



## European Technical Approval ETA-10/0013

English translation prepared by DIBt - Original version in German language

Handelsbezeichnung  
*Trade name*

PYROSTAT-UNI RM; PYROSTAT-UNI RMB; PYROSTAT-UNI RM/LT

Zulassungsinhaber  
*Holder of approval*

G+H Isolierung GmbH  
Bürgermeister-Grünzweig-Straße 1  
67059 Ludwigshafen

Zulassungsgegenstand  
und Verwendungszweck  
*Generic type and use  
of construction product*

Rohrabschottungen, die unter Verwendung einer intumeszierenden  
Matte hergestellt werden  
*Pipe Penetration Seal Using an Intumescent Mat*

Geltungsdauer:  
*Validity:* vom  
*from*  
bis  
*to*

19 June 2013

12 April 2015

Herstellwerk  
*Manufacturing plant*

G + H ISOLIERUNG GmbH  
Leuschner Straße 2  
97084 Würzburg

Diese Zulassung umfasst  
*This Approval contains*

26 Seiten einschließlich 17 Anlagen  
*26 pages including 17 annexes*

Diese Zulassung ersetzt  
*This Approval replaces*

ETA-10/0013 mit Geltungsdauer vom 12.04.2010 bis 12.04.2015  
*ETA-10/0013 with validity from 12.04.2010 to 12.04.2015*

## I LEGAL BASES AND GENERAL CONDITIONS

- 1 This European technical approval is issued by Deutsches Institut für Bautechnik in accordance with:
  - Council Directive 89/106/EEC of 21 December 1988 on the approximation of laws, regulations and administrative provisions of Member States relating to construction products<sup>1</sup>, modified by Council Directive 93/68/EEC<sup>2</sup> and Regulation (EC) N° 1882/2003 of the European Parliament and of the Council<sup>3</sup>;
  - *Gesetz über das In-Verkehr-Bringen von und den freien Warenverkehr mit Bauprodukten zur Umsetzung der Richtlinie 89/106/EWG des Rates vom 21. Dezember 1988 zur Angleichung der Rechts- und Verwaltungsvorschriften der Mitgliedstaaten über Bauprodukte und anderer Rechtsakte der Europäischen Gemeinschaften (Bauproduktengesetz - BauPG) vom 28. April 1998<sup>4</sup>, as amended by Article 2 of the law of 8 November 2011<sup>5</sup>;*
  - Common Procedural Rules for Requesting, Preparing and the Granting of European technical approvals set out in the Annex to Commission Decision 94/23/EC<sup>6</sup>.
- 2 Deutsches Institut für Bautechnik is authorized to check whether the provisions of this European technical approval are met. Checking may take place in the manufacturing plant. Nevertheless, the responsibility for the conformity of the products to the European technical approval and for their fitness for the intended use remains with the holder of the European technical approval.
- 3 This European technical approval is not to be transferred to manufacturers or agents of manufacturers other than those indicated on page 1, or manufacturing plants other than those indicated on page 1 of this European technical approval.
- 4 This European technical approval may be withdrawn by Deutsches Institut für Bautechnik, in particular pursuant to information by the Commission according to Article 5(1) of Council Directive 89/106/EEC.
- 5 Reproduction of this European technical approval including transmission by electronic means shall be in full. However, partial reproduction can be made with the written consent of Deutsches Institut für Bautechnik. In this case partial reproduction has to be designated as such. Texts and drawings of advertising brochures shall not contradict or misuse the European technical approval.
- 6 The European technical approval is issued by the approval body in its official language. This version corresponds fully to the version circulated within EOTA. Translations into other languages have to be designated as such.

<sup>1</sup> Official Journal of the European Communities L 40, 11 February 1989, p. 12  
<sup>2</sup> Official Journal of the European Communities L 220, 30 August 1993, p. 1  
<sup>3</sup> Official Journal of the European Union L 284, 31 October 2003, p. 25  
<sup>4</sup> *Bundesgesetzblatt Teil I 1998*, p. 812  
<sup>5</sup> *Bundesgesetzblatt Teil I 2011*, p. 2178  
<sup>6</sup> Official Journal of the European Communities L 17, 20 January 1994, p. 34

## II SPECIFIC CONDITIONS OF THE EUROPEAN TECHNICAL APPROVAL

### 1 Definition of product/ products and intended use

#### 1.1 Definition of the construction product

##### 1.1.1 Description of the pipe penetration seal

The pipe penetration seals called "PYROSTAT-UNI RM", "PYROSTAT-UNI RMB" and "PYROSTAT-UNI RMLT" mainly consist of pre-cut parts of an intumescent mat (so-called wrap), a gap filling material and, if present, of an external insulation (so-called protective insulation) or two metal housings (see Appendix 1). The pipe penetration seal shall be constructed in accordance with Appendix 3 using the components listed in Annex 1.

