
19 08 14	sludges from other treatment of industrial waste water other than those mentioned in 19 08 13	**MNH**
19 08 99	wastes not otherwise specified	**MNH**
19 09	**wastes from the preparation of water intended for human consumption or water for industrial use**	
19 09 01	solid waste from primary filtration and screenings	**ANH**
19 09 02	sludges from water clarification	**ANH**
19 09 03	sludges from decarbonation	**ANH**
19 09 04	spent activated carbon	**ANH**
19 09 05	saturated or spent ion exchange resins	**ANH**
19 09 06	solutions and sludges from regeneration of ion exchangers	**ANH**
19 09 99	wastes not otherwise specified	**ANH**
19 10	**wastes from shredding of metal-containing wastes**	
19 10 01	iron and steel waste	**ANH**
19 10 02	non-ferrous waste	**ANH**
19 10 03*	fluff-light fraction and dust containing hazardous substances	**MH**
19 10 04	fluff-light fraction and dust other than those mentioned in 19 10 03	**MNH**
19 10 05*	other fractions containing hazardous substances	**MH**
19 10 06	other fractions other than those mentioned in 19 10 05	**MNH**
19 11	**wastes from oil regeneration**	
19 11 01*	spent filter clays	**AH**
19 11 02*	acid tars	**AH**
19 11 03*	aqueous liquid wastes	**AH**
19 11 04*	wastes from cleaning of fuel with bases	**AH**
19 11 05*	sludges from on-site effluent treatment containing hazardous substances	**MH**

19 11 06	sludges from on-site effluent treatment other than those mentioned in 19 11 05	**MNH**
19 11 07*	wastes from flue-gas cleaning	**AH**
19 11 99	wastes not otherwise specified	**ANH**
19 12	**wastes from the mechanical treatment of waste (for example sorting, crushing, compacting, pelletising) not otherwise specified**	
19 12 01	paper and cardboard	**ANH**
19 12 02	ferrous metal	**ANH**
19 12 03	non-ferrous metal	**ANH**
19 12 04	plastic and rubber	**ANH**
19 12 05	Glass	**ANH**
19 12 06*	wood containing hazardous substances	**MH**
19 12 07	wood other than that mentioned in 19 12 06	**MNH**
19 12 08	Textiles	**ANH**
19 12 09	minerals (for example sand, stones)	**ANH**
19 12 10	combustible waste (refuse derived fuel)	**ANH**
19 12 11*	other wastes (including mixtures of materials) from mechanical treatment of waste containing hazardous substances	**MH**
19 12 12	other wastes (including mixtures of materials) from mechanical treatment of wastes other than those mentioned in 19 12 11	**MNH**
19 13	**wastes from soil and groundwater remediation**	
19 13 01*	solid wastes from soil remediation containing hazardous substances	**MH**
19 13 02	solid wastes from soil remediation other than those mentioned in 19 13 01	**MNH**
19 13 03*	sludges from soil remediation containing hazardous substances	**MH**
19 13 04	sludges from soil remediation other than those mentioned in 19 13 03	**MNH**
19 13 05*	sludges from groundwater remediation containing hazardous substances	**MH**
19 13 06	sludges from groundwater remediation other than those mentioned in 19 13 05	**MNH**
19 13 07*	aqueous liquid wastes and aqueous concentrates from groundwater remediation containing hazardous substances	**MH**
19 13 08	aqueous liquid wastes and aqueous concentrates from groundwater remediation other than those mentioned in 19 13 07	**MNH**
20	MUNICIPAL WASTES (HOUSEHOLD WASTE AND SIMILAR COMMERCIAL, INDUSTRIAL AND INSTITUTIONAL WASTES) INCLUDING SEPARATELY COLLECTED FRACTIONS	
20 01	**separately collected fractions (except 15 01)**	
20 01 01	paper and cardboard	**ANH**
20 01 02	Glass	**ANH**
20 01 08	biodegradable kitchen and canteen waste	**ANH**
20 01 10	Clothes	**ANH**
20 01 11	Textiles	**ANH**
20 01 13*	Solvents	**AH**
20 01 14*	Acids	**AH**
20 01 15*	Alkalines	**AH**
20 01 17*	Photochemicals	**AH**
20 01 19*	Pesticides	**AH**
20 01 21*	fluorescent tubes and other mercury-containing waste	**AH**[A]
20 01 23*	discarded equipment containing chlorofluorocarbons	**AH**[A]
20 01 25	edible oil and fat	**MNH**[B]
20 01 26*	oil and fat other than those mentioned in 20 01 25	**MH**[B]

20 01 27*	paint, inks, adhesives and resins containing hazardous substances	**MH**
20 01 28	paint, inks, adhesives and resins other than those mentioned in 20 01 27	**MNH**
20 01 29*	detergents containing hazardous substances	**MH**
20 01 30	detergents other than those mentioned in 20 01 29	**MNH**
20 01 31*	cytotoxic and cytostatic medicines	**MH**
20 01 32	medicines other than those mentioned in 20 01 31	**MNH**[B]
20 01 33*	batteries and accumulators included in 16 06 01, 16 06 02 or 16 06 03 and unsorted batteries and accumulators containing these batteries	**MH**[B]
20 01 34	batteries and accumulators other than those mentioned in 20 01 33	**MNH**[B]
20 01 35*	discarded electrical and electronic equipment other than those mentioned in 20 01 21 and 20 01 23 containing hazardous components (3)	**MH**[B]
20 01 36	discarded electrical and electronic equipment other than those mentioned in 20 01 21, 20 01 23 and 20 01 35	**MNH**[B]
20 01 37*	wood containing hazardous substances	**MH**
20 01 38	wood other than that mentioned in 20 01 37	**MNH**
20 01 39	Plastics	**ANH**
20 01 40	Metals	**ANH**
20 01 41	wastes from chimney sweeping	**ANH**
20 01 99	other fractions not otherwise specified	**ANH**
20 02	**garden and park wastes (including cemetery waste)**	
20 02 01	biodegradable waste	**ANH**
20 02 02	soil and stones	**ANH**
20 02 03	other non-biodegradable wastes	**ANH**
20 03	**other municipal wastes**	
20 03 01	mixed municipal waste	**ANH**
20 03 02	waste from markets	**ANH**
20 03 03	street-cleaning residues	**ANH**
20 03 04	septic tank sludge	**ANH**
20 03 06	waste from sewage cleaning	**ANH**
20 03 07	bulky waste	**ANH**
20 03 99	municipal wastes not otherwise specified	**ANH**

A: For these entries the interpretation in [BMU 2005] differs from the above presented interpretation.

B: For these entries the interpretation in [UK EA 2015] differs from the above presented interpretation.

A.4. Examples of the classification of complex entries

This chapter presents additional information and examples providing guidance on characterisation approaches to be followed for some of the more problematic and complex entries, in particular packaging waste, waste from electrical and electronic equipment (WEEE) and end of life vehicles (ELV).

A.4.1. Packaging waste and contents

Separately collected packaging waste is to be allocated under sub-chapter 15 01. Such waste must not be classified under sub-chapter 20 01, as the heading of sub-chapter 20 01 explicitly excludes sub-chapter 15 01. Under sub-chapter 15 01 the following MNH entries are contained:

15 01 01	paper and cardboard packaging	MNH
15 01 02	plastic packaging	MNH
15 01 03	wooden packaging	MNH
15 01 04	metallic packaging	MNH
15 01 05	composite packaging	MNH
15 01 06	mixed packaging	MNH
15 01 07	glass packaging	MNH
15 01 09	textile packaging	MNH

The following MH entries are provided:

15 01 10*	packaging containing residues of or contaminated by hazardous substances	MH
15 01 11*	metallic packaging containing a dangerous solid porous matrix (for example asbestos), including empty pressure containers	MH

Before it is decided which entry for packaging waste is most suitable, one has to assess whether the waste actually should be classified as packaging waste at all, or rather be classified according its content. Figure 5 provides a flow chart supporting this decision. Please note that derogations from the flow chart presented in Figure 5 may be possible, e.g. for mixed packaging from households after considering Member State specific conventions and approaches. [OVAM 2015] for example states that mixed packaging waste which is cleaned at a licensed company and thus can be assumed that no hazardous residues are contained by the packaging waste, can be classified as non-hazardous.

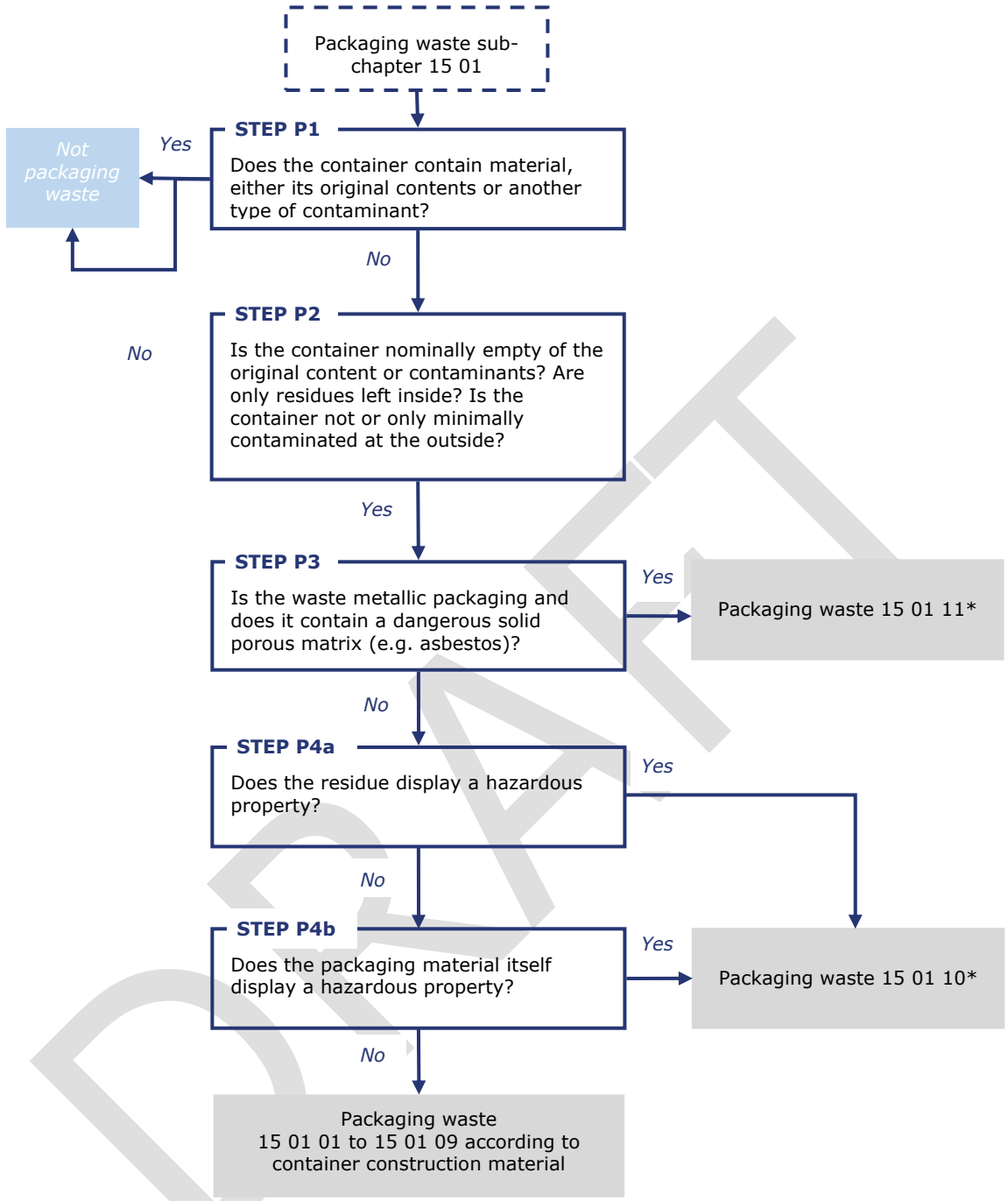

Figure 5: Flow chart for classification of packaging waste based on [UK EA 2015]

In order to allocate the sub-chapter 15 01 it is necessary to determine whether the packaging/container is nominally empty (cf. Step P1 and P2 in Figure 5). It is suggested to understand 'nominally empty' in the sense that the product's contents were effectively removed. This removal can be achieved by draining or scraping. The circumstance that minimal residues of the contents are present in the packaging waste does not preclude the packaging waste to qualify as "nominally empty" and does not prohibit the packaging waste from falling under subchapter 15 01 packaging waste.

To decide upon the question whether packaging is nominally empty, practical approaches applied in individual Member States can be used. For example in Austria related to packaging "completely emptying" means proper emptying ("free of trickles" such as leftover powder, sludge and drops; brush clean, spatula clean) except for unavoidable residues, without applying additional measures (such as heating). The term does not include cleaning of containers. A container has been emptied completely, if in the case of a renewed attempt of emptying, such as inverting the container no longer drops or solid remains are released.

When the packaging contains residual material that cannot be removed by normal standards (e.g. due to size of aperture or nature of material), then the waste should not be classified as packaging waste but as the residual material waste (e.g. half empty tin of solidified varnish might be classified as 08 01 11*).

In the case that waste containers are washed to remove the contents, further considerations should be taken to ensure an environmentally sound method is used.

If the packaging is nominally empty, it should be checked if it is metallic packaging which contains a dangerous solid porous matrix (e.g. asbestos in old fireproof packaging material), including empty pressure containers (Step P3 in Figure 5). Such metallic packaging needs to be assigned to code 15 01 11*.

With respect to steps P4a and P4b in Figure 5 it has to be noted that packaging which is nominally empty but which still can contain small quantities of residues can be either hazardous because (1) it displays hazardous properties because of the remaining residues OR because (2) it displays hazardous properties because of the packaging material itself (of which the packaging is manufactured) because it is contaminated with hazardous substances from the manufacturing process (e.g. with impregnating agents, stabilisers, flame retardants, plasticisers, pigments, …) or the use phase.

Accordingly, it has to be assessed in Step P4a whether the waste displays hazardous properties due to the remaining residues and in Step 4b whether the packaging material itself displays hazardous properties. Calculations whether threshold limits defined in Annex III to the WFD, based on hazard statement codes, are exceeded, should be based on the weight of the waste as it is when the classification of the waste is undertaken (i.e. a comparison would be made between the amount of contained hazardous substances against the total weight of the nominally empty packaging plus the leftover residue). If hazardous properties can be related to the residue or to the packaging material itself, entry 15 01 10* will apply. Otherwise a non-hazardous entry according the packaging's material needs to be assigned (codes 15 01 01 to 15 01 09) [UK EA 2015].

A.4.2. Waste from electrical and electronic equipment (WEEE)

In the LoW, there are two existing chapters explicitly referring to WEEE:

16 wastes not otherwise specified in the list

20 municipal wastes (household waste and similar commercial, industrial and institutional wastes) including separately collected fractions

According to the structure presented in paragraph A.1 of this document, chapter 20 takes precedence over chapter 16. In sub-chapter 20 01, separately collected WEEE from municipal waste can be allocated to the following hazardous entries:

20 01 21*	fluorescent tubes and other mercury-containing waste	AH
20 01 23*	discarded equipment containing chlorofluorocarbons	AH
20 01 35*	discarded electrical and electronic equipment other than those mentioned 20 01 21 and 20 01 23 containing hazardous components	MH

MNH entries are the following ones:

20 01 36	discarded electrical and electronic equipment other than those mentioned in 20 01 21, 20 01 23 and 20 01 35.	MNH

If WEEE arises from a commercial/ industrial source and cannot be seen as 'similar commercial, industrial and institutional waste', it thus cannot be allocated to an entry of chapter 20. Instead the following MH entries exist in chapter 16:

16 02 09*	transformers and capacitors containing PCBs	MH
16 02 10*	discarded equipment containing or contaminated by PCBs other than those mentioned in 16 02 09*	MH
16 02 11*	discarded equipment containing chlorofluorocarbons, HCFC, HFC	MH
16 02 12*	discarded equipment containing asbestos	MH
16 02 13*	discarded equipment containing hazardous components other than those mentioned in 16 02 09* to 16 02 12*	MH
16 02 15*	Hazardous components removed from discarded equipment	MH

MNH entries are the following ones:

16 02 14	discarded equipment other than those mentioned in 16 02 09 to 16 02 13	MNH
16 02 16	components removed from discarded equipment other than those mentioned in 16 02 15	MNH

If there are more specific entries for the characterisation of certain fractions of WEEE in the LoW, those entries shall be used for classification, e.g. batteries and accumulators stemming from WEEE may be allocated to sub-chapter 16 06 (batteries and accumulators). Additionally, different entries apart from chapters 16 and 20 of the LoW will have to be used for fractions generated during the treatment process of WEEE. Further information on treatment steps and resulting fractions thereof can be found in [BW 2003]. A graphical overview is displayed in Figure 6.

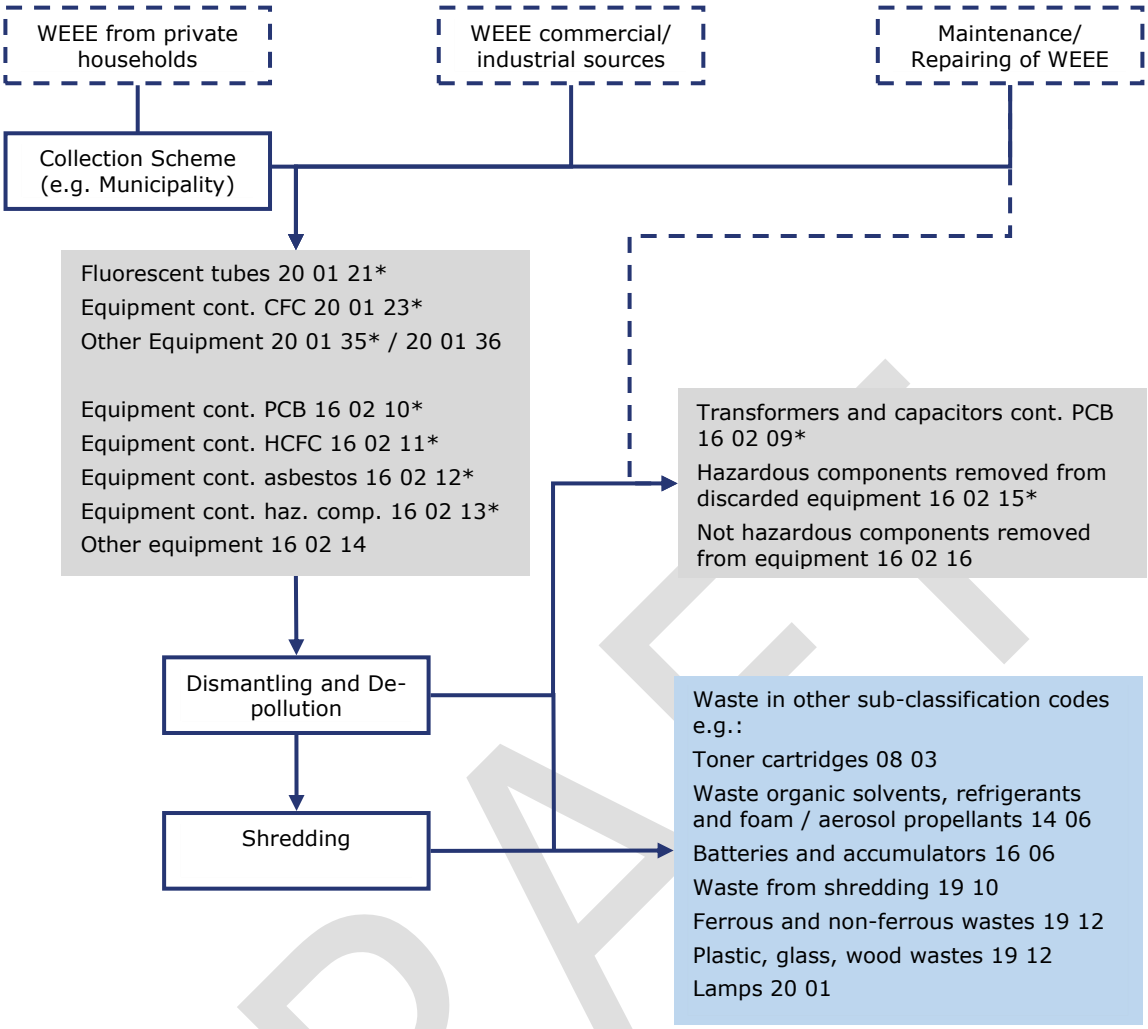

Figure 6: LoW entries from WEEE treatment adjusted from [IPA 2015] and [BW 2003]

Please note that the threshold values based on hazard statement codes refer to the state of the waste as it is when the classification of the waste is undertaken (i.e. the state in which it is usually transferred and subsequently managed). For the case of WEEE this might imply that if whole appliances are to be classified, the weight of the appliance has to be considered as basis for the applied concentration limits of hazardous substance. If separated fractions have to be classified (e.g. after selective treatment) the weight of the separated fractions are to be considered as basis for the applied concentration limits. Please refer also to MS specific approaches and conventions.

Labelling and record keeping of WEEE and batteries

Please note that labelling and record keeping obligations stemming from WFD do not apply to separate fractions of hazardous waste produced by households until they are accepted for collection, disposal or recovery by an establishment or an undertaking which has obtained a permit or has been registered in accordance with the WFD. Since collection points established under the WEEE or the Batteries Directive, in accordance with and under the preconditions of the two Directives, are not subject to the registration or permit requirements, the said obligations do not apply to these collection points but only once WEEE or waste batteries are accepted for collection, disposal or recovery at a waste treatment facility.

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Box 14: Remark on labelling and record keeping requirements for WEEE and batteries

A.4.3. End-of-life vehicles (ELV)

End-of-life vehicles are covered within the LoW in chapter 16 and in particular in sub-chapter 16 01. For whole vehicles two entries are mainly relevant:

16 01 04*	end-of-life vehicles	AH
16 01 06	end-of-life vehicles, containing neither liquids nor other hazardous components	ANH

Treatment processes within a facility for ELV are described in Figure 7. Depending on the treatment steps, different entries of the LoW (not from sub-chapter 16 01) come into play for fractions originally stemming from ELV.

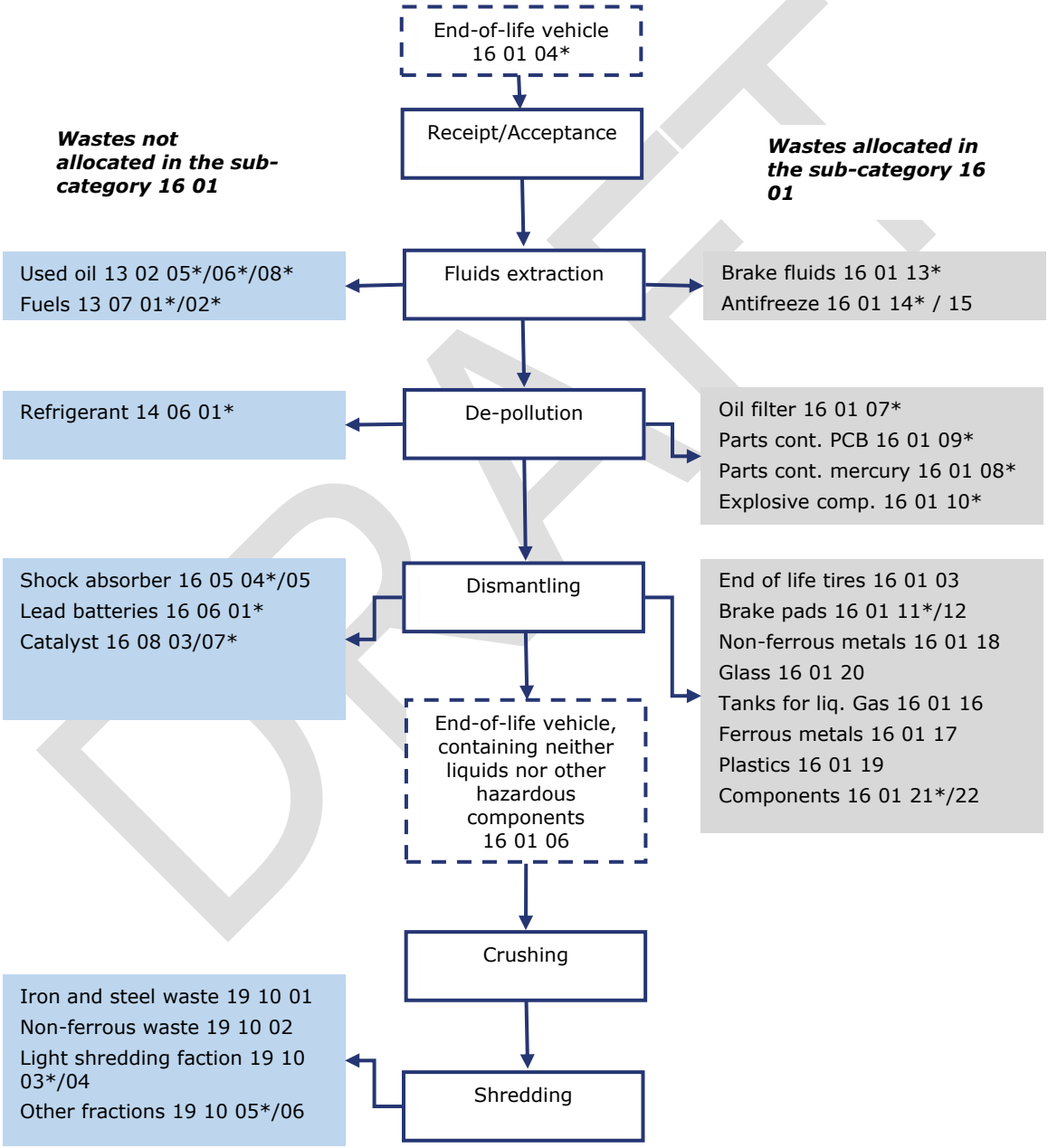


Figure 7: LoW entries from ELV treatment adjusted from [IPA 2015]

A.5. Examples for the assessment of specific constituents of specific waste types

This chapter presents additional information and examples for the assessment of specific constituents of specific waste types. In the following, certain waste types or pollutants will be investigated and difficulties with classification encountered will be explained. Main entries of the LoW used for the classification will be presented. Please note that the described applicable entries will not be exclusive.

