

Pinnatöötlemisseadmete heitgaaside termilise puhastamise süsteemid. Ohutusnõuded

Thermal cleaning systems for exhaust gas from surface
treatment equipment - Safety requirements

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

<p>Käesolev Eesti standard EVS-EN 12753:2005+A1:2010 sisaldab Euroopa standardi EN 12753:2005+A1:2010 ingliskeelset teksti.</p> <p>Standard on kinnitatud Eesti Standardikeskuse 31.12.2010 käskkirjaga ja jõustub sellekohase teate avaldamisel EVS Teatajas.</p> <p>Euroopa standardimisorganisatsioonide poolt rahvuslikele liikmetele Euroopa standardi teksti kättesaadavaks tegemise kuupäev on 26.05.2010.</p> <p>Standard on kättesaadav Eesti standardiorganisatsioonist.</p>	<p>This Estonian standard EVS-EN 12753:2005+A1:2010 consists of the English text of the European standard EN 12753:2005+A1:2010.</p> <p>This standard is ratified with the order of Estonian Centre for Standardisation dated 31.12.2010 and is endorsed with the notification published in the official bulletin of the Estonian national standardisation organisation.</p> <p>Date of Availability of the European standard text 26.05.2010.</p> <p>The standard is available from Estonian standardisation organisation.</p>
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English Version

**Thermal cleaning systems for exhaust gas from surface
treatment equipment - Safety requirements**

Systèmes d'épuration thermique de l'air extrait des
installations de traitement de surface - Prescriptions de
sécurité

Thermische Reinigungssysteme für Abluft aus Anlagen zur
Oberflächenbehandlung - Sicherheitsanforderungen

This European Standard was approved by CEN on 21 March 2005 and includes Amendment 1 approved by CEN on 23 April 2010.

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This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN Management Centre has the same status as the official versions.

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Foreword

This document (EN 12753:2005+A1:2010) has been prepared by Technical Committee CEN/TC 271, "Surface treatment equipment — Safety", the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by November 2010, and conflicting national standards shall be withdrawn at the latest by November 2010.

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

This document includes Amendment 1, approved by CEN on 2010-04-23.

This document supersedes EN 12753:2005.

The start and finish of text introduced or altered by amendment is indicated in the text by tags **A1** **A1**.

This European Standard has been prepared under a mandate given to CEN by the Commission of the European Communities and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For relationship with EU Directives, see informative Annex ZA, which is an integral part of this European Standard.

This European Standard is part of a set of standards devoted to the health and safety requirements of installations for the application and drying of coating materials.

The attention of the reader is drawn to the fact that compliance with this European Standard does not waive the obligation to comply with the regulations governing installations categorised for environmental protection which also deal with the risks of nuisance to the surroundings such as noise emitted outside the building, odours, pollution.

NOTE Although a thermal cleaning system, as an integral whole, formally does not fall under the scope of the ATEX Directive 94/9/EC, the standard is based upon a fundamental risk analysis according to this directive.

This European Standard includes a Bibliography.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

Introduction

This European Standard is a type C standard as stated in EN ISO 12100.

The machinery concerned and the extent to which hazards, hazardous situation and events are covered are indicated in the scope of this European Standard.

When provisions of this type C standard are different from those which are stated in type A or B standards, the provisions of this type C standard take precedence over the provisions of the other standards, for machines that have been designed and built according to the provisions of this European Standard.

1 Scope

1.1 This European Standard is applicable to thermal cleaning systems for exhaust gas from surface treatment equipment/systems as given below in which the concentration of exhaust gas to be cleaned (for the purpose of this European Standard, named "process gas") at the inlet to the thermal cleaning system is safely limited within the concentration ranges given in 5.2.2.2.

Surface treatment equipment includes:

- dryers according to EN 1539, curing equipment;
- flash-off areas;
- coating plants (e.g. closed spray booths, open fronted spray booths);
- machines using flammable solvents for the pre-treatment and cleaning of products or equipment (e.g. barrels, tins, cans or containers);
- related solvent handling equipment.

[A1] This European Standard deals only with the significant hazards from fire and explosion and hazards generated by residual process gases as listed in Clause 4, when used as intended and under the conditions foreseen by the manufacturer. **[A1]**

The types of thermal cleaning systems covered in this European Standard are

- direct combustion, and
- catalytic combustion

(see definitions in 3.1.1 and 3.1.2).

This European Standard applies in conjunction with the relevant requirements of EN 746-1 and EN 746-2.

For the purpose of this European Standard a thermal cleaning system for process gas contains the following components: fan(s), heat exchanger, process space, main and supporting burner, injection system, power driven dampers, control and power circuits joined together for the processing of flammable substances, predominantly volatile organic compounds, by effecting oxidation.

NOTE Thermal cleaning equipment is usually integrated with systems as covered by e.g. EN 1010-1, EN 1539, EN 12215, EN 12921-1 or EN 12921-3.

