

## **WF-RepTool Guidance document – issues of harmonization (update 2020)**

Version from 2020-12-15

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on behalf of & with the WF-RepTool expert group



## Introduction

This Guidance document has been put together to sum up some **principal questions** discussed in the WF-RepTool expert group and **to list issues of harmonization**.

The issues of harmonization come from a cross-check of WF-RepTool reports created by the treatment partners of the WEEE systems<sup>1</sup> of the WF-RepTool expert group members done in summer 2014.

**NEW20** In 2020 an update of this document was done to refer to the actual legal background for the determination of treatment results (see new point at page 1) and to insert questions which came up the years before. Relevant new entries are marked, small changes are done without marking. The order of the document has been changed a bit.

You may understand the following document better (or only ...) if you have already created or checked WF-RepTool reports.

All details on 'how to create a report' from **IT point of view** are described in detail in the **user manual** for the WF-RepTool (see 'user manual - reporter level') which you may download from the WF-RepTool website (see [www.wf-reptool.org](http://www.wf-reptool.org) > 'Information' > 'User manuals').

At the website you may also find **FAQs** (see [www.wf-reptool.org](http://www.wf-reptool.org) > 'Information' > 'FAQ'), which are answered there with brief answers and you will find **videos** on how to create a report (see [www.wf-reptool.org](http://www.wf-reptool.org) > 'Videos' > '... for reporters').

This Guidance document may be seen as **content-oriented information** supporting the user manual.

In this Guidance document the **TOP** marking has been set for very important issues and/or for issues done the wrong way often. You may search for this marking (search 'top' – search for whole words only) but please consider that all points described in this Guidance document should be considered when creating or controlling a report.

If you have any questions or remarks, please use the 'Contact us' option at the WF-RepTool website and let us know.

*the WF-RepTool expert group*

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<sup>1</sup> or by staff members of the WEEE systems on behalf of/for their treatment partners

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## A. Principles on the use of WF-RepTool

### Ownership & access

*Questions often asked regarding ownership, access, visibility of data, etc.*

The WF-RepTool has been developed on behalf of and is owned by the WEEE Forum (see [www.weee-forum.org](http://www.weee-forum.org)).

The WF-RepTool is provided to WEEE Forum members (WEEE systems) and third party users ('clients') (see [www.wf-reptool.org](http://www.wf-reptool.org) > 'Purchase').

The WF-RepTool may be installed at a server of the WEEE system or 'client', a hosting of WF-RepTool installations is available at a WF-RepTool server (at dedicated sectors).

WEEE systems or 'clients' act as administrators of their WF-RepTool installation.

Access to the WF-RepTool for the treatment operators is provided by the WEEE systems or 'clients'<sup>2</sup>.

WF-RepTool data are only visible to the WF-RepTool administrator and 'his' treatment partners (not visible to other administrators or the WEEE Forum).

The WF-RepTool standard language is English (see [www.wf-reptool.org](http://www.wf-reptool.org) > 'Information' > 'Translations').

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### NEW20 Legal background

The WF-RepTool has been developed to report treatment results for WEEE by fulfilling EU legislation (see user manual: model classification).

Most **actual legal requirements** are given by a Commission Implementing Decision<sup>3</sup> (short as **CID 2019 WEEE**) which was published December 2019. It sets **rules** for the **calculation** and **reporting** of data on treatment of WEEE and provides **data formats** for the reporting of results to the Commission. This CID will have to be adopted by the Members States and will be valid for the first full reporting year after adoption.

Requirements given by this CID 2019 WEEE and results from a cross-check if rules on the calculation of recycling & recovery results are fulfilled have been summed up in a separate Guidance document '**What to count as recycling & recovery?**' (see [www.wf-reptool.org](http://www.wf-reptool.org) > 'Information' > 'Guidance documents').

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### Principles on use

*The WF-RepTool is an IT application. The functions of this IT application are described in detail in the user manuals for this tool - see user manuals 'system level' and 'reporter level' (see [www.wf-reptool.org](http://www.wf-reptool.org) > 'Information' > 'User manuals') and questions often raised are answered in the FAQs (see [www.wf-reptool.org](http://www.wf-reptool.org) > 'Information' > 'FAQ').*

*However, how to use this IT application can be decided by the WEEE system / client. As the WF-RepTool expert group we tried to come to an agreement on the **general principles on the use** and we try to give proposals based on our experiences.*

*Kind and the level of data to be provided are pre-determined by the WEEELABEX standard 'Treatment' and/or the CENELEC standard EN50625-1. The WF-RepTool provides the option to aggregate those data.*

<sup>2</sup> General principles and proposals are here mainly addressed to WEEE systems using the WF-RepTool. These principles should also be followed by third party users / clients as reports done under their access might be uploaded to the WEEE systems reporting system.

<sup>3</sup> OJ L 330, 20.12.2019, p 72, COMMISSION IMPLEMENTING DECISION (EU) 2019/2193 of 17 December 2019 laying down rules for the calculation, verification and reporting of data and establishing data formats for the purposes of Directive 2012/19/EU of the European Parliament and of the Council on waste electrical and electronic equipment (WEEE)

## ➤ General

National laws can always supersede general principles of the WF-RepTool (e.g. providing more details on acceptors).

The WF-RepTool has been developed for the reporting of de-pollution results and for the reporting and calculation of recycling and recovery rates.

Separate WF-RepTool reports shall be provided per site and treatment process and after an important change in the treatment process.

The first step treatment operator [in most cases this will be the 'contracted partner'] is responsible to provide the WF-RepTool report for all treatment steps until final fractions and final technologies used<sup>4</sup>.

The use of the WF-RepTool (including the obligation to provide data until final technologies of WEEE fractions) should be part of the contract between the WEEE system and the treatment partner [= 'contracted partner'].

The 'contracted partner' shall fill in the report (→ call him 'reporter'). In case - on decision of the WEEE system - the WEEE system or any charged expert may elaborate reports.

The 'contracted partner' has to provide a WF-RepTool report at least once a year for each WEEE input category treated by him, shorter periods may be agreed<sup>5</sup>.

WF-RepTool codes do not necessarily have to be used in other documents<sup>6</sup>.

WF-RepTool assigns the classification<sup>7</sup> of the use of WEEE fractions resp. their shares in final technologies regarding preparing for re-use, recycling, other recovery or disposal. This classification is based on European laws and regulations.

The WF-RepTool provides the option for a 'national classification'. If this 'national classification' shall be applied, this 'national classification' has to be approved by individual documents of the relevant authority.

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## ➤ Tasks

'Tasks' shall only be set if no other option of data aggregation is available/possible/given. We propose to limit the use of the task function (e.g. allow only in special cases).

For hazardous wastes 'task' answers in the 'confidential mode' (black box feature) should not be allowed (see acceptors and technologies have to be given).

The treatment partner may ask for WF-RepTool access for 'his' acceptor of any of 'his' fractions to hand over a 'task' to him. The WEEE system / WF-RepTool access administrator decides about giving this access (or not) and with this - from version 4.1 (Jan. 2014) - about the option for handing over tasks to him.

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<sup>4</sup> remark: he is the party who knows where fractions are forwarded to

<sup>5</sup> advise: see FAQ 'Which period shall I choose to fill in WF-RepTool reports?', not to choose monthly reports – this will mislead treatment partners to copy/paste whole reports

<sup>6</sup> e.g. transport documents, if you use other codes in other documents you may insert these codes under 'internal codes' to the WF-RepTool

<sup>7</sup> the WF classification = WEEE Forum model classification

## ➤ Proof of data

The 'reporter' is responsible for keeping documented proof for reported data.

The WEEELABEX / CENELEC standard provides the minimum burden of proof.

The WEEE system may provide a more specific or more detailed 'national burden of proof' that states what has to be proved by the 'contracted partner' and how it shall be proven.

The responsibility for keeping documented proof shall be a part of the contract between the WEEE system and the 'contracted partner'.

For 'contracted partners' it is advisable to put the need for documented proof of downstream information into contracts with their downstream acceptors.

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## ➤ Control

A control of the WF-RepTool report shall be done as a minimum once a year. We propose to give a clear feedback (e.g. improvements to be done, see controller tools<sup>8</sup>).

We propose to do an additional on-site audit to verify the WF-RepTool report (process, output fractions achieved, documented proof for data).

Advise: Controlling a WF-RepTool report in detail (incl. plausibility of fractions achieved, check of all technologies used, details on classifications of use) might be a quite comprehensive work. A pre-check of the report should be done before any on-site audit. To give controller remarks to the report will help the treatment partner getting prepared for the audit (e.g. to provide answers & documents). The check of the WF-RepTool report should be done as a separate audit or as separate part of an audit on keeping technical standards. It should be seen as additional, separate work<sup>9</sup>.

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<sup>8</sup> inspect function, evaluation, individual controller remarks

<sup>9</sup> see limited time for audits and many other issues to be checked within WEEELABEX/CENELEC audits

## B. Principles on creating a WF-RepTool report

Options on how to generate a WF-RepTool report are described in detail in the **'user manual - reporter level'** (see [www.wf-reptool.org](http://www.wf-reptool.org) > 'Information' > 'User manuals') and are explained in **video tutorials** (see [www.wf-reptool.org](http://www.wf-reptool.org) > "Videos" > '... for reporters'). For questions often raised see the FAQs (see [www.wf-reptool.org](http://www.wf-reptool.org) > 'Information' > 'FAQ').

When looking at WF-RepTool report done by different users, we saw quite some differences. One of the goals of the WF-RepTool expert group is to come to a **more unified** and **harmonized structure** and **contents** of WF-RepTool reports. Please find our **proposals** based on our experiences.

Kind and the level of data to be provided are pre-determined by the WEEELABEX standard 'Treatment' and/or the CENELEC standard EN50625-1. The WF-RepTool provides the option to aggregate those data. You may see those data as **minimum information** to be provided and you are of course free to collect **more downstream information** to achieve a higher level of data transparency.

### Structure and principles to be followed in a report

#### ➤ Exclude non-WEEE fractions from reports

A **'delivery report'**<sup>10</sup> can be done including municipal waste, packaging material, wrongly allocated WEEE appliances<sup>11</sup>, WEEE parts or non-WEEE materials separated by sorting and losses (see option to deduct).

**'Treatment reports'** should be done **excluding** municipal waste, packaging material, wrongly allocated WEEE appliances WEEE parts or non-WEEE materials, losses and additional amounts<sup>12</sup> as these fractions should **not count to recycling & recovery rates** achieved. So, if they are mentioned, the 'option to deduct' must be used.

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#### ➤ Stepwise approach

A WF-RepTool report shall be created by using a **'stepwise approach'** for **each relevant treatment step** (in case by using several process steps). Relevant treatment steps are for example:

- manual de-pollution,
- shredding/granulation including accompanied separation steps and
- a separate, next step separation/conditioning of fractions (e.g. heavy media separation, plastics separation plant).

If all these treatment steps are done at **one site/location** (e.g. in different factory buildings), you may consider them as different plant components = 'houses' (**'house approach'**) reporting just fractions 'leaving the house'. But be aware that this approach will limit your options to do plausibility checks for individual treatment steps (e.g. residue fractions reported?).

**Each downstream operator / acceptor** should be reported as individual treatment step.

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<sup>10</sup> e.g. for total amounts of WEEE delivered to any treatment operator

<sup>11</sup> e.g. cooling and freezing appliances in the WEEE input category 'large household appliances' or screens & monitors in 'small appliances'

<sup>12</sup> e.g. material added for treatment

### ➤ **Waste collectors and traders are not treatment partners**

**Waste collectors, traders and brokers** are **not** to be considered as **acceptors** doing a treatment step, only treatment operators doing the **physical treatment** are to be considered as acceptor = treatment operator.

The waste collector, trader and broker may be indicated in the entry field for 'Trading steps'<sup>13</sup> (e.g. for cross-checking pick-up/transport/delivery documents).

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### ➤ **Don't lose the hazardous waste attribute (\*)**

TOP

Every material stream considered as **hazardous waste** = marked with an **asterisk (\*)** must be followed by **at least one** yield material stream marked with an asterisk (\*).

The hazardous waste characteristic may not disappear!

Examples:

*Plastics with brominated flame retardants (Br-FR) disappear?*

*Fractions achieved from treatment of circuit boards*

*Fluorescent coating material from CRT glass (front glass) disappear?*

*Hg off/from fluorescent coating material from gas discharge lamps not mentioned*

⇒ min.1 fraction or residues with hazardous waste marking (\*)

⇒ in case give a remark where the hazardous waste fraction will be included  
(e.g. internal name 'incl. xyz'<sup>14</sup>,  
e.g. 'incl. circuit boards' in fraction of mixed non-ferrous metals delivered to Cu-smelters,  
'incl. plastics with Br-FR' in fraction for incineration)

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### ➤ **Follow the treatment chain until the final technology is applied**

To get information about the **final technology used** for any **final fraction** is a crucial element for the WF-RepTool (see on base of the final technology applied the use of the final fraction / component of the final fraction will be classified – see Chart 1, page 6).

The final technology chosen has to be reported on base of information about the final acceptors (see remarks on 'Names of acceptors', following at page 8). **Exemptions** are:

- for **1-kind<sup>15</sup> 'pure' metal fractions** the final technology chosen (steel mill, Cu smelter etc.) may be **estimated** on base of the kind of the metal,
- for fractions having reached the **end-of-waste status** the **'intended'** final technology has to be given. This will be especially relevant for plastics fractions which will have to be distinguished as plastics fractions for plastics recycling/for products (> recycling) or plastics fractions for the 'use as fuel' (> energy recovery)<sup>16</sup>.

