

Nederlandse norm

# NEN-EN 14320-1

(en)

Materialen voor de thermische isolatie van gebouw- en industriële installaties - In-situ gevormde producten van gespoten hard polyurethaan- (PUR) en polyisocyanuraat- (PIR) schuim - Deel 1: Specificatie voor het gespoten hard schuimsysteem vóór de installatie

Thermal insulating products for building equipment and industrial installations - In-situ formed sprayed rigid polyurethane (PUR) and polyisocyanurate foam (PIR) products - Part 1: Specification for the rigid foam spray system before installation

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ICS 91.100.60; 91.120.10

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Als Nederlandse norm is aanvaard:  
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Voorbeeld  
 Preview

Normcommissie 353033 "Thermische isolatiematerialen"



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## Nederlands voorwoord

Voor de in deze norm vermelde normatieve verwijzingen bestaan in Nederland de volgende equivalenten:

| <u>vermelde norm</u> | <u>Nederlandse norm</u>    | <u>titel</u>   |
|----------------------|----------------------------|--|
| EN 312<br>EN 508-1   | NEN-EN 312<br>NEN-EN 508-1 | Spaanplaat - Specificaties<br>Dakbedekkingsproducten van metaalplaat - Specificatie voor zelfdragende producten van staalplaat, aluminiumplaat of corrosievast-staalplaat - Deel 1: Staal  |
| EN 520               | NEN-EN 520+A1              | Gipsplaten - Definities, eisen en beproevingsmethoden  |
| EN 823               | NEN-EN 823                 | Materialen voor de thermische isolatie van gebouwen - Bepaling van de dikte  |
| EN 826               | NEN-EN 826                 | Materialen voor de thermische isolatie van gebouwen - Bepaling van de samendrukbaarheid  |
| EN 1602              | NEN-EN 1602                | Materialen voor de thermische isolatie van gebouwen - Bepaling van de schijnbare dichtheid   |
| EN 1604              | NEN-EN 1604                | Materialen voor de thermische isolatie van gebouwen - Bepaling van de dimensionele stabiliteit bij gespecificeerde temperatuurs- en vochtigheidsomstandigheden   |
| EN 1609:1996         | NEN-EN 1609:1997           | Materialen voor de thermische isolatie van gebouwen - Bepaling van de wateropname bij kortstondige gedeeltelijke onderdompeling  |
| EN 12086:1997        | NEN-EN 12086:1997          | Materialen voor de thermische isolatie van gebouwen - Bepaling van de waterdampdoorlatendheidseigenschappen  |
| EN 12939             | NEN-EN 12939               | Thermische eigenschappen van bouwmaterialen en producten - Bepaling van de warmteweerstand volgens de methoden met de afgeschermd "hot plate" en de warmtestroommeter - Dikke producten met een hoge en een gemiddelde warmteweerstand |
| EN 13172:2012        | NEN-EN 13172:2012          | Producten voor thermische isolatie - Conformiteitsbeoordeling  |
| EN 13238             | NEN-EN 13238               | Bepaling van het brandgedrag van bouwproducten - Conditioneringsprocedures en algemene regels voor de keuze van ondergronden   |
| EN 13468             | NEN-EN 13468               | Materialen voor de thermische isolatie van gebouwen en industriële installaties - Bepaling van sporengrootheden van in water oplosbaar chloride, fluoride, silicaat, en natriumionen en pH   |
| EN 13501-1           | NEN-EN 13501-1+A1          | Brandclassificatie van bouwproducten en bouwdelen - Deel 1: Classificatie op grond van resultaten van beproeving van het brandgedrag   |
| EN 13823:2010        | NEN-EN 13823:2010          | Bepaling van het brandgedrag van bouwproducten - Bouwproducten, met uitzondering van vloerafwerkingen, blootgesteld aan een thermische aanval met een brandend voorwerp  |
| EN 14308:2009        | NEN-EN 14308:2009          | Materialen voor de thermische isolatie van gebouwen en industriële installaties - Fabrieksmatig vervaardigde producten van hard polyurethaanschuim (PUR) en polyisocyanuraatschuim (PIR) - Specificatie                                |
| EN 14706             | NEN-EN 14706               | Materialen voor de thermische isolatie van gebouwen en industriële installaties - Bepaling van de maximale bedrijfstemperatuur   |
| EN ISO 1182          | NEN-EN-ISO 1182            | Beproeving van het brandgedrag van bouwproducten - Ontvlambaarheidsproef   |
| EN ISO 1716          | NEN-EN-ISO 1716            | Bepaling van het brandgedrag van bouwproducten - Bepaling van de verbrandingswarmte  |
| EN ISO 9229:2007     | NEN-EN-ISO 9229:2007       | Thermische isolatie - Termen en definities   |