A distinction is made between the following pipe penetration seal variants (see Appendix 1):

For use in rigid walls or rigid floors:

- "PYROSTAT-UNI RM": one wrap passing completely through the wall or floor (variant A) or two wraps partially penetrate into the wall or floor on both sides (and, if present, external insulation on both sides) (variant B)
- "PYROSTAT-UNI RMB": two wraps close to the wall or floor on both sides (with a metal housing on both sides)

For use in rigid walls:

- "PYROSTAT-UNI RM/RMB": two wraps partially penetrate into the wall (with external insulations and metal housings on both sides)

For use in flexible walls:

- "PYROSTAT-UNI RM-LT": one wrap passing completely through the wall (with external insulation on both sides)

##### 1.1.2 Description of the components of the pipe penetration seal

###### 1.1.2.1 Wrap

The wrap called "PYROSTAT-UNI" of G+H Isolierung GmbH, 67059 Ludwigshafen, Germany consists of a glass fibre fabric and an intumescent coating on both sides.

The dimensions of the wrap shall comply with the information given in Appendix 1.

###### 1.1.2.2 Metal housing

The metal housing used for pipe penetration seals "PYROSTAT-UNI RMB" and "PYROSTAT-UNI RM/RMB" shall consist of corrosion resistant steel and shall comply with the information given in Appendix 1.

###### 1.1.2.3 External insulation

The external insulation (so-called protective insulation) used for the "PYROSTAT-UNI RM-LT" pipe penetration seal consists of synthetic rubber and shall comply with the information given in Appendix 1.

###### 1.1.2.4 Sealing material

Dimensionally stable non-combustible materials such as (e.g.) concrete, cement mortar or gypsum mortar are to be used for sealing any remaining cavities in rigid walls and floors (class A1 or A2-s1, d0 according to EN 13501-1).

Non-combustible mineral wool is to be used for sealing any remaining cavities in flexible walls (class A1 or A2-s1, d0 according to EN 13501-1). The cavities in the area of the wall lining may be optionally filled with an outer layer of gypsum or bonding compound.

The materials shall comply with the information given in Appendix 1.

## 1.2 Intended use

### 1.2.1 General

- 1.2.1.1 The pipe penetration seal is used to seal off openings in accordance with section 1.2.3 in fire-resistant walls and floors in accordance with section 1.2.2 penetrated by pipes in accordance with section 1.2.4<sup>7</sup> and serves to preserve the fire resistance of the wall or floor in the vicinity of the penetrations.
- 1.2.1.2 Depending on the pipe and insulation material, the pipe dimensions, the insulation thickness and the installation conditions the pipe penetration seal reaches a maximum fire resistance class of EI 90-C/U or EI 120-C/U (see also section 2.3).
- 1.2.1.3 The pipe penetration seal can be used in interiors without moisture loads (see section 2.5); for the intumescent component use category Z<sub>2</sub> in accordance with EOTA TR 024 was verified.

### 1.2.2 Building elements (walls and floors)

The pipe penetration seals "PYROSTAT-UNI RM" and "PYROSTAT-UNI RMB" may be used in rigid walls ( $d_W \geq 150$  mm or  $d_W \geq 200$  mm) and rigid floors ( $d_D \geq 150$  mm or  $d_D \geq 200$  mm) according to Appendix 2. The walls and floors shall be classified according to EN 13501-2 in accordance with the fire resistance period required.

The pipe penetration seal "PYROSTAT-UNI RM-LT" may be used in flexible walls ( $d_W \geq 100$  mm) according to Appendix 2. The walls shall be classified according to EN 13501-2 in accordance with the fire resistance period required.