For **all other fractions** the **final technology** used has to be determined on base of data collected (see Chart 1, page 6). At the beginning of work – and if no real data are available - best estimations may be done (see point 'No data available', page 10).

<sup>13</sup> to be agreed between the WEEE system/the WF-RepTool administrator and the treatment partner

<sup>14</sup> please consider the ban on mixing/diluting hazardous wastes

<sup>15</sup> if not 1-kind metal, the 2<sup>nd</sup> metal may be transferred to the slag (not recovered as metal) → classification on base of use of slag

<sup>16</sup> for CRT glass the end-of-waste status is not foreseen by the relevant regulation (see COMMISSION REGULATION (EU) No 1179/2012 – only for e.g. flat glass) but the option to consider it as end-of-waste is foreseen in the WEEELABEX standard, take care: only to be applied for glass used in the production of glass substances or re-melting in glass manufacturing facilities.

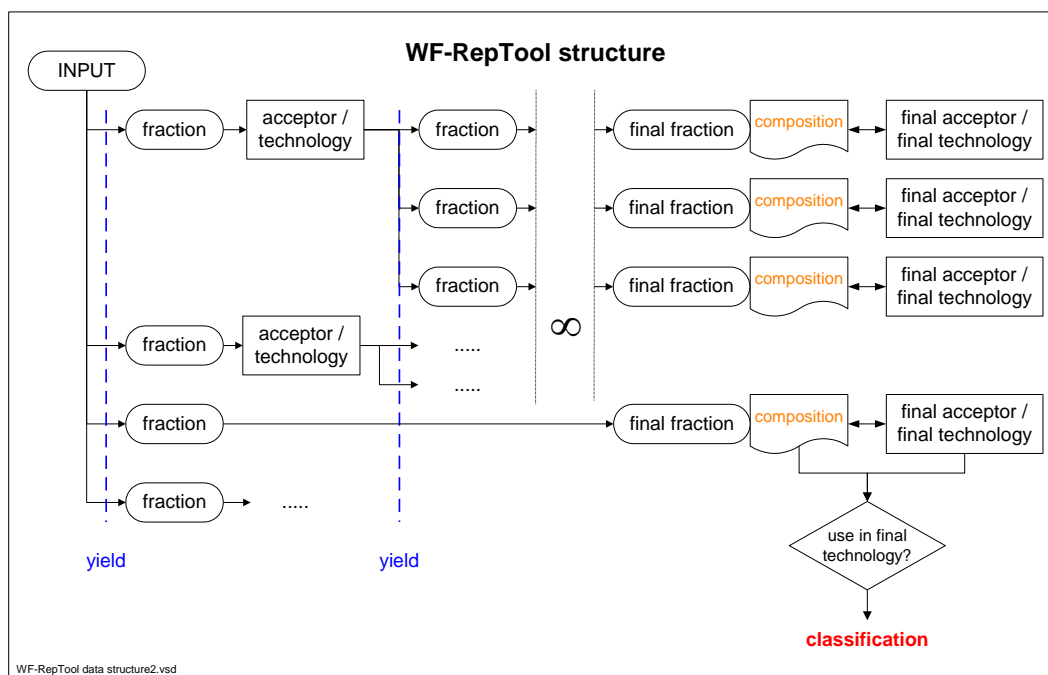


Chart 1: Follow the treatment chain to final technologies used

**NEW20** See CID 2019 WEEE where **recycling** is defined by the time when sorted materials are **entering** dedicated **recycling operations** (see Guidance document 'What to count as recycling & recovery?', point 'Recycling' by 'entry to recycling operation', page 6 there).

You may look further at:

- ⇒ 'Approval of/from technologies requested', page 21
- ⇒ 'Choose the 'use' in 'final technology', page 24
- ⇒ **NEW20** Downstream statements for fractions', page 39

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## ➤ Target of use approach

TOP

To go for the 'target of use approach' is one of the 'simplifications' of the WF-RepTool<sup>17</sup>. It was all the time the target that a treatment operator may (start to) elaborate a WF-RepTool report with information about WEEE fractions he may determine in 'his house' (e.g. handpicking analysis) and/or with experience data.

We did expect that WEEE fractions from (in case smaller) WEEE treatment operators will be mixed with other fractions by waste/metal collectors.

Based on this we ask '**what will be the target of use**' of the individual fraction (the component of the fraction) in the final technology (see Chart 1)?

We all the time pointed out, that we **do not ask** for the **yield** of **metal products**, iron in the steel mill or Cu in the Cu smelter. **NEW20 adapted** Parallel to this we do not ask for the yield of **slag** in the steel mill / smelter but we do ask what will happen with it (see by-product or defined product for use).

- Otherwise we would have to **determine the output fractions** achieved from **each WEEE fraction** in **each of the final technology plants** ... and this is realistically not possible! (see mix of input fractions – different WEEE fractions or WEEE fractions and non-WEEE

<sup>17</sup> see 2 % impurity option for 'pure' fractions, no losses of materials (e.g. to slag) determined

fractions – to/in final technologies; smelting analysis for each WEEE fraction not possible<sup>18</sup>).

This 'approach' is mainly relevant for **WEEE fractions**

- going to **steel mills** or **smelters** - especially circuit board fraction, non-ferrous metals fraction (see also 'Apply the target of use approach', page 24 and the option 'Use of data from analysis for circuit board fractions, page 30)
- going to **incineration processes** (see also 'Slag and ashes', page 34 and 'Metals separated from slag / ashes', page 37).

In both cases above and in all other cases we **do not ask for the real yield of output fractions from the final technologies** and where they will be forwarded to<sup>19</sup>.

This means that you shall list the **component/s** of the **final input fraction** to **any final technology** and choose the **planned = target of use** of this component within the final technology - see Chart 2 below which shall give you a simple example.

final fraction	component / composition			final technology	use in final technology		classification
iron fraction 'not pure'	Fe	95%	⇒	steel mill 'traditional'	Fe > Fe recovery	⇒	R
	organic residues	5%			organic residues > no definite use in smelter	⇒	TD

Chart 2: Classify use of 'iron fraction 'not pure'' delivered to a traditional steel mill

You may look further at:

- ⇒ 'Apply the target of use approach', page 24
- ⇒ 'Choose the 'use' in final technology', page 24
- ⇒ discussions about leaving the 'Target of use approach – box at page 36

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## ➤ Recycling definition

**NEW20 updated** Please see the Guidance document '**What to count as recycling & recovery?**' (see [www.wf-reptool.org](http://www.wf-reptool.org) > 'Information' > 'Guidance documents') in which the legal background and definitions of 'preparing for re-use', 'recycling', etc. are explained. A summary of findings to 'What to count as ...' is given starting with page 10 in this document.

Core elements are:

- The weight to be determined as **recycled** (see CID 2019 WEEE<sup>20</sup>) is: the weight that **'enter the recycling operation' whereby waste materials are reprocessed into products, materials or substances that are not waste.**
- Main **'materials'** from WEEE are listed, which may be calculated as recycled when they enter **dedicated recycling operations** (very limited options) as **sorted materials** (e.g. sorted metals, plastics separated by polymers).
- Mixed fractions from WEEE that enter any final operation are not mentioned, under components from WEEE it is mentioned that metals, plastics ... and other materials from the treatment of components of WEEE **'that are subject to recycling'** shall be counted.

<sup>18</sup> possible for specific WEEE fractions – e.g. circuit board fractions, in case of delivery of high amounts = price finding analysis

<sup>19</sup> in principle the WF-RepTool might be changed to the 'output of final technologies approach' but then we would have to follow for all fractions, not only for those ones for which we expect 'better results'

<sup>20</sup> CID 2019 WEEE, Article 1, point 2

- ✓ For this question we refer to the **second part** of the **rule** *'whereby waste materials are reprocessed into products, ... that are not waste'*;
- ✓ as for being not waste **end-of-waste criteria** would have been fulfilled, and those criteria are not given for quite some WEEE materials/fractions, we see it as a requirement that a **product** has to be achieved – see:

⇒ *'Approval of products requested'*, page 27

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## ➤ **'Purpose of the plant' of municipal waste incineration**

TOP

Based on a judgement of the European Court (Case C-458/00 - 13 February 2003) and the therein mentioned 'purpose of the plant' **any input** of material to a **municipal waste incineration** will be quoted as **'thermal disposal'** even if any kind of energy (e.g. electrical energy, steam etc.) is produced (see option for national classification / 'upgrading' in user manual). Based on this, we classify

- all shares<sup>21</sup> treated by a **municipal waste incinerator** as **'disposal'** (TD)
- all shares treated by a **hazardous waste incinerator** as **'disposal'** (TD)

Given by the Waste Framework Directive 2008 (WFD 2008) there is a **R1<sup>22</sup> classification** of municipal waste incinerators possible if energy **efficiency limits** are kept<sup>23</sup>

⇒ see option for 'municipal waste incineration - high energy efficiency' in point *'Approval of/from technologies requested'*, page 21

**NEW20** The Commission Implementation Decision on waste (CID 2019 waste<sup>24</sup>) provides an **exception** that **metals separated** and **recycled** after incineration of municipal waste may be counted provided that the **metals** meet certain **quality criteria**.

⇒ see discussed in *'Metals separated from slag / ashes'*, page 37

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## **Names of acceptors**

The name of the acceptor has to be given to be able to **check the plausibility** of the **technology used** mentioned.

For **hazardous wastes** (with asterisk \*) **all downstream information** (technologies used, acceptors) must be reported in the WF-RepTool report (including names of all acceptors).

For wastes classified as **non-hazardous waste** we propose also to document all names of acceptors (full downstream monitoring).

In case of **confidentiality 'problems'**, the names of downstream acceptors don't have to be reported in the WF-RepTool but should be kept internally (plus clear allocation procedure proposed: e.g. 'TP1' in WF-RepTool report + internal list of acceptors 'TP1' = name xyz) for the option to cross-check delivery documents.

<sup>21</sup> shares of input fractions

<sup>22</sup> R 1 **Use principally as a fuel** or other means to **generate energy** (\*)

<sup>23</sup> (\*) This includes incineration facilities dedicated to the processing of municipal solid waste only where their energy efficiency is equal to or above:

— 0,60 for installations in operation and permitted in accordance with applicable Community legislation before 1 January 2009,

— 0,65 for installations permitted after 31 December 2008,

<sup>24</sup> see Guidance document *'What to count as recycling and recovery?'*

Beside this, we propose the following approach<sup>25</sup>:

- a) for fractions having reached the **end-of-waste status** the name of the acceptor does **not** have to be given (but see the 'intended' final technology has to be given - see page 5),
- b) for **1-kind 'pure' metal fractions** the technology may be estimated on base of the kind of metal (see page 5) and this **technology** may be used in the **name** for the acceptor (e.g. 'diff. steel mills', 'diff. Cu smelters etc.'),
- c) for all final technologies called as **special** technologies (e.g. Cu smelter 'special', municipal waste incineration - high energy efficiency (R1), technology xyz – special use... – see 'Example technology contains 'approve'<sup>26</sup>) the **name** of the acceptor **must** be documented (at least internally<sup>27</sup>) to **proof technologies** reported (see point 'Approval of/from technologies requested', page 21),
- d) for all final technologies where it is mentioned that a **defined product** is achieved (see 'Example technology' contains 'defined product'<sup>28</sup>) the **name** of the acceptor **must** be documented (at least internally<sup>29</sup>) to be able to check & proof **products reported** (see point 'Approval of products requested' page 27),
- e) for fractions not being used for any recovery = use classified as **disposal**, the name of the acceptor does **not** have to be given<sup>30</sup>, the **technology** may be used in the **name** for the acceptor (e.g. use 'diff. landfills', 'diff. municipal waste incinerators').

For 'anonymous' acceptors from options above at least the **market region** should be reported in the WF-RepTool<sup>31</sup> to be able to sum up results regarding exports. You may distinguish between: national market, EU / EFTA market, outside EU / EFTA market or the individual countries within these regions.

If **no name** of the acceptor is provided by the waste collector, trader or separator, see proposal in point 'Name of acceptor', page 12.

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## Stored amounts

If there are **stored** amounts of **WEEE fractions**<sup>32</sup>, we propose following approach:


- stored amounts of **non-hazardous wastes** (without asterisk\*) may be **estimated**,
- stored amounts of **hazardous wastes** (marked with an asterisk\*) must be **determined** by **weighing** at the end of the reporting period.

In the case that WEEE fractions are **stored** for **several years** (e.g. fluorescent coating material - e.g. waiting for an appropriate technology to recover substances), take care to consider the amounts stored at the beginning of the period (i.e. deduct amount stored at the beginning of the year/period) and use only the 'difference amount' separated/achieved in the relevant year.

<sup>25</sup> consider national requirements or requirements of the WEEE system

<sup>26</sup> see 'Use in final technology' > choice with  > find/ filter in 'Example technology contains' - enter 'approve'

<sup>27</sup> consider national requirements or requirements of the WEEE system

<sup>28</sup> see 'Use in final technology' > choice with  > find/ filter in 'Example technology contains' - enter 'defined product'

<sup>29</sup> consider national requirements or requirements of the WEEE system

<sup>30</sup> but see & consider requirements to provide all downstream information for hazardous wastes

<sup>31</sup> consider national requirements or requirements of the WEEE system

<sup>32</sup> output fractions not delivered from the site at the end of the report period

Regarding **data** to be used for **stored amounts** of WEEE fractions we propose following approach: If WEEE fractions

- a) **have been delivered** to any acceptor **before** and this acceptor shall be chosen **again**, you may use data **from last delivery**,
- b) **shall be delivered** to a dedicated acceptor = there are already **agreements** where to deliver, you may provide **planned results**,
- c) are 'open' = there are **no plans** what to do with, you must use any **worst case** scenario (disposal option).