1.2 This European Standard is not applicable to:

- thermal paint removal systems;
- pyrolytic systems.

1.3 This European Standard is not applicable to thermal cleaning systems which are manufactured before the date of publication of this document by CEN.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 746-1, *Industrial thermoprocessing equipment — Part 1: Common safety requirements for industrial thermoprocessing equipment*

EN 746-2, *Industrial thermoprocessing equipment — Part 2: Safety requirements for combustion and fuel handling systems*

EN 954-1:1996, *Safety of machinery — Safety related parts of control systems — Part 1: General principles for design*

EN 1127-1:1997, *Explosive atmospheres — Explosion prevention and protection — Part 1: Basic concepts and methodology*

EN 13463-1:2001, *Non-electrical equipment for potentially explosive atmospheres — Part 1: Basic method and requirements*

EN 13463-5, *Non-electrical equipment intended for use in potentially explosive atmospheres — Part 5: Protection by constructional safety "c"*

prEN 14986, *Design of fans working in potentially explosive atmospheres*

EN 50015, *Electrical apparatus for potentially explosive atmospheres — Oil immersion "o"*

EN 50017, *Electrical apparatus for potentially explosive atmospheres — Powder filling "q"*

EN 50020, *Electrical apparatus for potentially explosive atmospheres — Intrinsic safety "i"*

EN 60079-0:2004, *Electrical apparatus for explosive gas atmospheres — Part 0: General requirements (IEC 60079-0:2004)*

EN 60079-1:2004, *Electrical apparatus for potentially explosive atmospheres — Part 1: Flameproof enclosures "d" (IEC 60079-1:2003)*

EN 60079-2, *Electrical apparatus for explosive gas atmospheres — Part 2: Pressurized enclosures "p" (IEC 60079-2:2001)*

EN 60079-7, *Electrical apparatus for explosive gas atmospheres — Part 7: Increased safety "e" (IEC 60079-7:2001)*

EN 60079-15, *Electrical apparatus for explosive gas atmospheres - Part 15: Type of protection "n" (IEC 60079-15:2001, modified)*

EN 60079-18, *Electrical apparatus for explosive gas atmospheres — Part 18: Construction test and marking of type of protection encapsulation "m" electrical apparatus (IEC 60079-18:2004)*

EN 60079-25:2004, *Electrical apparatus for explosive gas atmospheres — Part 25: Intrinsically safe systems (IEC 60079-25:2003)*

EN 60204-1:1997, *Safety of machinery — Electrical equipment of machines — Part 1: General requirements (IEC 60204-1:1997)*

EN 60519-1, *Safety in electroheat installations — Part 1: General requirements (IEC 60519-1:2003)*

EN ISO 12100-1:2003, *Safety of machinery — Basic concepts, general principles for design — Part 1: Basic terminology, methodology (ISO 12100-1:2003)*

EN ISO 12100-2:2003, *Safety of machinery — Basic concepts, general principles for design — Part 2: Technical principles (ISO 12100-2:2003)*

3 Terms and definitions

For the purposes of this European Standard, the terms and definitions given in EN ISO 12100-1:2003 and the following apply.

3.1

thermal cleaning system

assembly of linked components and machines such as fan(s), heat exchanger, process space, heating device (burner), power driven dampers, control and power circuits joined together for the processing of flammable substances, predominantly volatile organic compounds, by effecting oxidation. In a thermal cleaning process gases containing flammable substances are heated to a sufficient temperature in order to oxidise the flammable fraction

3.1.1

direct combustion

direct combustion of solvents in flames or high temperature atmosphere

3.1.1.1

direct regenerative combustion

direct combustion of preheated process gas, where the heat recovery of the storage media of the thermal reactor heated by thermal combustion is used (regenerative heat exchange)

3.1.1.2

direct recuperative combustion

direct combustion of preheated process gas, where the heat exchange (without heat storage) takes place between "cold" process gas and hot exhaust gas of the thermal combustion according to the (cross) reverse flow principle (recuperative heat exchange)

3.1.2

catalytic combustion

combustion of solvents with catalysts

3.1.2.1

catalytic regenerative combustion

catalytic combustion of preheated process gas, where the heat recovery of the storage media of the thermal reactor heated by thermal combustion is used (regenerative heat exchange)

3.1.2.2

catalytic recuperative combustion

direct combustion of preheated process gas, where the heat exchange (without heat storage) takes place between "cold" process gas and hot exhaust gas of the thermal combustion according to the (cross) reverse flow principle (recuperative heat exchange)

3.2

process gas

for the purpose of this European Standard process gas is defined as the exhaust gas from the surface treatment equipment/system and may contain a mixture of air and flammable substances. The process gas is the gas supplied to the thermal cleaning system for effecting of oxidation. It may include fumes, inert gases as well as solid and/or liquid particles which may trigger condensation and lead to deposits.

Process gas may also include recirculated exhaust gas from the thermal cleaning system