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EUROPEAN COMMITTEE FOR ELECTROTECHNICAL STANDARDISATION

TECHNICAL COMMITTEE 111X – Environment

Treatment of Waste Electrical and Electronic Equipment (WEEE) - General

Document for comments about a draft developed by CLC/TC 111X-WG06

(IMPORTANT: this Secretary Enquiry substitutes the formal NC Enquiry for the reasons below)

Background

CLC/TC111X WG06 had a meeting on 19th & 20th February 2013 and agreed the draft document **"Treatment of Waste Electrical and Electronic Equipment (WEEE) –General"** attached.

At the meeting Mr. Matthew Tomlin (CCMC Unit Manager – Standards Publications) had a very informative presentation which shows that if TC 111X follows the enquiry + vote procedure the process could be expected to take between 14 to 20 months. This is due in part because the enquiry + vote procedures foresees the need to have three sets of translation (before the enquiry, before the vote, and a check after the vote) and also because it is not possible to reduce the enquiry stage below 5 months. Other periods include internal CCMC processes and the time necessary for the WG to consider and respond to comments. {Note that the procedures do allow for CCMC to request that DKE & UTE forego their translation periods, this itself takes time and the request may be refused}. By comparison, this standard is intended to support the recast WEEE Directive which must be transposed into national law by no later than mid-February 2014. Hence, if we follow the enquiry + vote process we would not have the standard even approved (let alone available for purchase) before the Directive is adopted as national law.

For the above reason WG6 and TC 111X Officers agree to send the treatment standard out as a Secretary Enquiry for 6 weeks comment and then use the UAP procedure for the final vote.
Depending on the comments received we may decide to have a second round of comments as a Secretary Enquiry so as to minimise the chance of a negative vote at the UAP stage.

Next steps will be also discussed at the next CLC TC 111X plenary meeting (11 April 2013).

Requested action

TC 111X members are asked to comment on the enclosed document,

Replies are to be uploaded ONLY in CLC TC 111X Collaboration Tool area

by 2013-04-05

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Foreword

Introduction

This European standard aims to assist organisations in:

- achieving effective and efficient treatment and disposal of Waste Electrical and Electronic Equipment (WEEE) in order to prevent pollution and minimise emissions;
- promoting increased quantity and high quality recovery of secondary products;
- preventing inappropriate disposal of WEEE and fractions thereof;
- assuring protection of human health and safety, and the environment;
- preventing shipments of WEEE to operators whose operations fail to comply with this normative document or a comparable set of requirements.

This European Standard supports the objectives of the Community's environment policy. These aim to preserve, protect and improve the quality of the environment, protect human health and utilise natural resources prudently and rationally. That policy is based on the precautionary principle and the maxims that preventive action to minimise environmental damage should, where possible, be rectified at source and the polluter should pay.

This standard contains requirements applicable to the treatment of all types WEEE. In the future it will be supported by other standards covering particular treatment requirements for equipment containing volatile fluorocarbons or volatile hydrocarbons, lamps, flat panel displays and cathode ray tubes (CRTs).

Treatment of Waste Electrical and Electronic Equipment (WEEE) - General

1 Scope

This European standard is applicable to the treatment of all types of waste electrical and electronic equipment (WEEE). This standard will be supplemented, for example by standards covering specific equipment.

This standard applies to the treatment of WEEE until end-of-waste status is fulfilled, or until the WEEE is prepared for re-use, recycled, recovered, or disposed of.

This standard addresses all operators involved in the treatment and associated handling, sorting, and storage of WEEE.

2 Normative references

EN 50574:2012 Collection, logistics & treatment requirements for end-of-life household appliances containing volatile fluorocarbons or volatile hydrocarbons.

EN 14899:2005 Characterization of waste. Sampling of waste materials. Framework for the preparation and application of a sampling plan.

3 Terms & definitions

For the purposes of this document, the following terms and definitions apply:

3.1
backlight
part of the flat panel display, used with certain flat panel display technologies, that illuminates the flat panel to make the image visible

3.2
batch
definite and well-defined amount of WEEE or fractions thereof

3.3
batch process
procedure where a batch is processed to determine the composition of the resulting output fractions and de-pollution performance

3.4 component
constituent part of a device which cannot be physically divided into smaller parts without losing its particular function

3.5
CRT (Cathode Ray Tube)
component used to display images comprising a vacuum tube and integral fluorescent screen

Note to entry A CRT consists of a screen, cone, frit glass, shadow mask (only for colour CRTs), anti-implosion metal frame, and an electron gun.

3.6
CRT equipment
television set or computer monitor containing a Cathode Ray Tube

3.7
collection
gathering of WEEE, including the preliminary sorting and preliminary storage of WEEE for the purposes of transport to a WEEE treatment facility

Note to entry: The term “collection” is defined in Directive 2008/98/EC.

3.8
collection facility
location designated for the gathering of WEEE to facilitate separate collection

Note to entry Collection facilities are typically registered, listed, or otherwise approved or designated in accordance with the national legislation implementing Directive 2012/19/EU.

3.9
de-pollution
selective treatment during which certain substances, mixtures and components are removed from the WEEE stream

Note to entry Annex F identifies the substances mixtures and components that must be removed and treated from separately collected WEEE, the process being de-pollution.

3.10
disposal
void

Note to entry Directive 2008/98/EC defines disposal: "'disposal' means any operation which is not recovery even where the operation has as a secondary consequence the reclamation of substances or energy. Annex I sets out a non-exhaustive list of disposal operations"

3.11
end-of-waste
result of treatment whereby the resulting fractions are no longer classified as waste

Note to entry: Fractions that cease to become waste, following a recovery or recycling operation in compliance with specific criteria according to Article 6 of Directive 2008/98/EC, are regarded as secondary materials and so have achieved end-of-waste status.

3.12
energy recovery
production of useful energy through direct and controlled combustion or other processing of waste

Note to entry Energy recovery is a recovery operation where the material is used principally as a fuel or other means to generate energy, see R1 of Annex II of Directive 2008/98/EC.

3.13
electronic assembly
A set of components, at least one of which is an electronic or electrical component, assembled into a single unit
Note to entry: Example a group of components mounted on a printed wiring board (printed circuit board).

3.14
flat panel
that part of the flat panel display where the image is produced

3.15
flat panel display
assembly of components that use technologies that produce and display an image without the use of cathode ray tubes

Note to entry The term “flat panel module” is also used as an alternative to the term flat panel display.

3.16
flat panel display equipment
equipment using a flat panel display having a display screen larger than 100 cm^2

Note to entry: Examples of flat panel display equipment include LCD TV, Plasma TV, LCD screens and monitors, and notebooks.

3.17
fraction
separate material stream generated by the treatment of WEEE

3.18
hazardous waste
waste which exhibits one or more hazardous properties

Note to entry: The term “hazardous waste” is defined in Directive 2008/98/EC; the properties of hazardous waste are described in Annex III of Directive 2008/98/EC.

3.19
lamp
component of lighting equipment for general lighting purposes, but excluding filament bulbs

Note to entry This definition includes fluorescent lamps, high and low pressure discharge lamps, and LEDs included under Category 5 of Annex II of Directive 2012/19/EU.