We propose to use any **uniform term** in the **name** for the acceptor e.g. 'stock'. Advantage: you may sort the list of 'Final fractions' to find these 'stocks' and to adapt results when data are provided.

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## Losses

Losses of **above 5 %** in yield data for any fraction (e.g. batches, special treatment) shall **not be accepted**. The batch and/or other determination of results has to be repeated (see also WLX C.3.4<sup>33</sup>)

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## No data available

If OUTPUT fractions are delivered to any (trader or) acceptor not being ready to provide forwarding and/or treatment data,

- 1) you should **choose** any **other acceptor** being ready to provide information
- 2) first WF-RepTool reports may be generated on base of / with:
  - a) **similar results** from comparable acceptors,
  - b) on base of best **estimation**,
  - c) inserting **WF general packages**.

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## Do not copy/paste whole report

The option to copy/paste a report has been mainly foreseen to copy/paste the **structure** of a report. You have to consider ...

⇒ after copy/paste **check** and **insert actual data**  
e.g. **real de-pollution results** in the given period and/or  
**actual acceptors** with their technologies

- ⇒ that the copy/paste option was also foreseen for **shredding/separation results** of:
- **shredder input fractions** (e.g. large or small appliances after de-pollution) and/or
  - **fractions** which are **further treated** (e.g. CRT tubes, plastics fractions, cables etc.)

to be able to use the option to use **(batch) results** for **longer periods**

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<sup>33</sup> C.3.4 Any reasons for material input/output differences exceeding 5 percent of the total input amount during the batch process shall be checked. If there is no plausible reason, the batch shall be repeated. Breakdown or malfunctions of equipment during the batch shall be documented (see clause C.5).

## C. Issues of harmonisation

Options on how to generate a WF-RepTool report are described in detail in the 'user manual - reporter level' (see introductions to chapters before). When looking at WF-RepTool report done by different users, we saw some differences in the use and mistakes done several times. Please find our proposals on harmonization based on our experiences.

### Names of/for fractions

- ☒ Don't use fraction **names with 'dismantling'** (code 16 xx xx) for fractions from **shredding** and/or **separation**

⇒ follow the structure of WF-RepTool codes as explained in the user manual:<sup>34</sup>

**16 xx xx** for (sorting and) **dismantling** fractions  
**19 10 xx** for (mixed) fractions from (first) **shredder** operations  
**19 12 xx** for fractions from further (mechanical) **separation**

- ☒ Use name of fraction **'pure'**

⇒ use only for fractions with **< 2 % impurities**  
 (!cross-check with composition data, see page 16)

- ☒ Check the use of the fraction name of **'non-ferrous metals'**

⇒ set **priority** to use a name of **Cu-** and/or **Al fraction** (main component)  
 ⇒ only if **'real mixtures'** of non-ferrous metals or rest of non-ferrous metals (beside Cu-, Al fractions), then use name for/as non-ferrous metals fraction

- ☒ Don't use the name **circuit board fraction** for all fractions where some CBs<sup>35</sup> are included (example: 1x for sieving fraction + CBs, 1x for plastics fraction + CBs, 1x for Cu fraction + CBs + cables)

⇒ choose name of fraction from the **main component** of the fraction  
 ⇒ indicate the content of circuit boards with the **choice of name of faction**  
 (with components to be removed)  
 ⇒ do a remark on the content of circuit boards in **internal name**  
 (e.g. incl. circuit boards)

- ☒ Don't call all 'rest/remainder' fractions as **residues** fractions (consider traceability, understanding)

⇒ check if there are **more specific names**  
 e.g. sieving material, shredder light fractions, any fines,...  
 ⇒ use the name from the **main component** (e.g. plastics)

- ☒ Don't use **one fraction** for **fractions of different composition** and then split to different acceptors with different yield resp. composition data

⇒ choose (names for) **fractions** as **'they are leaving the house'** as **separate fractions** (in case use several times the fraction with the same name)  
 ⇒ only if the **same fraction** is delivered to **different acceptors**, use one fraction and the option to split to acceptors

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<sup>34</sup> see user manual 'reporter level' point 2.3.2.1

<sup>35</sup> circuit boards (CBs)


## Name of acceptor

- ☒ See **names** of the **acceptors** have to be given (see page 8).
- ☒ The **name** of the acceptor must be the name of the **physical operator** (not the name of the waste collector, trader)
  - ⇒ provide the name of **physical operator** (who is doing the treatment)  
(the name of the waste collector, trader may be given as additional information – separate field ‘Trading steps’)
- ☒ Do not use the **same name** of the treatment operator at **different levels** (e.g. name shredder/separators also used as e.g. steel mill, Cu smelter, plastics recycler and landfill operator) if the treatment operator **does not physically run** these different technologies.  
This is **not the case** in many cases, instead of filling in wrong information:
  - ⇒ keep the name for the acceptor **empty**, or use any **general term** like ‘n.d.’, ‘no info’<sup>36</sup>
  - ⇒ see example for **uniform term** for **no data achieved** in next sub point
- ☒ **No name of acceptor/s provided** by the waste collector, trader or separator (even if tried). If the **name/s** of acceptor/s (next or final step treatment technology) is/are **not provided** by the waste collector, trader or separator, do **not** use the **‘wrong’ name** of the waste collector/trader/separator, instead:

- ⇒ use any **uniform term** in the **name** for the acceptor e.g. **‘no information from acceptor’**, advantage: you may sort the list of ‘Final fractions’ to find these entries and to adapt results when data are provided<sup>37</sup>
- ⇒ see options for final technologies under  
‘What to do if no information on final technology’, page 20

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## Technology used by the acceptor

- ☒ See the **technology used** by the **acceptor** shall to be given (see page 5).
- ☒ How to **find & choose** the correct **technology** for the acceptor?
  - ⇒ see the **scroll-down** for **technologies used**, see
    - **‘interim’** technologies in upper area of list and
    - **‘final’** technologies in lower area of list
  - ⇒ see the **list of available technologies** (open with  beside ‘technology used’) and **check the remarks** given in the list of available technologies, see find/filter options for ‘Technology contains’ and ‘Remarks contains’

*examples – enter in ‘Technology contains’ or ‘Remarks contains’*

- *‘incin’ for different kinds of incinerators*
- *‘plast’ for different technologies of plastics conditioning, plastics recycling or production of other products of/with plastics*
- *‘glass’ for different technologies applicable for CRT glass and other glass*

<sup>36</sup> advantage: you may sort the list of ‘Final fractions’ to find these entries and to adapt results when data are provided

<sup>37</sup> of course efforts shall be continued to get the name of the (final) acceptor stated. This interim solution shall show that efforts are taken already and no miss-leading information is given

⇒ cross-check **what companies** are **really doing** and choose the technology **for this**, don't use the wording how they '**call themselves**'

examples:

- technology '**plastics recycling**' is very often **plastics conditioning**, or in case only a trader, see remark in 'First step fraction is final fraction', page 14 or 'First step fraction goes 100 % to products / recycled – most time NOT', page 14

☒ **Don't use** the option for '**other**' technologies (as you just don't want to search for options).

⇒ to prepare and to pick from a unified 'list of technologies used' was one the core issues of the WF-RepTool group to **unify the terms** to be used in the WF-RepTool (see list of available technologies above)

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### Examples of chosen technology is not plausible

see also 'Approval of/from technologies requested', page 21

#### ➤ To classify 100 % 'recycled' – cases of most time NOT

see also First step fraction is final fraction – most time NOT, page 14,

see also First step fraction goes 100 % to products / recycled – most time NOT, page 14

☒ **Plastics** from 1<sup>st</sup> step treatment to technology **plastics recycling** – most time not!

⇒ **plastics** from 1<sup>st</sup> step treatment (dismantling, shredding) will be **conditioned** (cut, cleaned, separated), this is an **interim technology** with **yield of fractions**

☒ **CRT glass** fractions to **CRT glass production** – most time not!

⇒ cross-check with e.g. **delivery approvals**, CRT glass production is finished (see also 'CRT glass', page 32)

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### Yield of fractions

☒ If an **interim technology** has been chosen, you will be asked to provide **data** on the **yield** of fractions

⇒ see remarks on 'Names of/for fractions' (see page 11)

⇒ with regard to the **traceability** of data ask for and give information in '**source of data**' (see remarks at page 38)

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### Examples of yield of fractions is not plausible

#### ➤ Missing fractions

☒ **Missing yield fractions** from 1st step treatment / de-pollution or next steps

examples

- 'typical' 1st fractions / de-pollution fractions are missing (e.g. batteries from small household appliances)
- 'typical' sorting fractions are missing (e.g. NH3-appliances for input cooling & freezing appliances, cabinets with not-PU insulation)
- any residue fractions missing

⇒ **check** with **real data** achieved (e.g. paper documentation)

⇒ cross-check with **experience data** / results from other treatment partners

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### ➤ A-typical yield results

- ☒ In case of an **a-typical yield results** (e.g. special WEEE input stream, special WEEE fraction)
  - ⇒ give a **remark** in the **input remarks** (for the whole report = WEEE input fraction) or in the **internal name** (for the fraction treated)
  - ⇒ give **information** in the '**source of data**' (see remarks at page 38)
- ☒ (Very) **High yield** / share of **metals** from WEEE input category or WEEE fractions (e.g. cables)
  - ⇒ compare with **results from other treatment partners**
    - ⇒ cross-check with **experience data**<sup>38</sup>
    - ⇒ and see above 'a-typical result'

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### ➤ First step fraction is final fraction – most time NOT

- ☒ **Dismantling fraction / 1st fraction** goes **direct** to **final technology** with classification of use as '**recycling**' - most time NOT:
  - ⇒ in most cases dismantling fractions / 1<sup>st</sup> fractions will be forwarded to further **shredding/grinding** and/or **separation** or **conditioning steps** (= interim technologies with yield of fractions)
  - ⇒ for '**low level recycling options**' ask for **approval** about **which products** are achieved – see next point

*examples further separation:*

- **CRT glass 'parts'** direct to e.g. CRT production or other glass production? NO: CRT glass 'parts' from dismantling will be forwarded to **CRT glass grinding/cleaning** – see next point not 100 % products
- **plastics** from 1<sup>st</sup> step treatment (dismantling, shredding) direct to plastics recycling / products? NO: plastics fractions from dismantling and/or coarse shredder treatment (incl. shredder for cooling & freezing appliances) will be forwarded to further **separation/conditioning steps** – see next point not 100 % products
- **concrete 'parts'** from dismantling to e.g. road construction? NO: concrete 'parts' from dismantling will be forwarded to **mineral conditioning** → yield of concrete 'pieces' or 'fines' which may be forwarded to road construction; in case of concrete parts from washing machines often/also Fe-fraction separated
- **flat glass 'parts'** from dismantling → most times go to 'other glass conditioning'

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### ➤ First step fraction goes 100 % to products / recycled – most time NOT

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- ☒ **Dismantling fraction / 1st fraction** goes **100 % to product = 100 % 'recycled'** - most time NOT:
  - ⇒ in most cases dismantling fractions / 1<sup>st</sup> fractions will be forwarded to **further separation steps** (see point before) where at least **some % of residues** fractions will be separated for any more 'low level' use (e.g. incineration or landfilling of residues)
  - ⇒ for '**low level recycling options**' ask for **approval** about **which products** are achieved

*examples:*

- **CRT glass 'parts'** direct to e.g. CRT production or other glass production, 100 % glass to product? NO: CRT glass 'parts' from dismantling will be forwarded to **CRT glass grinding/cleaning, different kinds** or

<sup>38</sup> ask in case at WF-RepTool expert group if data are available

**qualities of glass** will be separated being forwarded to different technologies, additionally some % of **residues** will be separated, most time forwarded to any 'lower level' use or to landfill, consider also remarks on technologies/use for CRT glass – see point 'CRT glass', page 32 plus: check for fraction/s with fluorescent coating material – see 'Don't lose the hazardous waste attribute (\*)', page 5

- **plastics** from **1<sup>st</sup> step** (dismantling, shredding) direct to plastics recycling, 100 % plastics to products? most time NO : plastics fractions from dismantling and/or shredder treatment will be forwarded **to further separation = conditioning steps**, most time **different qualities of plastics** will be separated (different next step technologies and uses, e.g. high quality plastics to granulated, lower quality plastics to other products), **some % of residues** will be separated and most time forwarded to any 'lower level' use (e.g. incineration (different options) or landfill) – see point 'Plastics from shredder processes', page 31

examples 'low level recycling options':

- **plastics** from **1<sup>st</sup> step** treatment (dismantling, shredding) may be forwarded to any 'production of other products of/with plastics' like park benches etc., also in this case there is most time a **further separation / conditioning** step before, and some % of residues are separated – see point above; if the next step treatment operator insists on **100 % product yield**, ask for any **approval** about **which products** are achieved and give a remark in the internal name and/or under 'use in final technology' (see 'Approval of products requested', page 27, see 'Plastics from shredder processes', page 31).