|                     |                         |  |
|---------------------|-------------------------|--|
| EN ISO 11925-2:2010 | NEN-EN-ISO 11925-2:2010 | Brandgedragproeven - Ontvlambaarheid van bouwproducten bij directe blootstelling aan vlammen - Deel 2: Beproeving met vlammen uit één bron |
| EN ISO 13787        | NEN-EN-ISO 13787        | Thermische isolatiematerialen voor gebouw- en industriële installaties - Bepaling van de gedeclareerde waarde voor thermische geleiding    |
| ISO 4590            | NEN-EN-ISO 4590         | Schuimkunststoffen - Bepaling van het volumepercentage open en gesloten cellen van harde materialen  |

Voorbeeld  
Preview

ICS 91.100.60

English Version

Thermal insulating products for building equipment and industrial installations - In-situ formed sprayed rigid polyurethane (PUR) and polyisocyanurate foam (PIR) products - Part 1: Specification for the rigid foam spray system before installation

Produits isolants thermiques pour l'équipement du bâtiment et les installations industrielles - Produits en mousse rigide de polyuréthane (PUR) ou de polyisocyanurate (PIR) projetée, formés en place - Partie 1: Spécifications relatives aux systèmes de projection de la mousse rigide avant mise en œuvre

Wärmedämmstoffe für die technische Gebäudeausrüstung und für betriebstechnische Anlagen in der Industrie - An der Verwendungsstelle hergestellter Wärmedämmstoff aus Polyurethan (PUR)- und Polyisocyanurat (PIR)-Spritzschaum - Teil 1: Spezifikation für das Schaumsystem vor dem Einbau

This European Standard was approved by CEN on 24 November 2012.

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Preview

## Foreword

This document (EN 14320-1:2013) 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 July 2013, and conflicting national standards shall be withdrawn at the latest by July 2013.

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(s).

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

This European Standard consists of two parts which form a package. The first part is the harmonised part satisfying the mandate and the CPD and is the basis for the CE marking covering the products, which are placed on the market. The second part, which is the non-harmonised part, covers the specification for the installed products. Both parts need to be used for the application of the insulation products in the end-use applications covered by the EN 14320.

This European Standard is one of a series for expanded perlite, exfoliated vermiculite and polyurethane/polyisocyanurate in-situ formed insulation products used in building equipment and industrial installations, but this standard may be used in other areas where appropriate.

The reduction in energy used and emissions produced during the installed life of insulation products exceeds by far the energy used and emissions made during the production and disposal processes.

This document is one of a series of standards as listed below:

EN 14320, *Thermal insulating products for building equipment and industrial installations — In-situ formed sprayed rigid polyurethane (PUR) and polyisocyanurate foam (PIR) products* consists of the following parts:

- Part 1: *Specification for the rigid foam dispensed system before installation* (the present document)
- Part 2: *Specification for the installed insulation products*

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



## 1 Scope

This European Standard specifies requirements for in-situ formed sprayed rigid polyurethane (PUR) and polyisocyanurate (PIR) foam products for the insulation of building equipment and industrial installations, for example storage vessels, pipes and ducts used for the supply of fuels, oil, other liquids, hot and cold water, air and other gases.