Reference can also be made to guidance documents on MS level which may contain further examples, e.g. [UK EA 2015] and [OVAM 2015] present further examples on waste oils and contaminated soils.

A.5.1. Organic constituents and specific chemical compounds

The following example provides general guidance on the classification of waste containing organic ingredients and specific chemical compounds such as PAH (Polycyclic Aromatic Hydrocarbons), BTEX (Benzene, Toluene, Ethylbenzene and Xylene) or other hydrocarbons.

General information

Polycyclic aromatic hydrocarbons (PAH) describe substances (exemplary components: Acenaphtene, Anthracene, Flourene, Pyrene, etc.) that are often found together in groups of two or more [US EPA 2008].

BTEX (acronym for Benzene, Toluene, Ethylbenzene and Xylene) is a group of related volatile organic compounds [ETSA 2015]. In some definitions found in literature it is only referred to BTX, where ethylbenzene is not included.

Hydrocarbons are compounds of hydrogen and carbon in various combinations that are present in petroleum products and natural gas. Some hydrocarbons are major air pollutants, some may be carcinogenic and others contribute to photochemical smog [ETSA 2015].

Main origin

PAHs are created when products like coal, oil, gas, and waste are burned but the combustion process is not complete. Examples are fumes from vehicle exhaust, coal production plants or other facilities burning coal, petroleum, oil or wood. Most PAHs are used to conduct research. However, some PAHs are used to make dyes, plastics, and pesticides. Some are used in medicines [US EPA 2008].

BTEX are made up of naturally-occurring chemicals that are found mainly in petroleum products such as gasolines or naphtha. BTEX can enter the environment from leaking underground storage tanks (UST's), overfills of storage tanks, fuel spills from auto accidents and from landfills.

Benzene can be found in gasoline and in products such as synthetic rubber, plastics, nylon, insecticides, paints, dyes, resins-glues, furniture wax, detergents and cosmetics. Other sources are auto exhaust, industrial emissions and cigarette smoke. Toluene occurs naturally as a component of many petroleum products. Toluene is used as a solvent for paints, coatings, gums, oils and resins. Xylenes are used in gasoline and as a solvent in printing, rubber and leather industries [ATSDR 2014].

Origins of waste containing hydrocarbons are industrial sites and combustion plants, motor vehicles and other gasoline-powered equipment, e.g. aircrafts or construction equipment [ETSA 2015].

Aspects to be considered for waste classification

Table 5 contains hazard statement code(s), hazard class and category codes for benzene, toluene and xylene-

Table 5: Hazard Statement Code(s), Hazard Class and Category Code(s) for BTEX according Table 3.1 of Part 3 of Annex VI to the CLP Regulation

International Chemical Identification	CAS No.	Hazard Statement Code(s)	Hazard Class and Category Code(s)
Benzene	71-43-2	H225 H350 H340 H372 ** H304 H319 H315	Flam. Liq. 2 Carc. 1A Mua. 1B STOT RE 1 Asp. Tox. 1 Eye Irrit. 2 Skin Irrit. 2
Toluene	108-88-3	H225 H361d *** H304 H373 ** H315 H336	Flam. Liq. 2 Repr. 2 Asp. Tox. 1 STOT RE 2 * Skin Irrit. 2 STOT SE 3
Ethylbenzene	100-41-4	H225 H304 H332 H373 (hearing organs)	Flam. Liq. 2 Asp. Tox. 1 Acute Tox. 4 * STOT RE 2
o-xylene *p*-xylene *m*-xylene Xylene	95-47-6 106-42-3 108-38-3 1330-20-7	H226 H332 H312 H315	Flam. Liq. 3 Acute Tox. 4 * Acute Tox. 4 * Skin Irrit. 2
"According to CLP: An asterisk (*) indicates a minimum classification. Classification can be further refined based on new information. Two asterisks (**) indicate that information about the route of exposure is not conclusive Three asterisks (***) indicate that information for classification for fertility and developmental effects under Directive 67/548/EEC, has been translated only for those effects classified under that Directive."			

Regarding organic compounds, sum parameters like PAH, BTEX and hydrocarbons (the latter sometimes referred also as "mineral oils" or total petroleum hydrocarbons (TPH) are often applied in practical waste analysis. The CLP Regulation does not recognise these as group entries for which a classification could be assigned. However, MS level,

specific conventions may exist for the classification of waste as hazardous by using the above presented sum parameters.

The LoW specifies that "where applicable the following notes included in Annex VI to Regulation (EC) No 1272/2008 may be taken into account when establishing the hazardous properties of wastes: 1.1.3.1. Notes relating to the identification, classification and labelling of substanes: Notes B, D, F, J, L, M, P, Q, R, and U." Relevant to this respect are notes M and L. Therefore benzo[a]pyrene can be used as a marker compound representing PAH for carcinogenicity for certain coal tar entries. For hazard statement code(s), hazard class and category code(s) of benzo[*a*]pyrene please refer to Table 6. More information on the usage of PAH and benzo[*a*]pyrene for the example of coal tar can be found in chapter A.5.5.

Table 6: Hazard Statement Code(s), Hazard Class and Category Code(s) for benzo[*a*]pyrene according Table 3.1 of Part 3 of Annex VI to the CLP Regulation

International Chemical Identification	CAS No.	Hazard Statement Code(s)	Hazard Class and Category Code(s)
Benzo[*a*]pyrene Benzo[*def*]chrysene	50-32-8	H350 H340 H360FD H317 H400 H410	Carc. 1B Muta. 1B Repr. 1B Skin Sens. 1 Aquatic Acute 1 Aquatic Cronic 1

A.5.2. Substances that deplete the ozone layer

The following section provides general guidance on the classification of waste containing substances that deplete the ozone layer (ODS).

General information

Ozone-depleting substances generally contain chlorine, fluorine, bromine, carbon, and hydrogen in varying proportions and are often described by the general term halocarbons. Chlorofluorocarbons (CFCs), carbon tetrachloride, and methyl chloroform are important human-produced ozone-depleting gases. Another important group of human-produced halocarbons are the halons, which contain carbon, bromine, fluorine, and (in some cases) chlorine. Most known substances with a significant ozone depleting potential are covered by the Montreal Protocol which aims to phase out ODS. The corresponding EU legislation is Regulation EC/1005/2009 (see paragraph below).

These substances have a significant potential to harm the ozone layer for two reasons. The first is that they do not break down in the lower atmosphere - they can remain in the atmosphere for long time periods. The second is that they contain chlorine and/or bromine and thus help the natural reactions that destroy ozone [EEA 2014].

Main origin

Ozone depleting substances were, and still are used in many applications including refrigeration, air conditioning, foam blowing, cleaning of electronics components, manufacture of solvents and as components of fire extinguishers.

Main sources for waste containing ODS which in practice cause problems in their classification are foams from disposed refrigerators and construction and demolition wastes (e.g. waste containing PCB).

Applicable entries of the LoW

A non-exhaustive list of main entries applicable for wastes containing ODS is presented below:

14 06 01*	chlorofluorocarbons, HCFC, HFC	AH
14 06 02*	other halogenated solvents and solvent mixtures	AH
16 02 11*	discarded equipment containing chlorofluorocarbons, HCFC, HFC	MH
16 02 14	discarded equipment other than those mentioned in 16 02 09 to 16 02 13	MNH
16 05 04*	gases in pressure containers (including halons) containing hazardous substances	MH
16 05 05	Gases in pressure containers other than those mentioned in 16 05 04	MNH
17 06 03*	Other insulation materials consisting of or containing hazardous substances	MH
17 06 04	Insulation materials other than those mentioned in 17 06 01 and 17 06 03	MNH
20 01 23*	discarded equipment containing chlorofluorocarbons, HCFC, HFC	AH

Further entries may be applicable, e.g. 15 01 10* (packaging containing residues of or contaminated by hazardous substances) in case the packaging contains residues of ODS, e.g. old spray cans.

Aspects to be considered for waste classification

Annex I (controlled substances) and II (new substances) of Regulation EC/1005/2009 on substances that deplete the ozone layer provides a list of substances to be classified as ODS and their respective ozone-depleting potential.

Aforementioned mainly relevant entries 14 06 01* and 14 06 02* are AH entries. As a consequence, wastes assigned with these entries are classified as hazardous without further assessment (even if they would not display hazardous properties). However, the hazardous properties will have to be assessed e.g. for filling a consignment note.

In case of old insulation foams as used in construction that might contain ODS, a decision between the MH entry (17 06 03*) and the MNH entry (17 06 04) needs to be made. For this decision between a MH or a MNH entry, the relevant hazardous property is HP 14 'Ecotoxic' (cf. chapter C.14). As there is no harmonised classification approach for HP 14 currently available on EU level (see chapter C.14), the current MS approaches need to be considered for the assessment of waste containing ODS.

As a provisional measure, some MS apply a concentration limit of 0.1 %, stemming from the former EU chemical legislation (DSD or respectively DPD). The latter directive laid down, that the generic concentration limit for substances (in a preparation), classified as hazardous to the ozone layer (N, R59), that trigger classification of the mixture as hazardous to the ozone layer, lies at 0.1 %. For the decision between a MH and a MNH entry, this means that waste containing 0.1 % or more of ODS will have to

be classified as hazardous by HP14. Thereby the concentration limit of 0.1 % is related to an individual ODS not to the total of such substances.

A.5.3. Asbestos

The following example provides general guidance on the classification of waste containing asbestos.

General information

Asbestos is a mineralogical name which describes certain fibrous silicates belonging to the mineralogical group of the serpentine and the amphibole minerals and those are crystallized in the so-called asbestiform form. The minerals that fall under this definition are: amosite, crocidolite, anthophyllite, chrysotile, fibre-shaped actinolite and tremolite [OVAM 2015].

Main origin

The use of asbestos including chrysotile is in practice completely banned in the EU since 2005 (see restriction entry 6 in Annex XVII to the REACH Regulation). However, asbestos is still a substance of concern as there were numerous recorded uses of asbestos and it still can be found inter alia in insulation, as a constituent of cement, in industrial buildings, plants, private homes, ships, heating and cooling systems and work equipment [OSHA Unknown].

Applicable entries of the LoW

A non-exhaustive list of main entries applicable for wastes containing asbestos is presented below:

06 07 01*	wastes containing asbestos from electrolysis	MH
06 13 04*	wastes from asbestos processing[8]	AH
10 13 09*	wastes from asbestos-cement manufacture containing asbestos[9]	MH
10 13 10	wastes from asbestos-cement manufacture other than those mentioned in 10 13 09[9]	MNH
15 01 11*	metallic packaging containing a hazardous solid porous matrix (for example asbestos), including empty pressure containers	MH
16 01 11*	brake pads containing asbestos	MH
16 02 12*	discarded equipment containing free asbestos	MH
17 06 01*	insulation materials containing asbestos	MH
17 06 05*	construction materials containing asbestos	AH

Please note that the aforementioned list is just exemplary. There are further applicable LoW entries not literally mentioning asbestos, e.g. for contaminated soils containing asbestos fibres and demolition waste containing asbestos cement (17 05 03* and 17 05 04).

Aspects to be considered for waste classification

[8] These activities are prohibited in Europe. Hence the entry no longer has much meaning for the classification of waste.

For a decision between a MH or a MNH entry, the relevant hazardous property is HP 7 'Carcinogenic'. Asbestos is classified according to the CLP Regulation with hazard class 'Carc. 1A' and category code 'STOT RE 1' corresponding to hazard statement codes H350 and H372. Following Annex III of the WFD (cf. chapter C.7) the concentration limit for H350 is 0.1 %.

As a consequence, waste containing 0.1 % or more of asbestos will have to be classified as hazardous by HP7. Please note that the identification of asbestos waste usually is done on the basis of knowledge on the material and expert judgement. However, there might be methods for determination on MS level, e.g. the official method for the determination of asbestos in Italy is DM 06/09/1994 GU n° 288 10/12/1994 with the technique DRX, SEM or FT-IR where DRX is considered to be most suitable for bulky material and waste.

Materials containing asbestos, for example a sheet of insulation material, is classified under the appropriate code for that asbestos waste. Member States may provide additional guidance on this, and require that the asbestos is assessed/classified separately from the waste it is mixed with.

A.5.4. Wastes containing CaO and $Ca(OH)_2$

The following example provides general guidance on the classification of waste containing calcium oxide CaO and calcium hydroxide $Ca(OH)_2$.

General information

CaO (also called lime or quicklime) may take the form of odourless crystals, white or greyish- white lumps, or granular powder. The commercial material may have a yellowish or brownish tint because of its iron content.

$Ca(OH)_2$ (also called hydrated lime) is a soft white, powder or granule and non-combustible.

Main origin

Calcium oxide and calcium hydroxide are used in similar industries and applications:

- Use as raw material in the preparation of chlorinated lime, bleaching powder, and calcium salts. Also used as a binding agent for the manufacture of several products such as cement, and other building and paving materials.
- Used for water treatment and for the treatment of waste effluents from different industries.
- Used as a scrubbing and neutralizing agents in the chemical and petrochemical industry.
- Large volumes of calcium oxide and calcium hydroxide are generated in combustion processes and can be found in the leftover ash.
- Involved in different operations in the following industries: iron and steel manufacturing (as well as other metals), ammonia synthesis, metal ores refining, manufacture of fine chemicals (e.g. pharmaceuticals, lubricants), pulp and paper industry, leather manufacturing, etc.

Applicable entries of the LoW

There are many entries where wastes containing $CaO/Ca(OH)_2$ could be allocated. A non-exhaustive list of applicable entries is presented below. According to [UBA 2013], relevant entries for wastes containing $CaO/Ca(OH)_2$ can mainly be found in the following sub-chapters:

10 01 wastes from power stations and other combustion plants (except 19)

10 02	wastes from the iron and steel industry
10 13	wastes from manufacture of cement, lime and plaster and articles and products made from them

Please refer to chapter A.3 to check which entries of the aforementioned sub-chapters are referred to as ANH, AH, MNH or MH entries.

When $CaO/Ca(OH)_2$ is used for scrubbing flue gas in thermal disposal of waste, the following entry may apply for the solid residues (also taking into account the potential presence of other hazardous substances in the flue gas):

19 01 07*	solid waste from gas treatment	AH

Additional entries may apply for wastes containing $CaO/Ca(OH)_2$. Entry 06 02 01* calcium hydroxide for instance needs to be assigned for wastes containing Ca(OH)2 resulting from manufacture, formulation, supply and use of bases.

Aspects to be considered for waste classification

While choosing the appropriate entry for a waste containing $CaO/Ca(OH)_2$, please note that absolute non-hazardous entries will be non-hazardous. This means no further assessment on hazardous properties is necessary in order to determine whether the hazardous or non-hazardous entry shall be assigned.. For instance, slags from iron and steel industry can be assigned to the following entries:

10 02 01	wastes from the processing of slag	ANH
10 02 02	unprocessed slag	ANH

Even if the CaO content of aforementioned slags from iron and steel industry would be above the concentration limit as laid down in Annex III to the WFD , the waste will be classified as non-hazardous [UBA 2013], unless a Member State applied Article 7 of the WFD (see Box 13).

In many self-classifications or respectively safety data sheets in the frame of the CLP Regulation, calcium oxide (CaO) and calcium hydroxide ($Ca(OH)_2$) are assigned hazard statement codes H315, H318 and H335. However, there exist other self-classifications using other hazard statement codes (refer to Annex B on which data sources to consult in order to check different self-classifications of CaO and $Ca(OH)_2$). Please note that information gathered exclusively from self-classifications are not sufficient for waste classification.

For a decision between a MH or a MNH entry, the relevant hazardous properties are HP 4 'Irritant – skin irritation and eye damage' and HP 5 'Specific Target Organ Toxicity (STOT)/Aspiration Toxicity'. Corresponding concentration limits are laid down in Annex III of the WFD (cf. chapter C.4 and C.5) and are also displayed in Table 7. Please note that Table 7 is based on hazard statement codes assigned to calcium oxide and calcium hydroxide have been taken from self-classifications. In case these hazard statement codes can be validated by using additional information (e.g. information from the waste generating process), the consequence is:

- if the sum of the concentrations of all substances classified as H318 (e.g. CaO and Ca(OH)2) exceeds or equals 10 %;

the waste shall be classified hazardous according HP4.

Additionally:

- if the sum of concentrations of all substances classified as H335 (e.g. CaO and Ca(OH)2) exceeds or equals 20 %;

the waste shall be classified hazardous according HP5.

In accordance with the first indent of the Annex to the LoW, if a testing of the waste applying (non-vertebrate animal) methods provided in the Test Methods Regulation reveals that the waste in question does not display these hazardous properties, the results of the test shall prevail.

Please refer to chapter C.4 and C.5 for further information.

Table 7: Hazard statement codes and concentration limits for CaO and $Ca(OH)_2$

	Hazard Class and Category Code(s)	Hazard Statement Code(s) from self-classification	Concentration limit (total of substances)
CaO	Eye Dam. 1 STOT SE 3	H318 H335	≥ 10 % ≥ 20 %
$Ca(OH)_2$	Eye Dam. 1 STOT SE 3	H318 H335	≥ 10 % ≥ 20 %

A.5.5. Wastes containing coal tar and bitumen

The following example provides general guidance on the classification of waste containing coal tar.

General information

Coal tar is a viscous material composed of complex, high-molecular-weight, compounds e.g. derived from the destructive distillation of wood or coal [ETSA 2015].

Bitumen is a generic term applied to natural inflammable substances of variable colour, hardness, and volatility, composed principally of a mixture of hydrocarbons substantially free from oxygenated bodies [ETSA 2015]. Bitumen is manufactured from the distillation of crude oil during petroleum refining [Asphalte Insitute & Eurobitume 2015].

[Asphalte Institute & Eurobitume 2015] further explain the terminology of bitumen: *"Petroleum bitumen is known by different names throughout the world. For example the term 'bitumen' is typically used in Europe and is synonymous with the term 'asphalt', or 'asphalt binder' used in North America. Outside North America, the term 'asphalt' is used to describe mixtures of bitumen with mineral materials. […]*

Coal derived products such as coal tar or coal-tar pitches are very different from bitumen. These are manufactured by the high-temperature pyrolysis (>800°C) of bituminous coals and differ from bitumen substantially in composition, physical characteristics, and potential health risks."

Main origin

The majority of coal tar is distilled to produce refined products, including creosote, coal-tar pitch, crude naphthalene, and anthracene oils. Some crude coal tar is used as fuel for blast furnaces in the steel industry, because of its high availability and heating value. In the industry of alumina and aluminium production and processing, coal tar is used in several process steps, particularly in the manufacturing of anodes. Further applications are in the broad sectors of construction and in various coal related industries.

According to [Asphalte Institute & Eurobitume 2015] the current world production of bitumen is approximately 87 million tons per year and more than 250 known

applications of bitumen exist. The majority of bitumen is used in the construction sector, in particular in paving and roofing applications.

Applicable entries of the LoW

A non-exhaustive list of main entries applicable for wastes containing coal tar is presented below:

17 03 01*	bituminous mixtures containing coal tar	MH
17 03 02	bituminous mixtures other than those mentioned in 17 03 01	MNH
17 03 03*	coal tar and tarred products	AH

Aspects to be considered for waste classification

Potential hazards of wastes containing coal tar depend on their level of PAHs, which are known to have carcinogenic effects (high for coal tar, rather low in bitumen) [CUMBRIA 2011]. Thus, please refer also to chapter A.5.1.

Indicator tests exist to identify whether the waste containing coal tar contains a significant concentration of PAH components. Tests will indicate presence of PAH but *not* give a measurement. Examples are [OVAM 2015, CUMBRIA 2011]:

- use of PAH marker in combination with use of a UV lamp;
- white spray paint;
- adding a drop of methylene chloride.

When the test gives positive results it is assumed that the material contains tar and therefore is dangerous. Unless the holder of the waste stream is able to demonstrate that the concentration of PAHs is below the thresholds levels in Annex III to the WFD and thus can be classified as non-hazardous. However the classification as non-hazardous must not be done exclusively by the presence of PAHs but from all the substances present in the waste stream. The spray test is only indicative [OVAM 2015].

Coal tar and its distillates (e.g. tar oils) potentially display carcinogenic properties. If the concentration of such materials is at or above 0.1 % the waste would possess the hazardous property HP 7 carcinogenic (cf. chapter C.7).

Determining the coal tar content is usually not conducted in the testing of waste. Instead, Table 3.1 of Part 3 of Annex VI to the CLP Regulation uses benzo[a]pyrene as a marker compound for carcinogenicity for certain coal tar entries. Where the concentration of benzo[a]pyrene is at or above 50 ppm (mg/kg) e.g. in the asphalt concrete alone (excluding other material) then the amount of coal tar should be considered to be sufficient for the material to be hazardous and thus coded 17 03 01*.

Any sampling of asphalt concrete would need to ensure that layers with different concentrations of benzo[a]pyrene are properly and representatively assessed [UK EA 2015].

A.5.6. Metals and alloys

The following example provides general guidance on the classification of waste containing metals and alloys.

General information

The term metals comprises a number of chemical elements in the periodic table that form a metallic bond with other metal atoms. In most cases they appear shiny, are

malleable and hard and are able to conduct heat and electricity. Materials with similar physical properties, resulting from the mixture of several metals (i.e alloys) are also often commonly referred to as "metal".

Main origin

Metal wastes arise in various sectors such as WEEE, ELV, construction and demolition and several industrial uses.

Applicable entries of the LoW

Although entries 17 04 01 – 17 04 09* specifically refer to separate metals, only construction and demolition wastes shall be assigned with those entries. As long as the respective metal wastes are not contaminated with any hazardous substances (external contamination, e.g. paint, not associated to the metal or alloy itself), MNH entries 17 04 01 – 17 04 07 can be assigned according the metallic composition of the waste. Otherwise the hazardous mirror entry 17 04 09* is applicable.

If the waste in question does not stem from construction and demolition, other chapters of the LoW are applicable, e.g. in the case of metal waste from surface treatment, sub-chapter 12 01 (wastes from shaping and physical and mechanical surface treatment of metals and plastic).

In any case the most suitable LoW entry needs to be assigned according the order of precedence as described in chapter A.2.

As a consequence, metal wastes from waste management facilities cannot be assigned to entries of chapter 17 but can be assigned among others to the following exemplary entries:

19 10	waste from shredding of metal-containing wastes	
19 10 01	iron and steel waste	ANH
19 10 02	non-ferrous waste	ANH
19 10 05*	other fractions containing hazardous substances	MH
19 12	wastes from the mechanical treatment of waste (for example sorting, crushing, compacting, pelletising) not otherwise specified	
19 12 02	ferrous metal	ANH
19 12 03	non-ferrous metal	ANH
19 12 11*	other wastes (including mixtures of materials) from mechanical treatment of wastes containing hazardous substances	MH

Additionally, specific non-hazardous entries for metals exist in chapter 15 (waste packaging) and 20 (municipal waste).

A detailed reference to heavy metals is not included in this example.

Aspects to be considered for waste classification

In the LoW pure metal alloys are specifically exempt of the classification as hazardous:

> *'The concentration limits defined in Annex III to Directive 2008/98/EC do not apply to pure metal alloys in their massive form (not contaminated with hazardous substances). Those waste alloys that are considered as hazardous waste are specifically enumerated in this list and marked with an asterisk (*)'*

As the legislation does not define 'massive form', some Member States use a particle size (diameter) > 1 mm as a threshold to indicate the classification of metals as 'massive form' in contrast to powders/dust [BMLFUW AT 2015].

Additionally, special care should be taken in order to avoid misclassification of scrap metals as waste. Council Regulation (EU) No 333/2011 establishes criteria determining when certain types of scrap metal (iron, steel and aluminium scrap) cease to be waste. Similar legislation exists for copper scrap (Commission Regulation (EU) No 715/2013). Operators may decide voluntarily whether to make use of this end-of waste status for metal scrap that fulfils the respective criteria. If fulfilling the relevant criteria, metals/alloys may not be considered waste as defined according the WFD, and the classification according this guidance document is not applicable.

In the case of massive metals, hazardous entries are unlikely to be used, unless a substantial indication exists that metal fractions have been contaminated with non-metal hazardous substances during the treatment process in a way that the waste displays hazardous properties.

Only alloys in their massive form that are specifically listed as hazardous, or contaminated by non-metal hazardous substances, should be treated as hazardous. According to [UK EA 2015], the only 'alloy' specifically listed in the LoW and assigned to an AH entry is:

18 01 10*	amalgam waste from dental care	AH

Please note that the flow charts for the assessment of hazardous properties as displayed in Annex C do not specifically recall that the concentration limits defined in Annex III to the WFD do not apply to pure metal alloys in their massive form.