3.20
logistics facility
location for receiving sorting, storing, and preparing for transport of WEEE, with the intention to deliver to treatment facilities

3.21
material recovery
void

Note to entry Decision 2011/753/EU contains the following: “‘material recovery’ means any recovery operation, excluding energy recovery and the reprocessing into materials which are to be used as fuel”

3.22
operator
entity that performs one or more processes on WEEE

Note to entry: Processes on WEEE could include collection, handling, shipping, sorting, storage, transport, trading, treatment, or preparing for re-use.

3.23
preparing for re-use
void

Note to entry Directive 2008/98/EC contains the following: "‘preparing for re-use’ means checking, cleaning or repairing recovery operations, by which products or components of products that have become waste are prepared so that they can be re-used without any other pre-processing".

3.24
recovery
void

Note to entry Directive 2008/98/EC contains the following: “‘recovery’ means any operation the principal result of which is waste serving a useful purpose by replacing other materials which would otherwise have been used to fulfil a particular function, or waste being prepared to fulfil that function, in the plant or in the wider economy. Annex II sets out a non-exhaustive list of recovery operations”.

3.25
recycling
void

Note to entry: Directive 2008/98/EC contains the following: “‘recycling’ means any recovery operation by which waste materials are reprocessed into products, materials or substances whether for the original or other purposes. It includes the reprocessing of organic material but does not include energy recovery and the reprocessing into materials that are to be used as fuels or for backfilling operations”.

3.26
removal
void Note 1 to entry Directive 2012/19/EU contains the following: “‘removal’ means manual, mechanical, chemical or metallurgic handling with the result that hazardous substances, mixtures and components are contained in an identifiable stream or are an identifiable part of a stream within the treatment process. A substance, mixture or component is identifiable if it can be monitored to verify environmentally safe treatment”.

Note 2 to entry Where used in this standard, the word “remove” shall be construed as having a meaning that corresponds to the defined word “removal”.

3.27
re-use
void

Note to entry Directive 2008/98/EC contains the following: "'re-use' means any operation by which products or components that are not waste are used again for the same purpose for which they were conceived".

3.28
storage
process whereby WEEE is selected and deposited in a particular location awaiting treatment or preparing for re-use

3.29
treatment facility
location where WEEE undergoes treatment

3.30
treatment operator
operator responsible for the treatment of WEEE

3.31
treatment
void

Note to entry Directive 2008/98/EC contains the following: "'treatment' means recovery or disposal operations, including preparation prior to recovery or disposal".

3.32
volatile fluorocarbon (VFC)
organic chemical compound consisting of carbon and fluorine atoms (in some cases also with chlorine and/or hydrogen), which is able to change phase when used as a refrigerant or produce cells in plastic structure of an insulating foam when used as a blowing agent

Note 1 to entry Common commercial designations for these materials are R12, R11 for CFCs, R22, R141b for HCFCs and R134a for HFCs.

Note 2 to entry Chemically, volatile fluorocarbons could be either alkyl halides or alkene halides.

Note 3 to entry CFC, HCFC, HFC and HC are all VOCs – Volatile Organic Compounds.

3.33
volatile hydrocarbon (VHC)
organic chemical compound consisting entirely of hydrogen and carbon which is able to change phase when used as a refrigerant or produce cells in plastic structure of an insulating foam when used as a blowing agent

Note to entry Common designations for volatile hydrocarbons are R290 for propane, R600a for isobutane, R1270 for propene and RC601 for cyclopentane. Mixtures of VHC are also possible.

3.34
waste
void

Note to entry Directive 2008/98/EC contains the following: "'waste' means any substance or object which the holder discards or intends or is required to discard".

3.35
WEEE (Waste Electrical and Electronic Equipment)
void

Note 1 to entry: Directive 2012/19/EU contains the following: "'waste electrical and electronic equipment' or 'WEEE' means electrical or electronic equipment which is waste within the meaning of Article 3(1) of Directive 2008/98/EC,, including all components, subassemblies and consumables which are part of the product at the time of discarding".

Note 2 to entry Considering note 1 to entry, this standard covers whole equipment discarded as WEEE and fractions thereof.

4 Administrative and organisational requirements

4.1 Compliance

The treatment operator shall maintain a record documenting compliance with the requirements of this standard.

NOTE It is recommended that the treatment operator establish and maintain a procedure in order to identify legal requirements that are applicable to the environmental, health and safety aspects of all activities, services and processes undertaken at the facility. A register of the treatment operator's activities and related legal provisions should be maintained together with valid permits required by all relevant authorities.

4.2 Management principles

The treatment operator shall ensure that a management system is in place for all activities in the fields of health, safety, environment and quality.

The treatment operator shall demonstrate continuous improvement of their activities by a review and management process. This management process shall be updated or revised as changes occur to the activities of the treatment operator and evaluated in order to monitor its effectiveness.

4.3 Technical and infrastructural preconditions

The treatment operator shall possess infrastructure, in terms of size, technologies installed, and characteristics of the operations, that is suitable for the activities performed on site. Suitability of the site shall be assessed by a risk management process for all tasks performed on site and include the identification of hazards, the assessment of risk and, where appropriate, the elimination or reduction of the risk, and documentation of the process.

This risk assessment shall include the identification of those locations and activities that require the use of personal protective equipment.

NOTE Directive 89/391/EEC provides requirements for the safety and health for the protection of workers at work.

Treatment facilities including storage areas shall be designed, organised, and maintained to provide safe access to, and egress from, the site. They shall also prevent, as far as reasonable practical, access by unauthorised persons.

Weatherproof covering shall be required for the areas where:

- WEEE that can cause emissions that are hazardous to the environment is stored and/or treated, or;
- whole equipment and/or components, intended for preparation for re-use are stored and/or prepared for re-use.

NOTE 3 Weatherproof covering can, for example, be provided by a lid or cover over a container, or a roofed building. The type of weatherproof covering required will depend of the types and quantities of waste and the storage and treatment activities undertaken.

NOTE 4 Provision of weatherproof covering may be required for a number of reasons:

- to minimise the contamination of water, air, and land;
- to assist in the containment of hazardous materials and fluids; and
- to facilitate proper treatment of WEEE.

Treatment facilities shall be secured to prevent damage to, and theft of, WEEE and components thereof.

4.4 Training

All persons at the treatment facility shall be made familiar with the environmental, health and safety policy of the facility. Employees and contractors involved in operations shall be instructed and trained to perform the tasks assigned to them.

Training shall include emergency response planning, occupational health and safety measures, and training for the relevant operations performed on site. The effectiveness and suitability of training shall be checked regularly. Training programmes shall be delivered at a level suitable to the trainee in form, manner and language.

Employee training materials and information including technical guidance documents, risk assessments, safety statements, information charts, information tables, photos or examples of components of WEEE, and safety data sheets for hazardous chemical components shall be available at the work place and be easily accessible at all times.

Where the risk assessment has identified the need for personal protective equipment (PPE) training in the proper use of that PPE shall be provided.