Depending on the type of foam products complying with this standard, they may have service temperature ranges which lie within the limits of  $\pm 200$  °C.

This Part 1 of this European Standard is a specification for the rigid foam system before installation.

Part 1 of this European Standard describes the product characteristics and it includes procedures for testing, marking and labelling and the rules for evaluation of conformity.

This European Standard does not specify the required levels of all properties that should be achieved by a product to demonstrate fitness for purpose in a particular end-use application. The required levels are to be found in regulations or non-conflicting standards.

This European Standard does not cover factory made rigid polyurethane or polyisocyanurate foam insulation products or in-situ products intended to be used for the insulation of buildings.

This standard does not specify performance requirements for direct airborne sound insulation and acoustic absorption applications.

**NOTE** Foam products are either called flexible or rigid. The flexible products are used in upholstery and mattresses and are characterised by their ability to deflect, support and recover to their original thickness continually during their in-use phase. Those that are not flexible are termed rigid and do not possess these flexible characteristics. They are mostly used for thermal insulation purposes and vary widely in their compression strength values. Once the cell structure is crushed in a rigid foam, it does not recover its thickness fully. Some of these rigid foams are very low in density with very low compression strengths and are sometimes described "commercially" as "soft foams" or "semi-rigid" foams. This note has been included to clarify that all foams with such descriptions are covered by this standard's used of the term rigid foam.

## 2 Normative references

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

EN 312, *Particleboards — Specifications*

EN 508-1, *Roofing products from metal sheet — Specification for self-supporting products of steel, aluminium or stainless steel sheet — Part 1: Steel*

EN 520, *Gypsum plasterboards — Definitions, requirements and test methods*

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

EN 826, *Thermal insulating products for building applications — Determination of compression behaviour*

EN 1602, *Thermal insulating products for building applications — Determination of the apparent density*

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

**EN 14320-1:2013 (E)**

EN 1607:1996, *Thermal insulating products for building applications — Determination of tensile strength perpendicular to faces*

EN 1609:1996, *Thermal insulating products for building applications — Determination of short term water absorption by partial immersion*

EN 12086:1997, *Thermal insulating products for building applications — Determination of water vapour transmission properties*

EN 12667:2001, *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*

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 13172:2012, *Thermal insulation products — Evaluation of conformity*

EN 13238, *Reaction to fire tests for building products — Conditioning procedures and general rules for selection of substrates*

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

EN 13823:2010, *Reaction to fire tests for building products — Building products excluding floorings exposed to the thermal attack by a single burning item*

EN 14308:2009, *Thermal insulation products for building equipment and industrial installations — Factory made rigid polyurethane foam (PUR) and polyisocyanurate foam (PIR) products — Specification*

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

EN ISO 1182, *Reaction to fire tests for products — Non-combustibility test (ISO 1182)*

EN ISO 1716, *Reaction to fire tests for products — Determination of the gross heat of combustion (calorific value) (ISO 1716)*

EN ISO 9229:2007, *Thermal insulation — Vocabulary (ISO 9229:2007)*

EN ISO 11925-2:2010, *Reaction to fire tests — Ignitability of products subjected to direct impingement of flame — Single-flame source test (ISO 11925-2:2010)*

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

ISO 4590, *Rigid cellular plastics — Determination of the volume percentage of open cells and of closed cells*

### **3 Terms, definitions, symbols and abbreviations**

#### **3.1 Terms and definitions**

For the purposes of this document, the terms and definitions given in EN ISO 9229:2007 and the following apply.

