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**Zahteve za zbiranje, prevoz in ravnanje z gospodinjskimi napravami s pretečeno uporabnostjo, ki vsebujejo hlapne fluorokarbene ali hlapne ogljikovodike**

Collection, logistics & treatment requirements for end-of-life household appliances containing volatile fluorocarbons or volatile hydrocarbons

Anforderungen an die Sammlung, Logistik und Behandlung von Altgeräten aus dem Haushalt die flüchtige Fluorkohlenwasserstoffe oder flüchtige Kohlenwasserstoffe enthalten

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Exigences de collecte, logistique et traitement pour la fin de vie des appareils domestiques contenant des fluorocarbures volatils ou des hydrocarbures volatils

**Ta slovenski standard je istoveten z: EN 50574:2012**

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13.030.30	Posebni odpadki	Special wastes
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EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

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Exigences de collecte, logistique et traitement pour la fin de vie des appareils domestiques contenant des fluorocarbures volatils ou des hydrocarbures volatils

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Comité Européen de Normalisation Electrotechnique  
Europäisches Komitee für Elektrotechnische Normung

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## Foreword

This document (EN 50574:2012) was prepared by CLC/TC 111X/WG 04, "Environment - End of life requirements for household appliances containing volatile fluorinated substances or volatile hydrocarbons".

The following dates are fixed:

- latest date by which this document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2013-03-26
- latest date by which the national standards conflicting with this document have to be withdrawn (dow) 2015-03-26

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## Introduction

This document establishes requirements for the transportation, sorting and treatment of household appliances containing volatile fluorocarbons or volatile hydrocarbons after they have been discarded as waste electrical and electronic equipment (WEEE).

The methodologies for the inspection of the performance of treatment systems for household refrigerators and freezers in step 2 treatment was developed in the early 1990s. The methodologies used for performance tests since then have been created to evaluate the efficiency of treatment plants designed to recover VFCs from insulating foam. The evaluation criteria used for performance testing are based on the VFC content of household refrigerators and freezers that were produced in the 1970s and 1980s.

The increasing appearance on the recycling market of appliances with VFC-free insulation (foamed with VHC) has had a strong impact on the general framework conditions for performance testing over the last few years. In the early 1990s the quantity of R11 (a VFC) was reduced by approximately 50 %. R11 was then largely phased out in favour of VHCs in the early 2000s.

Consequently the expected values from step 2 treatment that had been achieved in the 1990s are no longer applicable for the appliances that are recycled today. Nowadays more and more VFC-free appliances and appliances containing reduced quantities of VFC come back for recycling.

The WEEE within the scope of this standard could contain substances that if released untreated to the atmosphere could contribute to ozone depletion or global warming. The substances may be present in the refrigerating system and in insulating foam. This standard seeks to reduce the environmental impact caused by such WEEE by defining requirements covering sorting, transportation, handling and treatment. It covers how substances with a high global warming potential and/or ozone depletion potential are removed from WEEE and subsequently treated so as to significantly reduce environmental impacts.

By addressing the above issues this standard supports the WEEE Directive 2002/96/EC.

## 1 Scope

This European Standard defines requirements for the end of life handling, transportation, storage, sorting and treatment of WEEE household appliances containing volatile fluorocarbons, volatile hydrocarbons, or both. Furthermore, this European Standard only applies to WEEE household appliances that use heat-transfer media other than water e.g. refrigerators, freezers, heat pump tumble dryers, de-humidifiers and portable air conditioners. Discarded appliances covered by this European Standard will have been deposited at a collection facility as domestic WEEE.

The European Standard describes requirements for the removal of volatile fluorocarbons and volatile hydrocarbons. These substances can be found as refrigerant in the refrigerating system (partly dissolved in the oil) and as blowing agent in the insulating foam of discarded household appliances.

