Tööstuslikud termotöötlusseadmed. Osa 2: Põlemis- ja kütusekasutussüsteemide ohutusnõuded

Industrial thermoprocessing equipment - Part 2: Safety requirements for combustion and fuel handling systems

EESTI STANDARDI EESSÕNA **NATIONAL FOREWORD**

Käesolev Eesti standard EVS-EN 746-2:1999 sisaldab Euroopa standardi EN 746-2:1997 ingliskeelset teksti. Käesolev dokument on jõustatud 23.11.1999 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes. Standard on kättesaadav Eesti standardiorganisatsioonist.	This Estonian standard EVS-EN 746-2:1999 consists of the English text of the European standard EN 746-2:1997. This document is endorsed on 23.11.1999 with the notification being published in the official publication of the Estonian national standardisation organisation. The standard is available from Estonian standardisation organisation.

Käsitlusala: Käesolev EN 746 osa kehtib kõigi põletus- ja kütusekasutusseadmete kohta, mida kasutatakse tööstuslikes termotöötlusseadmetes ja mis vastavad standardis EN 292-1 esitatud seadmete määratlusele; näiteks sulatusahjud, kuivatid, ahjud, küttesüsteemid, soolavannid, sulatuspaagid ning seadmed integreeritud põletitele ja jootelampidele, lõikeseadmetele, plaatkuumutitele vms. Standard hõlmab igasugused gaasilised, vedelad ja tahked kütused ning nende ühendid, mis tekitavad põlemisel õhuga või muu vaba hapnikku sisaldava gaasiga; samuti põletid, mis pole tehasega lahutamatult seotud, isegi kui selle kohta pole otsest viidet.	**Scope:**

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Võtmesõnad: eristuskiri, info, kütused, liigitus, ohtlikud seadmed, ohud, ohutusmõõtmised, ohutusnõuded, seadmestiku ohutus, tööstuslikud ahjud, tööstustooted, õnnetuste vältimine

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English version

Industrial thermoprocessing equipment

Part 2: Safety requirements for combustion and fuel handling systems

Equipements thermiques industriels – Partie 2: Prescriptions de sécurité concernant la combustion et la manutention des combustibles

Industrielle Thermoprozeßanlagen – Teil 2: Sicherheitsanforderungen an Feuerungen und Brennstoffführungssysteme

This European Standard was approved by CEN on 1997-02-15.

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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.

The European Standards exist 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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CEN

European Committee for Standardization
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Contents

FOREWORD

This European Standard has been prepared by Technical Committee CEN/TC 186 "Industrial thermoprocessing - 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 September 1997, and conflicting national standards shall be withdrawn at the latest by September 1997.

The working group that drafted this Part of EN 746 comprised experts from the following countries: Belgium, France, Germany, Italy, Netherlands and the United Kingdom.

This standard forms one part of safety standards covering Industrial Thermoprocessing Equipment.
The full list of parts of this standard is given below:

EN 746 Industrial Thermoprocessing Equipment

- Part 1: Common Safety Requirements for Industrial Thermoprocessing Equipment
- Part 2: Safety Requirements for Combustion and Fuel Handling Systems
- Part 3: Safety Requirements for the Generation and Use of Atmosphere Gases
- Part 4: Particular Safety Requirements for Hot Dip Galvanising Thermoprocessing Equipment
- Part 5: Particular Safety Requirements for Salt Bath Thermoprocessing Equipment
- Part 6: Particular Safety Requirements for Material Melting, Remelting and Liquid Phase Maintaining Thermoprocessing Equipment
- Part 7: Particular Safety Requirements for Vacuum Thermoprocessing Equipment
- Part 8: Particular Safety Requirements for Quenching Equipment

An assessment of the foreseeable risks arising from the use of the equipment covered by this Part of EN 746 was carried during the drafting process.