**3.1.1****polyurethane foam PUR  
(in-situ formed products)**

rigid cellular plastics insulation material or product with a structure based on polymers mainly of the polyurethane type

**3.1.2****polyisocyanurate foam PIR  
(in-situ formed products)**

rigid cellular plastics insulation material or product with a structure based on polymers mainly of the polyisocyanurate type

**3.1.3****polyurethane foam PU**

rigid cellular plastics insulation materials or products including both polymer types based mainly on polyurethane (PUR) or mainly on polyisocyanurate (PIR) groups

**3.1.4****rigid foam spray system**

kit of constituent components which when sprayed generates the rigid polyurethane (PUR) or the rigid polyisocyanurate foam (PIR) characterised by the specified properties of the foam generated

**3.1.5****isocyanate component**

liquid isocyanate material which is one of the components of the rigid foam system

**3.1.6****polyol component**

liquid polyhydroxyl compound containing an expanding agent, catalysts and other additives which is one of the components of the foam system

**3.1.7****cream time**

time which has elapsed between the time at which the stirring procedure was started and the moment when the foam is observed as starting to rise (usually measured in seconds)

**3.1.8****gel time**

time which has elapsed between the time at which the stirring procedure was started and the moment when, by means rod (or a match) applied into the surface of the foam, a polymeric string can be drawn from the foam surface (usually measured in seconds)

**3.1.9****tack-free time**

time which has elapsed between the time at which the stirring procedure was started and the moment when the middle of the top surface of the foam is no longer tacky to the touch

**3.1.10****free-rise density**

density of the unfaced cut test specimen taken from the reaction profile test sample (see D.4 and D.5)

**3.1.11****mixing ratio**

proportions of the components of the rigid foam spray system specified by the manufacturer to be sprayed to generate the rigid polyurethane or polyisocyanurate foam

Note 1 to entry: This can be expressed either as weight or volume ratio or both.

**EN 14320-1:2013 (E)****3.1.12****industrial storage vessels**

storage vessels used as building equipment or located in industrial installations

**3.1.13****service temperature range**

temperature range between the minimum and maximum service temperatures (see 4.3.6 and 4.3.7)

**3.1.14****production batch**

amount of a component produced discontinuously in a single period of time of a rigid foam system

**3.1.15****level**

given value which is the upper or lower limit of a requirement, where the level is given by the declared value of the characteristic concerned

**3.1.16****class**

combination of two levels of the same property between which the performance falls, where the level is given by the declared value of the characteristic concerned

**3.2 Symbols and abbreviations****3.2.1 Symbols used in this standard**

|                       |   |                   |
|-----------------------|---|-------------------|
| $d$                   | is the thickness  | mm                |
| $\Delta\varepsilon_l$ | is the relative change in length  | %                 |
| $\Delta\varepsilon_b$ | is the relative change in width   | %                 |
| $\Delta\varepsilon_d$ | is the relative change in thickness                                       | %                 |
| $\lambda_l$           | is one test result of thermal conductivity                                | W/(m·K)           |
| $\Delta\lambda_a$     | is the ageing increment from measured aged values of thermal conductivity | W/(m·K)           |
| $\Delta\lambda_f$     | is the fixed ageing increment   | W/(m·K)           |
| $\lambda_D$           | is the declared thermal conductivity                                      | W/(m·K)           |
| $\mu$                 | is the water vapour diffusion resistance factor                           | -                 |
| $n$                   | is the number of test results   | -                 |
| $\sigma_{10}$         | is the compressive stress at 10 % deformation                             | kPa               |
| $\sigma_m$            | is the compressive strength   | kPa               |
| $\sigma_a$            | is the substrate adhesion strength perpendicular to faces                 | kPa               |
| $W_p$                 | is the short term water absorption by partial immersion                   | kg/m <sup>2</sup> |
| $w$                   | is the soluble chloride ion content                                       | mg/kg             |

# Bestelformulier

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\_\_ ex. NEN-EN 14320-1:2013 en Materialen voor de thermische isolatie van  
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hard polyurethaan- (PUR) en polyisocyanuraat- (PIR) schuim - Deel 1:  
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