### 1.2.3 Openings (in the building elements)

- 1.2.3.1 The pipe penetration seal may be used to close openings, if the width of the remaining gap around the insulated pipe is not larger than 50 mm.
- 1.2.3.2 The pipe pipe penetration seals may be used to close openings, if the distance between the opening to be sealed off and other openings or components is at least 200 mm. For the distance between adjacent openings for pipe penetration seals according to this ETA see section 1.2.4.4.

### 1.2.4 Services (Installations)

- 1.2.4.1 The pipe penetration seal may be used on pipes made from steel, stainless steel, cast iron or copper which are fixed perpendicular to the wall or floor surface (depending on the seal variant, the fire resistance class required and the type and thickness of the building element) (see Annexes 9 to 13). The pipes shall have dimensions<sup>8</sup> according to Annexes 10 to 13. The insulations (material and thickness) shall comply with the information given in Annexes 9 to 13.
- 1.2.4.2 For wall applications, the first support of the pipes shall be at a distance of  $\leq 650$  mm on both sides of the wall. The supports shall be non-combustible in their essential parts.
- 1.2.4.3 The pipe work may be used for combustible or non-combustible liquids and fluids, pneumatic dispatch systems or vacuum cleaning pipes.

The regulations of the Member States shall be observed for more precise specifications of the pipe works (intended use of pipes) for which the penetration seal may be used (e.g. drinking water pipes, heating pipes, waste water pipes)<sup>9</sup>.

<sup>7</sup> The technical provisions of the Member States for the design of piping systems and the reliability of pipe penetrations are not affected by this.

<sup>8</sup> Outer pipe diameter ( $d_A$ ) and pipe wall thickness ( $s$ )

<sup>9</sup> The pipe penetration seal may only be fitted to these pipe work types if it fulfils the classification required in the respective country. Particular attention must be paid to the ending of the classification, which reflects the pipe end situation from the fire resistance tests performed to verify the fitness for use (see section 2.3).

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1.2.4.4 The pipes, for which the pipe penetration seal according to this ETA may be used, shall have a distance of at least 50 mm between each other (measured between the insulations).

**1.2.5 Working life**

The provisions in this European technical approval are based on an assumed working life of 10 years for the pipe penetration seal provided the conditions laid down in sections 4 and 5 relating to manufacturing, installation, use and repair are met. The information provided on the working life cannot be interpreted as a guarantee given by the manufacturer, but should be regarded only as a means for choosing the right products in relation to the expected economically reasonable working life of the construction.

**2 Product characteristics and methods of verification****2.1 General**

2.1.1 The fitness of the pipe penetration seal for the intended use was evaluated in accordance with ETAG 026 Part 2:2008-01-01.

For the evaluation of the pipe penetration seal, the product properties "reaction to fire", "fire resistance", "emission of dangerous substances" as well as "durability and serviceability" were taken into consideration.

2.1.2 The product properties specified in sections 2.2 to 2.5 only apply to the penetration seal and its components described in this ETA. Deutsches Institut für Bautechnik shall be immediately notified of any changes to the materials, composition, dimensions or properties of these components. Deutsches Institut für Bautechnik will then decide if a new evaluation is required.

**2.2 Reaction to fire**

The wrap, the metal housing, the outer insulation (protective insulation) and the joint filling material fulfil the requirements for the reaction to fire classes according to EN 13501-1 given in Appendix 1.

**2.3 Fire resistance**

The pipe penetration seal was tested in accordance with prEN 1366-3:07/2007 and EN 1366-3:2009-07. As a maximum, the penetration seal fulfils the requirements of Class EI 90 – C/U or EI 120 – C/U according to EN 13501-2 depending on the pipe dimensions, the pipe material, the installation conditions and the type of the building element (see Appendix 2).

In the annexes the maximum fire resistance class verified – under the respective installation conditions and for the respective pipe dimensions – is specified. If installed in walls or floors of the same thickness and density and with the same structure as specified there, but with a lower fire resistance class, the fire resistance class of the pipe penetration seal is reduced to the fire resistance class of the wall or floor.

The fire resistance classes specified in the annexes with the ending -C/U cover the classes of the same fire resistance duration, but with the ending -C/C.

