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**Toplotnoizolacijski proizvodi za opremo stavb in industrijske inštalacije -  
Proizvodi iz fleksibilne elastomerne pene (FEF) - Specifikacija**

Thermal insulation products for building equipment and industrial installations - Factory made flexible elastomeric foam (FEF) products - Specification

Wärmedämmstoffe für die technische Gebäudeausrüstung und für betriebstechnische Anlagen in der Industrie - Werkmäßig hergestellte Produkte aus flexiblem Elastomerschaum (FEF) - Spezifikation

Produits isolants thermiques pour l'équipement du bâtiment et les installations industrielles - Produits manufacturés en mousse d'elastomere flexible (FEF) - Spécification

**Ta slovenski standard je istoveten z: EN 14304:2009**

**ICS:**

91.100.60	Materiali za toplotno in zvočno izolacijo	Thermal and sound insulating materials
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**SIST EN 14304:2010****en,fr,de**

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EUROPEAN STANDARD

EN 14304

NORME EUROPÉENNE

EUROPÄISCHE NORM

November 2009

ICS 91.100.60

English Version

Thermal insulation products for building equipment and industrial installations - Factory made flexible elastomeric foam (FEF) products - Specification

Produits isolants thermiques pour l'équipement du bâtiment et les installations industrielles - Produits manufacturés en mousse élastomère flexible (FEF) - Spécification

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This European Standard was approved by CEN on 29 September 2009.

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 CEN Management Centre 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 CEN Management Centre has the same status as the official versions.

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## Foreword

This document (EN 14304:2009) has been prepared by Technical Committee CEN/TC 88 “Thermal insulating materials and products”, 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 May 2010, and conflicting national standards shall be withdrawn at the latest by August 2011.

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 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 89/106/EEC.

For relationship with EU Directive 89/106/EEC, see informative Annex ZA, which is an integral part of this document.

Locally responsible authorities and contracting entities, who are bound by EU Directives to specify their requirements using European harmonized product standards, are allowed to demand additional properties outside the provisions of this standard if this is technically necessary because of prevailing operational conditions of the building equipment or the industrial installation projected or because of safety regulations.

This European Standard contains five annexes:

- Annex A (normative), Factory production control
- Annex B (normative), Determination of minimum service temperature
- Annex C (normative), Thermal conductivity measurement
- Annex D (informative), Additional properties
- Annex ZA (informative), Clauses of this European Standard addressing the provisions of the EU Construction Products Directive

This document includes a bibliography.

This European Standard is one of a series of standards for insulation products used in building equipment and industrial installations, but this standard can be used in other areas, where appropriate.

In pursuance of Resolution BT 20/1993 revised, CEN/TC 88 have proposed defining the standards listed below as a European package of standards, setting (21 months after availability) as the date of withdrawal (dow) of national standards which conflict with the European standards of this package.

The package of standards comprises the following group of interrelated standards for the specifications of factory made thermal insulation products, all of which come within the scope of CEN/TC 88:

EN 14303, *Thermal insulation products for building equipment and industrial installations — Factory made mineral wool (MW) products — Specification*

EN 14304, *Thermal insulation products for building equipment and industrial installations — Factory made flexible elastomeric foam (FEF) products — Specification*

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EN 14305, *Thermal insulation products for building equipment and industrial installations — Factory made cellular glass (CG) products — Specification*

EN 14306, *Thermal insulation products for building equipment and industrial installations — Factory made calcium silicate (CS) products — Specification*

EN 14307, *Thermal insulation products for building equipment and industrial installations — Factory made extruded polystyrene foam (XPS) products — Specification*

EN 14308, *Thermal insulation products for building equipment and industrial installations — Factory made rigid polyurethane foam (PUR) and polyisocyanurate foam (PIR) products — Specification*

EN 14309, *Thermal insulation products for building equipment and industrial installations — Factory made products of expanded polystyrene (EPS) — Specification*

EN 14313, *Thermal insulation products for building equipment and industrial installations — Factory made polyethylene foam (PEF) products — Specification*

EN 14314, *Thermal insulation products for building equipment and industrial installations — Factory made phenolic foam (PF) products — Specification*

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, 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 the United Kingdom.

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## 1 Scope

This European Standard specifies the requirements for factory made flexible elastomeric foam products which are used for the thermal insulation of building equipment and industrial installations with an operating temperature in the range of approximately - 200 °C to + 175 °C.

NOTE Below an operating temperature of - 50 °C, tests regarding the suitability of the products in the intended application shall be performed. Manufacturer's advice should be heeded in all cases.

The products are manufactured in the form of sheets, tubes, rolls and tapes with or without coating and/or self-adhesive backing and/or different closure systems.

This European Standard describes product characteristics and includes procedures for testing, evaluation of conformity, marking and labelling.

Products covered by this standard are also used in prefabricated thermal insulation systems and composite panels; the performance of systems incorporating these products is not covered.

This European Standard does not specify the required level of a given property that shall be achieved by a product to demonstrate fitness for purpose in a particular application. The levels required for a given application can be found in regulations and invitations to tender.