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

For relationship with EU Directive(s), see informative Annex ZA, which is an integral part of this standard.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

0 INTRODUCTION

This standard has been prepared to be a harmonized standard to provide one means of conforming with the essential safety requirements of the Machinery Directive and associated EFTA Regulations.

The extent to which hazards are covered is indicated in the scope of the standard. In addition, machinery shall comply as appropriate with EN 292 for hazards which are not covered by this standard.

This European standard is a Type C-Standard as defined in EN 292.

The equipment dealt with and the extent to which hazards are covered are indicated in the scope of this Part of EN 746.

This Part of EN 746 assumes that the equipment are operated and maintained by trained personnel.

Where for clarity an example of a preventative measure is given in the text this should not be considered as the only possible solution. Any other solution leading to the same risk reduction is permissible if an equivalent level of safety is achieved.

1 SCOPE

This Part of EN 746 applies to all combustion and fuel handling equipment used in industrial thermoprocessing equipment which meets the definition for machinery given in 3.1 of EN 292-1:1991, referred to hereafter as "equipment", e.g. furnaces, kilns, ovens, heating systems such as salt baths and melting tanks, and equipment such as integrated burners and torches used in casting machines, ladle heating etc.

It applies to the handling of fuel immediately adjacent to the equipment but downstream of and including the main plant manually operated fuel shut off valve. It specifies the list of hazards, the safety requirements and associated measures as well as the user instructions relating to fuel handling and combustion equipment.

It applies to all forms of gaseous, liquid and solid fuel and any combinations of them in combustion with air or other gas containing free oxygen.

This Part of EN 746 also applies to gas torches, work station burners, working flame burners and other burners not integral with the plant, even though they are not covered by the mandate.

This Part of EN 746 specifies the requirements to be met by the manufacturer to ensure the safety of persons and property during commissioning, start-up, operation, shut-down and maintenance, as well as in the event of foreseeable faults or malfunctions. It specifies the safety requirements at stages in the life of the equipment, and its design, ordering, construction and use.

The hazards covered by this Part of EN 746 are listed in clause 4.

This Part of EN 746 applies to equipment which is placed on the market after the date of issue of this standard.

This Part of EN 746 does not apply to but may be used as reference for:

- gas torches for welding, flame cutting and related processes;
- boiler installations;
- environmental space heating of any kind;
- the storage of fuel;
- industrial food processing.

2 NORMATIVE REFERENCES

This European standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

2.1 Group references

EN 292-1:1991	Safety of machinery - Basic concepts, general principles for design - Part 1: Basic terminology, methodology
EN 292-2:1991	Safety of machinery - Basic concepts, general principles for design - Part 2: Technical principles and specifications
EN 60 204-1	Safety of machinery - Electrical equipment of machines - Part 1: General requirements (IEC 204-1:1992, modified)
IEC 364-4-41	Electrical installations of buildings; Part 4: Protection for safety; Chapter 41: Protection against electrical shock
IEC 364-4-43	Electrical installations of buildings; Part 4: Protection for safety; Chapter 43: Protection against overcurrent
IEC 364-4-47	Electrical installations of buildings; Part 4: Protection for safety; Chapter 47: Application of protective measures for safety. Section 470 - General. Section 471 - Measures of protection against electric shock

IEC 364-4-442	Electrical installations of buildings; Part 4: Protection for safety; Chapter 44: Protection against overvoltages; Section 442 - Protection of low-voltage installations against faults between high-voltage systems and earth
IEC 364-4-443	Electrical installations of buildings; Part 4: Protection for safety; Chapter 44: Protection against overvoltages; Section 443 - Protection against overvoltages of atmospheric origin or due to switching
IEC 364-4-473	Electrical installations of buildings. Part 4: Protection for safety; Chapter 47: Appplication of protective measures for safety. Section 473 - Measures of protection against overcurrent
IEC 364-4-45	Electrical installations of buildings. Part 4: Protection for safety; Chapter 45: Protection against undervoltage
IEC 364-4-46	Electrical installations of buildings. Part 4: Protection for safety; Chapter 46: Isolation and switching