**2.4 Emission of dangerous substances**

The intumescent material according to Section 1.1.2.1 does not contain substances registered as dangerous substances in the list of the European Commission.

For assessment purposes, the chemical compositions of the material was made available to the Deutsches Institut für Bautechnik.

Note: In addition to the specific clauses relating to dangerous substances contained in this European technical approval, there may be other requirements applicable to the products falling within its scope (e.g. transposed European legislation and national laws, regulations and administrative provisions). In order to meet the provisions of the Construction Products Directive, these requirements need also to be complied with, when and where they apply.

## 2.5 Durability and serviceability

The intumescent material according to Section 1.1.2.1 fulfils the requirements of use category Z<sub>2</sub> in accordance with EOTA TR 024. That means that the materials can be exposed to the conditions in interiors without moisture loads, without expecting significant changes in fire protection characteristics.

## 3 Evaluation and attestation of conformity and CE marking

### 3.1 System of attestation of conformity

According to Decision 1999/454/EG, amended by Decision 2001/596/EC of the European Commission<sup>10</sup>, system 1 of the attestation of conformity applies.

This system of attestation of conformity is defined as follows:

System 1: Certification of the conformity of the product by an approved certification body on the basis of:

- (a) Tasks of the manufacturer:
  - (1) factory production control;
  - (2) further testing of samples taken at the factory by the manufacturer in accordance with a prescribed test plan;
- (b) Tasks of the approved body:
  - (3) initial type-testing of the product;
  - (4) initial inspection of the factory and of factory production control;
  - (5) continuous surveillance, assessment and approval of factory production control.

Note: Approved bodies are also referred to as "notified bodies".

### 3.2 Responsibilities

#### 3.2.1 Tasks of the manufacturer

##### 3.2.1.1 Factory production control

The manufacturer shall exercise permanent internal control of production. All the elements, requirements and provisions adopted by the manufacturer shall be documented in a systematic manner in the form of written policies and procedures, including records of results performed. The factory production control shall ensure that the product is in conformity with this European technical approval.

The manufacturer may only use the initial/raw/constituent materials stated in the technical documentation of this European technical approval.

<sup>10</sup> Official Journal of the European Communities 178/52, 14 July 1999

The factory production control shall be in accordance with the control plan dated 19 June 2013 relating to the European technical approval ETA-10/0013 granted on 19 June 2013, which is part of the technical documentation of this European technical approval. The control plan is laid down in the context of the factory production control system operated by the manufacturer and deposited with Deutsches Institut für Bautechnik.<sup>11</sup>

The results of factory production control shall be recorded and evaluated in accordance with the provisions of the control plan.

### 3.2.1.2 Other tasks of the manufacturer

The manufacturer shall provide a technical datasheet and an installation guide containing at least the following information:

#### Technical data sheet:

##### 1. Field of application:

- Building elements into which the penetration seal may be installed, type and properties of the building elements, such as minimum thickness, density and – in the case of lightweight constructions – the construction requirements.
- Installations that may pass through the penetration seal, type and properties of the installations (including insulation if relevant), such as materials, diameter, thickness; necessary/permitted supports/fastenings; distances.
- Dimensions, minimum thicknesses etc. of the penetration seal
- Climatic conditions covered by the ETA: dry indoor application

##### 2. Construction of the penetration seal including the necessary components and additional products (i.e. gap filling material) with clear indications whether they are generic or specific.

#### Installation instructions:

- Installation method (e.g. preparation of the supporting structure before installing the pipe penetration seal)
- The sequence of working steps to be followed

The manufacturer shall, on the basis of a contract, involve a body which is approved for the tasks referred to in section 3.1 for products in accordance with ETAG 026-2, in order to undertake the actions laid down in section 3.2.2. For this purpose, the control plan referred to in sections 3.2.1.1 and 3.2.2 shall be handed over by the manufacturer to the approved body involved.

The manufacturer shall make a declaration of conformity, stating that the construction product is in conformity with the provisions of the European technical approval ETA-10/0013 issued on 19 June 2013.

### 3.2.2 Tasks for the approved bodies

The approved bodies shall perform the following tasks in accordance with the provisions laid down in the control plan:

- Initial type-testing of the product
- Initial inspection of factory and factory production control
- Continuous surveillance, assessment and approval of factory production control

The approved bodies shall record the essential points of their actions referred to above and state the results obtained and conclusions made in a written report.