4.5 Monitoring

The treatment operator shall record the origin of each consignment of WEEE accepted at the treatment facility.

NOTE 1 The origin of each consignment is typically location and reference details of the collection facility or logistics facility.

The treatment operator shall record the downstream treatment of WEEE and fractions until end-of-waste status is reached or until the WEEE is prepared for re-use, recycled, recovered, or disposed of. Documentation shall record treatment in accordance with Clause 5.

NOTE 2 Downstream monitoring requirements also apply where the downstream operator is a dealer or broker, and when shipped across borders.

The treatment operator shall maintain the following records from the output fractions resulting from the treatment process:

- for fractions that have reached end-of-waste status, only data on the composition of the fractions;
- for metal fractions which contain less than 2 % of non-metal fractions, data on the mass of the output fraction, and the type of treatment technology;
- for non-metal fractions containing less than 2 % of other materials data on the mass of the output fraction, information on the first acceptor and the final treatment technology;
- for fractions which are classified as hazardous according to the European list of wastes, and/or fractions containing materials and components covered by Annex F, data on the mass of the output fraction, information on the first acceptor and the downstream acceptor(s) of the fractions, and the final treatment technology;
- for all other fractions, the mass of the output fraction and information on the first acceptor;
- for final fractions being forwarded for disposal, the final treatment technology, and information on the downstream acceptor(s) shall be recorded.

An overview of documentation required for downstream monitoring and the determination of recycling and recovery rates is given in Annex G.

The information provided on acceptors shall include the following details: name, address of treatment facility, treatment technology and permit issued by the appropriate governmental organisation.

NOTE 3 The documentation of downstream monitoring for the output fractions means the provision of information regarding each acceptor and not to each shipment.

NOTE 4 Regulation 333/2011 establishes the criteria for determining when certain types of scrap metal cease to be waste under Directive 2008/98/EC.

NOTE 5 The European List of Waste (Commission Decision 2000/532/EC) provides a harmonised list of waste, including hazardous substances.

NOTE 6 Final treatment technology means the process used for final treatment of materials, e.g. smelting, incineration with or without energy recovery, plastic recycling.

NOTE 7 Fractions which are classified as hazardous according to either the European list of wastes or fractions containing materials and components covered by Annex F: e.g. a washing machine with only the motor

removed, mix of batteries, non-ferrous stream containing electrolyte capacitors, plastic mixture with prohibited flame retardants.

4.6 Shipments

No treatment operator shall initiate, contribute to shipments of WEEE, or fractions thereof, which would result in treatment that is not in compliance with this standard.

NOTE 1 Regulatory requirements for cross border shipments, including monitoring, are covered in Regulation 1013/2006/EC.

NOTE 2 Council Directive 2006/117/EURATOM defines requirements for the supervision and control of shipments of radioactive waste between Member States and into and out of the Community.

5 Technical requirements

5.1 General

WEEE shall be handled and stored with due care in order to avoid release of hazardous substances into air, water, or soil, as a result of damage and/or leakage.

NOTE 1 Handling includes loading and unloading.

During handling and storage due attention shall be given to:

- temperature exchange equipment (to avoid damage to the temperature exchange system);
- CRT equipment (to avoid implosion and/or emissions of fluorescent coatings);
- lamps and appliances containing lamps (to avoid breakage resulting in the release of mercury);
- smoke detectors (as they may contain radioactive components);
- appliances containing oil and other fluids within an internal circuit, or capacitors containing mineral or synthetic oil (to avoid spillages and other emissions); and
- appliances containing asbestos or ceramic fibres (to avoid release of asbestos or ceramic fibres).

NOTE 2 Temperature exchange equipment includes refrigerators, freezers, equipment which automatically delivers cold products, dehumidifying equipment, air-conditioning equipment and heat pumps.

NOTE 3 Appliances that contain lamps include sun beds and flat panel display equipment.

NOTE 4 Appliances that may contain asbestos include heaters and stoves.

During treatment of WEEE, confidential and personal data stored in the permanent memory shall be destroyed or permanently deleted.

NOTE 5 Personal data is defined in Directive 95/46/EC and can be found, for example, on hard disks found in computers, (telephone) memory cards and memory chips (e.g. within debit/credit cards).

5.2 Receiving of WEEE at treatment facility

The treatment operator shall:

- weigh and record each delivery that is received at the facility, and
- separate the WEEE from the non-WEEE and weigh and record the proportion of each.

NOTE Non-WEEE shall be treated in accordance with the requirements of Directive 2008/98/EC.

The treatment operator shall, at all times, provide weatherproof covering for the following types of WEEE; lamps and equipment containing lamps, CRT equipment, flat panel displays and flat panel display equipment.

5.3 Handling of WEEE

All handling of WEEE, including the loading, unloading and transport, shall be carried out using appropriate tools, containers and fixings to avoid damage.

Uncontrolled tipping of containers with CRT equipment, flat panel display equipment, temperature exchange equipment, and lamps and equipment containing lamps shall not be permitted.

WEEE shall not be handled in a way that subsequent preparation for re-use, de-pollution or recovery is adversely affected.

CRT equipment, flat panel display equipment, temperature exchange equipment, and lamps shall be placed in containers or stacked in a stable manner to prevent damage or breakage.

5.4 Storage of WEEE prior to treatment

The maximum amount of WEEE stored by the treatment operator shall not exceed the amount of WEEE that can be treated at their treatment facility within six months.

Locations that store WEEE prior to treatment shall have:

- impermeable surfaces to prevent ground water and soil contamination;
- the provision of spillage collection facilities relevant to the type of WEEE stored;
- where appropriate, decanters and cleanser-degreasers, and
- weatherproof covering for appropriate areas (see 4.3), so that under normal atmospheric conditions there are no emissions which give rise to an adverse environmental impact.

NOTE 1 Technical requirements of storage of WEEE are described in Annex VIII of Directive 2012/19/EC

Where containers are used for storage of equipment and fractions, and these have led to pollutant dispersion, the affected containers shall be cleaned and decontaminated prior to their re-use, recycling or disposal.

NOTE 2 Examples of instances where it is appropriate to clean and decontaminate containers include those where the following have occurred: leakage of oil and powdered fluorescent coating materials and contamination from broken glass from devices, or fractions thereof, that contained mercury (e.g. lamps or CRTs).

5.5 De-pollution

The treatment operator shall have procedures to identify WEEE which are known to contain substances, mixtures and/or components listed in Annex F.

NOTE 1 Knowledge regarding which types of WEEE contain substances, mixtures and/or components listed in Annex F can be obtained from previous experience or via information obtained from producers.

The treatment processes identified in the above procedures shall result in the removal of substances, mixtures and components, as listed in Annex F, from WEEE in accordance with Annex A.

NOTE 2 General de-pollution guidelines are described in Annexes A, B and E. Future standards and technical specifications will provide specific de-pollution requirements for particular types of WEEE.