A.5.7. Organic peroxides

The following example provides general guidance on the classification of waste containing organic peroxides.

General information

The CLP Regulation defines organic peroxides in Annex I, Section 2.15:

> *'Organic peroxides means liquid or solid organic substances which contain the bivalent -O-O- structure and may be considered derivatives of hydrogen peroxide, where one or both of the hydrogen atoms have been replaced by organic radicals. The term organic peroxide includes organic peroxide mixtures (formulations) containing at least one organic peroxide. Organic peroxides are thermally unstable substances or mixtures, which can undergo exothermic self-accelerating decomposition. In addition, they can have one or more of the following properties:*
>
> - *be liable to explosive decomposition;*
> - *burn rapidly;*
> - *be sensitive to impact or friction;*
> - *react dangerously with other substances.'*

Main origin

The plastics and rubber industries are important users of organic peroxides. Organic peroxides and mixtures containing organic peroxides are used as e.g. accelerators, activators, catalysts, cross-linking agents, curing agents, hardeners, initiators and

promoters. Other applications may be the use as bleaching agents (e.g. flour bleaching), as active pharmaceutical ingredients and as flame retardant synergists.

Applicable entries of the LoW

There are many entries where wastes containing organic peroxides could be allocated. A non-exhaustive list of applicable entries is presented below:

16 09 03*	peroxides, for example hydrogen peroxide	AH
16 09 04*	oxidising substances, not otherwise specified	AH

All above mentioned entries are absolute hazardous entries, which means no assessment on hazardous properties is necessary in order to determine whether the waste is to be classified as hazardous if one of these entries is assigned to wastes containing organic eproxides. However, the assessment of hazardous properties will still be necessary, e.g. for filling a consignment note.

Aspects to be considered for waste classification

For a decision between the MH and the MNH entry in the field of organic peroxides, hazardous properties HP1 and HP3 are most relevant.

In the determination of HP1 'Explosive' (cf. chapter C.1), cut-off values for organic peroxides need to be considered. A waste containing organic peroxides classified with hazard statement class H240 or H241 needs to be assessed for HP1, unless the following statements hold true:

- No other hazardous substances assigned hazard statement codes listed in Table 9 (see chapter C.1) are present, and
- One of the following two criteria is met:
    - the waste contains >1 % but ≤ 7 % hydrogen peroxide, and the available oxygen content (O_i) of the organic peroxide(s) is ≤ 0.5 %;
    - the waste contains ≤ 1 % hydrogen peroxide, and the available oxygen content (O_i) of the organic peroxide(s) is ≤ 1 %.

The available oxygen content, O_i (%) for any given organic peroxides has to be calculated according chapter 2.15 of the CLP Regulation:

O_i (%) = Σ (16x (ni x ci / mi))

where:

ni : number of peroxide groups per molecule of organic peroxide i.

ci: concentration (mass %) of organic peroxide I in the waste.

mi: gram molecular mass of organic peroxide i

'Σ' means that if a waste contains more than one organic peroxide the available oxygen from each is added together. This includes all organic peroxides, and is not restricted to those classified as H240 or H241.

[UK EA 2015] provides an example calculation for methyl ethyl peroxide which is presented in the following. A waste contains 2.9 % methyl ethyl peroxide (C_2H_5-O-O-CH_3) and 3 % hydrogen peroxide. The concentration of hydrogen peroxide is > 1% and ≤ 7 % hydrogen peroxide (see criteria above). Methyl ethyl peroxide has a molecular mass of 76g (so 'mi' is 76) and one peroxide functional group present (so ni is 1). When applying these values in the the formula 'O_i (%) = Σ (16x (ni x ci / mi))' for a concentration ('ci') of 2.9% in the waste, methyl ethyl peroxide has an available

oxygen content (O_i) of 0.61% (16 x 1 x 2.9 / 76). This is above the available oxygen threshold of 0.5 % for criteria (i), so HP1 must be assessed.

Organic peroxides have specifically to be considered in determining HP 3 'Flammable'. A waste containing self-reactive substances or organic peroxides classified as H240 or H241 may possess the hazardous property HP 3 Flammable as a result of the assessment of HP 1 Explosive classifying the waste as a whole as H242. Please refer to chapter C.3 for additional information.

Further guidance on organic peroxides according the CLP Regulation can be found directly in the CLP Regulation or in its corresponding guidance document (cf. pages 234ff of [ECHA 2013]).

A.5.8. Rubber wastes

The following example provides general guidance on the classification of rubber wastes.

General information

Rubber wastes are mainly end of life products from the use of tyres and general rubber goods.

Main origin

The annual production in 2013 of tyres and general rubber goods amounted to ~4.67 million tonnes and ~2.57 million tonnes respectively. Rubber waste arises in relevant quantities from tyres and general rubber goods. In 2012 the quantity of end-of-life tyres amounted to 2,765 kt. There is no specific information available for general rubber goods [ETRMA 2015].

Applicable entries of the LoW

A non-exhaustive list of main entries applicable for wastes containing rubber and tyres (and also other organic waste) is presented below:

16 01 03	end-of-life tyres	ANH
16 03 05*	organic wastes containing hazardous substances	MH
16 03 06	organic wastes other than those mentioned in 16 03 05	MNH
19 12 04	plastic and rubber	ANH

Aspects to be considered for waste classification

The majority of rubber waste is allocated to ANH entries. Waste code 16 03 06 is a MNH entry to the MH entry 16 03 05* (organic wastes containing hazardous substances) under chapter 16 (wastes not otherwise specified in the list) sub-chapter 16 03 (off-specification batches and unused products). This hazardous entry can be used for unused rubber products with oils or solvents or for contaminated off-specification rubber batches which are contaminated e.g. with oils or solvents. As a last resort, rubber wastes from the MFSU of plastics, synthetic rubber and man-made fibres can be allocated to waste code 07 02 99.

A.5.9. Plastic wastes

The following example provides general guidance on the classification of plastic wastes.

General information

A plastic material is an organic solid, essentially composed by a mixture of a polymer or combination of polymers of high molecular mass with other substances such as additives, stabilisers, fillers, etc. A polymer is a chain of many repeating molecular units of monomers. The monomers of plastic are either natural or synthetic organic compounds. The term resin is sometimes used as synonym of a commercial polymer [EC JRC 2014].

Main origin

The EU is one of the world's crucial players in plastic manufacturing and in 2012 produced about 57 million tons of plastic. EU Converter demand in 2012 was about 46 million tons and the quantity of post-consumer plastic waste was approximately 25 million tons [Plastics Europe Facts 2013].

Plastic wastes arise from end of life plastic products from industrial or household applications. The generation of post-consumer plastics waste is dominated by plastic packaging waste. Other relevant sectors in particular are: building and construction, automotive, WEEE and agriculture [EC JRC 2014].

Applicable entries of the LoW

A non-exhaustive list of main entries applicable for wastes containing plastics is presented below:

Plastic packaging

15 01 02	plastic packaging	MNH
15 01 05	composite packaging	MNH
15 01 06	mixed packaging	MNH
15 01 10*	packaging containing residues of or contaminated by hazardous substances	MH

Plastic waste from construction and demolition

17 02 03	plastic	MNH
17 02 04*	glass, plastic and wood containing or contaminated with hazardous substances	MH

Entries which (can) contain plastic but do not explicitly refer to plastic, such as:

17 04 10*	cables containing oil, coal tar and other hazardous substances	MH
17 04 11	cables other than those mentioned in 17 04 10	MNH
17 06 03*	other insulation materials consisting of or containing hazardous substances	MH
17 06 04	insulation materials other than those mentioned in 17 06 01 and 17 06 03	MNH
17 09 03*	other construction and demolition wastes (including mixed wastes) containing hazardous substances	MH
17 09 04	mixed construction and demolition wastes other than those mentioned in 17 09 01, 17 09 02 and 17 09 03	MNH

Plastic waste from automotive applications

16 01 19	plastic	ANH
19 10 03*	fluff-light fraction and dust containing hazardous	MH

	substances	
19 10 04	fluff-light fraction and dust other than those mentioned in 19 10 03	MNH

Plastic WEEE

19 12 04	plastic and rubber	ANH

Entries which (can) contain plastic but do not explicitly refer to plastic, such as:

16 02 15*	hazardous components removed from discarded equipment	
16 02 16	components removed from discarded equipment other than those mentioned in 16 02 15	
19 10 03*	fluff-light fraction and dust containing hazardous substances	MH
19 10 04	fluff-light fraction and dust other than those mentioned in 19 10 03	MNH
19 10 05*	other fractions containing hazardous substances	MH
19 10 06	other fractions other than those mentioned in 19 10 05	MNH
19 12 11*	other wastes (including mixtures of materials) from mechanical treatment of waste containing hazardous substances	MH
19 12 04	plastic and rubber	MNH
19 12 12	other wastes (including mixtures of materials) from mechanical treatment of wastes other than those mentioned in 19 12 11	MNH

Agriculture

02 01 04	waste plastics (except packaging)	ANH

Apart from the aforementioned sectors, further entries for plastics can be found throughout different chapters of the LoW. Examples are:

07 02 13	waste plastic	ANH
07 02 16*	Wastes containing hazardous silicones	MH
07 02 17	Waste containing silicones other than those mentioned in 07 02 16	MNH
12 01 05	plastics shavings and turnings	ANH
12 01 16*	waste blasting material containing hazardous substances	MH
12 01 17	waste blasting material other than those mentioned in 12 01 16	MNH
20 01 39	plastics	ANH

Aspects to be considered for waste classification

Plastic materials usually contain not only plastic polymers but a variety of different additives in the plastic matrix to improve performance and use application or processing properties of the final product. Additives are a different group of special chemicals which are either incorporated into the plastic matrix prior or during processing or applied to the final products' surface after the processing [Bart 2005].

A specific plastic waste which can be allocated to a mirror entry can be hazardous either because of the additives it contains or because the waste is contaminated with hazardous substances e.g. oils or solvents.

Typically relevant additives in plastic waste are for example stabilisers or pigments (e.g. cadmium, chromium, lead or tin compounds, BPA, nonylphenol compounds) flame retardants (SCCPs, MCCPs, PBDEs, HBCD, etc.), plasticisers (phthalates, SCCPs, MCCPs, etc.) and a variety of other possibly contained additives (for details see [BiPRO 2015]).

Note that waste code 15 01 10* can be either hazardous because (1) the packaging is hazardous if it contains (usually non-plastic) residues of hazardous substances OR because (2) the plastic material itself (of which the packaging is manufactured) contains hazardous substances (see also example on packaging waste in chapter A.4.1).

A.5.10. POP wastes

The following example provides general guidance on the classification of waste containing POPs.

General information

Persistent Organic Pollutants (POPs) are organic chemical substances. They possess a particular combination of physical and chemical properties such that, once released into the environment, they persist for long periods of time, they become widely distributed throughout the environment, accumulate in the fatty tissue of living organisms including humans, and are toxic to both humans and wildlife.

Main origin

POPs are a group of different substances or substance groups with different origin. Many POPs are or were intentionally produced pesticides or industrial chemicals which have been used for manifold technical or agricultural applications. Other POPs are produced unintentionally as a by-product e.g. during manufacturing or incineration processes.

Aspects to be considered for waste classification

The Stockholm Convention on POPs and the Protocol to the regional UNECE Convention on Long-Range Transboundary Air Pollution (CLRTAP) are international instruments, whose POP substance lists are amended continuously. As soon as new substances/substance groups are classified in the Convention as POPs, they are subsequently included in the POP Regulation.

Specific waste related provisions for POPs are established under the aforementioned POP Regulation. Following Article 7, wastes consisting of POPs, containing or contaminated with them above specific limit values (concentration limit referred to in Article 7(4)(a) – the so called 'low POP-content limit value'), must be disposed of or recovered, without undue delay and in accordance with the provisions laid down in the POP Regulation in such a way as to ensure that the POP content is destroyed or irreversibly transformed so that the remaining waste and releases do not exhibit the characteristics of POPs. Disposal or recovery operations that may lead to recovery, recycling, reclamation or re-use of the POPs are prohibited.

According to the LoW, the following applies in case of mirror entries:

> *'Wastes containing polychlorinated dibenzo-p-dioxins and dibenzofurans (PCDD/PCDF), DDT (1,1,1-trichloro-2,2- bis (4-chlorophenyl)ethane), chlordane, hexachlorocyclohexanes (including lindane), dieldrin, endrin, heptachlor, hexaclorobenzene, chlordecone, aldrine, pentachlorobenzene,*

mirex, toxaphene hexabromobiphenyl and/or PCB exceeding the concentration limits indicated in Annex IV to Regulation (EC) No 850/2004 of the European Parliament and of the Council (1) shall be classified as hazardous.'

It is not foreseen to add further POPs to the LoW.

Thus, waste containing specific POPs in concentrations which exceed the limit values established in the POP Regulation (cf. Table 8) shall be classified as hazardous. For wastes containing other POPs, the concentration limit values resulting from Annex III to the WFD apply.

Table 8: Limit values established in the POP Regulation for those POPs which are listed in the LoW

Substance	CAS No.	EC No.	Concentration limit referred to in Article 7(4)(a)
Polychlorinated dibenzo-p-dioxins and dibenzofurans (PCDD/PCDF)			15 µg/kg ([1])
DDT (1,1,1-trichloro-2,2-bis (4-chlorophenyl)ethane)	50-29-3	200-024-3	50 mg/kg
Chlordane	57-74-9	200-349-0	50 mg/kg
Hexachlorocyclohexanes, including lindane	58-89-9	210-168-9	50 mg/kg
	319-84-6	200-401-2	
	319-85-7	206-270-8	
	608-73-1	206-271-3	
Dieldrin	60-57-1	200-484-5	50 mg/kg
Endrin	72-20-8	200-775-7	50 mg/kg
Heptachlor	76-44-8	200-962-3	50 mg/kg
Hexachlorobenzene	118-74-1	200-273-9	50 mg/kg
Chlordecone	143-50-0	205-601-3	50 mg/kg
Aldrin	309-00-2	206-215-8	50 mg/kg
Pentachlorobenzene	608-93-5	210-172-5	50 mg/kg
Polychlorinated Biphenyls (PCB)	1336-36-3 and others	215-648-1	50 mg/kg ([2])
Mirex	2385-85-5	219-196-6	50 mg/kg
Toxaphene	8001-35-2	232-283-3	50 mg/kg
Hexabromobiphenyl	36355-01-8	252-994-2	50 mg/kg

([1]) The limit is calculated as PCDD and PCDF according to the toxic equivalency factors (TEFs) as indicated in Regulation (EC) No 850/2004
([2]) Where applicable, the calculation method laid down in European standards EN 12766-1 and EN 12766-2 shall be applied.

Waste which falls under the obligations of Article 7 of the POP Regulation because it contains POPs in concentrations which exceed the low POP content limit value is not necessarily a hazardous waste. For example a waste containing pentaBDE (main historic use in flexible PUR foams for automotive and upholstery applications) in a concentration of 5 % shall be treated according to Article 7 of the POP Regulation (concentration limit for the sum of POP-BDEs 0.1 %) but is not a hazardous waste (limit value for pentaBDE 10 %). Note that all obligations for producers or holders of waste stemming from POPs Regulation have to be fulfilled independently whether the classification of waste in line with the LoW leads to the waste to be considered as hazardous or not.

Please note that for wastes which are only classified as hazardous due to their POP content it may be difficult to complete the consignment notes as usually the hazardous properties HP 1 to 15 have to be recorded and reported.

Annex B: Data sources and information basis on hazardous substances

Once it is analysed which substances are present within the waste in question, it needs to be analysed if the identified substances are hazardous substances and how their chemical classification is determined. Annex B provides guidance on both, the examination whether identified substances are hazardous substances and their chemical classification. It further describes data sources providing relevant information for this purpose. The major data sources are displayed in Figure 8. Reference is made to the respective chapter of this document (grey box) and to the official source (blue box). Further explanations on the data sources including information on their precedence are given in the respective paragraphs below.

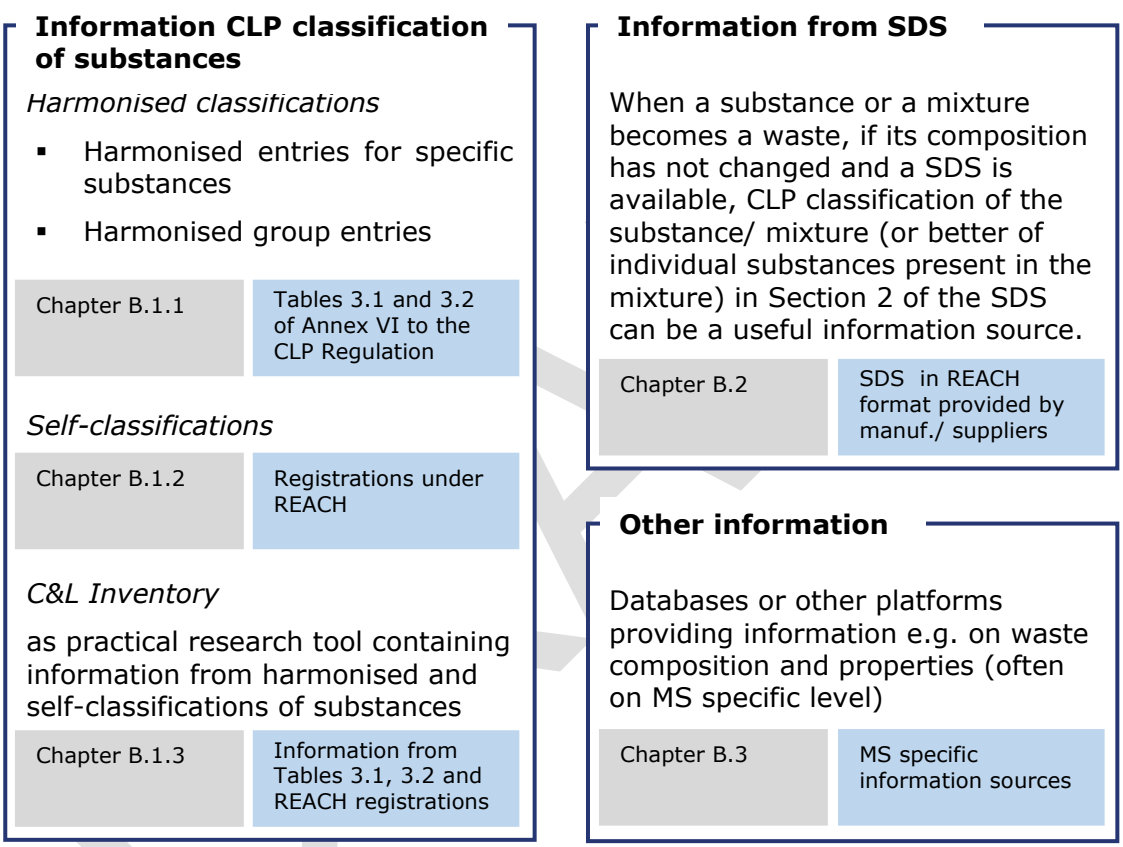


Figure 8: Data sources for information on hazardous substances

B.1 Classification of substances as hazardous according the CLP Regulation

On many occasions, the decisive criterion for the assignment of MH or MNH entries is the presence of 'hazardous substances', in line with the HP-criteria and related thresholds contained in Annex III to the WFD (consult in detail Annex C of this document). The EU CLP Regulation provides the criteria to assess the physical, human health and environmental hazards of substances. A hazardous substance is a substance that is assigned a hazard statement code when classified using the CLP Regulation. Information about which hazard statement codes are assigned to which substances can be derived from harmonised classifications and when not available partly also from self-classifications as described in the following sections.

B.1.1 Harmonised classification of substances

Some substances are 'officially' classified by means of a formal decision at the EU level. These are referred to as 'harmonised classifications' and listed in Table 3.1 of Part 3 of Annex VI to the CLP Regulation.

A harmonised classification provides information on the chemical classification and labelling of a substance:

Hazard statement code	The code assigned to the hazard class and category. For example a carcinogen could be 'H350' or 'H351'.
Hazard Class	The nature of the hazard. For example a carcinogenic is 'Carc.'
Hazard Category	A sub-category of the hazard class that describes the severity of the hazard. For example a carcinogen could be '1A'. '1B' or '2'.

The hazard classes and categories presented in Table 3.1 of Part 3 of Annex VI to the CLP Regulation take legal precedence over all other sources of information on those hazard classes and categories, and they must be used for classification. Note that a harmonised classification may be incomplete where it only covers the hazard classes and categories listed. For information on terminology please refer to the Glossary of this document or to [ECHA 2013].

Table 3.1 of Part 3 of Annex VI to the CLP Regulation is regularly updated by adaptations to technical progress (ATPs). It contains two types of harmonised classifications:

- harmonised classifications for specific substances (such as e.g. 'lead chromate'), and
- harmonised group classifications (such as e.g. 'lead compounds').

Harmonised classifications can be found in the Classification and Labelling (C&L) Inventory maintained by the European Chemical Agency (ECHA) (cf. chapter B.1.3). In case a harmonised classification for a specific substance is existent, information of this classification shall prevail over information from harmonised group classifications.

B.1.2 Self-classifications

Manufacturers, importers and downstream users of substances are obliged to perform a self-classification under the CLP Regulation (in the framework of registration of substances under REACH), determined through the application of the CLP classification criteria.

There can be multiple classifications for the same substance due to:

- the different composition, form or physical state of the substance placed on the market;
- a manufacturer or producer identifying insufficient information to assess that hazard class or category (which they will report as 'data lacking', 'inconclusive', or 'conclusive but not sufficient for classification');
- the manufacturer, importer or downstream user has access to, or has generated, different or additional data.

Self-classifications may be used to identify what hazard classes and categories have already been identified by other notifiers going beyond the harmonised classification and should serve as general information basis. It is recommended to check in particular those self-classifications showing the highest number of notifiers. There are

ongoing efforts to get notifiers to agree on self-classifications. However, if no harmonised classification is available and only self-classifications for the substances in question are available, the waste holder cannot finalise the classification of the substances solely based on self-classifications. Instead it is recommended to use other information sources for the classification of the waste, such as SDS.

B.1.3 The C&L Inventory as research tool

The C&L Inventory[9] managed by the ECHA can be used to search for the classification of substances or group of substances which are relevant in the context of waste classification (and, if applicable, for verification of that information). This inventory allows for an easy research for harmonised classifications of substances or group of substances as it contains information from Table 3.1 and Table 3.2 of Part 3 of Annex VI to the CLP Regulation. It also contains self-classifications provided in the framework of registration of substances under REACH and notifications of unregistered substances (e.g. low volume importers who are not obliged to register). When no harmonised classification and more than one self-classification is reported in the C&L Inventory, the ECHA database on registered substances[10] can help supporting information obtained from the C&L Inventory.

Furthermore the C&L Inventory is translated into all EU languages.

However, it should be noted that the C&L Inventory is subject to regular changes in content and the content should be considered with caution (e.g. the convergence of classifications per substance is a steady work in progress in the C&L Inventory).

Please find below the exemplary harmonised entry of 'lead chromate' (CAS Number 7758-97-6) as it is displayed in the C&L Inventory.

[9] http://echa.europa.eu/regulations/clp/cl-inventory

[10] http://echa.europa.eu/de/information-on-chemicals/registered-substances

Harmonised classification - Annex VI of Regulation (EC) No 1272/2008 (CLP Regulation)

General Information

Index Number	EC Number	CAS Number	International Chemical Identification
082-004-00-2	231-846-0	7758-97-6	lead chromate

ATP Inserted / Updated: CLP00/ATP01
CLP Classification (Table 3.1)

Classification		Labelling			Specific Concentration limits, M-Factors	Notes
Hazard Class and Category Code(s)	Hazard Statement Code (s)	Hazard Statement Code (s)	Supplementary Hazard Statement Code(s)	Pictograms, Signal Word Code(s)		
Carc. 1B	H350	H350		GHS09 GHS08 Dgr		Note 1
Repr. 1A	H360Df	H360Df				
STOT RE 2	H373 **	H373 **				
Aquatic Acute 1	H400					
Aquatic Chronic 1	H410	H410				

Signal Words	Pictograms
Danger	 Environment  Health hazard

Figure 9: Exemplary harmonised entry for 'lead chromate' as displayed in the C&L Inventory

As displayed in Figure 9, 'lead chromate' is classified as:

- Carc. 1B H350
- Repr. 1A H360Df
- STOT RE 2 H373**
- Aquatic Acute 1 H400
- Aquatic Chronic 1 H410

In order to assess if the waste in question displays hazardous properties (see chapter 3.2.2 and Annex C) due to its content of the hazardous substance 'lead chromate', the information on hazard class, hazard category and hazard statement codes of 'lead chromate' needs to be considered.

B.2 Information on composition, properties and waste management of substances/ mixtures becoming waste

For substances and mixtures that are classified as hazardous according to CLP, as also for non-classified mixtures containing hazardous substances above certain thresholds, a SDS need to be provided by the supplier. SDS have to fulfil certain requirements and comply with a format defined in Article 31 of the REACH Regulation, and must include information:

- on the classification of the substance or mixture in accordance with Title II of CLP Regulation (section 2 of the SDS); this may be a harmonised classification or a self-classification (see chapter B.1);
- on the composition / the ingredients (section 3 of the SDS);
- on 'disposal considerations' (section 13 of the SDS);
- on exposure scenarios (in the Annex).