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## Examples for not plausible yield of fractions from dedicated fractions

### ➤ Yield fractions from circuit board fractions

- ☒ Fraction of **hard plastics** (pieces) from **circuit board fractions** / **circuit board chassis** from dismantling – NO:

⇒ a yield of **hard plastics** from a **circuit board fraction** from **dismantling** has **to be checked**, try to have a look at / get a picture of the fraction!

example:

- cases seen that from dismantling of circuit boards from large household appliances, it is a fraction of mainly hard plastics, with some (small shares of) circuit boards – in this case I would choose a name for the fraction as 'plastics xyz and give a remark in the internal name 'incl. circuit boards' – otherwise also results on circuit boards dismantled are not comparable with other results!
  - in treatment/separation = yield results of this fraction a circuit board fraction should be shown
  - if forwarded to smelters, such a fraction will often be pre-shredder to separate hard plastics (e.g. to add them in controlled manner as fuel substitute) – ask for pre-shredding results; if you don't get separation results, give a remark that you are sure that hard plastics are given as composition of the fraction

⇒ if it is a **circuit board fraction** (pieces of circuit boards) from **mechanical treatment and separation** (code 19 12 xx), a yield<sup>39</sup> of **hard plastics** is **not plausible**;

- call the organic **base material** of **circuit boards** as **organic residues** – see also:

⇒ see 'Circuit board fractions', page 30

⇒ see 'Circuit board chassis / non-ferrous metals mixtures to smelters', page 29

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### ➤ Yield fractions from cables

- ☒ Very high yield of metals – e.g. **70 % Cu fraction** from cables – NO:

⇒ possible yield of **Cu** see **experience data** (e.g. regular cables 35 – 42 % Cu), in very special cases – see 'A-typical yield results', page 14

<sup>39</sup> see later: 'plastics' also not plausible as composition data

☒ Only **Cu fraction** and (cable) **plastics** fraction for **plastics recycling** – NO:

⇒ you should expect a **residue fraction** of plastics not going to plastics recycling

☒ If only **Cu fraction** and **cable plastics** as yield data?

⇒ fraction of **cable plastics** should be **further separated** at the acceptor, some % residues from separation beside any plastics going to products, not plausible that 100 % to plastics recycling

⇒ see 'Cable plastics', page 32

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## Components of final fractions<sup>40</sup>

☒ **Cross-check** name of fraction (see 'Names of/for fractions', page 11) with **composition data**

⇒ for '**pure**' fractions (< 2 % impurities') **100 %** of the **main component** is possible & 'allowed', you may give more detailed information (e.g. 1 % organic residues'),

⇒ for fractions '**not pure**' **other shares** of the composition have to be shown (e.g. organic or inorganic residues)

☒ Use of **component** of '**other metals**'?

⇒ set **priority** to provide information/shares of **components Fe, Cu, Al**, only for the 'rest of metals' (e.g. Zn, Sn, Pb, etc. ) use 'other metals'

TOP

☒ Use of **component** of '**residues**'?

⇒ use composition '**residues**' (organic or inorganic) only for '**impurities**' in/of other fractions (the 'non-target' material of this fraction)<sup>41</sup>

TOP

⇒ set **priority** to use:

a) '**fractions**' (e.g. plastics, other organic fractions, glass, other inorganic fractions) for fractions separated as '**target fractions**' (e.g. target to separate any plastics fraction, wood fraction etc.)  
(→ see more options to split & characterize the 'use' later)

b) you may use '**mixed fractions – disposal**' for mixed fractions separated and forwarded to a disposal process (for fractions going to landfill, 'regular' MWI)  
– see next point

☒ Use of component/composition of '**mixed fractions – disposal**'?

⇒ use composition 'mixed fractions – disposal' for **mixed fractions separated and forwarded** to a **disposal process** (for fractions going to landfill, 'regular' MWI)

⇒ **don't use** as composition data for any **impurity** in another 'target fraction' of e.g. metals or plastics fractions, use in this case '**residues**' – see point before

⇒ beside 'mixed fractions – disposal' you **don't need** to give information on any **other components** and/or any **residues** in this fraction<sup>42</sup>

<sup>40</sup> fractions delivered to final technologies / final processes; 'Components' coming from composition, not from components dismantled/removed

<sup>41</sup> see special requirement of Recupel to ask for separate information on hard plastics

<sup>42</sup> see special requirement of Recupel to ask for separate information on hard plastics

- ☒ **Residue fractions** from treatment or **waste fractions** (e.g. from dismantling) are **not** necessarily **100 % organics!** (see when e.g. input to any co-incineration or MWI - high energy efficiency (R1))

⇒ determine **real composition data** (organics <> not organics)  
e.g. by rough estimation by view analysis or any sampling results

⇒ see also point '*Classification of use of plastics, other organic fractions or organic shares*', page 25

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## Plausibility of composition data of final fractions

### ➤ General composition data, a-typical results

- ☒ For many WEEE fractions experience data on the composition of final fractions are available<sup>43</sup>. In case of an **a-typical results of composition data**:

⇒ give a **remark** in the **internal name** for the final fraction  
⇒ give **information** in the '**source of data**' (see remarks at page 38)

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## Examples for not plausible composition data of final fractions

### ➤ Composition of circuit board fractions

- ☒ **Circuit board fractions do not consist of 100 % other metals!**

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⇒ see **experience data** – circuit board fractions **consist of**  
(Fe – if chassis), Cu, Al, other metals [see '*priority to provide information/shares of components Fe, Cu, Al*' at page 16] organic residues, inorganic residues (if high quality, e.g. glass fibre reinforced)

⇒ see '*Circuit board fractions*', page 30

⇒ see '*Use of data from analysis for circuit board fractions*', see page 29

- ☒ **Circuit board fractions do not consist of hard plastics<sup>44</sup>**

⇒ use **organic residues** instead – see this is a target fraction of Cu, other non-ferrous metals and precious metals and organic shares are the 'impurities'  
[see remarks on '*use composition 'residues'*' at page 16]

⇒ see '*Circuit board fractions*', page 30

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<sup>43</sup> cross-check with data from other treatment partners, in case ask the WF-RepTool expert group for

<sup>44</sup> see also no yield fraction of hard plastics – page 15

## Use general data or data for WEEE input category or fraction?

- ☒ **Which data** - data (composition data or yield of fractions) from/for an **individual WEEE treatment stream** ⇔ **general data** for a 'mix' forwarded from the plant (e.g. non-ferrous metals fraction, plastics fraction) – shall be used?

options:

- **data** for the delivery of a '**mixed fraction**' forwarded from the plant of the treatment operator to the acceptor (e.g. is mixture of WEEE stream A, B, C +/- other material)
- **analysis** for fractions from **WEEE treatment stream** – even by handpicking, small scale analysis

⇒ **data** for the **fraction** from/for the **WEEE treatment stream** shall be used (e.g. analysis for a batch from SHHA, not for the 'mix' of the regular delivery)

TOP

⇒ ad **metal fractions**: priority for analysis from acceptor but if 'mixed delivery' to acceptor and no option to get data for the WEEE treatment stream, internal sorting analysis or chemical analysis preferred;

⇒ ad **plastics fractions**: first priority for analysis from acceptor but if 'mixed delivery' to acceptor and no option to get data for the WEEE treatment stream, internal analysis for material from WEEE treatment stream BUT under consideration of the target plastics of the acceptor, options of separation by the acceptor and technologies chosen by the acceptor for the fractions achieved.

- ☒ Use of **general data/analysis** for **input material** for/to accepting plant?

examples:

- 2/several different fractions delivered to same accepting plant, same yield data as information?
- general information for different circuit board fractions delivered to smelters?

⇒ no, **yield** or **composition data** should give a picture of the **individual fraction**

⇒ if **no individual data** are **available**, i.e. general data for a mix have to be used, you should give a **remark** (e.g. in the internal name 'data for xyz' or in 'source of data' - see remarks at page 38)

⇒ data/analysis of accepting treatment partners should be **checked** for **plausibility** for the **fraction delivered** (consider: not only the existence of a downstream statement should be checked, also the content should be checked!)

- ☒ **Total yield** of the **accepting plant**? (e.g. plant which is processing quite some other input material too, e.g. shredder or (plastics, mineral) conditioning plant, incineration plant)

⇒ no, determine - even estimate - **yield** with or **use** of components of the **individual fraction** from the **WEEE treatment stream** (e.g. do view analysis or handpicking analysis of the individual WEEE fraction and estimate yield or use of components on base of the technology used)

examples:

- CRT glass 'pieces' and CRT glass 'fines' are delivered to same plant/same process → same yield of fractions?: NO
- general slag/ash yield from incinerator?: NO ... and use of slag as xyz?: NO  
see points 1) 'Target of use approach', page 6 & 'Apply the target of use approach', page 24 and 2) 'Slag and ashes', page 34

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## Pre-treatment step or final treatment step to be used for classification?

### ☒ Example **PU foam** used as '**oil binding material**':

⇒ we understand the technology and the use '**production of / use as oil binding material**' as a technology where 'real oil binding material' is produced as a **defined product** (e.g. definite quality specifications), packed in bags and used e.g. by the fire brigade, at car workshops etc. to bind/suck off oil spillages coming from (work) accidents,

⇒ we understand the **mixing of PU foam** with liquid wastes (used colours, paints, solvents, resins,...) for the later use in co-incineration processes as '**conditioning of high caloric material**' (interim technology) and the **co-incineration** plant is the final technology (e.g. 'used for fuel substitution' → ER)<sup>45</sup>

### ☒ **NEW20 updated** Other **WEEE fractions** used for '**conditioning**'<sup>46</sup>:

⇒ also for other WEEE fraction used for 'conditioning' of other wastes (e.g. paints) for incineration (e.g. also hazardous wastes incineration) only the **classification** of the **use** in the **final technology** may apply which means in case of following examples:

- e.g. plastics/PU or other organic fractions (e.g. wood) +/- mixed with other wastes > used for fuel substitution' in 'co-incineration - with ER': ER
- e.g. plastics/PU or other organic fractions (e.g. wood) > incineration with high energy efficiency (R1)' in 'municipal waste incineration - high energy efficiency (R1) (to be approved)': ER
- e.g. plastics/PU or other organic fractions (e.g. wood, oil) +/- mixed with other wastes > hazardous waste incineration' > use fuel substitution but 'purpose of plant' waste incineration': TD  
(see '*Purpose of the plant*' of municipal waste incineration, page 8)

### ☒ **NEW20 updated** The yield of fractions from **cracking** [fractions from cracking of plastics (and oil) have been foreseen in the new list of OUTPUT fractions in 2013) (fuels and liquid/solid residues)]:

⇒ the **cracking process** is seen as **interim technology**, the use of the fractions achieved will be classified according to the **final technology** applied

- fuels: according to information it is expected that fuels achieved shall be used as/for<sup>47</sup> internally or externally in co-incineration plants: ER, in case product level will be achieved
- liquid residues are expected to contain hazardous substances and are expected as to be incinerated with regard on this: TD<sup>48</sup>
- solid residues are expected to contain hazardous substances and are expected as<sup>49</sup> to be disposed with regard on this, e.g. landfills: LD

<sup>45</sup> see also recycling definition (see page 5) '... does not include energy recovery and the reprocessing into materials that are to be used as fuels ...'

<sup>46</sup> sometimes but not correctly called stabilization'

<sup>47</sup> to be cross-checked with final technologies applied in reality

<sup>48</sup> to be cross-checked with final technologies applied in reality

<sup>49</sup> to be cross-checked with final technologies applied in reality

- ☒ **NEW20<sup>updated</sup>** Delivery to any **R4<sup>50</sup>** or **R5<sup>51</sup>** **acceptor** to be seen as **100 % recycling?**

examples:

- ⇒ *WEEE fraction going to a further separation process (acceptor classified as R4)*
- ⇒ *mineral fraction, sieving or filter material (incl. organic residues) going to 'mineral conditioning' (acceptor classified as R5)*

⇒ **no, not** to be classified as **100 % recycling!**

- the WFD 2008, Annex II sets out a non-exhaustive list of **recovery operations**, this is **not** a list of **recycling operations**

- in case R4 or R5 operators do a **separation of fractions** only- see also an acceptor running a shredder technology may be seen as R4, 'his' results will not be fractions, which will be classified as recycling per se ...

⇒ the question on **which technology** is applied for the **fractions achieved** has to be raised and the **yield** and/or the **composition of fractions** have to be determined [for the WEEE fraction delivered - see point 'Total yield of the accepting plant', page 18]

⇒ **final fractions achieved** by the separation or conditioning (or the mixing) have to be determined and to be used for the classification, i.e. '**their**' **composition** and the **use in the final technology** [see also 'Approval of products requested', page 27]

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#### Examples of technologies not to be accepted for dedicated WEEE fractions

*Technologies or uses not to be accepted shall be limited by regulations or standards (see WLX / EN standard) In the following list we give some examples mentioned.*

- ☒ **Compressors** from cooling and freezing appliances shall **not be prepared re-used**<sup>52</sup>.
- ☒ For **PU foam > 0.2 % (H)CFC** no use of the fraction classified as **recycling [(M)R]** shall be chosen<sup>53</sup>.
- ☒ **Cleaned CRT** glass must be **recycled or recovered** (may not be disposed of) when exported **outside EU / EFTA**<sup>54</sup>.

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#### What to do if no information on final technology

- ☒ See the **final technologies** have to be given (see page 5).
- ☒ If **no information** on the **final technology** is provided by the waste collector / trader and/or treatment operator (e.g. separator) **at all**:  
 ⇒ first step option: start with **best estimations** and give a **remark** (e.g. 'technology estimated')

<sup>50</sup> R 4 Recycling/reclamation of metals and metal compounds

<sup>51</sup> R 5 Recycling/reclamation of other inorganic materials (\*\*\*), (\*\*\*). This includes soil cleaning resulting in recovery of the soil and recycling of inorganic construction materials.

<sup>52</sup> see WLX standard treatment – requirements cooling & freezing appliances point 1.3, Step 1, point 6: Compressors shall not be re-used.