Products with a declared thermal conductivity greater than 0,050 W/(m·K) at 10 °C are not covered by this standard.

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This European Standard does not cover products for the insulation of the building structure.

The normative part of this standard does not cover compressive stress (see Annex D, D.5).

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## 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 822, *Thermal insulating products for building applications — Determination of length and width*

EN 823, *Thermal insulating products for building applications — Determination of thickness*

EN 824, *Thermal insulating products for building applications — Determination of squareness*

EN 1604, *Thermal insulating products for building applications — Determination of dimensional stability under specified temperature and humidity conditions*

EN 1609, *Thermal insulating products for building applications — Determination of short term water absorption by partial immersion*

EN 12085, *Thermal insulating products for building applications — Determination of linear dimensions of test specimens*

EN 12086, *Thermal insulating products for building applications — Determination of water vapour transmission properties*

EN 12667, *Thermal performance of building materials and products — Determination of thermal resistance by means of guarded hot plate and heat flow meter methods — Products of high and medium thermal resistance*

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EN 12939, *Thermal performance of building materials and products — Determination of thermal resistance by means of guarded hot plate and heat flow meter methods — Thick products of high and medium thermal resistance*

EN 13172, *Thermal insulating products — Evaluation of conformity*

EN 13467, *Thermal insulating products for building equipment and industrial installations — Determination of dimensions, squareness and linearity of preformed pipe insulation*

EN 13468, *Thermal insulating products for building equipment and industrial installations — Determination of trace quantities of water soluble chloride, fluoride, silicate, sodium ions and pH*

EN 13469, *Thermal insulating products for building equipment and industrial installations — Determination of water vapour transmission properties of preformed pipe insulation*

EN 13472, *Thermal insulating products for building equipment and industrial installations — Determination of short term water absorption by partial immersion of preformed pipe insulation*

EN 13501-1, *Fire classification of construction products and building elements — Part 1: Classification using test data from reaction to fire test*

EN 13823, *Reaction to fire tests for building products — Building products excluding flooring exposed to the thermal attack by a single burning item*

EN 14366:2004, *Laboratory measurement of noise from waste water installations*

EN 14706, *Thermal insulating products for building equipment and industrial installations — Determination of maximum service temperature*

EN 14707, *Thermal insulating products for building equipment and industrial installations — Determination of maximum service temperature for preformed pipe insulation*

EN 15715:2009, *Thermal insulation products — Instructions for mounting and fixing for reaction to fire testing — Factory made products*

EN ISO 354, *Acoustics — Measurement of sound absorption in a reverberation room (ISO 354:2003)*

EN ISO 3822-1, *Acoustics — Laboratory tests on noise emission from appliances and equipment used in water supply installations — Part 1: Method of measurement (ISO 3822-1:1999)*

EN ISO 4589-1, *Plastics — Determination of burning behaviour by oxygen index — Part 1: Guidance (ISO 4589-1:1996)*

EN ISO 8497, *Thermal insulation — Determination of steady-state thermal transmission properties of thermal insulation for circular pipes (ISO 8497:1994)*

EN ISO 11654, *Acoustics — Sound absorbers for use in buildings — Rating of sound absorption (ISO 11654:1997)*

EN ISO 11925-2, *Reaction to fire tests — Ignitability of building products subjected to direct impingement of flame — Part 2: Single-flame source test (ISO 11925-2:2002)*

EN ISO 13787, *Thermal insulation products for building equipment and industrial installations — Determination of declared thermal conductivity (ISO 13787:2003)*



### 3 Terms, definitions, symbols, units and abbreviated terms

#### 3.1 Terms and definitions

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

##### 3.1.1 Terms and definitions as given in EN ISO 9229:2007

###### 3.1.1.1

**flexible elastomeric foam**

closed cell flexible foam, made of natural or synthetic rubber, or a mixture of the two and containing other polymers and other chemicals which may be modified by organic or inorganic additives

###### 3.1.1.2

**tube**

(insulation) product for application on cylindrical objects

###### 3.1.1.3

**roll**

(insulation) product supplied in the form of a wound cylinder

###### 3.1.1.4

**pipe insulation**

insulation product designed to fit around pipes

###### 3.1.1.5

**thermal insulation**

process of reducing heat transfer through a system, or to describe a product, component or system which performs that function

###### 3.1.1.6

**test specimen**

single item within a sample or part of an item used for a test

###### 3.1.1.7

**Initial Type Test****ITT**

test(s) performed on a product prior to commencing normal production to prove that the product is capable of conforming to the relevant requirements of a standard

###### 3.1.1.8

**building equipment**

system incorporated in a permanent manner in construction works forming part of the heating, cooling and ventilation installation of those works

###### 3.1.1.9

**industrial installation**

plant and associated vessels, pipes, ducts etc. used by industry to manufacture or store a product or to transfer a fluid

##### 3.1.2 Additional terms and definitions

###### 3.1.2.1

**sheet**

flexible insulation product of rectangular shape with or without facing or adhesive backing

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## 3.1.2.2

**tape**

thin, narrow strip of insulation material with or without adhesive backing supplied in rolls

## 3.1.2.3

**form pieces**

prefabricated elbows, T-pieces or else formed from tubes, sheets or rolls etc.