With this information available, the SDS can be a useful information tool for the further assessment steps that have to be carried out during classification according to the LoW once a particular product has become waste.

Note that in case the product becoming waste is a mixture of two or more substances (e.g. a pot of varnish), the classification information for mixtures is a valuable source of information in general and secondly the classifications of the individual component substances must be used, rather than the overall chemical classification of the mixture. Section 3 of a SDS for mixtures provides the classifications according CLP for the individual hazardous constituents of the mixture. This information may be validated or complemented by means of a search at the C&L inventory (cf. chapter B.1.3).

Note that for substances and mixtures for which a SDS is not mandatory as well as also in the case of articles, voluntary product information sheets may be available that are not conforming to SDS but provide information on composition and recommended disposal practices.

Additional checks are recommended where either:

- the information provided may be out of date (a product is discarded considerable time after it was last supplied);
- there is any reason to believe the information is incomplete, inadequate, or inaccurate.
- information on the waste-generating process suggests that additional substances (e.g. contaminants) may be present in the waste which are not covered by SDS.

B.3 Other information sources

Apart from the information sources presented in the previous chapters, there may exist further useful literature on the presence and content of substances potentially present in waste. Which source can be consulted must be decided on a case-by-case basis. In general, potential examples are:

- BREF documents;
- Industrial process handbooks;
- Sector notebooks of the US Environmental Protection Agency;
- Process and substance information from the producer of the waste (process descriptions);
- Databases on typical composition of certain wastes.

Especially regarding the later aspects it should be noted that in some Member States, databases specifically referring to composition, physical-chemical properties and classification of waste streams are publicly available. These databases further provide waste-specific guidance for producers or holders of waste and/or competent authorities. An example of such a relevant data base is ABANDA[11], managed by German regional authority LANUV. In addition there is software available to facilitate waste classification, such as HazWasteOnline[tm12] from the UK.

Further/ additional information may be available on data bases and tools managed at Member States level.

[11] http://www.lanuv.nrw.de/abfall/bewertung/abanda.htm

[12] https://www.hazwasteonline.com/default.aspx?ReturnUrl=%2f

Annex C: Specific approaches to determine hazard properties (HP1 to HP15)

C.1. Determining HP 1: Explosive

Definition and further description of Annex III to WFD

Annex III to the WFD defines HP 1 'Explosive' as:

> *'waste which is capable by chemical reaction of producing gas at such a temperature and pressure and at such a speed as to cause damage to the surroundings. Pyrotechnic waste, explosive organic peroxide waste and explosive self-reactive waste is included.'*

Regarding HP 1, to note that the scope of WFD excludes 'decommissioned waste explosives' (see chapter 3.1.1). Thus, it is recommended to check whether the relevant waste in question is subject to the rules of WFD and LoW in the first place.

The WFD further explains that:

> *'When a waste contains one or more substances classified by one of the hazard class and category codes and hazard statement codes shown in Table 1 [*see Table 9*], the waste shall be assessed for HP 1, where appropriate and proportionate, according to test methods. If the presence of a substance, a mixture or an article indicates that the waste is explosive, it shall be classified as hazardous by HP 1.'*

Waste containing substances that are classified with the hazard class, category and statement codes in Table 9 can be tested to show whether it displays that hazardous property or not. Alternatively, a waste containing those substances can simply be assumed to be hazardous by HP 1.

Table 9: Hazard Class, Category Code(s) and Hazard Statement Code(s) for waste constituents for the classification of wastes as hazardous by HP 1 Explosive

Hazard Class and Category Code(s)	Hazard statement Code(s)	Description
Unst. Expl.	H 200	*Unstable explosives*
Expl. 1.1	H 201	*Explosive; mass explosion hazard.*
Expl. 1.2	H 202	*Explosive, severe projection hazard*
Expl. 1.3	H 203	*Explosive; fire, blast or projection hazard*
Expl. 1.4	H 204	*Fire or projection hazard*
Self-react. A	H 240	*Heating may cause an explosion*
Org. Perox. A		
Self-react. B	H 241	*Heating may cause a fire or explosion*
Org. Perox. B		

Where a product that has become waste is known to be explosive, it shall also be considered as HP 1.

Some substances may be explosive under certain conditions, e.g. those assigned Hazard statement Codes H205 *May mass explode in fire* or EUH001 *Explosive when dry*. These substances do not make a waste hazardous by HP 1, but their presence in a waste could make that waste exhibit hazardous property HP 15; see Section C.15 for further details.

A waste containing a substance classified as H240 or H241 should be considered for HP 3 flammable where the waste is not hazardous by HP 1.

Flow Chart

Figure 10 sets out the assessment process for HP 1.

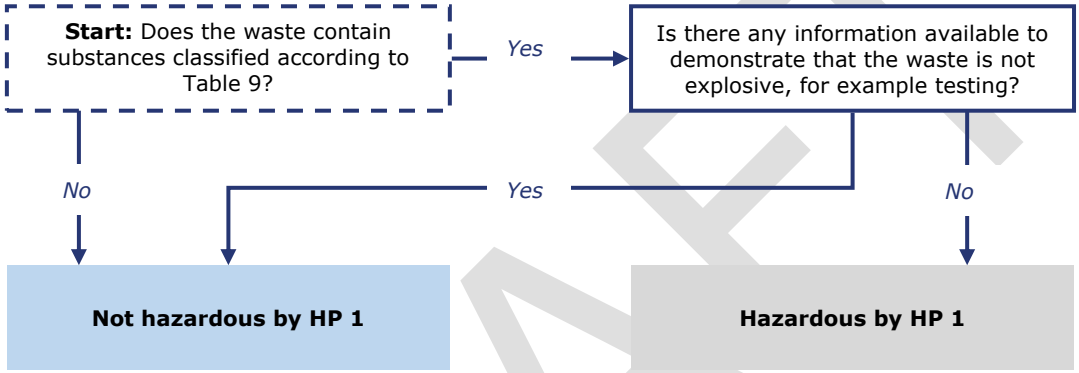


Figure 10: Flow chart for determination of HP 1 (Adjusted from [UK EA 2015])

Test Methods

Part A of the Annex to the Test Methods Regulation provides the following test method which may be regarded in the assessment of HP 1 'Explosive':

- A.14. Explosive Properties

Wastes containing substances listed in Table 9 should be tested for explosive properties in accordance with [ECHA 2013].

Separate sections are provided in [ECHA 2013] for testing of mixtures containing:

- organic peroxides (2.15)
- self-reactive substances and mixtures (2.8)
- explosives (2.1).

The CLP Regulation classifies self-reactive substances and mixtures in one of the seven categories of 'types A to G' [ECHA 2013]. Waste containing an organic peroxide or a self-reacting substance, where the waste is classified by testing as Type A (H240) or Type B (H241), displays HP 1. Where this is not the case, a waste classified as Type C, D, E or F (H242) displays HP 3.

A waste containing another substance listed in Table 9, where the waste is classified by testing as Unstable Explosive (H200), Division 1.1(H201), 1.2(H202), 1.3(H203) or 1.4(H204), displays HP 1.

A detailed example for an assessment of organic peroxides according HP 1 can be found in chapter A.5.7.

C.2. Determining HP 2: Oxidising

Definition and further description of Annex III to WFD

Annex III to the WFD defines HP 2 'Oxidizing' as:

> '*waste which may, generally by providing oxygen, cause or contribute to the combustion of other materials*'

The WFD further explains that:

> *'When a waste contains one or more substances classified by one of the hazard class and category codes and hazard statement codes shown in Table 2, the waste shall be assessed for HP 2, where appropriate and proportionate, according to test methods. If the presence of a substance indicates that the waste is oxidising, it shall be classified as hazardous by HP 2.'*

A waste containing substances that are classified with the hazard class, category and statement codes in Table 10 can be tested to show whether it displays that hazardous property or not. Alternatively a waste containing those substances can simply be assumed to be hazardous by HP 2.

Table 10: Hazard Class, Category Code(s) and Hazard Statement Code(s) for waste constituents for the classification of wastes as hazardous by HP 2 Oxidising

Hazard Class and Category Code(s)	Hazard statement Code(s)	Description
Ox. Gas 1	H 270	*May cause or intensify fire; oxidiser*
Ox. Liq. 1	H 271	*May cause fire or explosion; strong oxidiser*
Ox. Sol. 1		
Ox. Liq. 2 Ox. Liq. 3	H 272	*May intensify fire; oxidiser*
Ox. Sol. 2 Ox. Sol. 3		

Where

- the waste contains only one of these substances;
- that substance is assigned a specific concentration limit in Table 3.1 of Part 3 of Annex VI to CLP;
- that substance is present in the waste below that limit;

it can be assumed that the waste is not hazardous by HP 2.

An example is 'nitric acid' which is listed as H272, Ox. Liq. 3 with a specific concentration limit of ≥ 65%. Where 'nitric acid' is present in a waste above 65% that waste has to be classified as HP 2 (in addition to HP 8).

Calculation method for oxidising gases

Where a waste contains a substance assigned H270 it is possible to calculate whether or not the waste displays HP 2. The calculation method is provided by ISO 10156 (as amended) and should be applied in accordance with section 2.4 of [ECHA 2013].

Flow chart

Figure 11 sets out the assessment process for HP 2.

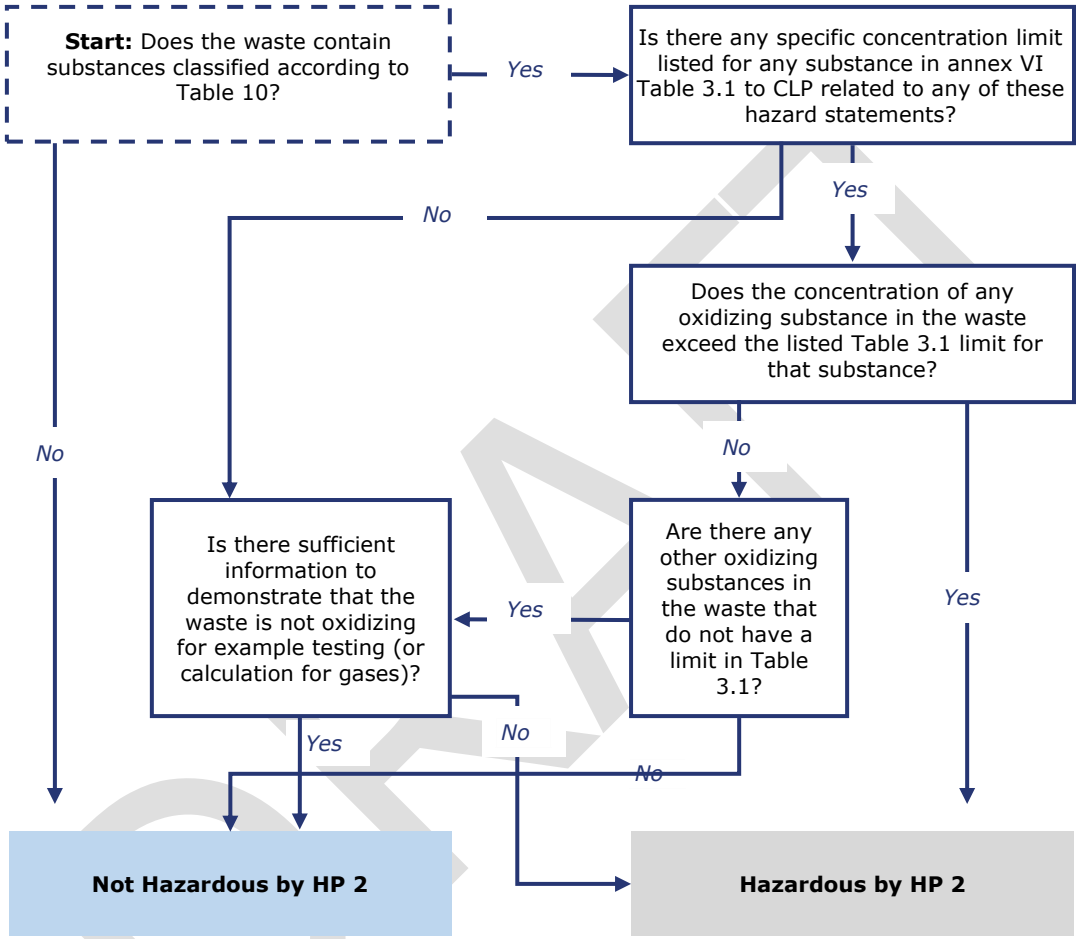


Figure 11: Flow chart for determination of HP 2 (Adjusted from [UK EA 2015])

Test Methods

Part A of the Annex to the Test Methods Regulation provides the following test methods which may be regarded in the assessment of HP 2 'Oxidising':

- A.17. Oxidising Properties (Solids)
- A.21. Oxidising Properties (Liquids)

Wastes containing substances listed in Table 10 should be tested on oxidising properties in accordance with [ECHA 2013]. Separate sections are provided in [ECHA 2013] for testing of mixtures containing:

- Oxidising gases (2.4)

- Oxidising liquids (2.13)
- Oxidising solids (2.14).

A waste containing an oxidising substance, where the waste is classified by testing as H270, H271, or H272, displays HP 2.

C.3. Determining HP 3: Flammable

Definition and further description of Annex III to WFD

Annex III to the WFD defines HP 3 'Flammable' over 6 indents:

- *'flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and ≤ 75°C;*
- *flammable pyrophoric liquid and solid waste: solid or liquid waste which, even in small quantities, is liable to ignite within five minutes after coming into contact with air;*
- *flammable solid waste: solid waste which is readily combustible or may cause or contribute to fire through friction;*
- *flammable gaseous waste: gaseous waste which is flammable in air at 20°C and a standard pressure of 101.3 kPa;*
- *water reactive waste: waste which, in contact with water, emits flammable gases in dangerous quantities;*
- *other flammable waste: flammable aerosols, flammable self-heating waste, flammable organic peroxides and flammable self-reactive waste.'*

The WFD further explains that:

> *'When a waste contains one or more substances classified by one of the following hazard class and category codes and hazard statement codes shown in Table 3 [see Table 11], the waste shall be assessed, where appropriate and proportionate, according to test methods. If the presence of a substance indicates that the waste is flammable, it shall be classified as hazardous by HP 3'*

A waste containing substances that are classified with the hazard class, category and statement codes in Table 11 can be tested to show whether it displays that hazardous property or not. Alternatively a waste containing those substances, other than in trace amounts, can simply be assumed to be hazardous by HP 3.

Table 11: Hazard Class, Category Code(s) and Hazard Statement Code(s) for waste constituents for the classification of wastes as hazardous by HP 3 Flammable

Hazard Class and Category Code(s)	Hazard statement Code(s)	Description
Flam. Gas 1	H220	Extremely flammable gas
Flam. Gas 2	H221	Flammable gas
Aerosol 1	H222	Extremely flammable aerosol
Aerosol 2	H223	Flammable aerosol
Flam. Liq. 1	H224	Extremely flammable liquid and vapour
Flam. Liq.2	H225	Highly flammable liquid and vapour
Flam. Liq. 3	H226	Flammable liquid and vapour

Flam. Sol. 1 Flam. Sol. 2	H228	Flammable solid
Self-react. CD Self-react. EF Org. Perox. CD Org. Perox. EF	H242	Heating may cause a fire
Pyr. Liq. 1 Pyr. Sol. 1	H250	Catches fire spontaneously if exposed to air
Self-heat.1	H251	Self-heating: may catch fire
Self-heat. 2	H252	Self-heating in large quantities; may catch fire
Water-react. 1	H260	In contact with water releases flammable gases which may ignite spontaneously
Water-react. 2 Water-react. 3	H261	In contact with water releases flammable gases

Where a waste contains substances assigned H220 or H221 it is possible to calculate whether or not the waste displays HP 3 (fourth indent). The calculation method is provided by ISO 10156 and should be applied in accordance with section 2.2 of [ECHA 2013].

Where a waste contains substance assigned H260 or H261, i.e. a substance which is capable of releasing a highly flammable gas at a rate in excess of 1 litre of gas per kilogram of substance per hour when water is added, it is possible to calculate the minimum concentration of the substance in the waste that would make it hazardous by HP 3 (fifth indent). Below this concentration the waste is not considered hazardous pursuant to HP 3 (fifth indent). At or above the concentration the waste is considered to be HP 3, or tested. Examples of substances and calculation is provided by [UK EA 2015] and is displayed in the following section.

A brief example for an assessment of organic peroxides according HP 3 based on assessing HP1 can be found in chapter A.5.7.

Flow chart

Figure 12 sets out the determination process for HP 3.

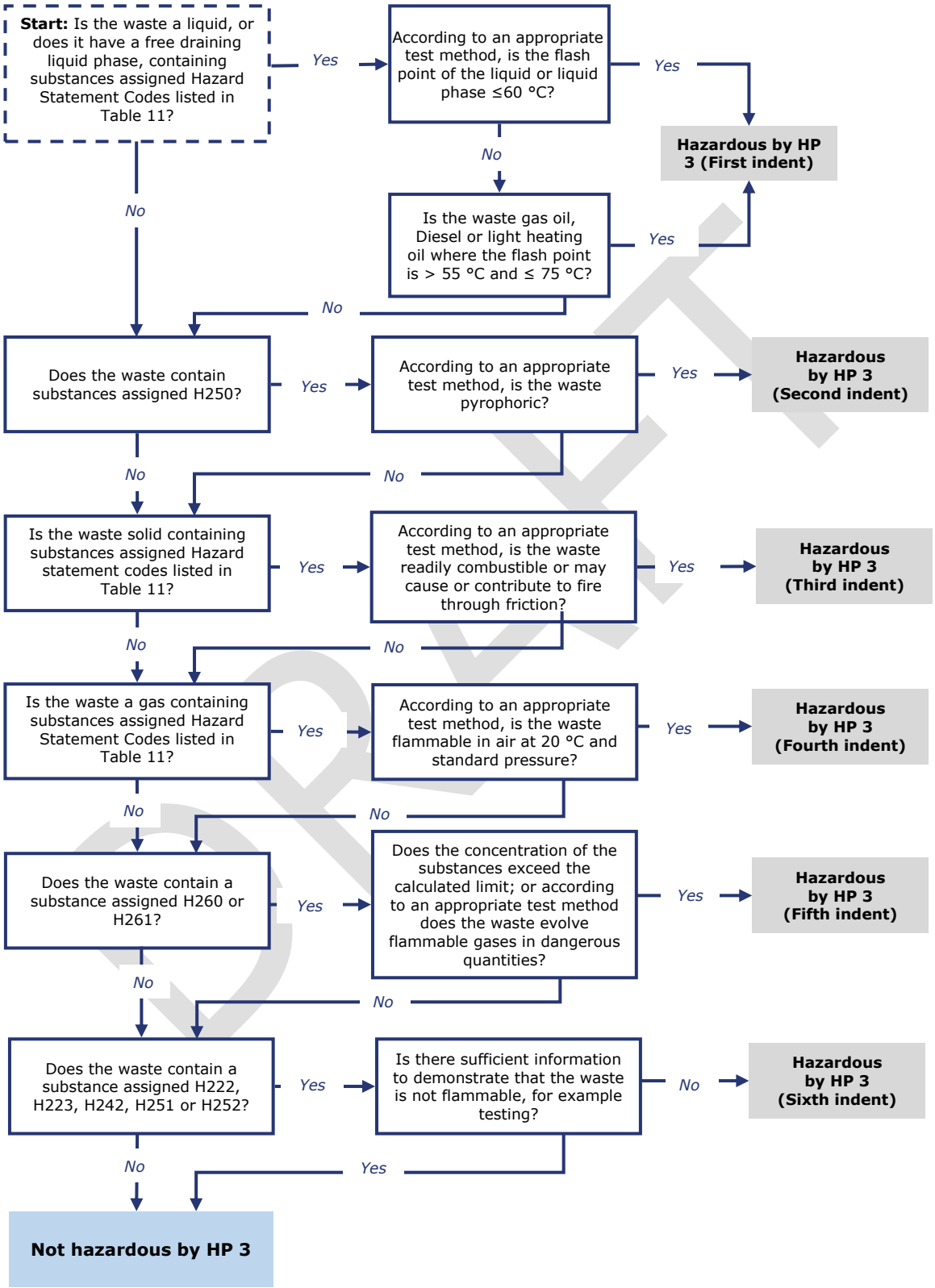


Figure 12: Flow chart for determination of HP 3 (Adjusted from [UK EA 2015])

Calculation method for HP 3 (fifth indent)

As already indicated, when a substance is assigned H260 or H261 if it is capable of releasing a highly flammable gas at a rate in excess of 1 litre of gas per kilogram of substance per hour when water is added.

If a waste contains a substance assigned H260 or H261, it is possible to calculate the limiting concentration of the substance in the waste that would make it hazardous by HP 3 (fifth indent). The background of this calculation method is, that the amount of the reactive substance needed to generate one litre of the flammable gas is calculated, based on stoichiometry and by applying the volume of a mol of gas at standard pressure and temperature. The concentration limit of one litre is taken from test method A.12. Flammability (Contact with water) as described in Part A of the Annex to the Test Method Regulation.

Below this concentration the waste will not be hazardous as a result of HP 3 (fifth indent). At or above the concentration the waste should be assumed to be HP 3, or tested. An example of how to do the calculation is taken from [UK EA 2015] and displayed below in Box 15.

Calculation method HP 3 (fifth indent)

1. Write a balanced equation for the reaction that produces the gas. The general form of this equation should be as follows:

rR + wW → pP + gG

where R is the H260/H261 substance, W is water, P is a product of the reaction, and G is the gas released; r, w, p and g are the stoichiometric ratios that balance the equation.

2. Attribute molecular weights and stoichiometric ratios to the substances in the equation.

3. Divide (r x molar weight of R) by (g x 22.4). This gives the mass of R that will evolve 1 litre of gas. 1 mol of gas occupies 22.4 litres at standard temperature and pressure.

4. Divide this amount (in grams) by 1,000 (to convert to kilograms) and multiply it by 100 to give a percentage by weight, and thus the limiting concentration for HP 3 (fifth indent) of substance R.

Example calculation: A waste contains aluminium carbide. Aluminium carbide is a H260 substance which reacts with water to give methane gas.

Al_4C_3	+	$6H_2O$	→	$2Al_2O_3$	+	$3CH_4$
aluminium carbide		water		aluminium oxide		methane
144 g		18 g		102 g		16 g
1 mol		6 mol		2 mol		3 mol

r = 1 mol of Al_4C_3, R = 144 g; g = 3 mol CH_4.

Limiting concentration of aluminium carbide in waste = [144 / (3x22.4)] / 1,000 x 100,

which is 0.21% (approximately 0.2%).

Box 15: Calculation method HP 3 (fifth indent) [UK EA 2015]

Threshold limits derived from the calculation for some H260 and H261 substances are given in Table 12.

Table 12: Examples of substances which may cause a waste to exhibit HP 3 Flammable (fifth indent) and their threshold concentrations[13] [UK EA 2015]

Substance name	Hazard Statement Codes associated with HP3 (fifth indent)	Equation	Concentration limit for waste to be H3-A (fifth indent) (%)[1]
Lithium	H260	$2Li + 2H_2O \rightarrow 2LiOH + H_2$	0.1
Sodium	H260	$2Na + 2H_2O \rightarrow 2NaOH + H_2$	0.2
Magnesium powder (pyrophoric)	H261	$Mg + 2H_2O \rightarrow Mg(OH)_2 + H_2$	0.1
Aluminium powder (pyrophoric) Aluminium powder (stabilised)	H261	$2Al + 6H_2O \rightarrow 2Al(OH)_3 + 3H_2$	0.1
Potassium	H260	$2K + 2H_2O \rightarrow 2KOH + H_2$	0.4
Calcium	H261	$Ca + 2H_2O \rightarrow Ca(OH)_2 + H_2$	0.2
Zinc powder / zinc dust (pyrophoric)	H260	$Zn + 2H2O \rightarrow Zn(OH)_2 + H_2$	0.3
Zirconium powder (pyrophoric)	H260	$Zr + 4H_2O \rightarrow Zr(OH)_4 + 2H_2$	0.2
Aluminium carbide	H260	$Al_4C_3 + 6H_2O \rightarrow 2Al_2O_3 + 3CH_4$	0.2
Lithium aluminium hydride	H260	$LiAlH_4 + H_2O \rightarrow LiAl(OH)_2 + 4H_2$	0.1
Sodium hydride	H260	$NaH + H_2O \rightarrow NaOH + H_2$	0.1
Calcium hydride	H260	$CaH_2 + 2H_2O \rightarrow Ca(OH)_2 + 2H_2$	0.1
Calcium carbide	H260	$CaC_2 + H_2O \rightarrow Ca(OH)_2 + C_2H_2$	0.3
Calcium phosphide	H260	$Ca_3P_2 + 6H_2O \rightarrow 2PH_3 + 3Ca(OH)_2$	0.4
Aluminium phosphide	H260	$AlP + 3H_2O \rightarrow PH_3 + Al(OH)_3$	0.3
Magnesium phosphide	H260	$Mg_3P_2 + 6H_2O \rightarrow 2PH_3 + 3Mg(OH)_2$	0.3

[13] This is not a complete list of such substances.

Trizinc diphosphide	H260	$Zn_3P_2 + 6H_2O \rightarrow 2PH_3 + 3Zn(OH)_2$	0.6
Diethyl (ethyldimethyl-silanolato) aluminium	H260	$(C_2H_5)_2Si(CH_3)_2C_2H_5Al + 2H_2O \rightarrow 2C_2H_6 + Al(OH)_2Si(CH_3)_2C_2H_5$	0.4

Notes:

[1] Rounded to one decimal place.