Depollution shall not damage or destroy components in a way that hazardous substances are released to the environment or distributed to fractions, unless subsequent treatment to remove or render harmless the hazardous substances is carried out. Where release to the environment is possible the fraction containing the hazardous substances shall be sealed prior to treatment. The subsequent treatment mentioned above may be performed at the treatment operator's location or another location. Where the subsequent treatment is not performed at the treatment operator's location, the WEEE thus transferred shall be accompanied by information on depollution already undertaken.

Fractions containing hazardous substances, hazardous mixtures, or hazardous components shall not be diluted or mixed with other fractions or materials for the purpose of reducing their concentration.

The treatment process to separate material streams shall be documented. Removed substances, mixtures and components (and fractions containing those substances, mixtures and components) shall be kept separate and shall be clearly identifiable labelled.

NOTE 3 Substances, mixtures and components, to be removed are listed in Annex F.

If it is uncertain whether WEEE contains substances, mixtures or components as listed in Annex F, it shall be treated as though it does contain those substances mixtures or components.

NOTE 4 Examples of where WEEE could need to be treated as if it contains substances, mixtures or components as listed in Annex F include:

- capacitors that could contain polychlorinated biphenyls (PCB),
- plastics parts that could contain brominated flame retardants or
- products covered by more specific treatment standards, such as temperature exchange equipment, flat panel display equipment, CRT equipment and lamps.

5.6 De-pollution monitoring

Monitoring of de-pollution performance is an important criterion to facilitate continuous improvement of the treatment process.

Treatment operators shall carry out monitoring of depollution performance in accordance with the appropriate method, or methods, set out in Annex B, C and the relevant specific standard, using a systematic approach which documents each step of the process.

a) comparing a measurement of the mass of de-polluted fractions in the outgoing stream with the corresponding target value;

b) establishment of a mass balance between incoming and outgoing streams, and;

c) analysis of representative samples from relevant fractions that result from the treatment of WEEE.

NOTE 1 Benchmarks and target values relative to method (a) can be assessed on the basis of collected data and statistical analyses. In the future target values and limits will be specified in technical specifications.

5.7 Treatment of non de-polluted WEEE and fractions

Except as specified below, WEEE and fractions containing hazardous substances, hazardous mixtures, or hazardous components shall be treated separately from other waste. It is permitted to treat WEEE and fractions containing hazardous substances, hazardous mixtures, or hazardous components with other hazardous waste if:

- the mixing operation is carried out by a treatment operator which has obtained a permit from the relevant authorities for this activity; and
- the mixing operation does not adversely affect human health, safety, or the environment as determined by review of the relevant risk assessment; and
- the mixing process does not create an additional hazardous waste stream.

If non de-polluted WEEE and fractions are treated by a downstream treatment operator, this treatment operator shall be informed in accompanying documents of the potential presence of hazardous material.

NOTE The downstream treatment operator must be informed of the need for the non-depolluted WEEE or fractions to be depolluted in compliance with the objectives of this standard regardless of the hazardous or non-hazardous nature.

5.8 Storage of fractions

All fractions containing hazardous substances shall be stored in a manner that prevents dispersal of the hazardous material to the environment.

Weatherproof covering shall be provided for storage locations for capacitors, mercury containing components, batteries, printed circuit boards, toner cartridges, asbestos and components which contain asbestos, cathode ray tubes, lamps, components containing refractory ceramic fibres and components containing radioactive substances.

Containers used for the storage of fractions containing hazardous substances shall be cleaned and decontaminated prior to their re-use, recycling or disposal.

5.9 Recycling and recovery targets

The treatment operator shall demonstrate that they reach the applicable recycling and recovery targets.

NOTE The recycling and recovery targets are described in Directive 2012/19/EC.

If WEEE categories, subject to different recycling and recovery targets are treated together the calculation of recycling and recovery targets shall be according to the method provided for in Annex C.

Determination of the recycling and recovery rates shall be carried out at least on an annual basis according to the requirements of Annex DC.

The recycling and recovery rates for a treatment category shall be determined in accordance with Annex C. Where current batch process data is available this shall be used in preference to annual data.

5.10 Recovery and disposal of fractions

The following applies to output fractions comprising mixed materials.

- Where such a fraction is less than or equal to 20 % of the mass of the original input material to the treatment process the treatment operator shall use the composition of this output fraction, as declared by the downstream treatment operator; however, where this is not available a documented simplified analyses (e.g. hand-picking analysis) for a representative composition of this fraction shall be used.
- Where such a fraction contains 2 % or more impurities by mass, and this fraction is greater than 20 % of the mass of the original input material to the treatment process, then the treatment operator shall require that a batch process be carried out by the downstream treatment operator using this material.

Fractions resulting from the WEEE treatment process can have reached end of waste status, or they can be sent for recycling, recovery, or disposal. The principals of the waste hierarchy shall be adhered to.

Within disposal options for organic carbon containing fractions (e.g. plastics, wood, cardboard), priority shall be set to avoid long-term emissions at landfill sites.

NOTE Requirements for the operation of landfill sites are given in Directive 1999/31/EEC.

Hazardous waste that is designated for disposal shall only go to a facility that is designed and designated for the acceptance and disposal of hazardous waste. Hazardous substances or preparations shall, prior to landfill disposal, either be broken down into non-hazardous substances, or be immobilized, or properly packaged such that the hazardous substances, mixtures or components cannot be released into the environment.

5.11 Documentation

The treatment operator shall maintain the following:

- records demonstrating compliance with the requirements of this standard according to 4.1;
- records demonstrating compliance with legal and regulatory obligations applying to all activities undertaken on site;
- process diagrams with information on each treatment step and the resulting fractions;
- internal administrative procedures and documentation relating to management reviews and related improvement processes according to 4.2 and in particular, results of internal controls and de-pollution monitoring (see Annex B);
- records concerning health, safety, and environmental monitoring including records of maintenance of site and servicing of machinery according to 4.3;

  NOTE Records concerning health, safety, and environmental monitoring include first aid measures, emergency plans, risk assessments documents and records describing incidents, accidents, work related illness, leakages, fires, and related damages.
- records concerning training of employees and instructions/guidance regarding treatment processes including manual dismantling according to 4.4;

- records of cleaning and decontamination of containers used for storing fractions containing mercury and lamps according to 5.4;
- results from batch processes performed according to Annex C, and;
- documents that record downstream monitoring of each fraction according to 4.5 and records describing the determination of recycling and recovery rates prepared in accordance with Annex C. An overview of the documentation required is given in Annex G.

The treatment operator shall maintain records of each mass balance conducted. Each mass balance calculation shall be supported by documentation of all material flows (summaries of incoming and outgoing deliveries and all stored quantities of EEE and WEEE fractions). An overall mass balance describing the material flow through the facility shall be prepared at least on an annual basis; information about individual mass balance calculations, if any, shall be accumulated to provide an annualised mass balance.

All documents shall be stored securely for a period of five years, unless legislation or authorities stipulate a longer period.

Annex A
(Normative)

De-pollution

A.1 Introduction

This Annex refers to clause 5.5, de-pollution, and gives additional information about substances, mixtures, and components to be removed from WEEE according to Annex F.

