

**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 sisaldab Euroopa standardi EN 12753:2005 ingliskeelset teksti.</p> <p>Käesolev dokument on jõustatud 22.06.2005 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes.</p> <p>Standard on kättesaadav Eesti standardiorganisatsioonist.</p>	<p>This Estonian standard EVS-EN 12753:2005 consists of the English text of the European standard EN 12753:2005.</p> <p>This document is endorsed on 22.06.2005 with the notification being published in the official publication of the Estonian national standardisation organisation.</p> <p>The standard is available from Estonian standardisation organisation.</p>
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<p><b>Käsitlusala:</b></p> <p>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.</p>	<p><b>Scope:</b></p> <p>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.</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.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

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 Central Secretariat has the same status as the official versions.

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## Foreword

This European Standard (EN 12753:2005) 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 2005, and conflicting national standards shall be withdrawn at the latest by November 2005.

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, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

## 0 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.

This European Standard deals only with the significant hazards from fire and explosion as listed in Clause 4, when used as intended and under the conditions foreseen by the manufacturer.

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