Test Methods

Part A of the Annex to the Test Methods Regulation provides the following test methods which may be regarded in the assessment of HP 3 'Flammable':

- A.10. Flammability (Solids)
- A.11. Flammability (Gases)
- A.12. Flammability (Contact with water)

Wastes containing substances listed in Table 11 should be tested for flammable properties in accordance with [ECHA 2013]. Separate sections are provided in [ECHA 2013] for testing of mixtures containing:

- flammable gases (2.2)
- aerosols (2.3)
- flammable liquids (2.6)
- flammable solids (2.7)
- self-reactive substances and mixtures (2.8)
- pyrophoric liquids (2.9)
- pyrophoric solids (2.10)
- self-heating substances and mixtures (2.11)
- water reactive substances (2.12)
- organic peroxides (2.15).

C.4. Determining HP 4: Irritant – skin irritation and eye damage

Definition and further description of Annex III to WFD

Annex III to the WFD defines HP 4 'Irritant' as:

> '*waste which on application can cause skin irritation or damage to the eye*'

HP 4 is linked to HP 8 'Corrosive', since both HPs refer to the potential for harm or damage to tissue at different levels of severity. Regarding HP 8, consult chapter C.8 for further details.

Note that:

- Hazardous waste containing irritant substances can display irritant properties (depending on concentration);
- Hazardous wastes containing corrosive substances can display either corrosive or irritant properties dependent upon concentration.

Mechanical irritation produced by some substances is not included within the definition of HP 4.

The WFD further explains that:

> *When a waste contains one or more substances in concentrations above the cut-off value, that are classified by one of the following hazard class and category codes and hazard statement codes and one or more of the following concentration limits is exceeded or equalled, the waste shall be classified as hazardous by HP 4.*
>
> *The cut-off value for consideration in an assessment for Skin corr. 1A (H314), Skin irrit. 2 (H315), Eye dam. 1 (H318) and Eye irrit. 2 (H319) is 1 %.*
>
> *If the sum of the concentrations of all substances classified as Skin corr. 1A (H314) exceeds or equals 1 %, the waste shall be classified as hazardous according to HP 4.*
>
> *If the sum of the concentrations of all substances classified as H318 exceeds or equals 10 %, the waste shall be classified as hazardous according to HP 4.*
>
> *If the sum of the concentrations of all substances classified H315 and H319 exceeds or equals 20 %, the waste shall be classified as hazardous according to HP 4.*
>
> *Note that wastes containing substances classified as H314 (Skin corr.1A, 1B or 1C) in amounts greater than or equal to 5 % will be classified as hazardous by HP 8. HP 4 will not apply if the waste is classified as HP 8.*

Table 13: Hazard Class, Category Code(s) and Hazard Statement Code(s) for waste constituents and the corresponding concentration limits for the classification of wastes as hazardous by HP 4

Hazard Class and Category Code(s)	Hazard statement Code(s)	Description	Concentration limit (total of substances)
Skin Corr. 1A	H314	Causes severe skin burns and eye damage	≥1 % and <5 %

Eye Dam. 1	H318	Causes serious eye damage	≥ 10 %
Skin irrit. 2 and Eye irrit. 2	H315 and H319	Causes skin irritation and Causes serious eye irritation	≥ 20 %[14]

An example for the assessment of wastes containing CaO and $Ca(OH)_2$ according HP 4 can be found in chapter A.5.4.

Where a waste contains a substance that is H314 Skin Corr.1A, 1B or 1C at a concentration ≥ 5 % see also HP 8 Corrosive (chapter C.8 of this document) as this waste shall be classified as hazardous by HP 8 and not by HP 4.

Above mentioned concentration limits are applied to the known components of a waste. It may be difficult to identify all specific substances present in certain wastes. Where the waste is not 'Irritant' as a result of the known substances and some substances are still unknown, the pH value of the waste should be used for assessment (see Figure 13).

A waste with a pH ≤ 2 or ≥ 11.5 should be considered HP 8 Corrosive unless both:

- an acid or alkali reserve test suggests that the classification as 'Corrosive' is not warranted, and
- further in vitro testing has confirmed that classification (as 'Irritant' or neither 'Irritant'/'Corrosive')

The acid/ alkali reserve test measures the buffering capacity of the waste. More information on acid/alkali reserve test can be found in 'Test No. 122: Determination of pH, Acidity and Alkalinity' within the OECD Guidelines for the Testing of Chemicals[15] or in [Young et al. 1988].

Cut-off values

The following cut-off values apply to the assessment:

- for H314, H315, H318 and H319 the cut off value is 1 %.

An individual substance present at a concentration below this cut off value is not included in the total concentrations given in Table 13 and Figure 13.

[14] Please be aware that the criteria of 20% for H315 and H319 may only be applied if the compound is classified as H315 and H319 [OVAM 2015]. If the compound is only classified as H315 or only as H319 the waste will not fall under HP4. For example sulphur is only classified as H315, not as H319. Therefore the presence of sulphur will not make a waste hazardous.

[15] http://www.oecd-ilibrary.org/environment/test-no-122-determination-of-ph-acidity-and-alkalinity_9789264203686-en

Flow chart

Figure 13 sets out the assessment process for HP 4.

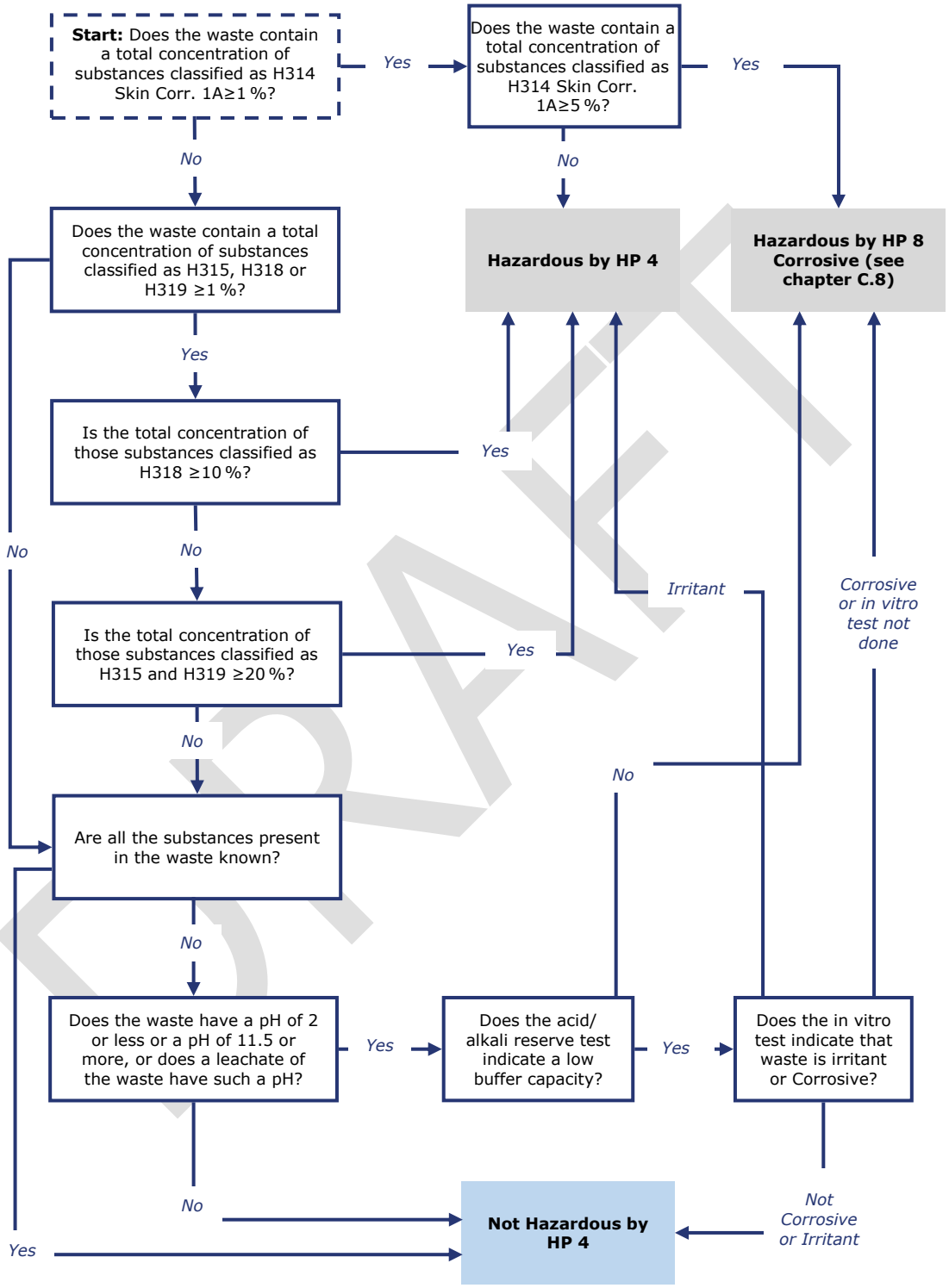


Figure 13: Flow chart for the determination of HP 4 (Adjusted from [UK EA 2015])

2328

2329 **Test Methods**

2330 A HP 4 assessment of a waste is to be done on the basis of

2331 ▪ identification of the individual substances in the waste;

2332 ▪ their classification;

2333 ▪ reference to concentration limits in Annex III to the WFD.

2334 If testing is considered to determine this hazard property, waste containing
2335 substances listed in Table 13 should be tested for irritant properties in accordance with
2336 the section 3.2 of [ECHA 2013]. A mixture assigned H315, H318 or H319 by this
2337 assessment is considered HP 4.

2338 If testing is considered, a combination of acid/ alkali reserve test and in-vitro testing is
2339 recommended. An example on how to integrate the acid/ alkali reserve and in-vitro
2340 testing into a general testing stetting can be found in [UK EA 2015].

2341 As already described above, the acid/ alkali reserve test measures the buffering
2342 capacity of the waste. More information on acid/alkali reserve test can be found in
2343 'Test No. 122: Determination of pH, Acidity and Alkalinity' within the OECD Guidelines
2344 for the Testing of Chemicals or in [Young et al. 1988].

2345 Part B of the Annex to the Test Methods Regulation provides the following test method
2346 which may be regarded in the assessment of HP 4 'Irritant':

2347 ▪ B.46 In Vitro Skin Irritation: Reconstructed Human Epidermis Test Method

2348 Test methods given in the Test Methods Regulation that rely on animal testing are not
2349 appropriate.[16]

2350 Further in-vitro methods may be available from other sources, such as the European
2351 Union Reference Laboratory for alternatives to animal testing.[17]

2352 Where a hazardous property of a waste has been assessed by a test and by using the
2353 concentrations of hazardous substances as indicated in Annex III to the WFD, the
2354 results of the test shall prevail.

2355

2356

[16] See Annex to the LoW (point 2, indent 2): *"A hazardous property can be assessed by using the concentration of substances in the waste as specified in Annex III to Directive 2008/98/EC or, unless otherwise specified in Regulation (EC) No 1272/2008, by performing a test in accordance with Regulation (EC) No 440/2008 or other internationally recognised test methods and guidelines, taking into account Article 7 of Regulation (EC) No 1272/2008 as regards animal and human testing."*

[17] https://eurl-ecvam.jrc.ec.europa.eu/

C.5. Determining HP 5: Specific Target Organ Toxicity (STOT) / Aspiration Toxicity

Definition and further description of Annex III to WFD

Annex III to the WFD defines HP 5 'Specific Target Organ Toxicity (STOT)/ Aspiration Toxicity' as:

> '*waste which can cause specific target organ toxicity either from a single or repeated exposure, or which cause acute toxic effects following aspiration*'

The WFD further explains that:

> '*When a waste contains one or more substances classified by one or more of the following hazard class and category codes and hazard statement codes shown in Table 4 [see Table 14 of this document], and one or more of the concentration limits in Table 4 [see Table 14 of this document] is exceeded or equalled, the waste shall be classified as hazardous according to HP 5. When substances classified as STOT are present in a waste, an individual substance has to be present at or above the concentration limit for the waste to be classified as hazardous by HP 5.*
>
> *When a waste contains one or more substances classified as Asp. Tox. 1 and the sum of those substances exceeds or equals the concentration limit, the waste shall be classified as hazardous by HP 5 only where the overall kinematic viscosity (at 40°C) does not exceed 20.5 mm²/s.[Footnote: The kinematic viscosity shall only be determined for fluids]'*

Table 14: Hazard Class, Category Code(s) and Hazard Statement Code(s) for waste constituents and the corresponding concentration limits for the classification of wastes as hazardous by HP 5

Hazard Class and Category Code(s)	Hazard statement Code(s)	Description	Concentration limit
STOT SE 1	H370	Causes damage to organs	≥ 1 % (Indiv.)
STOT SE 2	H371	May cause damage to organs	≥ 10 % (Indiv.)
STOT SE 3	H335	May cause respiratory irritation	≥ 20 % (Indiv.)
STOT RE 1	H372	Causes damage to organs through prolonged or repeated exposure	≥ 1 % (Indiv.)
STOT RE 2	H373	May cause damage to organs through prolonged or repeated exposure	≥ 10 % (Indiv.)
Asp. Tox. 1	H304	May be fatal if swallowed and enters airways	≥ 10 %(total)

An example for the assessment of wastes containing CaO and $Ca(OH)_2$ according HP 5 can be found in chapter A.5.4.

Flow chart

Figure 14 sets out the determination process for the HP 5.

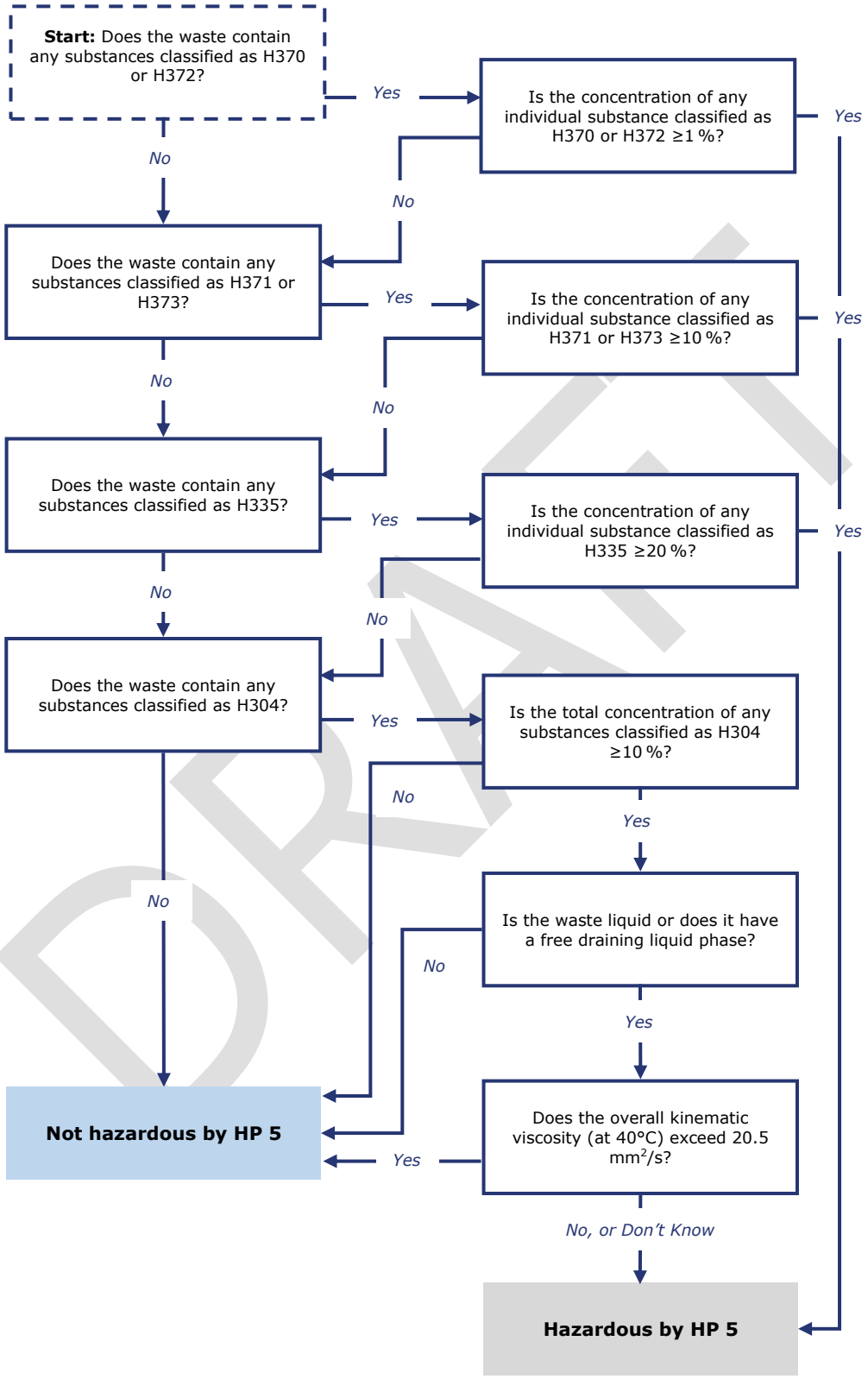


Figure 14: Flow chart for the assessment of HP5 (Adjusted from [UK EA 2015])

Test Methods

A HP 5 assessment of a waste is made based

- on the identification of the individual substances in the waste;
- their classification;
- reference to concentration limits.

If testing is considered when determining this hazard property, waste containing substances listed in Table 14 should be assessed for specific target organ toxicity and aspiration toxicity properties in accordance with the section 3.8 of [ECHA 2013].

Test methods given in the Test Methods Regulation that rely on animal testing are not appropriate. [18] Further in-vitro methods may be available from other sources, such as the European Union Reference Laboratory for alternatives to animal testing.[19]

Where a hazardous property of a waste has been assessed by a test and by using the concentrations of hazardous substances as indicated in Annex III to the WFD, the results of the test shall prevail.

[18] See Annex to the LoW (point 2, indent 2): *"A hazardous property can be assessed by using the concentration of substances in the waste as specified in Annex III to Directive 2008/98/EC or, unless otherwise specified in Regulation (EC) No 1272/2008, by performing a test in accordance with Regulation (EC) No 440/2008 or other internationally recognised test methods and guidelines, taking into account Article 7 of Regulation (EC) No 1272/2008 as regards animal and human testing."*

[19] https://eurl-ecvam.jrc.ec.europa.eu/

C.6. Determining HP 6: Acute Toxicity

Definition and further description of Annex III to WFD

Annex III to the WFD defines HP 6 'Acute Toxicity' as:

> *'waste which can cause acute toxic effects following oral or dermal administration, or inhalation exposure'.*

The WFD further explains that:

> *If the sum of the concentrations of all substances contained in a waste, classified with an acute toxic hazard class and category code and hazard statement code given in Table 5 [see Table 15 of this document], exceeds or equals the threshold given in that table, the waste shall be classified as hazardous by HP 6. When more than one substance classified as acute toxic is present in a waste, the sum of the concentrations is required only for substances within the same hazard category.*

Cut-off values

The following cut-off values apply to the assessment:

- for H300, H310, H330, H301, H311, and H331 : 0.1 %
- for H302, H312, H332): 1 %.

An individual substances present at a concentration below the cut off, for a hazard statement code assigned to it, is not included in the sum of the concentrations for that hazard class and category code.

Table 15: Hazard Class, Category Code(s) and Hazard Statement Code(s) for waste constituents and the corresponding concentration limits for the classification of wastes as hazardous by HP 6

Hazard Class and Category Code(s)	Hazard statement Code(s)	Description	Concentration limit (sum of substances)
Acute Tox.1 (Oral)	H300	Fatal if swallowed	≥ 0.1 %
Acute Tox. 2 (Oral)	H300	Fatal if swallowed	≥ 0.25 %
Acute Tox. 3 (Oral)	H301	Toxic if swallowed	≥ 5 %
Acute Tox.4 (Oral)	H302	Harmful if swallowed	≥ 25 %
Acute Tox.1 (Dermal)	H310	Fatal in contact with skin	≥ 0.25 %
Acute Tox.2 (Dermal)	H310	Fatal in contact with skin	≥ 2.5 %

Acute Tox.3 (Dermal)	H311	Toxic in contact with skin	≥ 15 %
Acute Tox. 4 (Dermal)	H312	Harmful in contact with skin	≥ 55 %
Acute Tox.1 (Inhal.)	H330	Fatal if inhaled	≥ 0.1 %
Acute Tox.2 (Inhal.)	H330	Fatal if inhaled	≥ 0.5 %
Acute Tox. 3 (Inhal.)	H331	Toxic if inhaled	≥ 3.5 %
Acute Tox. 4 (Inhal.)	H332	Harmful if inhaled	≥ 22.5 %

2434

Flow chart

Figure 15 sets out the determination process for HP 6.

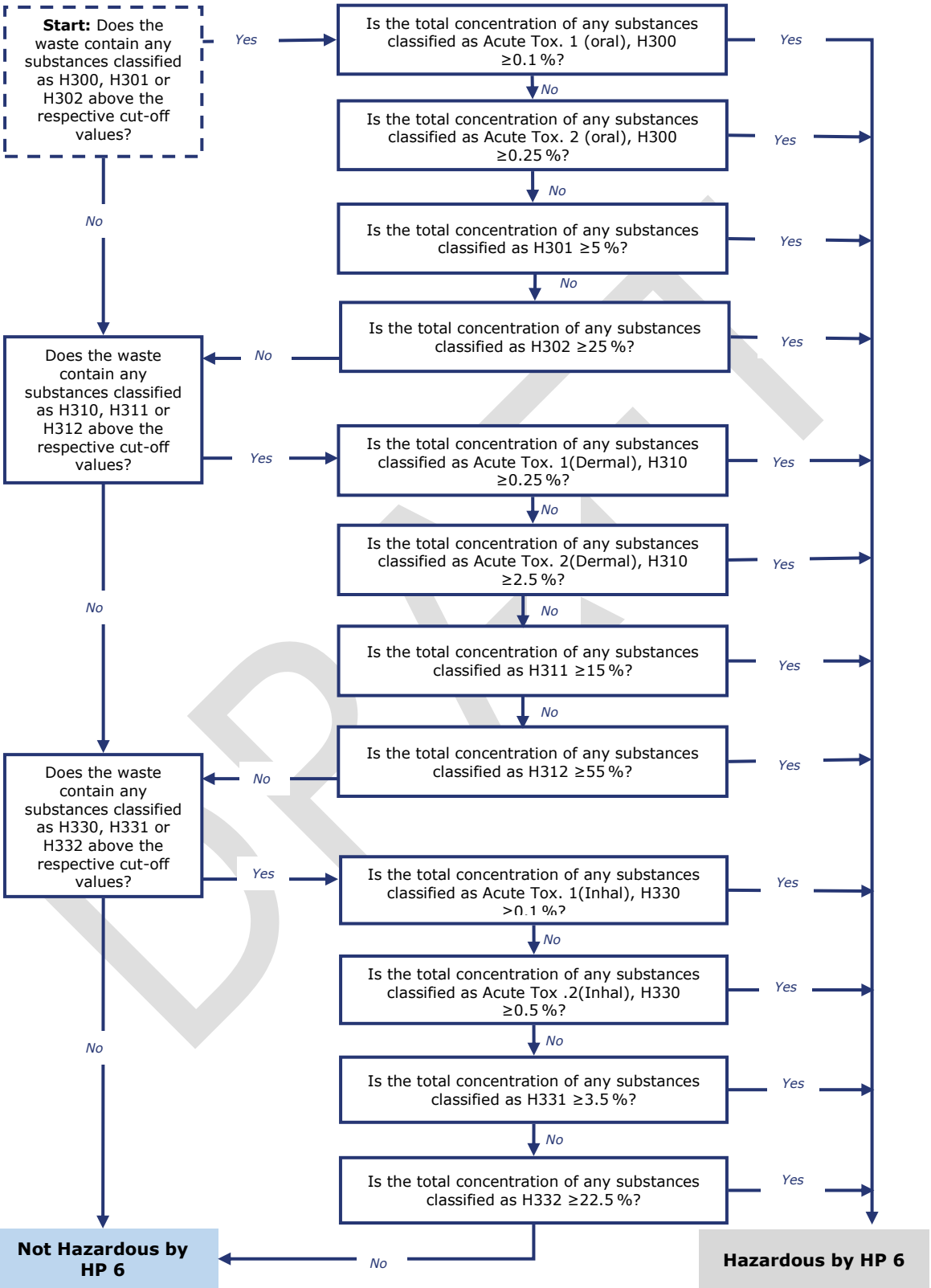


Figure 15: Flow chart for the determination of HP 6 (Adjusted from [UK EA 2015])

2439

2440 **Test Methods**

2441 A HP 6 assessment of a waste is to be made on the basis of

2442 ▪ the identification of the individual substances in the waste;

2443 ▪ their classification;

2444 ▪ reference to concentration limits.

2445 If testing is considered to determining this hazard property, waste containing
2446 substances listed in Table 15 should be assessed for acute toxicity properties in
2447 accordance with the section 3.1 of [ECHA 2013].

2448 Test methods given in the Test Methods Regulation that rely on animal testing are not
2449 appropriate. [20] Further in-vitro methods may be available from other sources, such as
2450 the European Union Reference Laboratory for alternatives to animal testing.[21]

2451 Where a hazardous property of a waste has been assessed by a test and by using the
2452 concentrations of hazardous substances as indicated in Annex III to the WFD, the
2453 results of the test shall prevail.