Substances, mixtures and components shall be removed such that they are contained as an identifiable stream or identifiable part of a stream at the end of the treatment process. A substance, mixture or component is identifiable if it can be monitored to prove environmentally safe treatment. As a consequence of this interpretation of the phrase “have to be removed” two different categories are distinguished in this Annex:

1) The following shall be removed as a distinct step during the treatment process and prior to size reduction and separation, e.g. shredding, unless the treatment technology captures the hazardous material in an identifiable stream such that it is not released to the environment:

   capacitors containing polychlorinated biphenyls (PCB), gas discharge lamps, volatile fluorocarbons, volatile hydrocarbons contained in a refrigerant system, batteries which are accessible in the equipment without using tools, toner cartridges; and components containing asbestos, mercury, refractory ceramic fibres, and radioactive substances.

2) The following shall be removed as an identifiable (part of a) stream during the treatment process:

   batteries which are not accessible in the equipment without using tools, printed circuit boards, plastics containing brominated flame retardants, cathode ray tubes, volatile fluorocarbons and volatile hydrocarbons other than those contained in a refrigerant system, liquid crystal displays, external electric cables and electrolyte capacitors (> 25 mm) containing substances of concern.

A.2 Capacitors

The following capacitors shall be removed from separately collected WEEE:

- polychlorinated biphenyls (PCB) containing capacitors;
- electrolytic capacitors containing substances of concern (height > 25 mm, diameter > 25 mm or proportionately similar volume).

If the treatment operator is not capable of separating the capacitors described above then they shall remove and treat all such capacitors as though they contained PCBs and/or are electrolytic capacitors containing substances of concern.

The effectiveness of the separation process shall be checked annually in accordance with Annex B.

NOTE: As it can be difficult to tell whether capacitors contain PCBs it suggested to screen all capacitors as below. Capacitors meeting one of the criteria below do not need to be removed as they are presumed to be free of PCBs:

- if it is evident that the capacitor was manufactured after 1986 or they come from appliances produced after 1987;
- if they are declared and/or labelled as being free of PCBs and
- If specific, independent studies and research data show that specific (types of) WEEE equipment do not contain PCB containing capacitors.

A.3 Printed circuit boards

Printed circuit boards shall be removed from separately collected WEEE.

NOTE 1 The fractions of lead, tin, antimony, chromium, beryllium oxide and cadmium on the printed circuit board, restricted brominated flame retardants in plastic parts mounted on the printed circuit board should be considered for further treatment.

NOTE 2 During mechanical processing of printed circuit boards there can be a risk of diffuse emission to the environment and contamination of workplaces with dust and heavy metals.

NOTE 3 Printed circuit boards occur in a wide range of electronic appliances and also in the electronic parts of large and small household appliances, tools, toys, sport equipment, and medical devices.

A.4 Components containing mercury

Mercury-containing WEEE and components shall be removed before any treatment process that can cause damage to the component, or shall be treated in such a way that the mercury can be monitored to prove environmentally safe treatment.

NOTE 1 Mercury tilt switches or vapour pressure switches can be found in old boilers, washing machines, chest freezers, irons, coffee machines and old telephone installations. Mercury containing relay switches were used in old high quality electronic and sophisticated monitoring equipment.

NOTE 2 Straight fluorescent lamps, compact fluorescent lamps, fluorescent lamps, high intensity discharge lamps - including pressure sodium lamps and metal halide lamps, and low pressure sodium lamps contain mercury.

A.5 Batteries and accumulators

Batteries which are accessible in the equipment without using tools shall be removed from WEEE before any treatment process that can cause damage to them. Batteries which are not accessible in the equipment without using tools shall be part of an identifiable stream in accordance with clause A.1 of this Annex.

Special precautions and safety measures shall be in place for operations involving used lithium batteries, and for fractions containing lithium batteries.

Lithium batteries shall be protected to prevent exposure to excessive heat, water, or any crushing or physical damage during handling, sorting, and storage.

A.6 Plastics containing certain types of brominated flame retardants

Plastic fractions containing certain brominated flame retardants (namely Octa-BDE, Penta-BDE and PBB) shall be removed and treated separately from other plastic fractions in the course of the recycling process. The maximum limit values for these brominated flame retardants are as follows, when determined using an accepted protocol:

- Octa-BDE, 1 000 ppm;
- Penta-BDE, 1 000 ppm;
- PBB, 50 ppm.

NOTE 1 Annex VII of Directive 2012/19/EU proscribes the removal of all plastics containing brominated flame retardants (BFR's). This does not imply that every brominated flame retardant is a hazardous substance – of the approximately 60 brominated flame retardants some 15 are restricted as regards their use in new products to be placed on the market in the EU. The distinction of the individual BFR's is currently not possible within an the operational recycling process and this is why the WEEE directive's Annex II proscribes the removal of all BFR's.

NOTE 2 Regulation (EC) 1907/2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) sets limit values for certain chemicals; these limits also covers materials (e.g. plastics) placed on the market after recycling.

NOTE 3 In addition to the above materials and associated limits it is foreseen that a future revision of Regulation (EC) 1907/2006 will restrict HBCD.

Plastic fractions are considered free of restricted brominated flame retardants when the above limits are fulfilled.

Plastic fractions that do not meet the above limits shall be used for energy recovery, or incinerated, or sent for chemical conversion, or disposal at appropriately licenced facilities. The downstream monitoring shall trace plastics fractions containing such brominated flame retardants, see B.4.

A.7 Volatile fluorocarbons and volatile hydrocarbons

WEEE containing either Volatile fluorocarbons or volatile hydrocarbons shall be sorted to a separate WEEE stream and treated according to the requirements of EN 50574:2012.

NOTE For example. volatile fluorocarbons or volatile hydrocarbons can be found in insulating foam from water boilers and as a cooling agent in the circulation system of heat pump tumble driers.

A.8 Asbestos

Waste and components that contain asbestos shall be removed as an identified stream from the remaining WEEE stream. This shall occur before any treatment process that can cause damage to such waste and components.

Handling shall avoid any emissions of asbestos fibres. Waste and components that contains asbestos shall be sealed with an impermeable covering and clearly marked with the related asbestos danger label.

NOTE Directive 87/217/EEC contains requirements for operators performing removal and disposal of asbestos

A.9 Components containing radioactive substances

Waste and components that contain radioactive substances shall be removed as an identified stream from the remaining WEEE stream. This shall occur before any treatment process that can cause damage to such waste and components.

Treatment facilities shall have a procedure in place to monitor for the presence of radioactive materials in waste and components.

NOTE Council Directive 96/29/Euratom lays down basic safety standards for the protection of the health of workers and the general public against the dangers arising from ionising radiation.

Annex B
(Normative)

De-pollution monitoring

B.1 Introduction

This annex supplements clause 5.6 and lays down the rules of monitoring de-pollution performance. Although only selected substances, mixtures and components shall be described in this annex, all such materials as described in Annex F shall be removed from WEEE.

Monitoring and control of the quality of de-pollution of capacitors, batteries, and printed circuit boards for all flows is based on two different methodologies. In the first methodology batch processing results are compared with a benchmark system. For the second methodology a chemical analysis of relevant fractions is required.