<sup>53</sup> see WLX standard treatment – requirements cooling & freezing appliances point 1.3, Step 2, point 3: After treatment PU-fractions shall **contain not more** than 0.2 % CFC, HCFC, and HFC

<sup>54</sup> see WLX standard treatment – requirements Specific requirements for the treatment of CRT display appliances point 5.3.6 Export of cleaned CRT glass outside the EU and EFTA territory is only permitted for the purpose of recycling or recovery.

☒ Special case - information stops at '**pure**' 1-kind metal fractions:

⇒ the **final technology** (steel mill, Cu smelter etc.) may be **estimated** on base of the **kind of the metal** (see exception under '*Follow the treatment chain until the final technology is applied*', page 5)

☒ Special case - information stops at the **sorter / separator** and only **yield data** of fractions are available – options:

use the **yield data** of fractions and **estimate** the **final technologies** on base of information on the **fractions achieved**

(for names of acceptors use e.g. 'no information from acceptor')

- see '*Names of acceptors*

⇒ Name of acceptor', page 12)

and give a **remark** that chosen technologies are estimations (e.g. in internal name)

⇒ use the **yield data** (of sorting / separation) as **composition data** and **apply** one of the options of '**simplifications**'<sup>55</sup>

a) for sorting/separation results of '**pure metal mixtures**' you might apply the option '*Summary result - output to different smelters*' (see page 41), in this case you have to give the **remark** 'summary result - output to different smelters' in the **internal name**<sup>56</sup> (consider limit values, see page 41)

b) for sorting/separation results of '**not pure**' metal mixtures' you might apply the option '*Summary result - output to different applications*' (see page 40), in this case you have to give the **remark** 'summary result - output to different applications' in the **internal name**<sup>57</sup> (consider limit values, see page 41)

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## Approval of/from technologies requested

### ➤ Approvals of (Cu) smelters

☒ **Use of organics** (fractions or shares/residues) in '**special**' smelters – **TOP** requirements:

⇒ the definite **use of organics / organic shares** (e.g. organic residues of circuit boards) in smelters as 'used for fuel substitution' or 'used as reducing agent' **must be approved** **NEW20 explain** by e.g. an **energy concept** to use the organics from input fractions as fuel (this is the base to call (and choose) smelters as 'special' smelters!)

⇒ the **approval** shall be given by an **independent study**

- any **public information** of the smelters (e.g. brochures, environmental reports or internet information) might be used as a **start-up information only**

⇒ **NEW20 explain** in this case you may choose the use 'used for fuel substitution'? – see page 25

<sup>55</sup> agree with the WEEE system / WF-RepTool administrator

<sup>56</sup> this is the base for an interpretation of this result as correct - see recovery of all metals in one smelter would not be plausible (see also 'Not all metals may be recovered as metal' page 18)

<sup>57</sup> see footnote 56 above – this is the base for an interpretation of this result as correct= to accept component data as fractions going to different applications

☒ **Slag as by-product or definite product** - requirements:

- ⇒ generating a **slag by-product** should be **approved** by the **smelter**
- ⇒ the **approval** shall be given by a **written document** of the **treatment operator** which
  - approves the **technology** to achieve the slag as by-product and the **by-product** achieved;
  - any **public information** of the smelters (e.g. brochures, environmental reports or internet information) might be used as a **start-up information only**
    - ⇒ for approval/s of **definite product/s** of/from/with slag see 'Slag from (Cu) smelters as defined product/s', page 29

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➤ **Approval of MWI as R1 plant and/or as plant with special use of organics**

☒ Use of **organic fractions** or **shares** in **municipal waste incinerators** with **R1 approval**:

- ⇒ '**regular**' **municipal waste incinerators** are classified as **disposal process** by a judgement of the European Court (see 'purpose of the plant', see page 8) BUT ...
  - ⇒ given by the Waste Framework Directive 2008 (WFD 2008) there is a **R1<sup>58</sup> classification possible**, if energy **efficiency limits** are kept<sup>59</sup> - in this case
    - ⇒ an **R1 approval** should be kept from the MWI plant/s being used as **delivery destination/s** (see name of the acceptor is necessary!)
      - ⇒ this **R1 approval** should be an **official approval** given by
        - the relevant **authority** or
        - any **independent study** or
      - in case an approval for plants of a region (see overview NL)
        - ⇒ Only in this case
  - the **technology** '**municipal waste incineration - high energy efficiency**' and
    - the use '> **incineration with high energy efficiency (R1)**' may be chosen.

☒ Use of **organic fractions** in **municipal waste incinerators** for **special use**:

- ⇒ in special cases/special plants a **special use** of organic fractions in (regular) **municipal waste incinerators** has been reported (e.g. to heat up plant)
  - ⇒ this **special use** has to be **approved** by the treatment operator (for this, the name of the acceptor is necessary!)

<sup>58</sup> R 1 Use principally as a fuel or other means to generate energy (\*)

<sup>59</sup> (\*) This includes incineration facilities dedicated to the processing of municipal solid waste only where their energy efficiency is equal to or above:

— 0,60 for installations in operation and permitted in accordance with applicable Community legislation before 1 January 2009,  
— 0,65 for installations permitted after 31 December 2008,

- ⇒ the **approval** shall be given by a **written document** of the **treatment operator** which
- approves **possible input fractions** (e.g. plastics of definite quality classes) for this special use and the **technology** to use the organic fractions (e.g. injection facilities);
  - any **public information** of the incinerator (e.g. brochures, environmental reports or internet information) might be used as a **start-up information only**

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#### ➤ **Approval of HWI as R1 plant and/or as plant with special use of organics**

- ☒ Use of **organic fractions** or **shares** in **hazardous waste incinerators** with **R1 approval**:

⇒ at present there are **no HWI plants** with **R1 approval** known to the WF-RepTool expert group, if this would change, the **same requirements** as for **MWI plants** would apply – see point before

- ☒ Use of **organic fractions** in **hazardous waste incinerators** for **special use**

⇒ in special cases/special plants a **special use of organic fractions in hazardous waste incinerators** might be possible (e.g. to heat up plant)

⇒ this **special use** has to be **approved** by the treatment operator (see name of the acceptor is necessary!)

⇒ the **approval** shall given by a **written document** of the **treatment operator** which

- approves **possible input fractions** (e.g. plastics of definite quality classes) for this special use and the **technology** to use the organic fractions (e.g. injection facilities);
- any **public information** of the incinerator (e.g. brochures, environmental reports or internet information) might be used as a **start-up information only**

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#### ➤ **Approvals of HWI on use of other input fractions**

- ☒ Use of **glass** (or other) **fractions** in **hazardous waste incinerators (HWI)**:

⇒ in special cases/special plants a **special use of glass fractions in hazardous waste incinerators** has been reported (e.g. to use glass as slag forming component to generate a protective layer in the drum of the HWI plant)

⇒ this **use** has to be **approved** by the treatment operator (the name of the acceptor is necessary!)

⇒ the **approval** shall be given by a **written document** which approves:

- the **technology** and the positive effect of the input fraction
- **possible input fractions** (e.g. glass of definite quality classes),
- the **kind and weight of material otherwise** to be applied as slag forming component (see requirement for 'recovery': replacing other materials, e.g. approved by former delivery documents)

⇒ the **classification of use** 'glass > used for feedstock substitution as slag forming component > slag not as by-product or as defined product for use' may be chosen (**OMR**)

(see requirement for 'recovery': replacing other materials fulfilled)

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## Apply the target of use approach

TOP

### ☒ Provide 'target of use' data or output fractions from final technologies?

- ⇒ Apply the '**Target of use approach**' (see page 6)  
*[short: you shall list the component/s of the input fraction to any final technology and the **planned use** of this component in the final technology]*  
 and **not** the  
 ▪ **output** of/from the **final technology** and it's **application**

examples:

- **Fe fraction** – 'target of use' of Fe is Fe recovery, not the yield of Fe from the steel mill is asked
- **inorganic residues** or **metals** going to **slag** – 'target of use' as slag as defined product for use as xyz, not the real yield of slag! + approval of application should be asked
- '**circuit board fraction/s**' – 'target of use' of the components of the fraction, not the output of Cu, metals, slag from the smelter! → determine the composition (or e.g. small scale analysis) and apply the target of use approach; see option 'Use of data from analysis for circuit board fractions', page 30
- **fractions** forwarded to **incineration processes** – 'target of use' of components of the fraction, not the output of the incinerator!
  - clear for plastics, other organic fractions, organic shares (residues) → used for fuel substitution (see exception for regular MWI, page 25) <> not the real 'efficiency' of the plant of incineration of the input fraction, you will not mention the fraction CO<sub>2</sub> as output!
  - but also not to determine ashes, slag or metal yields and the use of these fractions – see point before under 'Regular municipal waste incinerators – NO use of components', page 25, 'Slag and ashes', page 34, 'Metals separated from slag / ashes', page 37; see also 'Total yield of the accepting plant', page 18

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## Choose the 'use' in 'final technology'

TOP

The 'final technology' is the technology applied by the final acceptor.

### ☒ Choosing the 'use' of any fraction/component in the 'final technology' is the **core element** to come to the **classification** as recycling and recovery.


### ☒ How to **find & choose** the correct 'use in final technologies'?

- ⇒ see the **scroll-down** of 'Use in final technology' for **pre-selected uses** for the given component (quick choice for experienced/advanced users) ... or
- ⇒ if you are **not sure** which use to choose or **to check** the options of the scroll-down, search the **list of available uses**<sup>60, 61</sup> and **cross-check** the **given technology** (i.e. the final technology of the acceptor) with **examples of technologies** given in the list under 'Examples technology' (e.g. use the find/filter option with/in 'Examples technology contains')  
 ⇒ if you **don't find** the technology you are looking for/you apply, choose the use in a **similar or comparable technology** but ...  
 ⇒ consider the **technical / technological properties** in the technology (see 'Not all metals may be recovered as metal', next point)

### ☒ **Don't use** the option for '**other use**' (e.g. as you don't want to search for options)

- ⇒ **choose** from **given options**  
 ⇒ to prepare a '**list of available uses**' was the **core element** of work for the WF-RepTool development (i.e. to investigate, select, find a common wording for

<sup>60</sup> see ling: 'List of available components use in final technology'

<sup>61</sup> to be opened with the -button beside 'Use in final technology' scroll down

the possible options of use) and - with this - the **classification** as recycling and recovery

- ⇒ amounts/shares with the choice of 'other use' **will not be counted to total results** under the **WF-classification**<sup>62</sup> (as the WF-RepTool expert group could not agree on & pre-set the classification of use), results will not be comparable with other data

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### Examples for classification of use not to be accepted

#### ➤ Not all metals may be recovered as metals in one smelter!

- ☒ There are **dedicated metal smelters** (or furnaces or other technologies) for the recovery of **dedicated metals**:

- ⇒ take care **not to use options** which are **technological not possible!**  
please follow the advice in the point before ('if you are not sure')  
to search the examples for technologies **for the component** you search the use for

examples:

- NO Fe recovery in a Cu smelter! – see option for Fe as reducing agent, Fe-oxides go to slag, 'model 2' – different options for use of slag
- NO Cu recovery in a steel mill! – see very low limits of Cu for input of scrap to regular steel mill, in case of special steel mills/special steel, use as alloy material
- NO Al recovery in a Cu smelter! – see low limits, Al will burn off in regular smelter → Al-oxides not 'liked' in slag and/or products (technical properties), see separation of Al from circuit board fractions or similar fractions before Cu smelter (see page 30)

- ⇒ see option to use **simplifications** e.g. 'Summary result - output to different smelters' page 41) with given restrictions

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#### ➤ Regular municipal waste incinerators – NO use of components!

TOP

- ☒ For **regular municipal waste incinerators** (MWI and HWI) ...

- ⇒ in general: **no use of components** may be chosen – see '**purpose of the plant**' (see page 8) BUT:
- **use of organics** for classification as ER **only** if **R1 approval** (see next point) or '**special use**' in the plant to be **approved** (see remarks under 'Approval of/from technologies requested' at page 22)
  - **NEW20** option to **count** separation/use of **metals** if quality criteria are met but low plausible for WEEE appliances and WEEE fractions - see 'Metals separated from slag / ashes', page 37
- ⇒ yield & application of **slag not to counted** - see also 'Slag and ashes', page 34

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#### ➤ Classification of use of plastics, other organic fractions or organic shares

- ☒ For **plastics, other organic fractions** or **organic shares** of WEEE fractions the use of the fraction/share classified as **ER** (energy recovery)<sup>63</sup> may **not** be chosen for '**regular**' **municipal waste incinerators**.