2454

2455

[20] See Annex to the LoW (point 2, indent 2): *"A hazardous property can be assessed by using the concentration of substances in the waste as specified in Annex III to Directive 2008/98/EC or, unless otherwise specified in Regulation (EC) No 1272/2008, by performing a test in accordance with Regulation (EC) No 440/2008 or other internationally recognised test methods and guidelines, taking into account Article 7 of Regulation (EC) No 1272/2008 as regards animal and human testing."*

[21] https://eurl-ecvam.jrc.ec.europa.eu/

C.7. Determining HP 7: Carcinogenic

Definition and further description of Annex III to WFD

Annex III to the WFD defines HP 7 'Carcinogenic' as:

> '*waste which induces cancer or increases its incidence*'

The WFD further explains that:

> *'When a waste contains a substance classified by one of the following hazard class and category codes and hazard statement codes and exceeds or equals one of the following concentration limits shown in Table 6 [see Table 16 of this document], the waste shall be classified as hazardous by HP 7. When more than one substance classified as carcinogenic is present in a waste, an individual substance has to be present at or above the concentration limit for the waste to be classified as hazardous by HP 7.*

Table 16: Hazard Class, Category Code(s) and Hazard Statement Code(s) for waste constituents and the corresponding concentration limits for the classification of wastes as hazardous by HP 7

Hazard Class and Category Code(s)	Hazard statement Code(s)	Description	Concentration limit (Individual substance)
Carc. 1A	H350	May cause cancer	≥ 0.1 %
Carc. 1B			
Carc. 2	H351	Suspected of causing cancer	≥ 1.0 %

An example for the assessment of asbestos according HP 7 can be found in chapter A.5.3

Flow chart

Figure 16 sets out the determination process for HP 7.

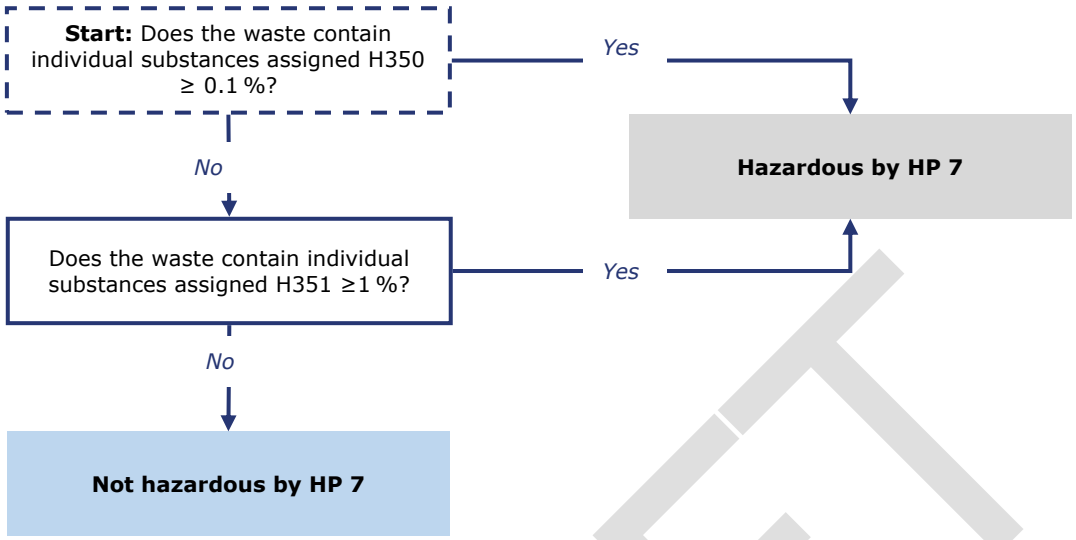


Figure 16: Flow chart for the determination of HP 7 (Adjusted from [UK EA 2015])

Test Methods

A HP 7 assessment of a waste is to be done based on

- the identification of the individual substances in the waste;
- their classification;
- reference to concentration limits.

If testing is considered to determining this hazard property, waste containing substances listed in Table 16 should be assessed for carcinogenic properties in accordance with the section 3.6 of [ECHA 2013].

Please note that testing to determine carcinogenicity is neither envisaged for waste nor for mixtures in the CLP Regulation. Mutagenicity tests (see chapter C.11) are considered in many cases to be a suitable indicator of potential carcinogenicity.

C.8. Determining HP 8: Corrosive

Definition and further description of Annex III to WFD

Annex III to the WFD defines HP 8 'Corrosive' as:

> '*waste which on application can cause skin corrosion*'

Hazards HP 8 and HP 4 are linked because they refer to the potential for harm or damage to tissue at different levels of severity. See C.4 for further details.

The WFD further explains that:

> *'When a waste contains one or more substances classified as Skin corr.1A, 1B or 1C (H314) and the sum of their concentrations exceeds or equals 5 %, the waste shall be classified as hazardous by HP 8.'*

Table 17: Hazard Class, Category Code(s) and Hazard Statement Code(s) for waste constituents and the corresponding concentration limits for the classification of wastes as hazardous by HP 8

Hazard Class and Category Code(s)	Hazard statement Code(s)	Description	Concentration limit (Sum of substances)
Skin corr. 1A, 1B, or 1C	H314	Causes severe skin burns and eye damage	≥ 5 %

For cases where a waste contains

- a substance to be classified as H314 Skin Corr.1A
- at a concentration ≥ 1 % and ≤ 5 %

see also HP 4 Irritant (chapter C.4 of this document).

Cut-off values

The following cut-off values apply to the assessment:

- For H314 : 1 %.

An individual substance present at a concentration below this cut off value is not included in the sum of the concentrations for H314.

Flow chart

Figure 17 sets out the determination process for HP 8.

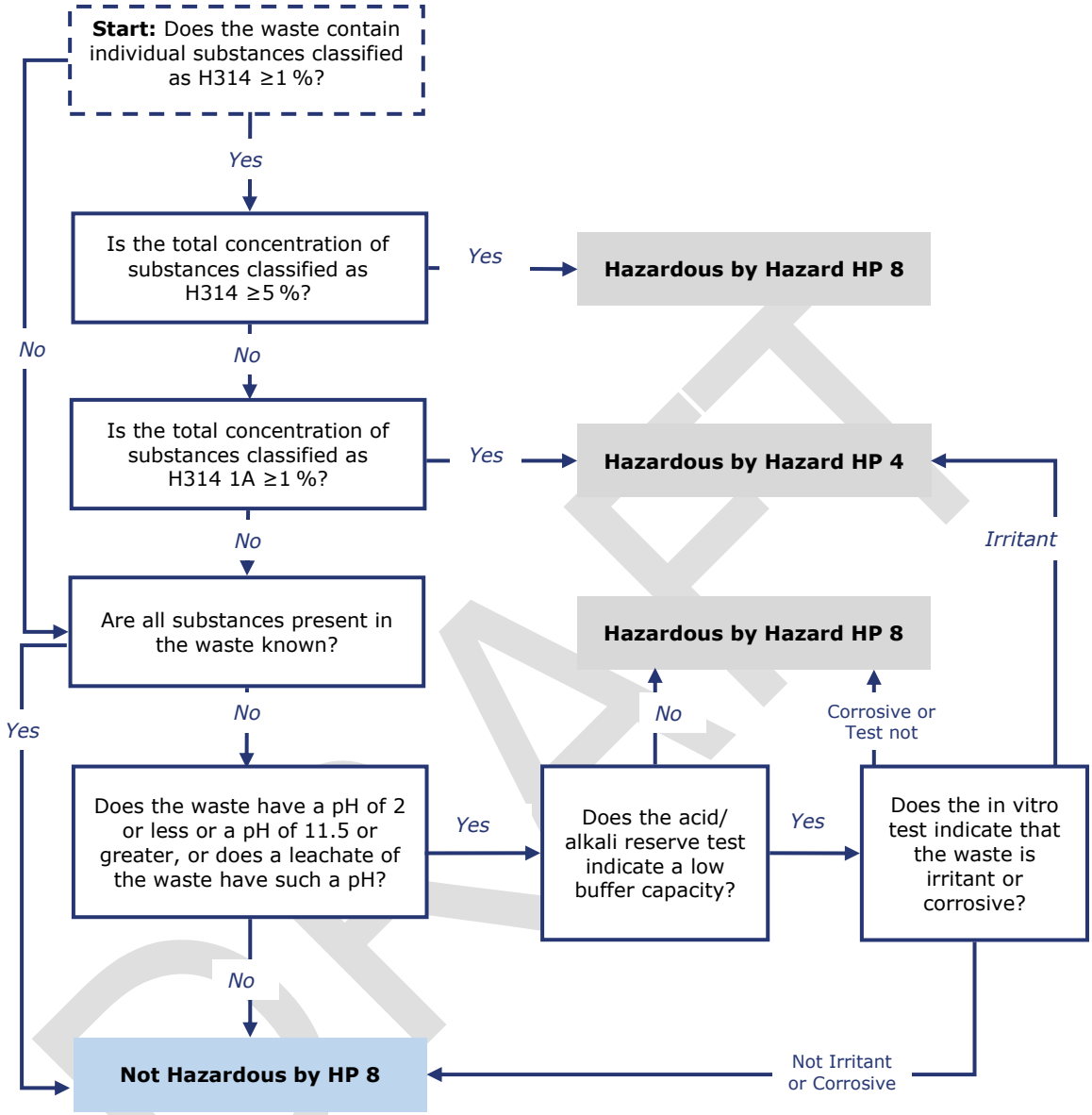


Figure 17: Flow chart for the determination of HP 8 (Adjusted from [UK EA 2015])

Test Methods

A HP 8 assessment of a waste is made on the basis of

- identification of the individual substances in the waste;
- their classification;
- reference to concentration limits in Annex III of the Waste Framework Directive.

If testing is considered to determining this hazard property, waste containing substances listed in Table 17 should be assessed for corrosive and irritant properties

in accordance with the section 3.2 of [ECHA 2013]. A mixture assigned H314 by this assessment is considered as hazardous by HP 8.

Part B of the Annex to the Test Methods Regulation provides the following in-vitro test methods which may be regarded in the assessment of HP 8 'Corrosive':

- B.40. In Vitro Skin Corrosion: Transcutaneous Electrical Resistance Test (TER)
- B.40 BIS. In Vitro Skin Corrosion: Human Skin Model Test

Test methods given in the Test Methods Regulation that rely on animal testing are not appropriate. [22]

Where a hazardous property of a waste has been assessed by a test and by using the concentrations of hazardous substances as indicated in Annex III to the WFD, the results of the test shall prevail.

[22] See Annex to the LoW (point 2, indent 2): *"A hazardous property can be assessed by using the concentration of substances in the waste as specified in Annex III to Directive 2008/98/EC or, unless otherwise specified in Regulation (EC) No 1272/2008, by performing a test in accordance with Regulation (EC) No 440/2008 or other internationally recognised test methods and guidelines, taking into account Article 7 of Regulation (EC) No 1272/2008 as regards animal and human testing."*

C.9. Determining HP 9: Infectious

Definition and further description of Annex III to WFD

Annex III to the WFD defines HP 9 'Infectious' as:

> *'waste containing viable micro-organisms or their toxins which are known or reliably believed to cause disease in man or other living organisms.'*

The WFD further explains that:

> *'The attribution of HP 9 shall be assessed by the rules laid down in reference documents or legislation in the Member States.'*

Remarks on the assessment process for HP 9

Toxins from micro-organisms have to be assessed analogously to chemical substances by considering their assigned hazard statement codes and associated hazardous properties. There are no hazard statement codes for infectious micro-organisms as they are not considered as hazardous substances under the CLP Regulation.

The assessment of HP 9 depends on a reference to categories of specific risk groups of organisms according their potential to cause and spread infection and their potential clinical treatment [UNEP 2004].

Therefore [WHO 2004] provides a widely recognized system categorising organisms according four risk groups:

- Risk Group 4 (high individual risk, high community risk);
- Risk Group 3 (high individual risk, low community risk);
- Risk Group 2 (moderate individual risk, low community risk);
- Risk Group 1 (low individual and community risk).

More information can be found in [WHO 2004]. [UN 2015] has taken up this approach and set up an indicative list of infectious substances (see Table 18).

Table 18: Indicative examples of infectious substances included in category A taken from Table 2.6.3.2.2.1 in [UN 2015]

UN Number and Proper Shipping Name	Micro-organism
Indicative examples of infectious substances included in category A in any form unless otherwise indicated	
UN 2814 Infectious substances affecting humans	▪ Bacillus anthracis (cultures only) ▪ Brucella abortus (cultures only) ▪ Brucella melitensis (cultures only) ▪ Brucella suis (cultures only) ▪ Burkholderia mallei - Pseudomonas mallei – Glanders (cultures only) ▪ Burkholderia pseudomallei – Pseudomonas pseudomallei (cultures only) ▪ Chlamydia psittaci - avian strains (cultures only) ▪ Clostridium botulinum (cultures only)

	▪ Coccidioides immitis (cultures only) ▪ Coxiella burnetii (cultures only) ▪ Crimean-Congo haemorrhagic fever virus ▪ Dengue virus (cultures only) ▪ Eastern equine encephalitis virus (cultures only) ▪ Escherichia coli, verotoxigenic (cultures only) ▪ Ebola virus ▪ Flexal virus ▪ Francisella tularensis (cultures only) ▪ Guanarito virus ▪ Hantaan virus ▪ Hantaviruses causing haemorrhagic fever with renal syndrome ▪ Hendra virus ▪ Hepatitis B virus (cultures only) ▪ Herpes B virus (cultures only) ▪ Human immunodeficiency virus (cultures only) ▪ Highly pathogenic avian influenza virus (cultures only) ▪ Japanese Encephalitis virus (cultures only) ▪ Junin virus ▪ Kyasanur Forest disease virus ▪ Lassa virus ▪ Machupo virus ▪ Marburg virus ▪ Monkeypox virus ▪ Mycobacterium tuberculosis (cultures only) ▪ Nipah virus ▪ Omsk haemorrhagic fever virus ▪ Poliovirus (cultures only) ▪ Rabies virus (cultures only) ▪ Rickettsia prowazekii (cultures only) ▪ Rickettsia rickettsii (cultures only) ▪ Rift Valley fever virus (cultures only) ▪ Russian spring-summer encephalitis virus (cultures only) ▪ Sabia virus ▪ Shigella dysenteriae type 1 (cultures only) ▪ Tick-borne encephalitis virus (cultures only) ▪ Variola virus ▪ Venezuelan equine encephalitis virus (cultures only) ▪ West Nile virus (cultures only) ▪ Yellow fever virus (cultures only) ▪ Yersinia pestis (cultures only)
UN 2900 Infectious substances	▪ African swine fever virus (cultures only) ▪ Avian paramyxovirus Type 1 - Velogenic Newcastle disease virus (cultures only)

affecting animals only	▪ Classical swine fever virus (cultures only) ▪ Foot and mouth disease virus (cultures only) ▪ Lumpy skin disease virus (cultures only) ▪ Mycoplasma mycoides - Contagious bovine pleuropneumonia (cultures only) ▪ Peste des petits ruminants virus (cultures only) ▪ Rinderpest virus (cultures only) ▪ Sheep-pox virus (cultures only) ▪ Goatpox virus (cultures only) ▪ Swine vesicular disease virus (cultures only) ▪ Vesicular stomatitis virus (cultures only)

Infectious substances (including wastes contaminated with such substances, such as medial or clinical wastes) in category A (as well as cultures of infectious substances of category B) must be classified under transport regulations, as

- UN 2814 "infectious substance, affecting humans", or
- UN 2900 "infectious substance, affecting animals only".

Considering the classification applied by [UN 2015], without testing, a reasoned judgment can be made whether the waste under consideration has to be classified as hazardous waste by HP 9.

In this regard [UK EA 2015] mentions two general aspects for the assessment of HP 9:

- In case it has to be decided whether to assign the MH or MNH entry to the waste under consideration, the waste will be assigned the MH entry by virtue of HP 9 if it contains a toxin produced by a micro-organism in a concentration that the waste displays the hazardous property HP 5 (Specific Target Organ Toxicity/ Aspiration Toxicity, see chapter C.5) or HP 6 (Acute Toxicity, see chapter C.6). Wastes that might be infectious due to microbial toxins include dredgings or skimmings from waterbodies where a cyanobacterial bloom has occurred.
- It needs to be identified whether relevant healthcare wastes can be associated with infection and have to be classified as infectious.

Regarding the latter aspect, relevant entries in the LoW (MH and MNH entries) that are linked to HP 9 are:

18 01	**Wastes from natal care, diagnosis, treatment or prevention of diseases in humans**	
18 01 03*	wastes whose collection and disposal is subject to special requirements in order to prevent infection	MH
18 01 04	wastes whose collection and disposal is not subject to special requirements in order to prevent infection (for example dressings, plaster casts, linen, disposable clothing, diapers)	MNH

18 02	**Wastes from research, diagnosis, treatment or prevention of disease involving animals**	
18 02 02*	wastes whose collection and disposal is subject to special requirements in order to prevent infection	MH

18 02 03	wastes whose collection and disposal is not subject to special requirements in order to prevent infection	MNH

To distinguish between the mirror entries 18 01 03*/ 18 01 04 or respectively 18 02 02*/ 18 02 03 [UK EA 2015] uses the term 'special requirement' as decisive criterion. The following information is directly taken from [UK EA 2015] which states that special requirements apply when:

- the source person or animal (the patient), is known or suspected to have a disease / infection caused by a micro-organism or its toxin and the waste is likely to contain the viable infectious agent or toxin; or
- the waste is, or is contaminated with, a culture or an enrichment of a micro-organism or its toxin that may cause disease in man or other living animals; or
- the waste may cause infection to any person or animal coming into contact with it.

According to [UK EA 2015], special requirements should be determined by clinical assessment of each waste item and patient, as follows:

- clinical assessment should be carried out by a healthcare professional who is familiar with the type of waste generated, the current medical condition and, where feasible, the past medical history of the patient
- it is unlikely that it will always be practical, or possible, to identify specific pathogens or toxins within the waste when a patient first presents symptoms as definitive laboratory identification requires time to undertake. The procedure for determining whether a waste is considered hazardous by HP 9 must therefore, where this is the case, assume that the disease causing agent has not been confirmed and should be based on clinical assessment of whether an unidentified infection of any type is suspected or known.
- all pathogens and microbial toxins should be included in the assessment. HP 9 does not consider the severity of the disease.

Any waste classified as hazardous by virtue of HP 9 Infectious shall be kept separately from other waste to prevent contamination.

Test Methods

There are no test methods given in the Test Methods Regulation.

C.10. Determining HP 10: Toxic for reproduction

Definition and further description of Annex III to WFD

Annex III to the WFD defines HP 10 'Toxic for reproduction' as:

> '*waste which has adverse effects on sexual function and fertility in adult males and females, as well as developmental toxicity in the offspring*'

The WFD further explains that:

> *'When a waste contains a substance classified by one of the following hazard class and category codes and hazard statement codes and exceeds or equals one of the following concentration limits shown in Table 7 [see Table 19 of this document], the waste shall be classified hazardous according to HP 10. When more than one substance classified as toxic for reproduction is present in a waste, an individual substance has to be present at or above the concentration limit for the waste to be classified as hazardous by HP 10.'*

Table 19: Hazard Class, Category Code(s) and Hazard Statement Code(s) for waste constituents and the corresponding concentration limits for the classification of wastes as hazardous by HP 10

Hazard Class and Category Code(s)	Hazard statement Code(s)	Description	Concentration limit (Individual substance)
Repr. 1A	H360	*May damage fertility or the unborn child*	≥ 0.3 %
Repr. 1B			
Repr. 2	H361	*Suspected of damaging fertility or the unborn child*	≥ 3.0 %

Flow chart

Figure 18 sets out the assessment process for HP 10.

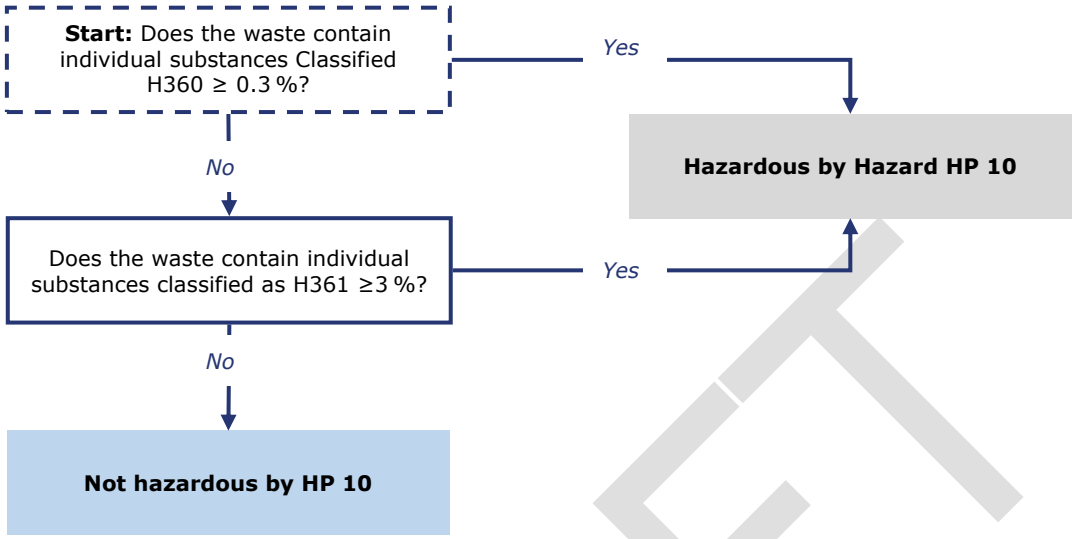


Figure 18: Flow chart for the determination of HP 10 (Adjusted from [UK EA 2015])

Test Methods

A HP 10 assessment of a waste is to be made on the basis of

- the identification of the individual substances in the waste;
- their classification;
- reference to concentration limits.

If testing is considered to determining this hazard property, waste containing substances listed in Table 19 should be assessed for toxic for reproduction properties in accordance with the section 3.7 of [ECHA 2013].

Please note that there are very limited options for testing reproductive toxicity properties in-vitro. Test methods given in the Test Methods Regulation mainly rely on animal testing and thus are not appropriate. [23] Further in-vitro methods may be available from other sources, such as the European Union Reference Laboratory for alternatives to animal testing.[24]

[23] See Annex to the LoW (point 2, indent 2): *"A hazardous property can be assessed by using the concentration of substances in the waste as specified in Annex III to Directive 2008/98/EC or, unless otherwise specified in Regulation (EC) No 1272/2008, by performing a test in accordance with Regulation (EC) No 440/2008 or other internationally recognised test methods and guidelines, taking into account Article 7 of Regulation (EC) No 1272/2008 as regards animal and human testing."*

[24] https://eurl-ecvam.jrc.ec.europa.eu/

C.11. Determining HP 11: Mutagenic

Definition and further description of Annex III to WFD

Annex III to the WFD defines HP 11 'Mutagenic' as:

> '*waste which may cause a mutation, that is a permanent change in the amount or structure of the genetic material in a cell*'

The WFD further explains that:

> '*When a waste contains a substance classified by one of the following hazard class and category codes and hazard statement codes and exceeds or equals one of the following concentration limits shown in Table 8 [see Table 20 of this document], the waste shall be classified hazardous according to HP 11. When more than one substance classified as toxic for reproduction is present in a waste, an individual substance has to be present at or above the concentration limit for the waste to be classified as hazardous by HP 11.*'

Table 20: Hazard Class, Category Code(s) and Hazard Statement Code(s) for waste constituents and the corresponding concentration limits for the classification of wastes as hazardous by HP 11 Mutagenic

Hazard Class and Category Code(s)	Hazard statement Code(s)	Description	Concentration limit (Individual substance)
Muta. 1A	H340	*May cause genetic defects*	≥ 0.1 %
Muta. 1B			
Muta. 2	H341	*Suspected of causing genetic defects*	≥ 1.0 %

Flow chart

Figure 19 sets out the determination process for HP 11.

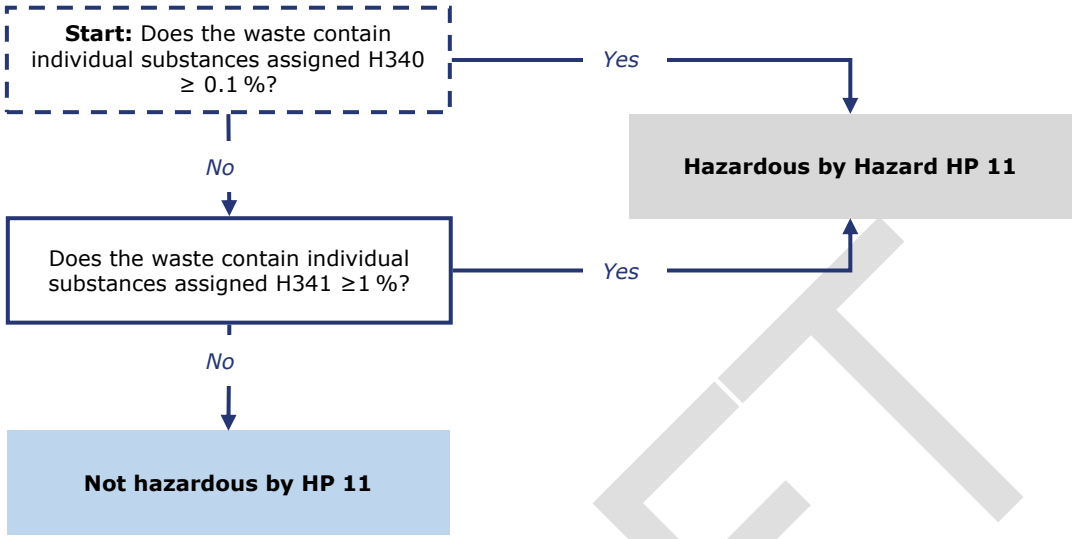


Figure 19: Flow chart for the determination of HP 11 (Adjusted from [UK EA 2015])

Test Methods

A HP 11 assessment of a waste is to be made on the basis of

- the identification of the individual substances in the waste;
- their classification;
- reference to concentration limits.