<sup>11</sup>

The control plan is a confidential part of the European technical approval and only handed over to the approved body involved in the procedure of attestation of conformity. See section 3.2.2.

The approved certification body involved by the manufacturer shall issue an EC certificate of conformity of the product stating the conformity with the provisions of this European technical approval.

In cases where the provisions of the European technical approval and its control plan are no longer fulfilled, the certification body shall withdraw the certificate of conformity and inform Deutsches Institut für Bautechnik without delay.

### 3.3 CE marking

The CE marking shall be affixed on the wrap, the steel housing as well as on the accompanying commercial documents. The letters "CE" shall be followed by the identification number of the approved certification body and be accompanied by the following additional information:

- the name and address of the manufacturer (legal entity responsible for the manufacture),
- the last two digits of the year in which the CE marking was affixed,
- the number of the EC certificate of conformity for the product,
- the number of the European technical approval,
- the number of the guideline for European technical approval,
- the use category,
- the designation of the product (trade name) (with indication of the size),
- declaration of any dangerous substances or "no dangerous substances",
- "see ETA-10/0013 for other relevant characteristics".

For an example of the CE marking see Appendix 4.

## 4 Assumptions under which the fitness of the product for the intended use was favourably assessed

### 4.1 General

#### 4.1.1 It is assumed that

- the penetration seal complies with the specifications in this ETA and the installation was carried out in accordance with this ETA and also in accordance with the technical data sheet and the installation instructions by the manufacturer,
- damages to the penetration seal are repaired accordingly,
- the seal is installed only in the building elements specified in this ETA,
- only installations in accordance with the specifications in this ETA pass through the openings (Parts or service support constructions other than those in accordance with section 1.2 shall not pass through the penetration seal.),
- the installation of the penetration seal does not affect the stability of the adjacent building elements – even in case of fire,
- the installations are fixed to the adjacent building elements (not to the seal) in accordance with the relevant regulations in such a way that, in case of fire, no additional mechanical load is imposed on the seal,
- the support of the installations is maintained for the classification period required.

#### 4.1.2 This European technical approval does not address any risks associated with the emission of dangerous liquids or gases caused by failure of the pipe(s) in case of fire nor does it prove the prevention of the transmission of fire through heat transfer via the medium in the pipes.

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- 4.1.3 This European technical approval does not verify the prevention of destruction of adjacent building elements with fire separating function or of the pipes themselves due to distortion forces caused by extreme temperatures. These risks shall be accounted for by taking appropriate measures when designing or installing the pipe work.

The mounting or hanging of the pipes or the layout of the pipe work shall be implemented in such a way that the pipes and the fire-resistant building elements shall remain functional for at least 90 minutes or 120 minutes (corresponding to the target period of fire resistance).

**4.2 Production**

The European technical approval was issued for the product on the basis of agreed data/information, deposited with Deutsches Institut für Bautechnik, which identifies the product that has been assessed and judged. Changes to the product or production process, which could result in this deposited data/information being incorrect, shall be reported to Deutsches Institut für Bautechnik before the changes are introduced. Deutsches Institut für Bautechnik will decide whether or not such changes affect the approval and consequently the validity of the CE marking on the basis of the approval, and if so whether further assessment or alterations to the approval shall be necessary.

**4.3 Installation**

The product characteristics specified in this European technical approval shall only apply if the penetration seal is installed in accordance with the specifications in Appendix 3 and also with the technical data sheet and the manufacturer's installation instructions.

**5 Indications to the manufacturer**

**5.1 Packaging, transport and storage**

5.1.1 The manufacturer's specifications for packaging, transport and storage shall be observed.

5.1.2 The packaging of the wrap and the steel housing shall contain the following information:

- Trade name or trademark or other symbol identifying the product
- The date of manufacture (day, month, year or coded information)
- The dimensions

5.1.3 The wrap and the steel housing shall be packaged for delivery in compliance with the usual delivery conditions and providing sufficient protection against the effects of normal handling.

**5.2 Use, maintenance, repair**

In general, no maintenance work is necessary. Repair can be performed by replacing damaged wraps, metal housings or an outer insulation and/or by renewing damaged gap seals.