The weighing process and the fraction considered shall facilitate comparison with the target value for that fraction.

NOTE In addition to the general depollution requirements, CENELEC will be developing standards covering the treatment of specific products such as CRT equipment, lamps, flat panel display equipment. Requirements to run batch processes are described in Annex D of this document.

Unless otherwise specified, requirements relating to capacitors, batteries and printed circuit boards are those that apply through application of Annex F.

B.2 Capacitors, batteries and printed circuit boards

During the processing of a batch, see 5.6 and 5.9 and Annex D, removed batteries, capacitors, and printed circuit boards shall be weighed separately and compared to the input volume of that batch.

To verify the efficiency of de-pollution during the processing of a batch, target values of removed batteries, capacitors, and printed circuit boards shall be reached.

Secretary Note: The limit values are being developed and it is proposed that these will be contained in a Technical Specification.

The treatment operator shall demonstrate, through documentation, that the batches are representative of day-to-day conditions. Records shall include the mass of:

- batteries, capacitors and printed circuit boards sent to a downstream treatment operator facility over a twelve month period;
- batteries, capacitors and printed circuit boards stored at the facility at the beginning of the twelve month period and again at the end of a twelve month period; and
- the related input categories of WEEE.

In the event that printed circuit boards form part of one or more output fractions, the total quantity of printed circuit boards treated in that batch shall be determined.

Related weighing records and supply notes shall be documented.

B.3 Analysis of fractions

In addition to the monitoring methodology (B.2) the quality of de-pollution shall be measured on the basis of a chemical analysis of the physically smallest non-metallic shredder fraction.

NOTE The physically smallest non-metallic shredder fraction is commonly referred to as the shredder light fraction. This is the result of air separation and/or screening after shredding. This fraction generally contains pieces of plastics, rubber, wood, glass and very little metal.

A mixed sample that is representative of the input material treated shall be taken and analysed at least once per year using a recognised sampling method, such as that specified in EN 14899.

B.4 Plastics

De-pollution monitoring shall take place with materials that are generated from fractions that might contain the brominated flame retardants referred to in A.6 and are likely to contain at least 10% by mass of plastic.

The limits contained in A.6 shall be verified annually and shall be representative of the volumes generated.

Provided that the removed materials are incinerated for energy recovery, or incinerated, or sent for chemical conversion, or disposal at appropriately licenced facilities no further analysis is required.

The operator shall have evidence that materials meet the above requirements.

NOTE The above evidence can be established by means of contractual obligation or other means.

Annex C
(Normative)

Determination of recycling and recovery rates

C.1 Introduction

This annex provides additional detail to 5.9 of this standard. It lays down the rules of determination and calculation of the recycling and recovery rates based on the processing of a batch or on the annual mass balance.

Fractions and components are considered to be recovered or recycled when they achieved end of waste status.

NOTE 1 Where the end-of-waste criteria, as specified in Article 6 of Directive 2008/98/EC, have been fulfilled it is not necessary to supply detailed information on downstream operators when determining the recycling and recovery rates.

The classification of the use of final fractions and components in technologies shall not deviate from the classification in C.5.

NOTE 2 This annex aims to report treatment results, following and covering the whole treatment chain and including the classification of the use of final fractions and components in final technologies (model classifications).

C.2 Principles

Determination of the recycling and recovery rates shall start with the untreated WEEE and end:

- when the end-of-waste status for fractions is achieved, or;
- with the final recovery or disposal of fractions.

The determination of the recycling and recovery rates shall be based on the input/output analysis of every step, of every operator, within the WEEE treatment chain. The input/output analysis encompasses the following elements:

- mass and description of the input material;
- information on the type of treatment technology used by the treatment operator;
-
- composition of the output fractions according to batch results or equivalent methods;
- information to identify all downstream treatment operators and the type of treatment technologies provided by them, and;
- classification of final use (see Annex G) of fractions sent for recovery or disposal.

The composition shall be described for the output fraction with the constituent materials (e.g. iron, copper, ABS without brominated flame retardant, polypropylene, wood) together with the percentage of these materials in each fraction except if a) the fraction contains less than 2% impurities or b) the fraction goes for energy recovery or disposal.

To determine the recycling and recovery rates the calculation shall follow all fractions until final treatment operations have been concluded. Fractions having a level of impurities of less than 2 % by mass are considered to be free of impurities, whereas fractions having a level of impurities of 2 % or greater by mass the proportion of the components shall be taken into account in the calculation.

NOTE: Impurity is taken to mean a material, other than an intended output (target) material, e.g. for a specific metal fraction this means all materials other than this specific metal. Material is taken to refer to the matter of which the item is made, e.g. copper, iron, wood, ABS, PP, glass.

Information required on the output fractions forwarded to final treatment technologies are, for:

- fractions that have reached end-of-waste status, data on the mass of the output fraction, composition of the fractions and the intended technology, and/or;
- fractions which are considered to contain less than 2 % impurities, data on the mass of the output fraction, the composition of the fraction, and/or;
  - for such metal fractions, the final treatment technology and the classification of final use of the fraction in the treatment technology may be estimated,
  - for such non-metal fractions, the final treatment technology and the classification of final use of the fraction in the treatment technology;
- fractions which are not considered to contain less than 2 % of impurities, data on the mass of the output fraction, data on the composition of the fractions, information on the first acceptor, the final treatment technology and the classification of final use of the materials of the fractions in the final treatment technology;
- for final fractions being forwarded for disposal, data on the mass of the output fraction, classification of final use and information on the downstream acceptor(s);

in case of fractions which are not considered to contain less than 2 % of impurities, the percentage of each fraction shall be provided.

An overview of the documentation required for downstream monitoring and the determination of recycling and recovery rates is given in Annex G.

NOTE 1 Regulation (EC) 333/2011 establishes the criteria for determining when certain types of scrap metal cease to be waste under Directive 2008/98/EC

The determination of the target recycling and recovery rates shall be completed for each of the WEEE treatment categories, for each WEEE treatment operator, and for each treatment facility.

The determination of the target recycling and recovery rates for a mixture of two or more WEEE categories to be treated, which are subject to different targets, is permitted if the input shares of the WEEE categories are known based on a reliable method. The target recycling and recovery rates of the mixture shall be calculated according to the following formulae:

- Target recycling rate of mixture = Recycling rate of X * share of X + recycling rate of Y * share of Y + ... + recycling rate of Z * share of Z;
- Target recovery rate of mixture = Recovery rate of X * share of X + recovery rate of Y * share of Y + ... + recovery rate of Z * share of Z.

NOTE 2 The target recycling and recovery rates for the WEEE categories are given in Directive 2012/19/EU, Article 11.

C.3 Calculation

The calculation of the recycling and recovery rates shall include each of the following quantities:

- WEEE prepared for re-use;
- WEEE fractions recycled;
- WEEE fractions used for other material recovery (e.g. backfilling);
- WEEE fractions used for energy recovery, and;
- WEEE fractions sent for disposal by this operator and all downstream operators.

During preparation for re-use a certain amount of the WEEE designated for potential preparation for re-use will not be capable of being prepared for re-use; this material shall be returned to the treatment process.