NOTE This European Standard has been prepared to fulfil the requirements of Directive 2002/96/EC but does not preclude the procedures described herein from being used to treat appliances that are not commonly found in private households.

It defines requirements pertaining to producers, WEEE compliance schemes (acting on behalf of producers) and waste treatment facilities so as to ensure the provisions of applicable national laws resulting from European legislation are fulfilled. These requirements are intended to define procedures, parameters based on the best available technologies at the time of the publication; however, provisions laid down by national regulatory bodies will continue to additionally apply. This standard only describes the results to be achieved, it does not specify how they are to be achieved nor does it prescribe the use of any specific technology.

This European Standard does not generally cover collection facilities, nor does it cover how appliances arrive at these facilities. However, this standard does address the sorting of heat-pump tumble dryers from other types of tumble dryer, a task that could be performed at a collection facility.

This European Standard defines requirements relating to handling, transportation, sorting and treatment of WEEE covered by the scope of this standard. This standard does not include any activity prior to delivery to a logistic facility.

## 2 Normative references

None

## 3 Abbreviations, terms and definitions

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

### 3.1 Abbreviations

#### 3.1.1

##### **WEEE**

waste electrical and electronic equipment

#### 3.1.2

##### **CFC**

chlorofluorocarbon

#### 3.1.3

##### **HCFC**

hydrochlorofluorocarbon

**3.1.4****HFC**

hydrofluorocarbon

**3.1.5****HC**

hydrocarbon

**3.1.6****VFC**

volatile fluorocarbon

**3.1.7****VHC**

volatile hydrocarbon

**3.1.8****PU**

polyurethane

**3.2 Terms and definitions****3.2.1****collection facility**

location designated for the gathering of WEEE from private households to facilitate separate collection

Note 1 to entry: The term “WEEE from private households” is defined in Directive 2002/96/EC (the WEEE Directive) and the terms “collection” and “separate collection” are defined in Directive 2008/98/EC (the Waste Framework Directive).

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Note 2 to entry: Collection facilities are typically registered, listed, or otherwise approved or designated in accordance with the national legislation implementing Directive 2002/96/EC (the WEEE Directive).

**3.2.2****logistics facility**

location for receiving WEEE in order to sort, store, and prepare for transport, with the intention to deliver to treatment facilities

**3.2.3****storage**

locating WEEE temporary prior to treatment

**3.2.4****responsible take-back party**

organisation that both a) arranges for the physical delivery of WEEE from a collection facility or logistics facility to a treatment facility and b) ensures that environmentally sound transport and treatment is performed on behalf of producers

Note 1 to entry: Different countries have different names for responsible take-back parties.

Note 2 to entry: Depending on the particular legislative provisions, The responsible take-back party could be the producer or a second party acting on their behalf (such as a WEEE Compliance Scheme).

**3.2.5****handling**

activity where WEEE is physically moved by workers or equipment for the intended purpose of storage, transport or treatment



**3.2.6****transport**

delivery of WEEE from a collection facility or a logistics facility to a treatment facility

**3.2.7****treatment**

Note 1 to entry: Directive 2002/96/EC defines “treatment” as:

“any activity that takes place after WEEE has been handed over to a facility for depollution, disassembly, shredding, recovery or preparation for disposal and any other operation carried out for the recovery and/or the disposal of WEEE”.

**3.2.8****treatment facility**

location where WEEE undergoes treatment

**3.2.9****step 1 treatment**

removal of VFC, VHC and oil from the refrigerating system

Note 1 to entry: Other components (i.e. compressors cable, glass shelves, plastic parts, mercury switches, capacitors) can also be removed during step 1 treatment.

**3.2.10****step 2 treatment**

removal of VFC, VHC from insulating foam

Note 1 to entry: Other fractions (i.e. ferrous metals, non-ferrous metals, plastics, PU foam) can also be separated during step 2 treatment.

Note 2 to entry: Step 2 treatment is not applicable for heat pump tumble dryers, de-humidifiers and portable air conditioners if they do not contain insulating foam.