2.2 Product references

EN 88	Pressure governors for gas appliances for inlet pressures up to 200 mbar
EN 125	Flame supervision devices for gas burning appliance - Thermo-electric flame supervision devices
EN 161	Automatic shut-off valves for gas burners and gas appliances
EN 230	Monobloc oil burners - Safety, control and regulation devices and safety times
EN 264	Safety shut-off devices for combustion plants using liquid fuels - Safety requirements and testing
EN 298	Automatic gas burner control systems for gas burners and gas burning appliances with or without fans
prEN 331	Manually operated ball valves and closed bottom taper plug valves for gas installations for buildings

EN 746-1:1997	Industrial thermoprocessing equipment - Part 1: Common safety requirements for industrial thermoprocessing equipment
EN 751	Sealing materials for metallic threaded joints in contact with 1st, 2nd and 3rd family gases and hot water
EN 982	Safety of machinery - Safety requirements for fluid power systems and their components - Hydraulics
EN 983	Safety of machinery - Safety requirements for fluid power systems and their components - Pneumatics
prEN 10208-1	Steel pipes for pipe lines for combustible fluids - Technical delivery conditions - Part 1: Pipes of requirement class A
EN 10208-2	Steel pipes for pipelines for combustible fluids - Technical delivery conditions - Part 2: Pipes of requirement class B
prEN 10216-1	Seamless steel tubes for pressure purposes - Technical delivery conditions - Part 1: Non-alloy steels with specified room temperature properties
prEN 10217-1	Welded steel tubes for pressure purposes - Technical delivery conditions - Part 1: Non-alloy steels with specified room temperature properties
ENV 10220	Seamless and welded steel tubes - Dimensions and masses per unit length
EN 25817	Arc-welded joints in steel - Guidance on quality levels for imperfections (ISO 5817:1992)
ISO 7-1	Pipe threads where pressure-tight joints are made on the threads - Part 1: Dimensions, tolerances and designation
ISO 228-1	Pipe threads where pressure-tight joints are not made on the threads - Part 1: Dimensions, tolerances and designation
ISO 3405	Petroleum products - Determination of distillation characteristics
ISO 7005-1	Metallic flanges - Part 1: Steel flanges

ISO 7005-2	Metallic flanges - Part 2: Cast iron flanges
ISO 7005-3	Metallic flanges - Part 3: Copper alloy and composite flanges

3 DEFINITIONS

For the purposes of this standard, the following definitions apply.

NOTE 1: A classification of plant, fuels and burners is given in Annex A.

NOTE 2: An alphapetic listing of the definitions, as well as their cross-references in German, French and English are given in informative Annex C.

3.1 air flow detector: A device for registering the existence of an adequate air flow.

3.2 air pressure detector: A device for registering the existence of an adequate air pressure.

3.3 air-fuel ratio: The ratio of the mass flow of combustion air to the mass flow of fuel in a mixture.

3.4 alternating pilot: A pilot for lighting the main burner that is extinguished at the end of the main burner ignition period and is re-ignited immediately before the main burner is shut down for control purposes.

3.5 automatic burner: A burner that is fitted with automatic ignition, a flame safeguard and burner control devices. Ignition, flame monitoring and the on/off operation of the burner occur automatically. The heat input of the burner can be adjusted during operation either automatically or manually.

3.6 burner: A combustion system under the control of a single system of safety shut-off valves.

3.7 burner input rate: The maximum burner thermal input rate expressed in terms of the net calorific value.

3.8 by-pass: A passage conveying fuel from the upstream side to the downstream side of a control so as to be independent of the action of the control.

3.9 calorific value: The quantity of heat produced by the combustion of unit volume or mass of fuel at a constant pressure of 1 013 mbar. A distinction is made between the gross calorific value (where the water produced by combustion is assumed to be condensed) and the net calorific value.

3.10 combustion chamber: That part of the plant in which the main combustion takes place.