If testing is considered to determining this hazard property, waste containing substances listed in Table 20 should be assessed for mutagenic properties in accordance with the section 3.5 of the [ECHA 2013].

Part B of the Annex to the Test Methods Regulation provides the following in-vitro test methods which may be regarded in the assessment of HP 11 'Mutagenic':

- B.10. Mutagenicity – In Vitro Mammalian Chromosome Aberration Test
- B.13/14. Mutagenicity: Reverse Mutation Test Using Bacteria
- B.15. Mutagenicity Testing and Screening for Carcinogenicity Gene Mutation – *Saccharomyces Cerevisiae*
- B.17. Mutagenicity – In Vitro Mammalian Cell Gene Mutation Test

Test methods given in the Test Methods Regulation that rely on animal testing are not appropriate[25].

[25] Annex to the LoW (point 2, indent 2): *"A hazardous property can be assessed by using the concentration of substances in the waste as specified in Annex III to Directive 2008/98/EC or, unless otherwise specified in Regulation (EC) No 1272/2008, by performing a test in accordance with Regulation (EC) No 440/2008 or other internationally recognised test methods and guidelines, taking into account Article 7 of Regulation (EC) No 1272/2008 as regards animal and human testing."*

2709

2710

C.12. Determining HP 12: Release of an acute toxic gas

Definition and further description of Annex III to WFD

Annex III to the WFD defines HP 12 'Release if an acute toxic gas' as:

> '*waste which releases acute toxic gases (Acute Tox. 1, 2 or 3) in contact with water or an acid*'

The WFD further explains that:

> *'When a waste contains a substance assigned to one of the following supplemental hazards EUH029, EUH031 and EUH032, it shall be classified as hazardous by HP 12 according to test methods or guidelines.'*

A waste containing substances that are assigned EUH029, EUH031 and EUH032 can be tested to show whether it displays that hazardous property or not. Otherwise a waste containing those substances can simply be assumed to be hazardous by HP 12.

Table 21: Hazard statements and supplemental hazards for waste constituents for the classification of wastes as hazardous by HP 12

Hazard Statement(s) / Supplemental Hazard(s)	
Contact with water liberates toxic gas	EUH029
Contact with acids liberates toxic gas	EUH031
Contact with acids liberates very toxic gas	EUH032

Flow chart

Figure 20 sets out the assessment process for HP 12.

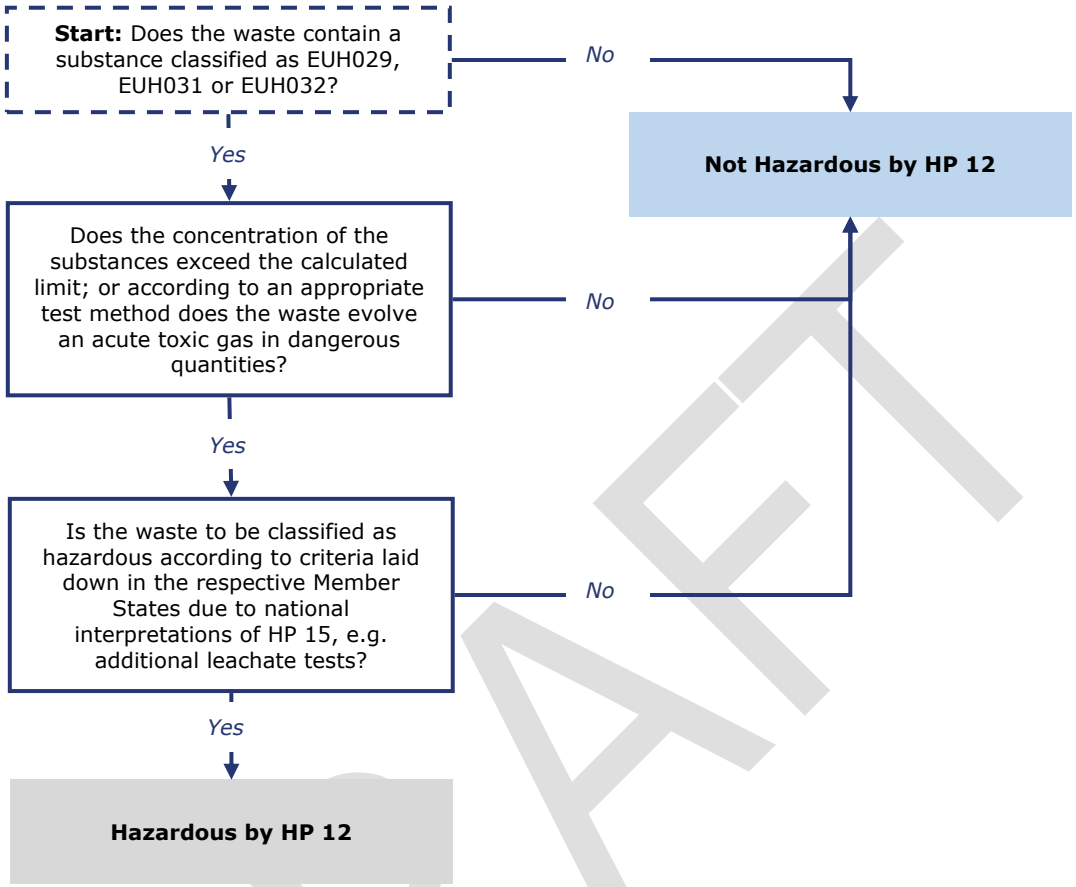


Figure 20: Flow chart for the determination of HP 12 (Adjusted from [UK EA 2015])

Calculation method

A detailed example on a possible calculation method for HP 12 is taken from [UK EA 2015] and presented in the following.

A substance is assigned EUH029, EUH031 or EUH032 if it is capable of releasing an acute toxic gas[26] when water or acid is added.

If a waste contains a substance assigned EUH029, EUH031 or EUH032, it is possible to calculate the limiting concentration of the substance in the waste that would make it hazardous by HP 12. An example of how to do the calculation is given below in

[26] The gases that are likely to be released include hydrogen sulphide, hydrogen fluoride, carbon disulphide, sulphur dioxide, chlorine, nitrogen dioxide, ammonia and hydrogen cyanide.

Calculation method HP 12

1. Write a balanced equation for the reaction that produces the gas. The general form of the equation is:

rR + wW = pP + gG

where R is the EUH029, EUH031 or EUH032 substance, W is water or an acid, P is a product of the reaction, and G is the gas released; r, w, p and g are the stoichiometric ratios that balance the equation.

2. Attribute molecular weights and stoichiometric ratios to the substances in the equation.

3. Divide (r x molar weight of R) by (g x 22.4). This gives the mass of R that will evolve 1 litre of gas. 1 mol of gas occupies 22.4 litres at standard temperature and pressure.

4. Divide this amount (in grams) by 1,000 (to convert to kilograms) and multiply it by 100 to give a percentage by weight, and thus the limiting concentration for HP 12 of substance R.

Example calculation: A waste contains aluminium nitride (AlN). Aluminium nitride is an EUH029 substance which reacts with water to give ammonia gas.

AlN + 3H2O = Al(OH)3 + NH3

aluminium nitride water aluminium hydroxide ammonia

r = 1 mol of AlN, R = 41 g; g = 1 mol NH3.

Limiting concentration of aluminium nitride in waste is ((1 x 41) / (1 x 22.4) / 1000) x 100, which is 0.18% (approximately 0.2%).

Box 16: Calculation method for HP 12 [UK EA 2015]

Threshold limits derived from the calculations for some EUH029, EUH031 ir EUH032 substances are given below in Table 22.

Table 22: Examples of substances which may cause a waste to exhibit HP 12 and their threshold concentrations[27] [UK EA 2015]

Substance name	Hazard Statement Codes	Equation	Concentration limits for waste to be HP 12 (%)[1]
Phosphorous pentasulphide	EUH029	$P_2S_5 + 8H_2O \rightarrow 5H_2S + 2H_3PO_4$	0.1
3,5-dichloro-2,4-difluoro-benzoyl fluoride (DCDFBF)	EUH029	DCDFBF + $H_2O \rightarrow$ HF + Prod.	1.0
Metam-sodium	EUH031	$CH_3NHCS_2Na + H^+ \rightarrow CH_3NH_2 + CS_2 + Na^+$	0.5
Barium sulphide	EUH031	$BaS + 2H^+ \rightarrow H_2S + Ba^{2+}$	0.8
Barium polysulphides	EUH031	$BaS_n + 2H^+ \rightarrow H_2S + Ba^{2+} + S_{n-1}$	0.8
Calcium sulphide	EUH031	$CaS + 2H^+ \rightarrow H_2S + Ca^{2+}$	0.3
Calcium polysulphides	EUH031	$CaS_n + 2H^+ \rightarrow H_2S + Ca^{2+} + S_{n-1}$	0.3

[27] This is not a complete list of substances with these properties.

Substance name	Hazard Statement Codes	Equation	Concentration limits for waste to be HP 12 (%)[1]
Potassium sulphide	EUH031	$K_2S + 2H^+ \rightarrow H_2S + 2K^+$	0.5
Ammonium polysulphides	EUH031	$(NH_4)_2S_n + 2H^+ \rightarrow H_2S + 2NH_4^+ + S_{n-1}$	0.3
Sodium sulphide	EUH031	$Na_2S + 2H^+ \rightarrow H_2S + 2Na^+$	0.4
Sodium polysulphides	EUH031	$Na_2S_n + 2H^+ \rightarrow H_2S + 2Na^+ + S_{n-1}$	0.4
Sodium dithionite	EUH031	$Na_2O_6S_2 + 2H^+ \rightarrow 2Na^+ + SO_2 + H_2SO_4$	0.9
Sodium hypochlorite, solution Cl active[2]	EUH031	$2NaOCl + 2H^+ \rightarrow Cl_2 + 2Na^+ + H_2O$	2.9
Calcium hypochlorite, solution Cl active[2]	EUH031	$Ca(OCl)_2 + 2H^+ \rightarrow Cl_2 + Ca^{2+} + H_2O$	0.6
Dichloroisocyanuric acid	EUH031	$C_3HCl_2N_3O_3 + 2H^+ \rightarrow C_3H_3N_3O_3 + Cl_2$	0.9
Dichloroisocyanuric acid, sodium salt of	EUH031	$C_3Cl_2N_3O_3Na + 3H^+ \rightarrow C_3H_3N_3O_3 + Cl_2 + Na^+$	1.0
Sodium dichloroisocyanruate, dihydrate	EUH031	$C_3Cl_2N_3O_3Na.2H_2O + 3H^+ \rightarrow C_3H_3N_3O_3 + Cl_2 + Na^+ + 2H_2O$	1.1
Trichloroisocyanuric acid	EUH031	$2C_3Cl_3N_3O_3 + 6H^+ \rightarrow 2C_3H_3N_3O_3 + 3Cl_2$	0.7
Hydrogen cyanide, salts of (with the exception of complex cyanides such as ferrocyanides, ferricyanides and mercuric oxycyanide)	EUH032	$NaCN + H^+ \rightarrow HCN + Na^+$	0.2
Sodium fluoride	EUH032	$NaF + H^+ \rightarrow HF + Na^+$	0.2
Sodium azide	EUH032	$NaN_3 + H^+ + H_2O \rightarrow NO_2 + NH_3 + Na^+$	0.3
Trizinc disphosphide	EUH032	$Zn_3P_2 + 6H^+ \rightarrow 2PH_3 + 3Zn^{2+}$	0.6
Calcium cyanide	EUH032	$Ca(CN)_2 + 2H^+ \rightarrow 2HCN + Ca^{2+}$	0.2
Cadmium cyanide	EUH032	$Cd(CN)_2 + 2H^+ \rightarrow 2HCN + Cd^{2+}$	0.4
Aluminium phosphide	EUH029 EUH032	$AlP + 3H^+ \rightarrow PH_3 + Al^{3+}$ $AlP + 3H_2O \rightarrow PH_3 + Al(OH)_3$	0.3 0.3

Substance name	Hazard Statement Codes	Equation	Concentration limits for waste to be HP 12 (%)[1]
Calcium phosphide	EUH029	$Ca_3P_2 + 6H_2O \rightarrow 2PH_3 + 3Ca(OH)_2$	0.4
Magnesium phosphide	EUH029 EUH032	$Mg_3P_2 + 6H_2O \rightarrow 2PH_3 + 3Mg(OH)_2$	0.3
Trizinc diphosphide	EUH029 EUH032	$Zn_3P_2 + 6H_2O \rightarrow 2PH_3 + 3Zn(OH)_2$	0.6

Notes:

[1] Rounded to one decimal place

[2] Based on 29.3 g sodium hypochlorite per 100 ml (max solubility)

Test Methods

There are no direct test methods for HP 12.

Where a test is necessary the test method for emission of flammable gas provided in section 2.12 of [ECHA 2013] should be used. Where the waste contains EUH031 or EUH032 substances a 1 M hydrochloric acid solution can be used to replace the water in the test.

C.13. Determining HP 13: Sensitising

Definition and further description of Annex III to WFD

Annex III of the Waste Framework Directive defines HP 13 'Sensitising' as:

> '*waste which contains one or more substances known to cause sensitising effects to the skin or the respiratory organs*'

The WFD further explains that:

> *'When a waste contains a substance classified as sensitising and is assigned to one of the hazard statement codes H317 or H334 and one individual substance equals or exceeds the concentration limit of 10 %, the waste shall be classified as hazardous by HP 13.'*

Table 23: Hazard Class and Category Code(s) and Hazard statement Code(s) for waste constituents and the corresponding concentration limits for the classification of wastes as hazardous by HP 13 Sensitising

Hazard Class and Category Code(s)	Hazard statement Code(s)	Description	Concentration limit (Individual substance)
Skin Sens. 1, 1A,and 1B	H317	*May cause an allergic skin reaction*	≥ 10 %
Resp. Sens. 1, 1A and 1B	H334	*May cause allergy or asthma symptoms or breathing difficulties if inhaled*	≥ 10 %

Flow chart

Figure 21 sets out the assessment process for HP 13.

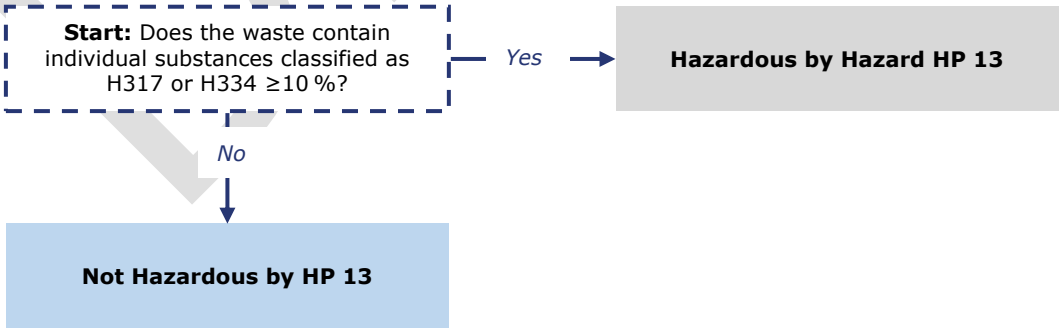


Figure 21: Flow chart for the assessment of HP13 (Adjusted from [UK EA 2015])

Test Methods

A HP 13 assessment of a waste is to be made on the basis of

- the identification of the individual substances in the waste;
- their classification;
- reference to concentration limits.

If testing is considered to determining this hazard property, waste containing substances listed in Table 23 should be assessed for sensitising properties in accordance with the section 3.4 of [ECHA 2013].

Test methods given in Part B of the Annex to the Test Method Regulation mainly rely on animal testing and thus are not appropriate. [28] Further in-vitro methods may be available from other sources, such as the European Union Reference Laboratory for alternatives to animal testing.[29]

[28] See Annex to the LoW (point 2, indent 2): *"A hazardous property can be assessed by using the concentration of substances in the waste as specified in Annex III to Directive 2008/98/EC or, unless otherwise specified in Regulation (EC) No 1272/2008, by performing a test in accordance with Regulation (EC) No 440/2008 or other internationally recognised test methods and guidelines, taking into account Article 7 of Regulation (EC) No 1272/2008 as regards animal and human testing."*

[29] https://eurl-ecvam.jrc.ec.europa.eu/

C.14. Determining HP 14: Ecotoxic

- TO BE COMPLETED AFTER THE VOTE OF 25 OCTOBER 2016

C.15. Determining HP 15: Waste capable of exhibiting a hazardous property listed above not directly displayed by the original waste

Definition and further description of Annex III to WFD

Annex III of the Waste Framework Directive defines HP 15 as:

> '*waste capable of exhibiting a hazardous property listed above not directly displayed by the original waste*'

The WFD further explains that:

> *'When a waste contains one or more substances assigned to one of the hazard statements or supplemental hazards shown in Table 9 [see Table 24 of this document], the waste shall be classified as hazardous by HP 15, unless the waste is in such a form that it will not under any circumstance exhibit explosive or potentially explosive properties.*
>
> *In addition, Member States may characterise a waste as hazardous by HP 15 based on other applicable criteria, such as an assessment of the leachate.'*

A waste containing substances that are assigned hazard statement or supplemental hazard codes in Table 24 can be tested to show whether it exhibits that hazardous property or not. Alternatively a waste containing those substances can simply be assumed to be hazardous by HP 15.

Member States may characterise a waste as hazardous by HP 15 based on other applicable criteria, such as an assessment of the leachate.

Table 24: Hazard statements and supplemental hazards for waste constituents for the classification of wastes as hazardous by HP 15

Hazard Statement(s) / Supplemental Hazard(s)	
May mass explode in fire	*H205*
Explosive when dry	*EUH001*
May form explosive peroxides	*EUH019*
Risk of explosion if heated under confinement	*EUH044*

Decision Tree

Figure 22 sets out the assessment process for HP 15.

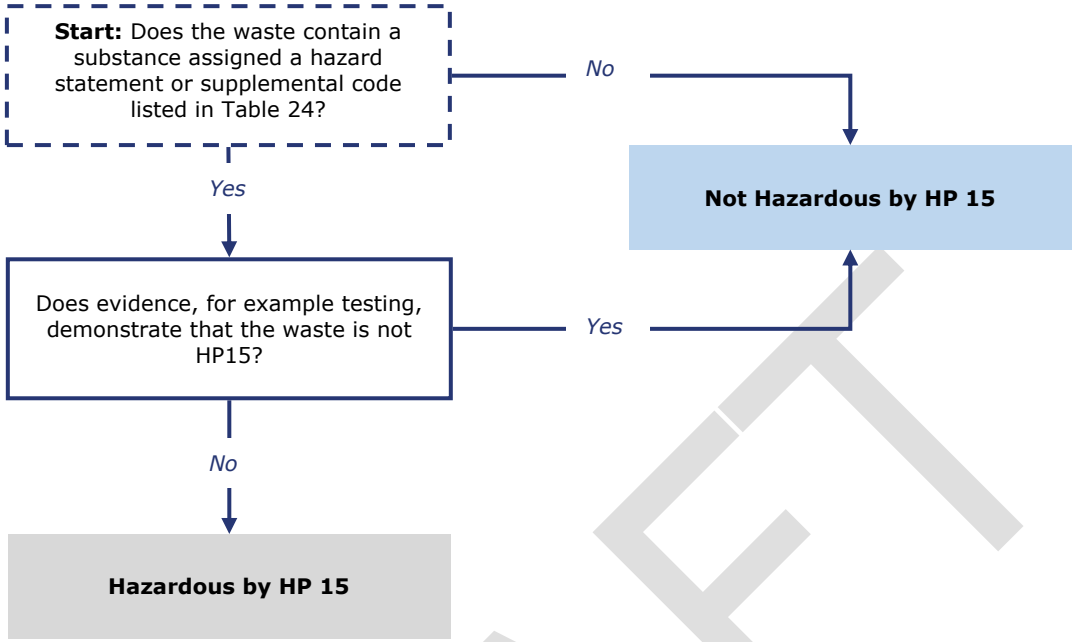


Figure 22: Flow chart for the assessment of HP15 (Adjusted from [UK EA 2015])

Test Methods

Wastes containing substances listed in Table 24 should be assessed or tested for in accordance with [ECHA 2013]. Section 2.1 provides guidance on the classification of mixtures for EUH001, EUH044 and H205.

A waste that would be labelled with a hazard statement or supplementary hazard code as a result assessment for EUH001, EUH019, EUH044 or H205 possesses the hazardous property HP 15.

Annex D: Sampling and chemical analysis of waste

In many cases, sufficient information on the waste in question will be available without a need for sampling, chemical analyses and testing (see chapter 3.2.1 for other information sources than sampling and chemical analyses of waste). Where sampling and/or chemical analyses are required, this Annex will on the one hand present a brief overview on waste sampling according to European standards. Basic concepts are mentioned. For more details please refer to the presented standards. In addition, this Annex contains a section with more information and references to specific issues of chemical analyses of waste.

D.1. Sampling

Poor sampling is one of the factors that undermine reliable classification of waste. Hence it is strongly recommended that sampling for the purpose of waste classification should be conducted in accordance with the available CEN standards, as they are presented below.

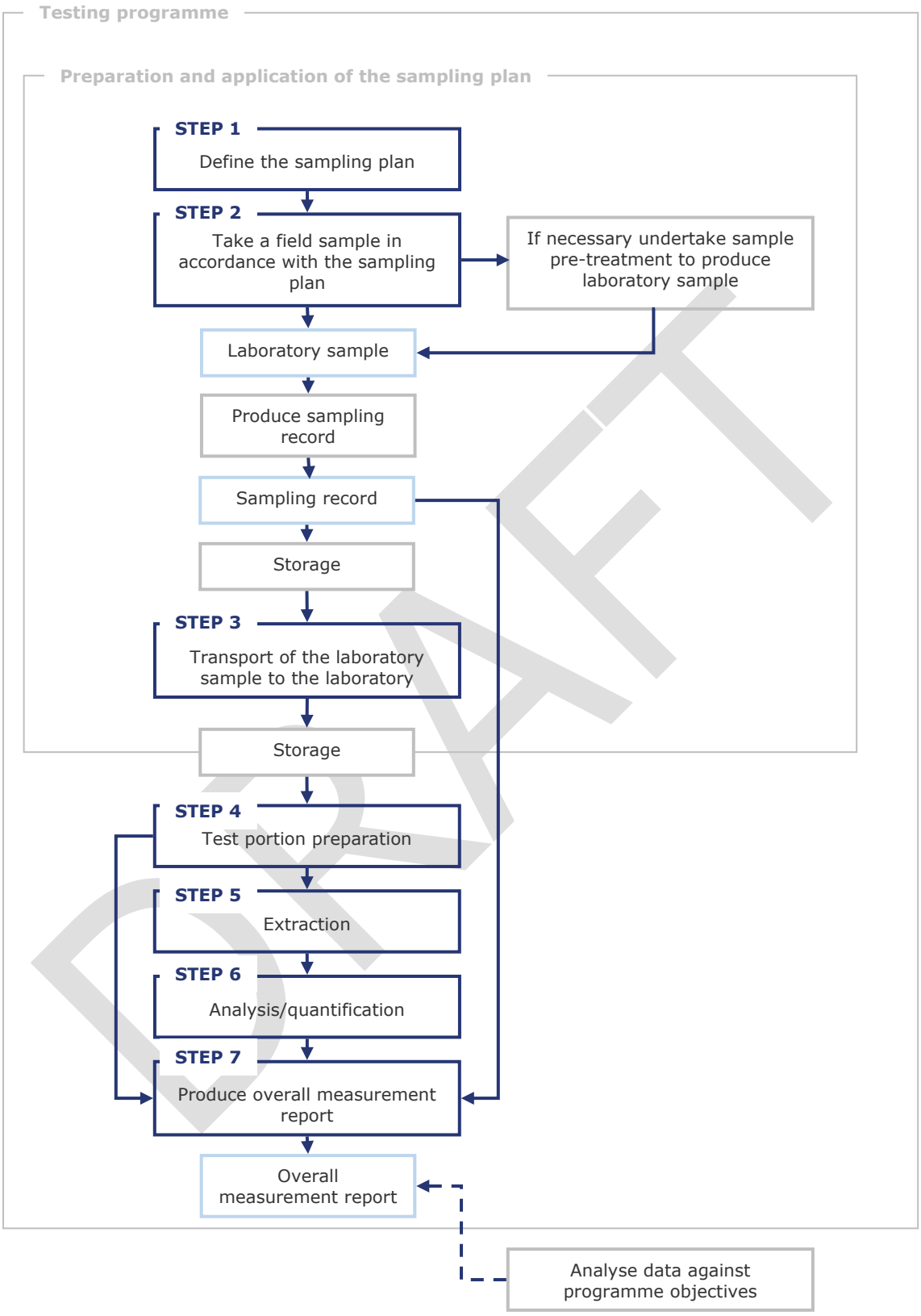
D.1.1. Sampling framework

The European Committee for Standardization (CEN), through its technical committee TC 292 has developed several standards, Technical Reports/Specifications, and state of the art documents for the characterisation of waste. Available documents need to be considered in a coordinated manner. The following list contains relevant standard documents on the 'characterisation of waste – Sampling of waste materials':

- **EN 14899**
  Framework for the preparation and application of a sampling plan;
- **CEN/TR 15310-1:2006**
  Guidance on selection and application of criteria for sampling under various conditions;
- **CEN/TR 15310-2:2006**
  Guidance on sampling techniques;
- **CEN/TR 15310-3:2006**
  Guidance on procedures for sub-sampling in the field;
- **CEN/TR 15310-4:2006**
  Guidance on procedures for sample packaging, storage, preservation, transport and delivery;
- **CEN/TR 15310-5:2006**
  Guidance on the process of defining the sampling plan.