**3.2.11****step 3 treatment**

converting VFC, VHC as a part of the treatment process into compounds that do not deplete the ozone layer

Note 1 to entry: Compounds should be considered to deplete the ozone layer are covered by EC Regulation 1005/2009.

**3.2.12****refrigerant**

fluid used for heat transfer in a mechanical refrigerating system which absorbs heat at a low temperature and a low pressure of the fluid and rejects it at a higher temperature and higher pressure of the fluid usually involving reversible changes of the phase of the fluid

[SOURCE: ISO 817:2005]

**3.2.13****refrigerating system**

part that uses a refrigerant to transfer thermal energy from one part of an appliance to another part

Note 1 to entry: The refrigerating system in new appliances is hermetically sealed and typically also contains oil.

**3.2.14****blowing agent**

substance that is used to produce cells in the structure of an insulating foam

**3.2.15****volatile fluorocarbon (VFC)**

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

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

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

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

**3.2.16****volatile hydrocarbon (VHC)**

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

Note 1 to entry: Common designations for volatile hydrocarbons are R290 for propane, R600a for isobutane, R1270 for propene and RC601 for cyclopentane. Mixtures of VHC are also possible.

**3.2.17****oil**

oil within the refrigerating system that lubricates the compressor

**3.2.18****target value**

quantity of blowing agent or refrigerant that is required to be recovered during treatment

Note 1 to entry: Target values could be set by e.g. an industry expert group or law.

**3.2.19****category 1 appliances**

single-door refrigerators having a storage capacity of less than 0,18 m<sup>3</sup>, as specified by the appliance manufacturer

Note 1 to entry: Category 1 appliances only have one compressor.

**3.2.20****category 2 appliances**

refrigerators or combined refrigerator/freezers having a total storage capacity ranging from 0,18 m<sup>3</sup> to 0,35 m<sup>3</sup>, as specified by the appliance manufacturer

Note 1 to entry: Category 2 appliances can have one or two compressors.

**3.2.21****category 3 appliances**

freezers having a storage capacity of less than, or equal to, 0,50 m<sup>3</sup> and refrigerator or combined refrigerator/freezer having a total storage capacity greater than 0,35 m<sup>3</sup> and less than or equal to 0,50 m<sup>3</sup> as specified by the appliance manufacturer

Note 1 to entry: Category 3 appliances can have one or two compressors.

**3.2.22****category 4 appliances**

refrigerators or freezers or combined refrigerator/freezer with a total storage capacity of more than 0,50 m<sup>3</sup>

**3.2.23****category 5 appliances**

refrigerators or freezers or combined refrigerator/freezers that are not household appliances

Note 1 to entry: Appliances like heat pump tumble dryers, de-humidifiers and portable air conditioners are not explicitly categorised but are taken into account in monitoring.

### 3.2.24 Disposal

operation which is not recovery even where the operation has as a secondary consequence the reclamation of substances or energy

Note 1 to entry: Text taken from Directive 2008/98/EC.

### 3.2.25 recovery

Note 1 to entry: Directive 2008/98/EC (the Waste Framework Directive) defines this term as:

"any operation the principal result of which is waste serving a useful purpose by replacing other materials which would otherwise have been used to fulfil a particular function, or waste being prepared to fulfil that function, in the plant or in the wider economy. Annex II [from Directive 2008/98/EC] sets out a non-exhaustive list of recovery operations."

## 4 Requirements prior to treatment

### 4.1 General

The requirements prior to treatment apply to all operators involved in handling, transportation, sorting, and storage of WEEE of appliances according to the scope of this document.

WEEE covered by this standard shall be stored, handled and transported in a way that damage of any part of the refrigerant system or the insulating foam is avoided. In particular, appropriate measures shall be introduced and documented so as to:

- prevent, as far as reasonably practicable, the emission of VFCs;
- reduce the risk of explosion due to the release of VHCs by ensuring that levels and measures are consistent with health and safety legislation.