- ⇒ see point above

<sup>62</sup> you may only set a national classification

<sup>63</sup> 'used for fuel substitution' or 'incineration with high energy efficiency (R1)'

- ⇒ only if the incinerator may be classified as '**municipal waste incineration - high energy efficiency**' and an **R1 approval** is provided  
(see remarks under '*Approval of/from technologies requested*' at page 22)
- ☒ The classifications of use '**used for fuel substitution**' or '**incineration with high energy efficiency (R1)**' may **not** be used in all cases for the **total input** of the fraction...
- ⇒ use only for the **organic fractions** or **share** of the fraction (i.e. not for any inorganic material (fractions or residues), metals), '*Apply the target of use approach*', page 24  
⇒ see also '*Total yield of the accepting plant?*', page 18
- ☒ For **plastics** or **organic shares** of WEEE fractions the use of the fraction/share classified as **ER (energy recovery)** may **not** be chosen in '**traditional**' **smelters**
- ⇒ see 'Use in final technology': '**no definite use** in smelter' = TD  
(see 'list of available uses' in '*Choose the 'use' in 'final technology*', page 24)  
⇒ only if approval as '**special**' **smelters**  
(see '*Approval of/from technologies requested*', page 21)
- ☒ For **plastics** or **organic shares** of WEEE fractions the use of the fraction/ use '**used for fuel substitution**' may not be chosen in '**special smelters**
- ⇒ please **don't choose** the use 'incineration with high energy efficiency (R1)', this use is foreseen for the technology 'municipal waste incineration - high energy efficiency (R1)

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#### ➤ **NEW20** Classification of use of slag delivered to landfills

- ☒ **Slag** delivered to **landfills** not meeting product requirement (see e.g. point *Slag from (Cu) smelters as defined product/s*, page 29) may **not** be classified as '**recycled**':
- ⇒ also for the case that **glass** from **gas discharge lamps** (incl. mercury) is treated in an HWI and **two positive effects** are given – the protection of the drum by a glass-slag layer (see *Approvals of HWI on use of other input fractions*', page 23) and the separation of mercury - but the slag from the incinerator is delivered to a landfill site, the use of glass may **not** be **classified** as '**recycling**' even if it is approved that the 'best available technology' (BAT) is applied.
- Arguments are:
- ⊖ there is **no definite product** achieved **not being waste!**  
(see 'recycling' definition, see also '*Approval of products requested*', page 27 .
- ! a HWI is a disposal process and in principle no use of components should be counted (see page 8), in this special case glass is replacing other slag forming materials (see meeting the 'recovery' definition), therefore we offer the option to count is as OMR.
- ? In case the **relevant authority** may **approve** any classification as 'recycling' (national classification); this has to be approved by **written document** from the authority referring to the '**recycling**' classification (not to Rx technology, not to BAT!)

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#### ➤ **NEW20** Use of **inorganic shares** not to be counted

- ☒ The use of **inorganic share** of any WEEE fraction treated in energy recovery processes may not be counted as 'recycled':
- ⇒ see point '*Slag and ashes*', page 34 on this

## Approval of products requested

**NEW20 updated** See based on the definition of 'recycling'<sup>64</sup> given by the WFD 2008<sup>65</sup> and requirements for the determination and calculation of data for the treatment of WEEE (see CID 2019 WEEE, see 'Recycling definition' at page 7 – see there: only main materials mentioned, not mixtures of materials like very common for treatment of WEEE, only limited options for recycling operations mentioned), we see it as one option to **classify** any use of a WEEE fraction as **'recycled'**, if reaching the **product attribute** can be **approved**.

In the WFD 2008, adopted by WFD 2018<sup>66</sup> (see Article 6) there are options given to achieve the **'end-of-waste status'** for waste fractions. This 'end-of-waste status' would make it easy to exclude these 'end-of-waste products' from the waste attribute and to classify them as 'recycled' or on base of the 'intended' final technology e.g. as used for 'energy recovery' (see *'Follow the treatment chain until the final technology is applied'*, page 5).

But for quite some fractions achieved from WEEE treatment<sup>67</sup> the end-of-waste attribute may not be achieved at least in a short time period (see CRT glass excluded from EOW criteria for glass, no end-of-waste regulation for special mineral fractions 'in sight').

We try to use a **simplified approach** to work within the WF-RepTool taking into account the **end-of-waste criteria** from WFD 2018, Article 6 as guidance to find the **product attribute**:

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

We distinguish WEEE fractions to be used as 'products' **directly = without** or **after** further treatment (e.g. mixing/conditioning/separation...) – see following.

The **'proof' of products** shall **not be necessary** if already **pure, separated fractions** are achieved and the **typical technology** for this fraction is applied.

examples **NEW20 adapted (see CID 2019 WEEE)**:

- all 'pure' 1-kind metal fractions forwarded to the applicable smelters
- separated kinds of plastics polymers (e.g. ABS, PS, PE/PP, PVC) **entering** pelletisation, extrusion, or moulding operations
- separated mixed plastics after plastics conditioning (i.e. separation of 'bad plastics', other material, fines, residues) **that** do not undergo further processing before their use in a final product
- **sorted glass** entering a glass furnace or the production of filtration media, abrasive materials, glass based insulation and construction materials
- **sorted wood** that does not undergo further treatment before utilisation in particleboard manufacture
- mineral fraction of pure/clean concrete 'pieces' forwarded to e.g. concrete production

<sup>64</sup> **'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;

<sup>65</sup> OJ L 312, 22.11.2008, p. 3 - DIRECTIVE 2008/98/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 19 November 2008 **on waste** and repealing certain Directives, Article 3

<sup>66</sup> OJ L 150, 14.6.2018 p. 109 - DIRECTIVE (EU) 2018/851 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 30 May 2018 **amending** Directive 2008/98/EC **on waste**

<sup>67</sup> see Council or Commission regulations for end-of-waste status are only available for iron/steel, aluminum, copper, glass cullets – see [http://ec.europa.eu/environment/waste/framework/end\\_of\\_waste.htm](http://ec.europa.eu/environment/waste/framework/end_of_waste.htm) and follow link to JRC reports

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➤ **Defined products** from WEEE fractions **without** further treatment

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TOP

- ☒ For **‘defined products’** from **WEEE fractions without** further treatment (WEEE fractions are ready for application when forwarded from the site of the treatment operator = delivery next step = to final application/final technology) ...

examples:

- mineral fraction of concrete ‘fines’ (‘sand’) separated as e.g. ‘technical sand’ for e.g. road construction
- CRT glass fractions as road construction material – see also ‘CRT glass’, page 32
- CRT glass fractions for other defined construction purposes, in case for defined construction purposes at landfill sites (e.g. draining material) – see also ‘CRT glass’, page 32
- plastics fractions as construction material, in case for defined construction purposes at landfill sites

...the following **proofs** should be asked (may be further developed):

- ⇒ **product specification** – including
  - approval of meeting **product specific technical requirements** or **requirements of standards** (e.g. like for certified recycling construction materials like e.g. freezing stability, pressure stability, temperature stability, gas and water permeability or percolation factors)
  - limit values given for the fraction (e.g. organic shares, metal content, etc.)
  - average results achieved for these limit values
- ⇒ **approval of application** by the acceptor (take care: statement that material is solely and exclusively used for the application mentioned (not ‘beside other applications ...’)
- ⇒ any **product / brand name** for this material (not obligatory)
- ⇒ information about the **price/revenue** or necessary **payment** to the acceptor and/or **difference** to other options (e.g. also negative market value possible) (not obligatory, indicator for ‘higher value’ than other options)

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➤ **Defined products** from WEEE fractions **after** further treatment

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TOP

- ☒ For **‘defined products’** from **WEEE fractions after** further treatment (WEEE fractions are further processed at the next treatment operator) ...

examples

- CRT glass, glass or other pieces or e.g. mineral fines etc. for concrete blocks, tiles, ...
- CRT glass, glass or other pieces or e.g. mineral fines e.g. to products for construction purposes (e.g. sand added to asphalt production)
- plastics products from plastics from 1<sup>st</sup> step treatment / shredder processes (see pages 14 and 31)
- plastics products from cable plastics (see page 32)
- all other products of/with plastics, other products of/with plastics and other products of/with glass

... the following **proofs** should be asked (may be further developed):

- ⇒ **product specification** – including
  - information on **which share (%)** of the forwarded WEEE fraction **is applied** in the **product** or in the **process** (see next point)
  - information about **meeting of technical specifications/requirements**, take care: including information **that with** and **the given share (%)** of the **WEEE fraction**
  - any **leaching tests** with the product achieved (e.g. CRT glass) (including information on test material e.g. size, test method e.g. pH value), take care: including information on **that with** and **the given share (%)** of the **WEEE fraction**

⇒ **process description**

- information about any **further separation** of the delivered WEEE fraction, including yield data
- information about in **which process step/s** the WEEE fraction(s) is(are) applied, in **which shares**

⇒ **product / brand name/s** for product/s achieved should be given (not obligatory)⇒ information about the **price/s/revenue/s** for **delivery of WEEE fraction** and/or **difference** to other options (e.g. also negative market value possible, see further processing necessary) (not obligatory, indicator for 'higher value' than other options)

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➤ <b>Slag from (Cu) smelters as defined product/s</b>
---

☒ **Slag as defined product/s** of/from (Cu) smelters:

⇒ generating a **defined product** of/from slag or the **use of slag in any definite product** should be **approved** by the **smelter**

⇒ the **approval** shall be given by a **written document** of the **treatment operator** which

- approves **defined product** achieved (e.g. any insulation material)
- for the **use** of the slag **in any definite product** – see discussion under point 'Slag from (Cu) smelters' (page 35) and the discussion box at page 36]
- any **public information** of the smelters (e.g. brochures, environmental reports or internet information) might be used as **a start-up information only**.
  - ⇒ for **by-products** see 'Approval of/from technologies requested', sub point 'Approvals of (Cu) smelters', page 21

☒ **Slag used for backfilling** application:

- ⇒ if the **slag** of the smelter is used for **backfilling application** (see 'backfilling' excluded from definition of 'recycling'), this may **not** be considered as **defined product** for use and not be **classified** as '**recycling**'
  - the use 'slag not as by-product or as defined product for use' has to be chosen → classification as OMR only!

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<b>Remarks on the composition &amp; use of shares of typical WEEE fractions</b>
---

➤ <b>Circuit board chassis / non-ferrous metals mixtures to smelters</b>
--

Circuit board chassis (typically dismantled from CRT appliances) and other non-ferrous metals fractions with high shares of Fe and/or Al will normally be shredded & separated before the input to any Cu smelter (even if the Cu smelter acts as direct acceptor, he will often do it internally as pre-treatment step). Typical fractions of this treatment are:

- Fe fraction
- Al fraction
- circuit board fraction

Normally:

- the Al fraction will be forwarded (to further separation or Al smelters)

- the Fe fraction may be forwarded (e.g. to steel mills) or may be used in the smelter itself (used as reducing agent)
- the circuit board fraction is the fraction of most interest for the Cu smelter – see point below

⇒ ask for and show the **process steps applied**

⇒ get information or estimate the **composition** of the final fractions

⇒ ask for and show the **real final technologies** and choose the correct use

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### ➤ Circuit board fractions

Depending on the quality, the circuit boards will consist of:

- the circuit board fraction itself / the circuit board base material and
- Fe frames
- Al parts like frames, coolers etc.
- other components

If the share of **Fe** and/or **Al** is **high**, they will be - most of the time - mechanically pre-treated and separated before the input to the (Cu) smelter - see point before..

The circuit board fraction +/- components will normally consist of:

- Cu
- (only low shares of Fe, Al)
- other metals (see 'priority to provide information/shares of components Fe, Cu, Al', page 16)
- organic residues – the organic base material like e.g. epoxide resin, low value circuit boards with cardboard as base material
- inorganic residues - e.g. glass fibres in glass fibre reinforced epoxide resin

⇒ **check** composition data if **these components** are given and you may in case continue with data from analysis – see the next point

⇒ you may go back to 'Composition of circuit board fractions', page 17

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### ➤ Use of data from analysis for circuit board fractions

TOP

When developing the WF-RepTool, we did not expect to get data from analysis for circuit board fractions → see 'Target of use approach', page 6.

Today, more and more treatment operators - especially those who achieve high volume of material or high value materials - ask for analysis and do want to use these results gathered in the WF-RepTool.

But what we see in results is, that partly the **shares of metals** given are **incredible high** and classified **recycled**.

These data should be **checked** for **plausibility** and for the 'mistake' that in case all metals, also those ones going to the slag (see smelter analysis results as metal-oxides) are classified as metal share/s and the use classified as recycling has been chosen (even for the total share of metal-oxides ...).

⇒ see points before

⇒ also 'Composition of circuit board fractions', page 17

We recommend the following **‘Proposal on the ‘simplified’ use of results from smelting analysis’**:

Data / steps	Use in final technology	classification
➤ use the content of the <b>target metals</b> (e.g. Cu, other metals) which are mentioned as <b>recovered</b> (+/- are paid ...)	metal recovery	R
➤ ask additionally for the <b>glowing loss</b> to determine the <b>share of organics</b> <ul style="list-style-type: none"> <li>▪ in cases seen <b>‘plastics’</b> are mentioned in analysis (often wrongly mentioned as ‘recycled’)</li> </ul>	depending on smelter technology <sup>68</sup>	ER or TD <sup>1)</sup>
➤ estimate (simplification) the <b>rest/difference</b> as <b>inorganic residues</b> going to the <b>slag</b>	depending on slag products and/or use of slag <sup>69</sup>	R or OMR <sup>1)</sup>

1) if **no approval** of the smelter technology or slag products is given (see footnotes), the **worse classification** has to be applied (worst case scenario)

Chart 3: ‘Proposal on the ‘simplified’ use of results from smelting analysis’

For this **simplified approach** ...

- ⊗ realize and concede that you will **lose information** on **non-target metals** (in analysis of Cu smelters in case mentioned as e.g. Al-oxide, Fe-oxide)

**NEW explain** In some analysis seen, metals going to the slag are mentioned separately but they are wrongly classified as recycled without given information on the use of slag.

- ⇒ you might **provide** these **shares of metals** in the WF-RepTool results, but take care on the calculation of metal-oxides <> share of metals

From **Fe- and Al-‘rich’** fractions Fe and Al will be separated at or on behalf of the Cu smelter before the input to the smelter - see ‘*Circuit board chassis / non-ferrous metals mixtures to smelters*’, page 29 ...