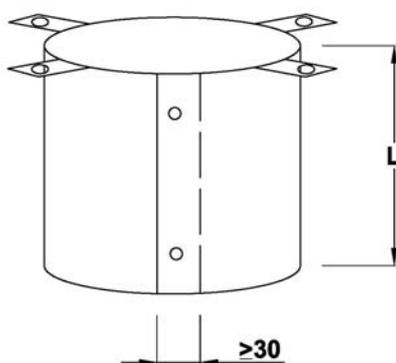
Prof. Gunter Hoppe  
Head of Department

*beglaubigt:*  
Racinowski

Name/Manufacturer	Description
<p>"PYROSTAT UNI" G+H Isolierung GmbH, 67059 Ludwigshafen, Germany</p>	<p>The <b>wrap</b> "PYROSTAT UNI" consists of a fibreglass fabric coated on one side with an intumescent material. The intumescent mat is a flexible anthracite-coloured material sheet with shimmering sparkles.<sup>1</sup></p> <p>Width: <math>\geq 250</math> mm (The wrap may be cut in two peaces for pipe penetration seal "PYROSTAT-UNI RM" each with a width of at least 125 mm. Under specific conditions a width of 150 mm is sufficient for pipe penetration seal "PYROSTAT-UNI RMB": see Annex 12).</p> <p>Length: depending on the outer diameter of the insulated pipe to seal off (wrapping in at least two layer)</p> <p><b>Intumescent material</b> in form of mats</p> <p>Reaction to fire according to EN 13501-1: class E Nominal thickness: 1,1 mm <math>\pm</math> 0,2 mm Weight per unit area: 1,2 kg/m<sup>2</sup> <math>\pm</math> 10% Loss of mass on heating<sup>2</sup>: 45,0 % <math>\pm</math> 5 % Expansion ratio<sup>3</sup>: &gt; 10-fach (tested at approx. 1,2 mm thick samples) Expansion pressure<sup>4</sup>: 0,4 N/mm<sup>2</sup> to 0,65 N/mm<sup>2</sup> tested at 300°C</p>
<p>Metal housing G+H Isolierung GmbH, 67059 Ludwigshafen, Deutschland</p>	<p>The metal casing consists of corrosion resistant steel (type 1.4301 or type 1.4571 stainless steel according to EN 10029 or type S235JRG2 (1.0038) galvanized steel according to EN 10025).</p> <p>Steel sheet thickness: <math>\geq 0,8</math> mm Dimensions: according to Annex 1 Reaction to fire according to EN 13501-1: class A1</p>
<p>"AF-Armaflex" Armacell GmbH, 48153 Münster or "Klimarock" Deutsche Rockwool Mineralwoll GmbH &amp; Co. OHG, 45952 Gladbeck</p>	<p>The <b>outer insulation</b> (so called protective insulation) consists of</p> <p>Synthetic rubber according to EN 14309 with a thickness <math>\geq 19</math> mm or <math>\geq 25</math> mm (see Annexes 10 to 13) and <math>\leq 32</math> mm</p> <p>or</p> <p>mineral fibre according to EN 14303 with a thickness <math>\geq 30</math> mm (see Annex 13)</p>
<p>Gap filling material for installation in rigid building elements, manufacturer-independent</p>	<p>For closing joints when installed in rigid building elements a <b>non-combustible material</b> (class A1 or A2-s1,d0 according to EN 13501-1) shall be used which is <b>dimensionally stable</b>, as e.g. concrete, cementitious or gypsum mortar.</p>
<p>Gap filling material for installation in flexible walls, manufacturer-independent</p>	<p>For closing remaining cavities inside flexible walls a <b>non-combustible stone wool</b> (class A1 or A2-s1,d0 according to EN 13501-1), which have a melting point of at least 1000°C according to DIN 4102-17. The wall lining area may be optionally filled with a 25 mm thick outer layer of gypsum or bonding compound.</p>
<p><sup>1</sup> A "Fingerprint", created in accordance with EOTA TR 024 "Characterisation, Aspects of Durability and Factory Production Control for Reactive Materials, Components and Products", Annex C, has been lodged with the DIBt for identification purposes. <sup>2</sup> Geprüft gemäß CUAP, Anhang A <sup>3</sup> Proben (ca 1.2 mm dick) geprüft gemäß CUAP, Anhang B <sup>4</sup> Geprüft bei 300°C gemäß CUAP, Anhang C</p>	
<p>PYROSTAT-UNI RM; PYROSTAT-UNI RMB; PYROSTAT-UNI RM/LT</p>	<p>Annex 1</p>
<p><b>APPENDIX 1 – DESCRIPTION OF THE PRODUCT</b> Description of the components of the product</p>	