## 3.1.2.4

**level**

given value, which is the upper or lower limit of a requirement

NOTE The level is given by the declared value of the characteristic concerned.

## 3.1.2.5

**class**

combination of two levels of the same property between which the performance will fall

## 3.1.2.6

**production line**

assemblage of equipment that produces products using a continuous process

## 3.1.2.7

**production unit**

assemblage of equipment that produces products using a discontinuous process

## 3.2 Symbols, units and abbreviated terms

## 3.2.1 Symbols and units used in this standard

$\alpha_p$	is the practical sound absorption coefficient	—
$\alpha_w$	is the weighted sound absorption coefficient	—
$b$	is the width	mm
$D_i$	is the inside diameter	mm
$D_{i,D}$	is the declared inside diameter of a tube	mm
$d$	is the thickness	mm
$d_D$	is the declared thickness of the product	mm
$\Delta\varepsilon_d$	is the relative change in thickness	%
$l$	is the length	m or mm
$L_{sc,A}$	is the single number descriptor of structure-borne sound	
$\lambda$	is the thermal conductivity	W/(m·K)
$\lambda_D$	is the declared thermal conductivity	W/(m·K)
$\mu$	is the water vapour diffusion resistance factor	—
$v$	is the deviation from squareness for tubes	mm

$S_b$	is the deviation from squareness for sheets and rolls on length and width	mm/m
$W_p$	is the short term water absorption	kg/m <sup>2</sup>
AP	is the declared level of practical sound absorption coefficient	
AW	is the symbol of the declared level of weighted sound absorption coefficient	
CL	is the symbol of the declared level of soluble chloride ions	
DS(TH)	is the symbol of the declared value for dimensional stability under specified temperature and relative humidity conditions	
F	is the symbol of the declared level of soluble fluoride ions	
MU	is the symbol of the declared level of water vapour diffusion resistance factor	
NA	is the symbol of the declared level of soluble sodium ions	
pH	is the symbol of the declared level of the pH-value	
SI	is the symbol of the declared level of soluble silicate ions	
ST(+)	is the symbol of the declared level for maximum service temperature	
ST(-)	is the symbol of the declared level for minimum service temperature	
WS	is the symbol of the declared level for short term water absorption	

### 3.2.2 Abbreviated terms used in this standard

<b>FEF</b>	is Flexible Elastomeric Foam
<b>ITT</b>	is Initial Type Test
<b>ML</b>	is Manufacturer's Literature
<b>FPC</b>	is Factory Production Control

## 4 Requirements

### 4.1 General

Product properties shall be assessed in accordance with Clause 5. To comply with this standard, products shall meet the requirements of 4.2, and the requirements of 4.3 as appropriate.

NOTE Information on additional properties is given in Annex D.

One test result for a product property is the average of the measured values on the number of test specimens given in Table 2.

**EN 14304:2009 (E)****4.2 For all applications****4.2.1 Thermal conductivity**

For flat specimens, thermal conductivity shall be based upon measurements carried out in accordance with EN 12667 or EN 12939 for thick products. For cylindrical specimens EN ISO 8497 shall be used as specified in 5.3.2.

In both cases, the thermal conductivity values shall be determined by the manufacturer and verified in accordance with EN ISO 13787. They shall be declared by the manufacturer according to measuring standards mentioned above covering the product service temperature range. The following conditions apply:

- the measured values shall be expressed with three significant figures;
- the declared thermal conductivity curve shall be given as a limit curve, defined in EN ISO 13787;
- the value of the declared thermal conductivity,  $\lambda_D$ , shall be rounded upwards to the nearest 0,001 W/(m·K);
- the lowest reference mean test temperature required is - 170 °C.

The declared equation/limit curve is the "declared reference" with three significant figures, that is to 0,000 1 W/(m·K) for  $\lambda$  values below 0,1 W/(m·K) and in 0,001 W/(m·K) for  $\lambda$  values above 0,1 W/(m·K). This shall be used as a reference for the verification of the declaration.

When thermal conductivity is declared as table derived from the equation, rounding upwards to the next 0,001 W/(m·K) has to be done for the full range of the thermal conductivity.

NOTE Determinations of the declared thermal conductivity of pipe sections, following EN ISO 8497 having joints in the metering area, include joints as defined in EN ISO 23993.

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**4.2.2 Dimensions and tolerances**

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**4.2.2.1 Linear dimensions**

The length,  $l$ , width,  $b$ , and thickness,  $d$ , of sheets, rolls and tapes shall be determined in accordance with EN 822 and EN 823. The length,  $l$ , thickness,  $d$ , and inside diameter,  $D_i$ , of tubes shall be determined in accordance with EN 13467. No test result shall deviate from the declared values by more than the tolerances given in Table 1.

**4.2.2.2 Squareness**

Deviation from squareness,  $S_b$ , of sheets and rolls shall be determined in accordance with EN 824. Deviation from squareness,  $v$ , of tubes shall be determined in accordance with EN 13467. No test result shall deviate from the declared values by more than the tolerances given in Table 1.