- ⇒ these **separation results** must be **integrated** to the report

- ⇒ **only** the smelting analysis for **Fe- and Al-‘low’** fractions should be used in this way

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#### ➤ **Plastics from shredder processes**

As output fraction from large shredders (car shredders), shredders for cooling & freezing appliances and medium shredders (e.g. chain shredders) **plastics fractions** are still **mixed** (different kinds of plastics) and/or include fines. These fractions have to go to the technology of **‘plastics conditioning’** ...

- ⇒ see ‘*First step fraction goes 100 % to products / recycled – most time NOT*’, page 14 and expect **different kinds/qualities** of plastics fractions and **some % of residues** with different applications/final technologies

<sup>68</sup> the use of the organics has to be determined on base of **kind of smelter used** – see approval as ‘special’ smelter for the use of organics / organic shares – see ‘Approval of/from technologies’, page 21

<sup>69</sup> the use of the slag as by-product or as defined product must to be approved – see ‘Approval of/from technologies’, page 21 resp. ‘Slag from (Cu) smelters as defined product/s’, page 24

- ⇒ consider the remark on 'low level recycling options' from there ... that if the next step treatment operator for mixed plastics from shredders insists on **100 % product yield**, ask for any **approval** about **which products** are achieved and give a **remark** in the internal name and/or under 'use in final technology' (see also '*Approval of products requested*' - *Defined products from WEEE fractions after further treatment*', page 28).

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### ➤ Cable plastics

Depending on the **quality of cables** treated and the **quality of separation** at the fine shredder (respectively cable shredder) cable plastics will - most time - need a **further separation** ('plastics conditioning') before the production of plastics products.

- ⇒ see '*Yield fractions from cables*', page 15 and expect **different kinds/qualities of plastics fractions** and **some % of residues** with different applications/final technologies
- ⇒ consider the remark given under '*First step fraction goes 100 % to products / recycled – most time NOT*', page 14 on 'low level recycling options' ... that if the next step treatment operator for **mixed cable plastics** insists on **100 % product yield**, ask for any **approval** about **which products** are achieved and give a **remark** in the internal name and/or under 'use in final technology' (see also '*Approval of products requested*' – '*Defined products from WEEE fractions after further treatment*', page 28).

#### ☒ Question '**Cable plastics** for **horse riding areas**?'

There is a **further separation** of cable plastics necessary to use them for horse riding areas. Plastics of low density (e.g. PE) must be separated (they would 'swim up' at horse riding areas, and 'do have a smell horses don't like'). Only the '**heavy**' **plastics** like mainly PVC may be applied for this purpose.

- ⇒ for the use of (mixed) cable plastics for **horse riding areas** they have to be further separated - expect **different kinds/qualities of plastics fractions** and **some % of residues** with different applications/final technologies
- ⇒ **cross-check** with **information** given by the acceptor of cable plastics

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### ➤ CRT glass

When checking information provided on the application of CRT glass fractions you should consider:

- ☒ **CRT glass production** nearly stopped ...
- ⇒ cross-check the **name** of the acceptor if a **delivery** to this option is chosen
- ☒ **Road construction** to be scrutinized – see technical properties ...
- ⇒ see '*Approval of products requested*', page 27
- ☒ **Other defined construction purposes** ...
- ⇒ see '*Approval of products requested*', page 27
- ☒ Question / special case **defined construction purposes at/for landfill** sites (e.g. draining material) ...
- ⇒ see '*Approval of products requested*', page 27

[back to Index of contents](#)**Questions on treatment & use results special fractions from WEEE treatment**

(At present) The WF-RepTool is designed for (and WF-RepLists are provided for) the **'regular' WEEE treatment and WEEE fractions**. We do not focus on the treatment of batteries or other specific fractions separated from WEEE for which other processes of separation and/or final treatment are applied. Treatment options and possible fractions achieved might be included in the future. Please see following entries as examples on how to tackle.

**➤ Oil fractions**

Oil fractions (e.g. compressor oil from cooling & freezing appliances) will be – depending on the quality – often separated by cracking (oil refinery process). For this, the 'interim' technology 'pyrolysis, cracking or similar' has been introduced<sup>70</sup>.

Results of this cracking process will be different oil fractions, partly used for new oil and/or partly used for incineration purposes and in case some % of residues.

⇒ provide **yield data** and **technologies used**

⇒ as this fraction is in many cases a **'minor fraction'**, you may agree to use the technology 'production of 'new oil' (final technology) and a **simplified summary result** (see 'Summary result - output to different applications', page 40

[back to Index of contents](#)**➤ Batteries**

☒ **Batteries** as mixtures from dismantling from WEEE and sorting from WEEE fractions or dedicated batteries/accumulators separately collected will follow different treatment processes than WEEE (e.g. smelting-separation, treatment of Ni-Cd accumulators and its fractions, separation of Pb batteries etc.<sup>71</sup>). For this the WF-RepTool would have to be adjusted in principles (interim and final technology at one step) and the WF-RepTool is - at present - not prepared for these technologies and fractions.

⇒ there should be a special 'project'<sup>72</sup> to determine & include the WF-RepLists (see specific input and output fractions, technologies used, classification of use) necessary for batteries → separate **'WF-RepTool batteries'**

⇒ for the meantime we propose to work with **'average' results'** as they are e.g. provided by the **battery system/s** – options are:

a) **yield data** - e.g. x % of Fe fraction to steel mill → Fe-recovery,  
x % of other metals to different smelter → metal recovery,  
x % of residues → no definite use in smelter

b) as this fraction is in many cases a **'minor fraction'**, you may agree to use the technology 'battery recycling' (final technology) and a **simplified summary result** (see 'Summary result - output to different applications', page 40

☒ For **acids** from separation of **lead batteries** (see introduction for this point and remark to of 'Batteries' above) the only technology foreseen in the WF-RepTool is 'chemical / physical treatment as disposal process' (i.e. no (interim) separation or neutralisation technology, no fractions from separation or neutralisation like salts, water...) and the only option for the use is *'all other inorganic fractions > no use - 'cold technologies'*; we

<sup>70</sup> but also applicable for the upcoming technology of cracking of plastics fractions

<sup>71</sup> to the WF-RepTool expert group: we need **experience data** and/or **packages** for Pb, Ni/Cd, NiMH, Li-ion, alkaline batteries or to go on with WF-RepTool batteries (see different technologies, fractions,...)

<sup>72</sup> ... as several times discussed for WEEE systems also taking over the responsibility for batteries collection and treatment

agreed within the WF-RepTool expert group that this will stay like it is and no adaptation of the WF-RepTool for this minor factor will be done ...

- ⇒ we propose to use the technology 'chemical / physical treatment as disposal process', choose for the composition of this fraction 100 % 'other inorganic fractions'<sup>73</sup> and classify the use as 'no use' – 'cold technologies' (see above)

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## ➤ NH3-CrO4-mixture

### ☒ NH3-CrO4-mixture

*example:*

- discussed as to be used for fuel substitution in co-incineration → ER - NO!!!

This is water solution classified as hazardous waste which has to be treated by chemical precipitation or neutralized (or treated in any other special way); in the WF-RepTool the only technology foreseen is 'chemical / physical treatment as disposal process' (see acids above) and the only option for the use is 'all other inorganic fractions > no use - 'cold technologies'; we agreed within the WF-RepTool expert group that this will stay like it is and no adaptation of the WF-RepTool for this minor factor will be done ...

- ⇒ we propose to use the technology 'chemical / physical treatment as disposal process', choose for the composition of this fraction 100 % 'other inorganic fractions'<sup>74</sup> and classify the use as 'no use' – 'cold technologies' (see above)

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## ➤ Slag and ashes

### ☒ Ashes and slag from (co-) incineration processes

*example:*

- discussed as to be used for feedstock substitute in e.g. cement industry e.g. used to produce clinker → MR – NO!

**NEW20** The Commission Implementation Decision on waste (CID 2019 waste<sup>75</sup>) makes clear: for **energy recovery operations**<sup>7677</sup> the **mineral fraction** of **incineration bottom ash** or **clinker** resulting from co-incineration shall **not be included** in the waste amount **recycled**<sup>78</sup>. Interpreted as:

- plastics fraction or other organic fractions incinerated in R1 MWI plants
  - e.g. plastics fractions as input to e.g. cement kilns
- ✓ **Target of use approach** of the WF-RepTool does only **count** the **energy recovery** from organic input material, **not** the material recovery of any **mineral fraction**

<sup>73</sup> or 'mixed fractions – disposal'

<sup>74</sup> or 'mixed fractions – disposal'

<sup>75</sup> see Guidance document 'What to count as recycling and recovery?'

<sup>76</sup> long version in CID 2019 waste, Article 3, point 7: Where municipal waste materials enter recovery operations whereby those materials are used principally as a fuel or other means to generate energy

<sup>77</sup> interpreted as: municipal waste incineration plants meeting R1 criteria and co-incineration plants

<sup>78</sup> CID 2019 waste, Article 3, point 7

You may see:

- ⇒ 'Purpose of the plant' of municipal waste incineration, page 8
- ⇒ 'Regular municipal waste incinerators – NO use of components!', page 25
- ⇒ 'Approval of MWI as R1 plant and/or as plant with special use', page 22
- ⇒ for **co-incineration** processes follow the 'Target of use approach' (see page 6),  
'Apply the target of use approach' (see page 24)

#### ☒ **Slag from (Cu) smelters**

example:

- discussed as slag to be used for road construction - these data in composition (mineral fraction) & use data for input fraction to Cu smelter - NO

- ⇒ for the **input of WEEE fractions** to any (Cu) **smelter** follow the  
'Target of use approach' (see page 6)  
[see also 'Apply the target of use approach', page 24]
- ⇒ in general the **yield** and **use** of slag does **not** have to be **determined** and **judged**
  - ⇒ **never** use the **total yield** of the (Cu) **smelter** as result for WEEE fractions  
 <> **not representative** for dedicated WEEE input fraction/s  
 [see 'Total yield of the accepting plant', page Fehler! Textmarke nicht definiert.]
  - ⇒ see option 'Use of data from analysis for circuit board fractions', page 30

Under the 'target of use approach' there are options given to distinguish the use of **components** (of the input fraction) with regard to the question if they would **end up** in the **slag** and a further **distinction** if the **slag** will be used as **by-product** or as **defined product**.

Component	Use in final technology	Examples technology	WF-class.
inorganic residues	inorganic residues > used as slag forming component > slag as by-product or as defined product for use	Cu smelter - slag as by-product or as defined product for use (to be approved) steel mill - slag as by-product or as defined product for use (to be approved) stainless steel works - slag as by-product or as defined product for use (to be approved)	R
	inorganic residues > used as slag forming component > slag NOT as by-product or as defined product for use	Cu smelter - slag NOT as by-product or as defined product for use steel mill - slag NOT as by-product or as defined product for use stainless steel works - slag NOT as by-product or as defined product for use [consider: inorganic residues serve for an useful purpose by replacing other materials & fulfil a particular function (recovery definition)] [consider: only weight of material otherwise to be applied as slag forming component may be counted]	OMR

1) if **no approval** on the slag product/s is given, the **worse classification** as OMR has to be applied (worst case scenario)

Chart 4: Example – distinguish use of slag

- ⇒ for **by-products** of (Cu) smelters see 'Approval of/from technologies requested', sub point 'Approvals of (Cu) smelters' (see page 21)
- ⇒ for **defined products** of slag **from** (Cu) smelters (i.e. the principle **as defined product**) see 'Slag from (Cu) smelters as defined product/s' (see page 29), requirements given under 'Approval of products requested', sub point 'Defined products from WEEE fractions without further treatment' (see page 28) apply

- ⇒ the option of **products** produced **with slag** from (Cu) smelters (i.e. '**in a defined product**') has to be further discussed when this question is raised for reporting  
– see following discussion box
- if the question is coming up, requirements given under  
'*Defined products from WEEE fractions after further treatment*' (see page 28)  
might be applied as an interim solution  
(please inform us/the WF-RepTool expert group about applications used)

Discussion:

**'Target of use approach' <> determine use of output fractions from final technologies'**

in principle:

- the final technology of e.g. a smelter could be changed to a **semi-final technology** → a share of the input fraction is 'final' treated (e.g. organic shares are burned), a share of the input material is separated = 'interim' technology by 'hot separation' (e.g. metals to metals or metal alloys, metals to slag, etc. inorganic residues to slag etc.) (IT development, change of classification of technologies in WF-RepLists)
- output fractions from semi-final technologies could be determined (research work, development of WF-RepLists)
- options for technologies and for the use of output fractions from semi-final technologies have to be added (development of WF-RepLists)
- for products achieved with final fractions from (semi-)final technologies requirements given under '*Approval of products requested*' might apply (see page 27 and sub points following)

but we have to consider that:

- with this step we would leave the 'Target of use approach' ...
  - beside for products with slag from a Cu smelter (see point where we enter from) ...
  - you might wish to apply this option for ashes / slag from co-incineration processes too<sup>79</sup> – see options in footmark (see equivalence of technologies) ... but ...
  - we would have to change to the **determination** of the **output from all treatment options** (see equivalence of technologies) – not only for those ones where result would be shifted to a 'positive' direction (e.g. also real metal yields, efficiency of e.g. incineration)
- Σ a lot of development work necessary, partly negative influence on total R&R results expected, need to determine each (semi-)final acceptor by name (see need to collect and option for a plausibility check of yield data), this will not be possible for quite some fractions being forwarded via traders, fractions being mixed for the input to (semi-)final technologies ...

This topic must be further discussed & decisions have to be found before any action!