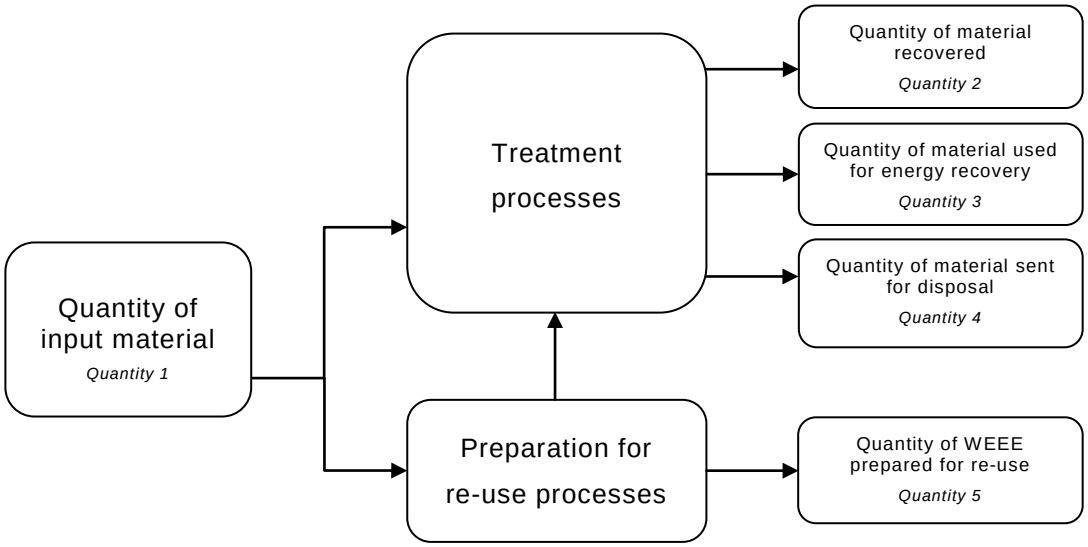

Figure C.1 Flow chart showing separate parts of the WEEE treatment process.

The recycling rate shall be calculated using by the following equation with reference to Figure C.1

$$recycling\ rate = \frac{Quantity\ 2 + Quantity\ 5}{Quantity\ 1}$$

The recovery rate shall be calculated using by the following equation with reference to Figure C.1

$$recovery\ rate = \frac{Quantity\ 2 + \ Quantity\ 3 + Quantity\ 5}{Quantity\ 1}$$

The treatment operator shall use the composition of this output fraction, as declared by the downstream treatment operator: However, where this is not available a documented simplified analyses (e.g. hand-picking analysis) on a representative composition of this fraction shall be used.

C.4 Documentation

The treatment operator shall make available an document detailing the calculation of the recycling and recovery rates, comprising the following elements:

- a flow chart showing the entire treatment stream with names of fractions, composition of fractions, and information on treatment technologies;
- records relating to the calculation of recycling and recovery rates from downstream operators, and;
- a detailed calculation of the recycling and recovery rate which is traceable and based on the flow chart.

The determination of the recycling and recovery rates shall be completed and updated at least once every year, but also following any changes within the processing chain which may influence the recycling and recovery rates. The documents and records relating to this process shall be stored for three years.

C.5 Classification of final use of fractions

To calculate the recycling and recovery rates the use of fractions and components forwarded to the final treatment technologies shall be classified according to their final use.

The options for classification of the use of fractions and components forwarded to the final treatment technologies shall be:

a) preparing for re-use;

b) recycling

c) other material recovery (e.g. backfilling);

d) energy recovery;

e) disposal.

The treatment operators shall document the destination and treatment technologies for fractions and the results of the downstream treatment in terms of the classification given in this clause.

NOTE If required by legal or regulatory requirements, a different classification could apply at national level.

Annex D
(Normative)

Requirements concerning processing of a batch

D.1 Introduction

This annex supplements clause 5.9 and lays down the requirements and preconditions to plan, to prepare, to carry out and to evaluate the processing of a batch.

A batch process shall be performed at least once every two years per site and per category. An additional batch process shall be carried out following significant changes of the input quality or subsequent to significant changes of the treatment technology.

Batch processing results shall be representative of normal day-to-day conditions, especially with respect to the composition of the input material and processing operations and parameters. The input material to the batch shall not be prepared or selected in order to change original composition. The method for collecting the input material to be used for the batch process shall be documented by the treatment operator.

D.2 Input material

The processing of batches shall be performed using a representative quantity (of both volumes and WEEE category) of input materials. The treatment operator shall demonstrate, through documentation that the batches are representative of day-to-day conditions.

The total mass of the input material shall be recorded by a means that provides traceability and data integrity.

Treatment category	**Minimum mass of Batch**
large appliances	• a minimum of 50 t in large shredders (40 - 50 t/h capacity) where the WEEE is completely treated at the end of the batch, or • A minimum of 10 t in a WEEE specific medium shredder where the WEEE is completely treated at the end of the batch, or • 5 t (100 units) for manual dismantling for large appliance, and
1) CRT display appliances	• a minimum of 10 t in a specific shredder for CRT display appliances where the WEEE is completely treated at the end of the batch or • 5 t (250 units) for manual dismantling
cooling & freezing appliances	• for step one treatment (in case of separate batch): a minimum of 10t where the step one treatment is completed at the end of the batch. • for step two treatment: a minimum of 10 t in a special shredder for cooling & freezing appliances where the WEEE is completely treated at the end of the batch • minimum 50 t of (H)(C)FC free cabinets in large shredders
2) small appliances	• a minimum of 50 t in large shredders (40 - 50 /h capacity) where the WEEE is completely treated at the end of the batch, or • A minimum of 10 t in a WEEE specific medium shredder where the WEEE is completely treated at the end of the batch, or • 5 for manual dismantling (200 units where the mass of the individual complete appliance is less than 1 kg)
3) lamps	• 5 t in a lamp specific treatment facility
4) fractions of WEEE (for output fractions from WEEE process and also for fraction in agreement with 5.9)	• minimum 2 hours of average capacity of the fraction specific treatment process, or • 1 day full capacity for manual process

Where the treatment facility usually treats mixed categories of WEEE the batches shall be representative of the normal conditions. In the case of a batch of mixed categories, the minimum input mass of the mixed batch shall be the sum of the minimum mass of the individual categories. The composition of the input categories shall be known and shall be consistent during the batch.

The presence of water in the input material shall be avoided, for example, by storing it under weatherproof conditions. The mixture and consistency of the input material shall be checked and evaluated visually, compared with normal supplies. Results and interpretation shall be reported.

D.3 Processing

Processing of batches shall involve the removal of substances, mixtures and components as listed in Annex F.

Prior to commencing the mechanical processing of a batch, the treatment operator shall either process about 10 % of the batch input volume, or empty the shredder.

Containers for the output material shall be identified. All output fraction areas or receptacles (boxes, containers) must be emptied; in case of big bags and any internal receptacles to collect fractions (e.g. filters), these shall be empty. The tare mass of receptacles shall be determined.

