

English Version

**Collection, logistics & Treatment requirements for WEEE - Part
3-5: Technical specification for de-pollution - Photovoltaic panels**

Exigences de collecte, logistique et traitement pour les
DEEE - Partie 5: Spécification relative au traitement final
des fractions de DEEE - Cuivre et métaux précieux

Sammlung, Logistik und Behandlung von Elektro- und
Elektronik-Altgeräten (WEEE) - Teil 3-5: Spezifikation für
die Endbehandlung der Fraktionen von Elektro- und
Elektronik-Altgeräten - Kupfer und Edelmetalle

This Technical Specification was approved by CENELEC on 2017-09-18.

CENELEC members are required to announce the existence of this TS in the same way as for an EN and to make the TS available promptly at national level in an appropriate form. It is permissible to keep conflicting national standards in force.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.



European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

Contents

Page

European foreword	3
Introduction	4
1 Scope	5
2 Normative references	5
3 Terms and definitions	6
4 De-pollution monitoring	6
4.1 Introduction	6
4.2 Target value methodology	6
4.3 Mass Balance methodology	6
4.4 Analysis methodology	6
5 Overview of the applicable methodologies	7
5.1 Applicable methodologies	7
6 Large appliances	7
7 Cooling and freezing appliances	7
8 CRT Display /FPD appliances	7
9 Lamps	7
10 Small appliances	7
11 Protocol for components removed during a batch process	7
12 Photovoltaic panels	7
12.1 Introduction	7
12.2 Analysis methodology	7
Annex A (normative) Sampling protocol for the physically smallest non-metallic mechanical treatment fraction	9
Annex B (normative) Sampling protocol for plastics	10
Annex C (normative) Targets	11
Annex D (informative) Target calculation example	12
Annex AA (normative) Sampling protocol for photovoltaic panel treatment fractions	13
AA.1 Introduction	13
AA.2 Number and size of samples	13
Table AA.1 — Sample size	13
AA.3 Principles of sampling	14
AA.3.1 Sampling during treatment process	14
AA.3.2 Sampling after a treatment process	14
AA.4 Mixed sample preparation	14
AA.5 Mixed sample reduction	15
AA.6 Packaging of samples	15
Bibliography	16

European foreword

This document (CLC/TS 50625-3-5:2017) has been prepared by CLC/TC 111X "Environment".

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC shall not be held responsible for identifying any or all such patent rights.

This document has been prepared under mandate M/518 given to CENELEC by the European Commission and the European Free Trade Association.

This document is to be used in conjunction with CLC/TS 50625-3-1:2015.

CLC/TS 50625-3-5 supplements or modifies the corresponding clauses in CLC/TS 50625-3-1:2015, so as to convert that publication into the Technical Specification: Treatment specification for photovoltaic panels.

When a particular subclause of part 3-1 is not mentioned in this part 3-5, that subclause applies as far as is reasonable. When this standard states "addition", "modification" or "replacement", the relevant text in part 3-1 is to be adapted accordingly.

NOTE The following numbering system is used:

- Subclauses, tables and figures that are numbered starting from 101 are additional to those in Part 1;
- unless notes are in a new subclause or involve notes in Part 1, they are numbered starting from 101, including those in a replaced clause or subclause;
- additional annexes are lettered AA, BB, etc.

Introduction

In order to support EN 50625-2-4, Collection, logistics and Treatment requirements for WEEE - Part 2: Treatment requirements for photovoltaic panels, covering treatment of WEEE and thereby fulfil the requirement of the European Commission's Mandate M/518 it is necessary to include normative requirements, such as target values and limit values for the analysis, into a document that is able to be revised to take into account both practical experience and changes in treatment technologies.

This document is a preview generated by EVS

1 Scope

Clause 1 is replaced with the following:

This European Technical Specification is intended to be used in conjunction with the WEEE Treatment Standard for photovoltaic panels, EN 50625-2-4 and Technical Specification for de-pollution – General CLC/TS 50625-3-1:2015.