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<sup>79</sup> ashes and slag from (co-) incineration processes: for dedicated fractions of **high volume** (case plastics to cement kiln) an analysis of this fraction (ash content) might be done - + approval that ash as/in product xyz  
Options:

a) work with existing options + remark like 'OUTPUT fraction ash in internal name ... see 'summary result - output to different applications', page 38

b) insert ash and slag fractions .... technologies of application → development of IT and WF-RepLists necessary  
! for **low volume fractions** --- see all remarks under ashes and slag from (co-) incineration processes

! for other applications - smelters, steel mills, incinerators → big development of IT and WF-RepLists necessary + see remark that we would have to apply for all technologies and options !!!

see option for slag products from (Cu) smelters already provided, see e.g. 'summary result - output from smelters', page 40

## ➤ Metals separated from slag / ashes

- ☒ **Metal shares** of fraction treated municipal waste incineration (**MWI**) / hazardous waste incineration (HWI) – metals recovered from **slag / ashes** from?

*example:*

- *discussed as to be calculated as sent to steel mills / smelters → MR – NO!*

**NEW20** The Commission Implementation Decision on waste (CID 2019 waste<sup>80</sup>) provides an **exception** that of **metals separated** and **recycled** after incineration of municipal waste may be counted, provided that the recycled metals meet certain **quality criteria**.

! Separately collected **WEEE (appliances)** will not be directly incinerated in MWI plants as separation of metals is one main target of treatment of WEEE (for smelters see there)

! for WEEE **fractions** from treatment of WEEE containing **metal residues**, the **metals** are **not counted** up to now - arguments:

- 'purpose of the plant' is disposal process
  - R1 option only for organic shares
- small pieces of metals will be oxidised and/or incorporated into the slag

➤ **in case to be adapted** in WF-RepTool but

- 1) only the **separable metal content** of the WEEE fraction shall be counted (not total mass balance of the MWI plant), plus see quality criteria and
- 2) **separation of metals** by MWI plant will have to be **approved**

You may see:

- ⇒ 'Purpose of the plant' of municipal waste incineration, page 8
- ⇒ 'Regular municipal waste incinerators – NO use of components!', page 25
- ⇒ 'Approval of MWI as R1 plant and/or as plant with special use', page 22

- ☒ **Metals** recovered from **slag / ashes** from **co- incineration** processes

- ⇒ – see 'consider' arguments for 'Ashes and slag from (co-) incineration processes' under 'Slag and ashes' (page 34)
- ⇒ see discussion box at page 36

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<sup>80</sup> see Guidance document 'What to count as recycling and recovery?'

## Source of data

- ☒ Ask for the **source of data** provided for all results but especially if **critical** (see e.g. 'To classify 100 % 'recycled' – cases of most time NOT', page 13, 'Approval of/from technologies requested', page 21 or 'Approval of products requested', page 27) or **a-typical results** (see page 14) are provided.
- ☒ Take care on:
  - ⇒ **'kind of data'** – see choices **NEW20** as explained in the user manual – reporter level point 2.5.2.9, e.g. real (yield) data like batch data, analysis, rough estimation etc., check & give information **how data** have been **determined** (please distinguish, not every piece of paper is an 'analysis')
    - **NEW20 example** see Table 1, page 39 as one example on **which** kind of data might be used for different WEEE fractions, incl. proposal on limit values;
    - **NEW20 explain** If no of the options for the choice is given, and only **estimations** have been done (not even doing a view analysis), no of these options shall be chosen and the term 'Estimation' should be used under 'Data provided by'
      - proposal: for a-typical results (see page 14) don't accept experience data;
  - ⇒ **'date of data'** - this should be the **date/period** when **data** have been **determined**, target is to show the actuality of data (do not use the date when information 'came in')
  - ⇒ **'data provided by'** – information should be the company (+/- name of the person) who **treated** the material and **provided data**, in case the name of the trader who provided experience data (not the person within the company who organized or collected or stores data)
 

As long as there is no separate remark field available<sup>81</sup>, you may also give information here, **for which (special) kind of fraction** the following yield or composition **data** are given (e.g. data for mix of xyz) (hint: use preferably the internal name for it = more quickly to be seen)
- ☒ **NEW20** There is the option to provide (an) **attachment(s)** as **proof(s)** for **source of data information** – see Table 1, page 39 for recommendations on which kind of data should be provided.

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## NEW20 Proofs for fractions

- ☒ At the 'Add/Edit acceptor/technology for output fraction – page' you will have to option to **upload** attachments as **proofs** for fractions.
  - ⇒ Please find in Table 1 **recommendations** on when & which **proofs** should be provided (for source of data information see page 38).

<sup>81</sup> will come in any next version of the WF-RepTool

Minimum requirements on kind of data & proofs			
treatment of ... output fraction	limit value [% of total input]	source of data info - kind of data	proof
shredder input de-polluted appliances	general	real yield data / batch *)	attach
output fractions classified as hazardous waste - if any separation - if any positive use chosen (not if disposal)	general	<b>analysis</b> (analysis by acceptor) (for fraction or very similar fraction)	attach
output fractions - general	> 20 %	real yield data / batch *)	attach
	> 5 - 20 %	<b>analysis</b> (from handpicking to analysis by acceptor)	attach
	> 1 - 5 %		results in house
	< 1 %	<b>estimation</b> (view analysis, experience value, market value data)	base for estimation - in house
output fractions with high R&R relevance (e.g. circuit board fractions)	> 3 %	<b>analysis</b> (analysis by acceptor) (for fraction)	attach
	> 0,5% - 3 %	<b>analysis</b> (analysis by acceptor) (for similar fraction)	attach
	< 0,5 %	general data	in house
'pure' output fractions (e.g. metals, plastics,...)	1 - 5 %	view analysis or handpicking	attach
	< 1 %	-	-
*) see WEEELABEX / CENELEC requirement, data for higher input amounts if available			

Table 1: Example on which source of data info, which proofs

[back to Index of contents](#)**NEW20 Downstream statements for fractions**

- ☒ If you accept '**downstream statements**' for fractions e.g. from **waste collectors**, you will have to **make sure** that **following information** are given:
- ✓ in case that a **further separation** of the fraction is applied, **yield results** must be **clear** (e.g. in wording, giving names for fractions, not any internal shortcuts)
  - ✓ **final technologies** for final fractions
  - ✓ in case of **mixed fractions**, forwarded to final technologies, the **composition** of the final fraction has to be given
  - ✓ the **classification** as preparing for re-use, as recycling or other material or energy recovery must be **clear** based on the **kind & composition** of the **fraction** (pure?) and the **final technology**
  - ✓ if any use as **disposal** is chosen, **no** of these data above have to be given
- ☒ We recommend **not** to accept '**downstream statements**' just providing **results** of **classification** (as % of RU, R, OMR, ER,...) if the **way of calculating** these results is **not agreed**.

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## D. Options for simplifications

**NEW20 updated** In case further downstream data are very difficult (up to not possible) to be determined. To avoid to have wrong data in WF-RepTool reports (e.g. wrong information on acceptors/technologies) we did think about 'simplifications' to be applied. In general, these are '**options**' which may be **agreed** between the WEEE systems / the WF-RepTool administrators and the reporter / the treatment operator.

### Summary results

#### ➤ Summary result - output to different applications

example / background:

- in case **mixed metal fractions** of very low amounts/shares are **further sorted / separated** by the acceptor 'far away' (e.g. in Far East), there is no 'reliable' tracing of final destinations possible

**NEW20 updated** Under this option **yield data** from any sorting / separation step may be provided as **composition/component data** under the **name** of the '**to-be sorted / separated fraction**'.

- ⇒ determine the possible yield data by any **handpicking analysis** of this fraction
- ⇒ later enter handpicking results **as components** (see example in Chart 5)

Instead of the sorting / separation technology you may choose the **final technology** you would apply for the material (estimated yield) with the **highest share**.

- ⇒ choose **final technology** as for the **highest share** (see Cu smelter in Chart 5)

You may **estimate** the **final technologies** for the estimated yield of fractions and you may choose the **use** as in the **estimated final technologies**.

- ⇒ choose **use** as in the **estimated final technology** (see Chart 5)
- ⇒ you may give a **remark** on the estimated use

When using this option, the remark '**summary results - output to different applications**' must be given in the **internal name** (see Chart 5). This is the pre-condition to see this result as correct – see as the given uses may not happen in the final technology mentioned, see '*Not all metals may be recovered as metal*', page 25.

19 12 03 / 02-1	mix of non-ferrous metals 'not pure'	summary result - output to different applications	5,0000%	xxx kg	1,0000%
Name of sorter/seperator	Cu smelter 'traditional'	F	100,0000%		
Cu	Cu > Cu recovery	<i>Cu and brass - estimate Cu smelter</i>	60,0000%	xx kg	xx%
Al	Al > Al recovery	<i>Al - estimate Al smelter</i>	20,0000%	xx kg	xx%
other metals	other metals > metal recovery	<i>total of other NF metals - estimate NF smelters</i>	3,0000%	xx kg	xx%
other metals	other metals > metal recovery	<i>Pb - estimate Pb smelter</i>	2,0000%	xx kg	xx%
plastics	all plastics > no use - 'cold technologies'	<i>hard plastics - # estimate landfill of residues</i>	8,0000%	xx kg	xx%
organic residues	inorganic residues > no use - 'cold technologies'	<i>foils, foam,... - # estimate landfill of residues</i>	2,0000%	xx kg	xx%
inorganic residues	inorganic residues > no use - 'cold technologies'	<i>stone, glass,... - # estimate landfill of residues</i>	5,0000%	xx kg	xx%
		<i>data e.g. from handpicking analysis + estimations, # worst case scenario</i>			

*\*) text in blue: remarks to explain = you may enter them under [R] for the 'use in final technology', not shown like this in reports*

Chart 5: Example – summary result - output to different applications

This option **may be applied** with **restrictions** only:

- with a limit** for **mixed metal fractions** which will be further sorted / separated → the **limit value** should be set **low** at – as a proposal - **1 %<sup>82</sup>** of the **total input**. Consider following:

<sup>82</sup> limit may be further discussed, may be set lower by the WEEE system/WF-RepTool administrator

⇒ for the **yield / share** of (estimated as 'pure') **metal fractions** the **technology** may be estimated **on base** of the **metal**

⇒ for the **yield / share** of **non-metal fractions** the **worst case scenario** should be applied

(see if the yield fractions and acceptors / technologies are known, you should apply the 'general WF-RepTool approach'! (yield fraction, technology, use → classification)

b) **without** a **limit** on the share of total input if this fraction is a **not typical WEEE fraction** (see introduction to 'Questions on treatment & use results special fractions from WEEE treatment', page 33). This option may be agreed and applied for e.g.:

⇒ **oil fractions** - **NEW20 example** (high) share as oil for new oil production, (low) share of residues e.g. to incineration

⇒ **lead batteries and other batteries** - **NEW20 example** different metals to different smelters or other metal recovery processes, estimated metal recovery, incl. metals estimated as going to slag/other products for use as definite product, residues for to disposal processes

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### ➤ Summary result - output to different smelters

examples / background:

- in case / especially for **metal fractions** which are **further separated** by the acceptor (often Cu smelter giving a remark that Fe, Al will be separated) only the Cu smelter is given as acceptor, results of the separation of metal fractions and the delivery to different smelters is given as component data – this is **not following** the **approach of providing separation results** and the final **acceptors / final technology** for these fractions → see 'Circuit board chassis / non-ferrous metals mixtures to smelters', page 29
- **'pure' metal fractions** further sorted / separated

Under this option information on **fractions** as '**estimated as separated**' may be provided as results. Like under the summary option above, '**estimated**' **yield data** of fractions from any **sorting / separation** may be provided as **composition/component data** under the name of the to-be sorted / separated fraction and under the **final technology** for the (to-be) sorted / separated **yield fraction** with (e.g.) the **highest share**.

The use of the '**estimated as separated**' **yield fractions** may be given under the '**use in final technology**' as the use **would be given** in the **different final technologies** (see Chart 6).

19 12 03 / 01-2	non-ferrous metals with iron 'pure'	summary result - output to different smelters	2,0000%	xxx kg	0,1000%
Name of sorter/separator	Cu smelter 'traditional'	F	100,0000%		
Cu	Cu > Cu recovery	<i>Cu and brass - estimate Cu smelter</i>	60,0000%	xx kg	xx%
Fe	Fe > Fe recovery	<i>Fe +/- steel - estimate steel mill</i>	10,0000%	xx kg	xx%
Al	Al > Al recovery	<i>Al - estimate Al smelter</i>	20,0000%	xx kg	xx%
other metals	other metals > metal recovery	<i>other NF metal A - estimate NF smelters</i>	6,0000%	xx kg	xx%
other metals	other metals > metal recovery	<i>other NF metal B - estimate NF smelters</i>	4,0000%	xx kg	xx%
		<i>data e.g. from handpicking analysis + estimations</i>			

*\*) text in blue: remarks to explain = you may enter them under [R] for the 'use in final technology', not shown like this in reports*

Chart 6: Example – summary result - output to different smelters

When using this option, the remark '**summary result - output to different smelters**' must be given in the **internal name** (see Chart 6). This is the pre-condition to see this result as correct (i.e. to be able to do the interpretation of this result as fraction going to different smelters) as the given uses may not happen in the same smelter, see '**Not all metals may be recovered as metal**', page 25.

This option **may be applied** with **restrictions** only:

a) for **‘pure’ metal fractions** if the **amount** of this ‘estimated as to be separated’ fraction (take care: in total, not the separation results) is **< 0,1 %<sup>83</sup>** of the **total input**. Consider following:

⇒ for the **yield / share** of (estimated as ‘pure’) **different metal fractions / metals** the **technology** may be estimated on base of the **metal**

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<sup>83</sup> limit may be further discussed, may be set by the WEEE system/WF-RepTool administrator