To obtain accurate and representative results, a testing programme needs to be set up before the first sample is taken. This way it is ensured that all necessary factors are considered to enable representative conclusions for the whole waste based on sample(s) [UK EA 2015]. EN 14899 describes this testing programme in detail. In particular seven steps are defined which are displayed in Figure 23.

Alternative sampling procedures are acceptable if they have considered the relevant factors identified in the standards listed above and produce an equally reliable result.



2883

Figure 23: Testing programme adapted from EN 14899:2005

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D.1.2. Sampling methodology

As Figure 23 covers the whole testing programme according to EN 14899:2005 in general, a more detailed focus shall be drawn on the sampling methodology, which consists of three key elements as displayed in Figure 24:

1. define the sampling plan;
2. take a field sample in accordance with the sampling plan;
3. transport the laboratory sample to the laboratory.

Each key element is divided in further sub-elements one should follow to obtain standardised sampling results.

Especially for defining the sampling plan several steps have to be performed. An informative template for a sampling plan is displayed in Annex A to EN 14899:2005. Figure 24 presents all sub-elements according to EN 14899:2005 and references to the corresponding technical report, where more detailed information can be found. Please note that Figure 24 (key elements including the definition of a sampling plan) has to be considered as a more detailed segment of the overall testing programme as presented in Figure 23.

Also note that EN 15002:2015 gives further guidance on how to prepare test portions from the laboratory sample (see Step 4 in Figure 23) which will be the next step after the preparing and applying the sampling methodology as it will be presented in detail in Figure 24).

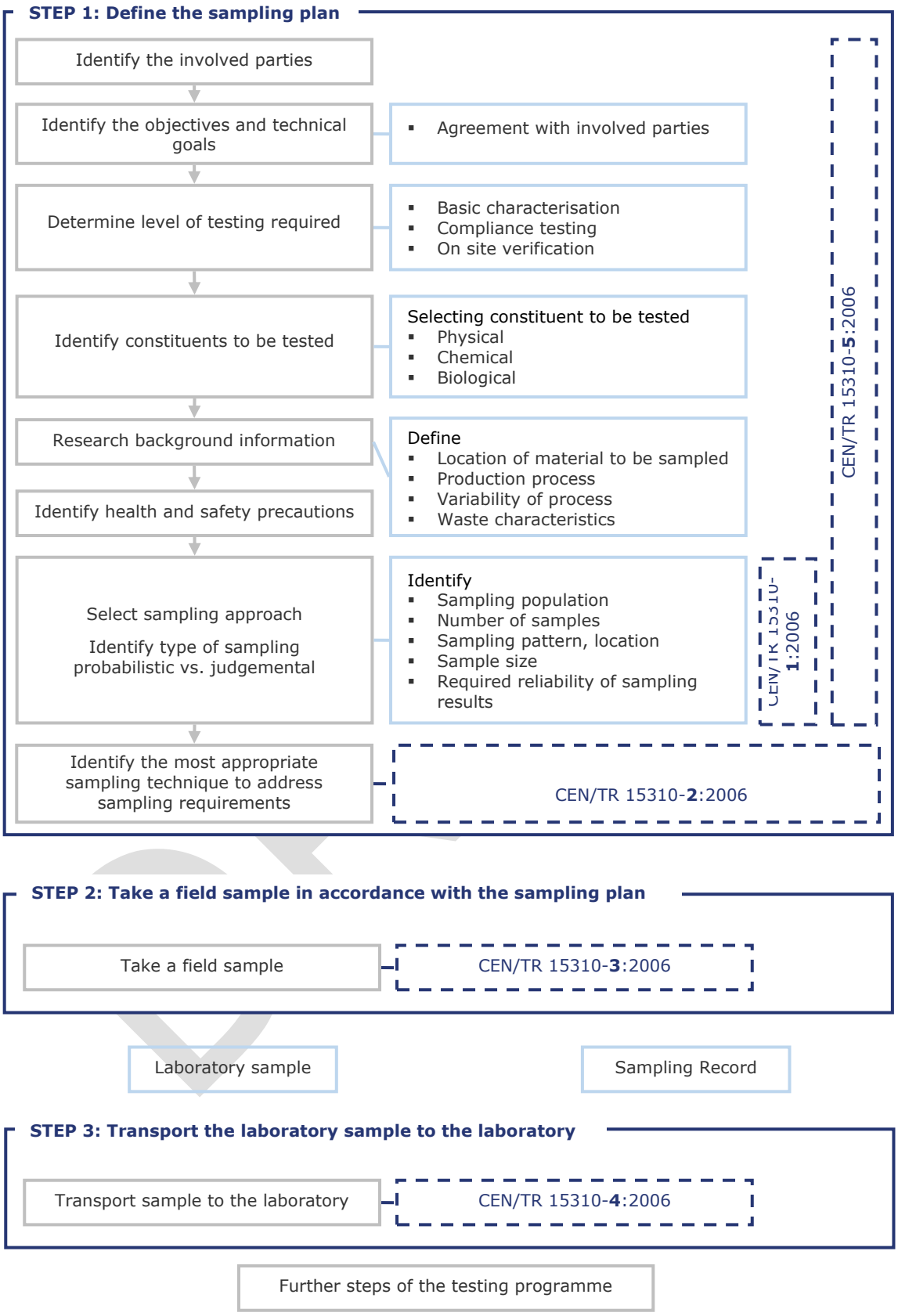

Figure 24: Key elements of sampling methodology according to EN 14899:2005

D.1.3. Sampling standards for different waste types

Waste can be present in a large variety of composition and consistency. To ensure reliable results, sampling methods need to be adapted according the nature of the waste to be sampled. CEN/TR 15310-2:2006 provides detailed information on sampling methods and techniques for different waste types while considering different circumstances. The following materials are referred to:

- mobile or viscous liquids
- sludge or paste-like substances
- powders granules and small crystals
- coarse or lumpy solids.

For most of these materials CEN/TR 15310-2:2006 refers to the following ways in which the waste may be stored or otherwise be available for sampling:

- drums, bags, kegs, blocks, cask or small or flexible walled containers
- vertical uniform or irregular, or horizontal cylindrical tanks
- moving liquids in a pipeline
- lagoons or pits
- hoppers, heaps, stockpiles and silos, falling streams and band or screw conveyors
- massive or large pieces.

Complementary, **CEN/TR 15310-3:2006** describes relevant aspects for preparation of sampling and sub-sampling in the field considering different consistencies of the waste in question.

Please note that further technical guidance on sampling methods for waste may be available on MS specific level.

D.1.4. Sampling strategies to deal with homogeneity/ heterogeneity

A basic condition for reliable results from sampling is that samples are representative for the waste composition. In the case of waste this is often complex since on the one hand pollutants may be distributed non-homogenously throughout the waste and on the other hand certain wastes additionally show a heterogeneous matrix [LAGA 2012].

Following EN 14899:2005, heterogeneity is the degree to which one constituent is non-uniformly distributed across the sample population. By contrast, homogeneity can be seen as the degree to which one constituent is uniformly distributed across the sample population.

MS specific technical guidelines may exist which provide further information on sampling strategies addressing heterogeneity of waste. [LAGA 2004] for example provides additional guidelines applied in Germany for examining the waste on its heterogeneity. In particular liquid, pumpable and dusty wastes as well as wastes where homogeneity can be assured via a visual inspection are considered to be homogeneous. Whereas all other wastes are considered to be heterogeneous [LAGA 2004].

If the heterogeneity of the waste is minimized as far as feasible, CEN/TR 15310-1:2006 and partly also CEN/TR 15310-2:2006 provide a holistic overview on sampling strategies to deal with heterogeneous and homogeneous waste types. It is important to already adapt the sampling plan to the heterogeneity of the waste to be sampled.

D.1.5. Statistical approach of sampling

The overall statistical approach of sampling including statistical basics applied to the special case of waste sampling is provided by CEN/TR 15310-1:2006**.** An excerpt of presented information within the technical report can be found below:

- Definition of population to be sampled
    - Overall population
    - Sub-population
- Variability
    - Spatial variability
    - Temporal variability
    - Random variability
- Different sampling approaches
    - Probabilistic sampling
    - Judgemental sampling
- Sampling patterns
    - Simple random sampling
    - Stratified random sampling
    - Systematic sampling
    - Judgemental sampling
- Sample size
- Frequency of sampling
- Reliability of sampling results
    - Confidence limits

D.2. Chemical analysis of waste

As already indicated in chapter 3.2.1 ('Step 3'), in certain cases the information derived from e.g. a SDS of a product becoming waste, GHS labels, knowledge of the 'waste-generating' process and other databases are not sufficient to allow an assessment of the hazardous properties of the waste in question. As sufficient knowledge on the waste's composition albeit is required to be able to make use of the calculation approach described in chapter 3.2.2 ('Step 4'), a chemical analysis of the waste in question may be necessary.

As a general information basis, Table 25 contains a non-exhaustive list of CEN methods and standards for the characterisation of waste. Apart from CEN methods and standards, [US EPA 2014] provides information on sampling and analysis of solid waste as applied in the US.

Table 25: Non-exhaustive list on CEN methods and standards for the characterisation of waste

Reference	Title
Leaching Tests	
CEN/TS 16660:2015	Characterization of waste. Leaching behaviour test. Determination of the reducing character and the reducing capacity
EN 15863:2015	Characterization of waste. Leaching behaviour test for basic characterization. Dynamic monolithic leaching test with periodic leachant renewal, under fixed conditions
EN 14997:2015	Characterization of waste. Leaching behaviour test. Influence of pH on leaching with continuous pH control
EN 14429:2015	Characterization of waste. Leaching behaviour test. Influence of pH on leaching with initial acid/base addition
EN 14429:2015	Characterization of waste. Leaching behaviour test. Influence of pH on leaching with initial acid/base addition
EN 14997:2015	Characterization of waste. Leaching behaviour test. Influence of pH on leaching with continuous pH control
CEN/TS 15364:2006	Characterization of waste. Leaching behaviour tests. Acid and base neutralization capacity test
CEN/TS 14405:2004	Characterization of waste. Leaching behaviour tests. Up-flow percolation test (under specified conditions)
EN 12457-1:2002	Characterisation of waste. Leaching. Compliance test for leaching of granular waste materials and sludges. One stage batch test at a liquid to solid ratio of 2 l/kg for materials with high solid content and with particle size below 4 mm (without or with size reduction)
EN 12457-2:2002	Characterisation of waste. Leaching. Compliance test for

	leaching of granular waste materials and sludges. One stage batch test at a liquid to solid ratio of 10 l/kg for materials with particle size below 4 mm (without or with size reduction)
EN 12457-3:2002	Characterisation of waste. Leaching. Compliance test for leaching of granular waste materials and sludges. Two stage batch test at a liquid to solid ratio of 2 l/kg and 8 l/kg for materials with a high solid content and with a particle size below 4 mm (without or with size reduction)
EN 12457-4:2002	Characterisation of waste. Leaching. Compliance test for leaching of granular waste materials and sludges. One stage batch test at a liquid to solid ratio of 10 l/kg for materials with particle size below 10 mm (without or with size reduction)
Analyses of Compounds	
EN 16377:2013	Characterization of waste. Determination of brominated flame retardants (BFR) in solid waste
EN 16192:2011	Characterization of waste. Analysis of eluates
EN 15216:2007	Characterization of waste. Determination of total dissolved solids (TDS) in water and eluates
Total Organic Carbon (TOC)	
EN 13137:2001	Characterisation of waste. Determination of total organic carbon (TOC) in waste, sludges and sediments
Digestion	
EN 13656:2002	Characterization of waste. Microwave assisted digestion with hydrofluoric (HF), nitric (HNO3), and hydrochloric (HCl) acid mixture for subsequent determination of elements
EN 13657:2002	Characterization of waste. Digestion for subsequent determination of aqua regia soluble portion of elements
Hydrocarbons C10 to C40	
EN 14039:2004	Characterization of waste. Determination of hydrocarbon content in the range of C10 to C40 by gas chromatography
Dry Matter	
EN 14346:2006	Characterization of waste. Calculation of dry matter by determination of dry residue or water content
Inorganic Compounds	
EN 14582:2007	Characterization of waste. Halogen and sulfur content. Oxygen combustion in closed systems and determination

	methods
EN 15192:2006	Characterisation of waste and soil. Determination of chromium (VI) in solid material by alkaline digestion and ion chromatography with spectrophotometric detection
Organic Compounds	
EN 15308:2008	Characterization of waste. Determination of selected polychlorinated biphenyls (PCB) in solid waste by using capillary gas chromatography with electron capture or mass spectrometric detection
EN 15527:2008	Characterization of waste. Determination of polycyclic aromatic hydrocarbons (PAH) in waste using gas chromatography mass spectrometry (GC/MS)
Elemental composition	
EN 16424:2014	Characterization of waste. Screening methods for the element composition by portable X-ray fluorescence instruments
EN 15309:2007	Characterization of waste and soil. Determination of elemental composition by X-ray fluorescence

There are recommendations and examples available on MS level which may give further guidance on the determination of constituents in liquid and solid waste. A method for the exhaustive determination of elements and substances in liquid and solid waste is proposed in "Characterization of waste - Determination of elements and substances in waste" described in the experimental standard AFNOR XP X30-489. It is a Work Item submitted to vote at European level *CEN/TC 292/WG 5 N 735 Determination of content of elements and substances in waste - experimental AFNOR Standard XP X30-489 (CEN/TC 292 N 1430)* for standardisation. More information on this document can be found at [HENNEBERT ET AL. 2013].

Information derived from chemical analyses of waste that can be used for the classification of waste shall be compositional data. As Box 17 underlines, results from leaching tests – as often obtained from laboratory results in the frame of testing the fulfillment of WAC criteria from the Landfill Directive – cannot be used exclusively for the hazard classification of waste. The only exemption from this principle may be the case of assessing HP 15. In particular, this means that, e.g. if a waste has failed the Inert WAC criteria from the Landfill Directive, it will not be hazardous or respectively non-hazardous automatically. WAC results should not be used exclusively for hazardous waste classification. A WAC analysis is only actually required if 1) the chosen treatment is disposal in landfills and 2) the class of landfill previously defined by a hazardous or non-hazardous classification requires a numerical WAC test. However, the substances present in the leachate may offer some clues regarding the constituents of the source waste.

Use of WAC laboratory results for waste classification

Input data for waste classification must be compositional data on the waste itself (in the form produced / managed). Results from leaching tests cannot be used directly, except where relevant for assessing HP 15 and potentially, depending on the outcome of on-going debate on the assessment of the ecotoxicity of waste, also for H14. As a consequence, analytical results obtained in the frame of fulfilling Waste Acceptance Criteria (WAC) cannot be used for the classification of the waste as hazardous or non-hazardous, although substances present in the leachate can offer some clues regarding the constituents of the source waste. In particular this means that, e.g. if a waste has failed the Inert WAC criteria from the Landfill Directive, it will not be hazardous automatically. WAC results should not be used for hazardous waste classification. A WAC analysis is only actually required if 1) the chosen treatment is disposal in landfills and 2) the class of landfill previously defined by a hazardous or non-hazardous classification requires a numerical WAC test.

Box 17: Use of WAC laboratory results for waste classification

Please note that in particular regarding inorganic substances, chemical analyses usually do not provide information about the specific chemical compounds within a waste but only allow the identification of cations and anions. Neither the molecular composition nor other consideration, such as the identification of mineralogical forms is usually possible using conventional analytical techniques. In the following, some possible methods to overcome this obstacle are presented. More approaches and conventions on MS level may be available which should be checked additionally.

D.2.1. Worst case substances

In the likely case that the waste holder has some knowledge on the elements but not on the substances present in the waste, it is suggested to use the concept of determining 'reasonable worst case' substances for each identified element. These worst case substances should be determined for each hazardous property and in the following should be used for the assessment of hazardous properties (see chapter 3.2.2).

Worst case substances should be determined taking into consideration which substances reasonably could exist in the waste. The term reasonable is explained by [UK EA 2015] that *"reasonable indicates that substances cannot exist within the waste because, for example, of their physical and chemical properties can be excluded"*. A similar explanation is used by [BMU 2005].

[INERIS 2015] contains a collection of 'realistic worst case' substances by elements for each hazardous properties, which can serve as general information basis.

D.2.2. Generic entries

No further speciation on identified elements is needed for elements having a 'generic entry' in the list of harmonised classifications in Table 3.1 of Part 3 of Annex VI to the CLP Regulation. However, the notes relating to the classification and labelling of mixtures presented in chapter 1.1.3.2 of Annex VI to the CLP Regulation may be taken into account when establishing the hazardous properties of wastes based on 'generic entries'. These entries are presented in Table 26.

Table 26: Generic entries of elements (11) in the CLP Regulation [INERIS 2015]

Ele-ment	Index No	International Chemical Identification	Hazard Class and Category Code(s)	Hazard Statement Code(s)
As	033-002-00-5	**arsenic** compounds, with	Acute Tox. 3 *	H331

Ele-ment	Index No	International Chemical Identification	Hazard Class and Category Code(s)	Hazard Statement Code(s)
		the exception of those specified elsewhere in this Annex	Acute Tox. 3 * Aquatic Acute 1 Aquatic Chronic 1	H301 H400 H410
Ba	056-002-00-7	**barium** salts, with the exception of barium sulphate, salts of 1-azo-2-hydroxynaphthalenyl aryl sulphonic acid, and of salts specified elsewhere in this Annex	Acute Tox. 4 * Acute Tox. 4 *	H332 H302
Be	004-002-00-2	**beryllium** compounds with the exception of aluminium beryllium silicates, and with those specified elsewhere in this Annex	Carc. 1B Acute Tox. 2 * Acute Tox. 3 * STOT RE 1 Eye Irrit. 2 STOT SE 3 Skin Irrit. 2 Skin Sens. 1 Aquatic Chronic 2	H350i H330 H301 H372 ** H319 H335 H315 H317 H411
Cd	048-001-00-5	**cadmium** compounds, with the exception of cadmium sulphoselenide (xCdS.yCdSe), reaction mass of cadmium sulphide with zinc sulphide (xCdS.yZnS), reaction mass of cadmium sulphide with mercury sulphide (xCdS.yHgS), and those specified elsewhere in this Annex	Acute Tox. 4 * Acute Tox. 4 * Acute Tox. 4 * Aquatic Acute 1 Aquatic Chronic 1	H332 H312 H302 H400 H410
Cr(VI)	024-017-00-8	**chromium (VI)** compounds, with the exception of barium chromate and of compounds specified elsewhere in this Annex	Carc. 1B Skin Sens. 1 Aquatic Acute 1 Aquatic Chronic 1	H350i H317 H400 H410
Hg	080-002-00-6	inorganic compounds of **mercury** with the exception of mercuric sulphide and those specified elsewhere in this Annex	Acute Tox. 2 * Acute Tox. 1 Acute Tox. 2 * STOT RE 2 * Aquatic Acute 1 Aquatic Chronic 1	H330 H310 H300 H373 ** H400 H410
Pb	082-001-00-6	**lead** compounds with the exception of those specified elsewhere in this Annex	Repr. 1A Acute Tox. 4 * Acute Tox. 4 * STOT RE 2 * Aquatic Acute 1 Aquatic Chronic 1	H360Df H332 H302 H373 ** H400 H410

Ele-ment	Index No	International Chemical Identification	Hazard Class and Category Code(s)	Hazard Statement Code(s)
Sb	051-003-00-9	**antimony** compounds, with the exception of the tetroxide (Sb_2O_4), pentoxide (Sb_2O_5), trisulphide (Sb_2S_3), pentasulphide (Sb_2S_5) and those specified elsewhere in this Annex	Acute Tox. 4 * Acute Tox. 4 * Aquatic Chronic 2	H332 H302 H411
Se	034-002-00-8	**selenium** compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex	Acute Tox. 3 * Acute Tox. 3 * STOT RE 2 Aquatic Acute 1 Aquatic Chronic 1	H331 H301 H373** H400 H410
Tl	081-002-00-9	**thallium** compounds, with the exception of those specified elsewhere in this Annex	Acute Tox. 2 * Acute Tox. 2 * STOT RE 2 * Aquatic Chronic 2	H330 H300 H373 ** H411
U	092-002-00-3	**uranium** compounds with the exception of those specified elsewhere in this Annex	Acute Tox. 2 * Acute Tox. 2 * STOT RE 2 Aquatic Chronic 2	H330 H300 H373** H411

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Annex E: References

E.1 General references

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E.2 Legal acts cited in the document

Citation	Full reference	Link
WFD	Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives (OJ L 312, 22.11.2008, p. 3).	http://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1428929775225&uri=CELEX:32008L0098
LoW	Decision 2000/532/EC on the list of waste pursuant to Directive 2008/98/C of the European Parliament and of the Council	http://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1429545485347&uri=CELEX:32000D0532
Regulation 1357/ 2014	Commission Regulation (EU) No 1357/2014 of 18 December 2014 replacing Annex III to Directive 2008/98/EC of the European Parliament and of the Council on waste and repealing certain Directives	http://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1438016393908&uri=CELEX:32014R1357
WSR	Regulation (EC) No 1013/2006 of the European Parliament and of the Council of	http://eur-lex.europa.eu/legal-

	14 June 2006 on shipments of waste (OJ L 190, 12.7.2006, p. 1).	content/EN/TXT/?qid=1428929927187&uri=CELEX:32006R1013
Landfill Directive	Council Directive 1999/31/EC of 26 April 1999 on the landfill of waste	http://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1438016469243&uri=CELEX:31999L0031
WAC	Council Decision of 19 December 2002 establishing criteria and procedures for the acceptance of waste at landfills pursuant to Article 16 of and Annex II to Directive 1999/31/EC	http://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1438016527737&uri=CELEX:32003D0033
Mining Waste Directive	Directive 2006/21/EC of the European Parliament and of the Council of 15 March 2006 on the management of waste from extractive industries and amending Directive 2004/35/EC — Statement by the European Parliament, the Council and the Commission (OJ L 102, 11.4.2006, p. 15).	http://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1428929962432&uri=CELEX:32006L0021
REACH Regulation	Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC (OJ L 396, 30.12.2006, p. 1).	http://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1428930012264&uri=CELEX:32006R1907R(03)
Test Methods Regulation	Council Regulation (EC) No 440/2008 of 30 May 2008 laying down test methods pursuant to Regulation (EC) No 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH)	http://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1438016591797&uri=CELEX:32008R0440
CLP Regulation	Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006 (OJ L 353, 31.12.2008, p. 1).	http://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1428930051039&uri=CELEX:32008R1272R(02)

POP Regulation	Regulation (EC) No 850/2004 of the European Parliament and of the Council of 29 April 2004 on persistent organic pollutants and amending Directive 79/117/EEC (OJ L 158, 30.4.2004, p. 7).	http://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1429545513272&uri=CELEX:32004R0850
Seveso III Directive	Directive 2012/18/EU of the European Parliament and of the Council of 4 July 2012 on the control of major-accident hazards involving dangerous substances, amending and subsequently repealing Council Directive 96/82/EC	http://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1429545561491&uri=CELEX:32012L0018
ODS Regulation	Regulation (EC) No 1005/2009 of the European Parliament and of the Council of 16 September 2009 on substances that deplete the ozone layer (OJ L 286, 31.10.2009, p. 1-30)	http://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1428930262325&uri=CELEX:32009R1005
Scrap Metal Regulation	Council Regulation (EU) No 333/2011 of 31 March 2011 establishing criteria determining when certain types of scrap metal cease to be waste under Directive 2008/98/EC of the European Parliament and of the Council	http://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1429545659392&uri=CELEX:32011R0333
Copper Scrap Regulation	Commission Regulation (EU) No 715/2013 of 25 July 2013 establishing criteria determining when copper scrap ceases to be waste under Directive 2008/98/EC of the European Parliament and of the Council	http://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1429545719391&uri=CELEX:32013R0715
DPD	Directive 1999/45/EC of the European Parliament and of the Council of 31 May 1999 concerning the approximation of the laws, regulations and administrative provisions of the Member States relating to the classification, packaging and labelling of dangerous preparations	
DSD	Directive 67/548/EEC of 27 June 1967 on the approximation of laws, regulations and administrative provisions relating to the classification, packaging and labelling of dangerous substances.	
Test Methods Regulation	Council Regulation (EC) No 440/2008 of 30 May 2008 laying down test methods pursuant to Regulation (EC) No 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH)	http://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1432296681885&uri=CELEX:32008R0440

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