2 Normative references

Clause 2 is replaced with the following:

EN 13650, *Soil improvers and growing media - Extraction of aqua regia soluble elements*

EN 14899, *Characterization of waste - Sampling of waste materials - Framework for the preparation and application of a Sampling Plan*

EN 15002, *Characterization of waste - Preparation of test portions from the laboratory sample*

CEN/TR 15310-1, *Characterization of waste - Sampling of waste materials - Part 1: Guidance on selection and application of criteria for sampling under various conditions*

CEN/TR 15310-2, *Characterization of waste - Sampling of waste materials - Part 2: Guidance on sampling techniques*

CEN/TR 15310-3, *Characterization of waste - Sampling of waste materials - Part 3: Guidance on procedures for sub-sampling in the field*

CEN/TR 15310-4, *Characterization of waste - Sampling of waste materials - Part 4: Guidance on procedures for sample packaging, storage, preservation, transport and delivery*

CEN/TR 15310-5, *Characterization of waste - Sampling of waste materials - Part 5: Guidance on the process of defining the sampling plan*

EN 50625-1:2014, *Collection, logistics & Treatment requirements for WEEE - Part 1: General treatment requirements*

EN 50625-2-4:2017, *Collection, logistics & treatment requirements for WEEE - Part 2-4: Treatment requirements for photovoltaic panels*

CLC/TS 50625-3-1:2015, *Collection, logistics & treatment requirements for WEEE - Part 3-1: Specification for de-pollution - General*

EN ISO 15587-1, *Water quality - Digestion for the determination of selected elements in water - Part 1: Aqua regia digestion (ISO 15587-1)*

EN ISO 15587-2, *Water quality - Digestion for the determination of selected elements in water - Part 2: Nitric acid digestion (ISO 15587-2)*

EN ISO/IEC 17025, *General requirements for the competence of testing and calibration laboratories (ISO/IEC 17025)*

EN ISO 17294-2, *Water quality - Application of inductively coupled plasma mass spectrometry (ICP-MS) - Part 2: Determination of selected elements including uranium isotopes (ISO 17294-2)*

EN ISO 17852, *Water quality - Determination of mercury - Method using atomic fluorescence spectrometry (ISO 17852)*

EPA Method 6020A, *Inductively coupled plasma — Mass spectrometry*

3 Terms and definitions

This clause of EN 50625-1 and CLC/TS 50625-3-1:2015 is applicable

4 De-pollution monitoring

4.1 Introduction

This subclause of CLC/TS 50625-3-1:2015 is applicable.

4.2 Target value methodology

This subclause of CLC/TS 50625-3-1:2015 is not applicable.

4.3 Mass Balance methodology

This subclause of CLC/TS 50625-3-1:2015 is not applicable.

4.4 Analysis methodology

Subclause 4.4 is replaced with the following:

This methodology uses the following approach:

- establish the limit value: these values are defined in this Technical Specification;
- sample the fractions: the sample for the analysis shall be prepared according to the sampling procedure defined in this Technical Specification;
- evaluate the analysis results: the concentration of substances shall be determined according to the analysis procedure defined in this Technical Specification;
- evaluate the de-pollution performance: compare the results of the analysis with the defined limit values. If the results are below the limit values then the performance of de-pollution fulfils the requirements.

The limit values for lead, cadmium and selenium are also used as an indicator of de-pollution from other hazardous substances that may be present in the various panels.

A laboratory shall perform the analysis on the samples for the residual amount of these pollutants in the glass fraction.

Depending on the treatment process used, one of the techniques below in Annex AA, shall be used to obtain a representative mixed sample:

- sampling during a treatment process
- sampling after a treatment process

NOTE 1 All the sampling protocols are based on EN 14899.

Analysis protocol will be implemented by laboratories. There are many types of physical-chemical sample processing and analysis. This Technical Specification describes the suitable methods for samples of glass fractions from photovoltaic panel treatment processes.

A laboratory that complies with EN ISO/IEC 17025 shall perform chemical analysis including processing of the samples. If the laboratory does not comply with EN ISO/IEC 17025 then duplicate samples shall be sent for checking to laboratory that does meet EN ISO/IEC 17025 on a regular basis, according to a defined process.

NOTE 2 The laboratory can be internal to the treatment operator or a third party laboratory.