The input mass of the batch shall be determined coincident with the processing of the batch whenever possible.

Process conditions shall be determined and documented. If the ratio of material input to output material exceeds 5 % of the total input amount processed the batch procedures shall be checked. If the reason for this deviation is unknown, another batch shall be processed. Breakdown or malfunctions of equipment during the batch shall be documented.

D.4 Output fractions

The total mass of the fractions shall to be measured and recorded using a means that provides traceability and data integrity.

Fractions containing less than 2 % impurities by mass shall not be subject to further analysis regarding composition. For:

- mixtures of metal fractions or metal components, the share of metals shall be estimated;
- non-metallic fractions, this criteria applies where the non-target material is considered as impurity.

NOTE 1 Final fractions being forwarded for disposal do not require analysis regarding their composition.

The composition of fractions which contain 2 % or more impurities by mass dedicated to further separation steps or to final recovery operations shall be analysed in accordance with one of the following methods:

- batch of the fraction, if the composition is higher than 20 % of the input material in accordance with clause 5.9;
- records of the downstream operator performing the next separation step or thermal recovery;
- hand-picking analysis, weighing the manually separated metallic and non-metallic shares of a representative sample;
- chemical analysis of a representative sample.

NOTE 2 If none of these analyses is possible (for example for fractions of low volume and share which may not be sorted by handpicking analysis and where there is too small a quantity for analysis), best estimations of the composition should be carried out.

D.5 Documentation and validation

The treatment operator shall make available an understandable and well-structured record of the batch process, comprising the following elements:

description and pictures of the input material, with special focus on composition (types and categories of appliances);

- input/output mass balance of the batch including information on losses and comments;
- description of the processing technologies with output fractions, including a flow chart of further downstream separation, treatment or disposal of fractions;
- description and documentation of output fractions including photographs of the output fractions and the weighing documents, and;
- the assessment of the composition of mixed output fractions including the methodology.

Results of the batch process and the supporting documentation shall be completed no later than one month after processing the batch; all documents shall be stored for five years.

The batch process results shall be validated. Validation shall comprise: a visual check during the batch, a visual check of all input and output fractions, verification of the documentation, and assessment of compliance with this Annex.

Annex E
(Void)

NOTE This annex has been included for future use. It is a placeholder for a potential normative annex.

Annex F
(Informative)

Materials and components of WEEE requiring selective treatment

The text of this annex is taken from Directive 2012/19/EU Annex VII “Selective treatment for materials and components of waste electrical and electronic equipment referred to in Article 8(2)”.

Annex VII requires:

"1. As a minimum the following substances, mixtures and components have to be removed from any separately collected WEEE:

- polychlorinated biphenyls (PCB) containing capacitors in accordance with Council Directive 96/59/EC of 16 September 1996 on the disposal of polychlorinated biphenyls and polychlorinated terphenyls (PCB/PCT) [1],
- mercury containing components, such as switches or backlighting lamps,
- batteries,
- printed circuit boards of mobile phones generally, and of other devices if the surface of the printed circuit board is greater than 10 square centimetres,
- toner cartridges, liquid and pasty, as well as colour toner,
- plastic containing brominated flame retardants,
- asbestos waste and components which contain asbestos,
- cathode ray tubes,
- chlorofluorocarbons (CFC), hydrochlorofluorocarbons (HCFC) or hydrofluorocarbons (HFC), hydrocarbons (HC),
- gas discharge lamps,
- liquid crystal displays (together with their casing where appropriate) of a surface greater than 100 square centimetres and all those back-lighted with gas discharge lamps,
- external electric cables,
- components containing refractory ceramic fibres as described in Commission Directive 97/69/EC of 5 December 1997 adapting to technical progress for the 23rd time Council Directive 67/548/EEC relating to the classification, packaging and labelling of dangerous substances [2],
- components containing radioactive substances with the exception of components that are below the exemption thresholds set in Article 3 of, and Annex I to, Council Directive 96/29/Euratom of 13 May 1996 laying down basic safety standards for the protection of the health of workers and the general public against the dangers arising from ionising radiation [3],
- electrolyte capacitors containing substances of concern (height > 25 mm, diameter > 25 mm or proportionately similar volume)

These substances, mixtures and components shall be disposed of or recovered in compliance with Directive 2008/98/EC.

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1 OJ L 243, 24.9.1996, p. 31.

2 OJ L 343, 13.12.1997, p. 19.

3 OJ L 159, 29.6.1996, p. 1.

2. The following components of WEEE that is separately collected have to be treated as indicated:
   - cathode ray tubes: the fluorescent coating has to be removed,
   - equipment containing gases that are ozone-depleting or have a global warming potential (GWP) above 15, such as those contained in insulating foams and refrigeration circuits: the gases must be properly extracted and properly treated. Ozone-depleting gases must be treated in accordance with Regulation (EC) No 1005/2009,
   - gas discharge lamps: the mercury shall be removed.

3. Taking into account environmental considerations and the desirability of preparation for re-use and recycling, points 1 and 2 shall be applied in such a way that environmentally sound preparation for re-use and recycling of components or whole appliances is not hindered."

Annex G
(Informative)
Documentation for downstream monitoring and establishment of recycling and recovery rates

G.1 Information requirements

Table G.1 summarises all the information required on fractions for the purpose of downstream monitoring and establishment of recycling and recovery rates. It is a figurative summary of the texts in paragraph 4.5, 5.9 and Annex C. The information recorded must give a just account of day-to-day business and all outlets used. It will therefore be applicable to both batch and annual data.

Information Required for Downstream Monitoring (4.5) and Establishment of Recycling & Recovery rates (5.9 and Annex C):	Mass	Composition	Classification of final use of fractions	Final Treatment Technology	Information on First Acceptor	Information on Downstream Acceptor(s), including Final Acceptor
Fractions that have reached end-of-waste status	A.C	4.5 + A.C		A.C		
Metal fractions which contain less than 2 % of non-metal fractions	4.5 + A.C	A.C	A.C	A.C		
Non-metal fractions containing less than 2 % of other materials	4.5 + A.C	A.C	A.C	4.5 + A.C	4.5	
Fractions which are classified as hazardous according to the European list of wastes and/or fractions containing materials and components covered by Annex F	4.5 + A.C	A.C	A.C	4.5 + A.C	4.5 + A.C	4.5
Final fractions being forwarded for energy recovery or disposal	A.C		A.C	4.5		4.5 + A.C
All other fractions	4.5 + A.C	A.C	A.C	A.C	4.5 + A.C	

Key

A.C. Requirement specified in Annex C

4.5 Requirement specified in clause 4.5

4.5 +A.C. Requirement specified in both Annex C and paragraph 4.5

Table G.1

G.2 Elaboration of terms used in Table G.1

Table G.2 provides an explanation of certain terms used in this standard.

Term	Explanation
First Acceptor	First operator after treatment operator
Down	Every operator following after the first acceptor.

Stream Acceptor(s)	
Final Acceptor	final operator at which location the final treatment step takes place, e.g. material recycling, energy recovery, disposal

989 **Table G.2**

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