NOTE 1 These measures are required to ensure that VFCs and VHCs are not released due to mishandling, since leakage of VFC could damage to the environment and leakage of VHC in confined places could result in an explosion.

NOTE 2 Employers should ensure that they are familiar with the general requirements for health and safety as laid down in Directive 89/391 EEC and also the particular requirements set out in Directive 1999/92/EC for the safety and health protection of workers potentially at risk from explosive atmospheres and Directive 94/9/EC on equipment and protective systems intended for use in potentially explosive atmospheres (ATEX).

If leakage of oil is detected, appropriate measures shall be taken to minimise environmental impacts.

### 4.2 Site requirements

All sites shall be secured against unauthorised access or egress.

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

NOTE Technical requirements for sites for storage and treatment are described in Annex III of Directive 2002/96/EC.

### 4.3 Transportation

It is permitted to transport WEEE within the scope of this standard with other WEEE providing the WEEE covered by this standard is not damaged as a consequence of this optimisation.

The WEEE within the scope of this standard shall not be crushed, compacted, or handled in a way that could damage any part of the refrigerant system or the insulating foam. In particular during transportation, internal transit or when loading and unloading appliances, care shall be taken to ensure that appliances' refrigerating systems and cabinets are not damaged.

#### 4.4 Sorting

WEEE within the scope of this standard shall be separated from other WEEE at logistic facilities and delivered to treatment facilities primarily specialized in the treatment of WEEE containing VFCs or VHCs. This sorting shall only be performed by trained or adequately supervised personnel.

To ensure that heat pump tumble dryers are treated correctly, as a precondition it is necessary that they are first identified and correctly sorted (see Annex D). The treatment of these appliances containing VFC shall be carried out only at facilities that perform step 1 treatment.

NOTE Treating WEEE without first separating appliances within the scope of this standard from other WEEE could result in emission of substances that are either harmful to the environment or present a risk of fire or explosion.

Separating VHC-containing appliances from VFC-containing appliances for separate treatment is only permitted if analytical evidence exists that identifies the blowing agents for each appliance.

#### 4.5 Compliance criteria

Parties responsible for any action covered by 4.1 through 4.4 shall have procedures in place to ensure and document compliance with the requirements set there.

These procedures (e.g. trainings, operational measures) and their regular approval shall be documented (for instance as part of that organisation's quality, environmental, or health and safety management system) and periodically audited. The results of such audits shall be made available to the party having responsibility for the quality of WEEE delivered for treatment on request (normally the responsible take-back party).

### 5 Requirements for treatment facilities

#### 5.1 General

The operator of the treatment facility shall ensure that all removed VFCs and VHCs are captured and subsequently disposed of, or recovered, in accordance with requirements set by the responsible take back parties. Removed VFCs, VHCs and mixtures thereof shall either be transported to an authorised facility for recovery or disposal, or recovered or destroyed by on-site conversion.

NOTE 1 Requirements for transportation are given by national measures implementing the "Accord européen relatif au transport international des marchandises dangereuses par route" (ADR).

NOTE 2 Recovery and destruction of used controlled ozone depleting substances is covered by EC Regulation No 1005/2009.

Separated VFCs shall be converted by a suitable process so that they no longer have the potential for causing depletion of the ozone layer. Where the VFCs are sent for conversion to a facility remote from the treatment facility, records of bills or delivery sheets shall be documented and maintained.

NOTE 3 All treatment facilities that treat WEEE in accordance with this standard will need to comply with explosion protection measures. Refer to Directive 1999/92/EC on minimum requirements for improving the safety and health protection of workers potentially at risk from explosive atmospheres and Directive 94/9/EC on the approximation of the laws of the Member States concerning equipment and protective systems intended for use in potentially explosive atmospheres (ATEX).