### Metal housing

The metal housing used for the "PYROSTAT-UNI RMB" and "PYROSTAT-UNI RM/RMB" pipe penetration seal shall be of corrosion resistant steel (type 1.4301 or type 1.4571 stainless steel according to EN 10029 or type S235JRG2 (1.0038) galvanized steel according to EN 10025) with a minimum plate thickness of 0.8 mm. The housing must be closed using self-tapping screws of sizes 4.2 x 13 mm or 4.2 x 9 mm, or tubular rivets of sizes 3.2 x 9 mm or 3.2 x 6 mm, with a 30 mm sheet overlap.



L = 250 mm for "PYROSTAT-UNI RMB" or

L = 150 mm for "PYROSTAT-UNI RMB" with reduced length (see Annex 12) or

L = 500 mm or L = 750 mm for "PYROSTAT-UNI RM/RMB" (see Annex 7)

The length is equal to the length of the wrap.

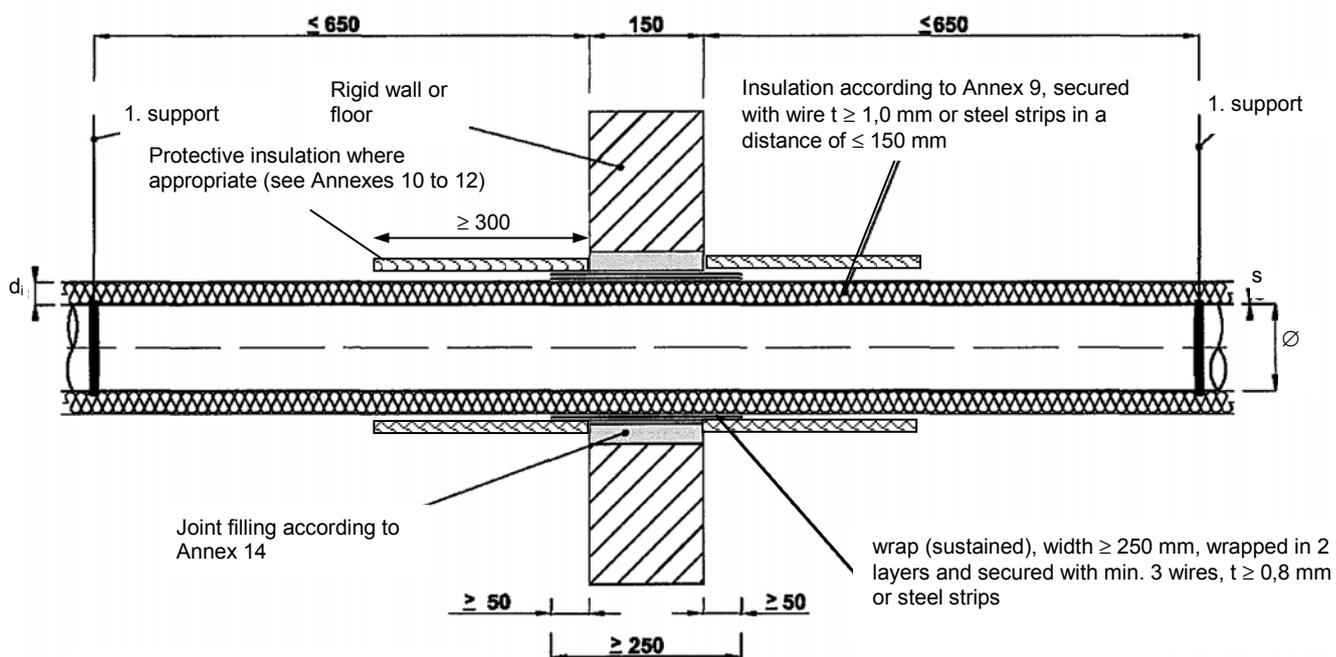
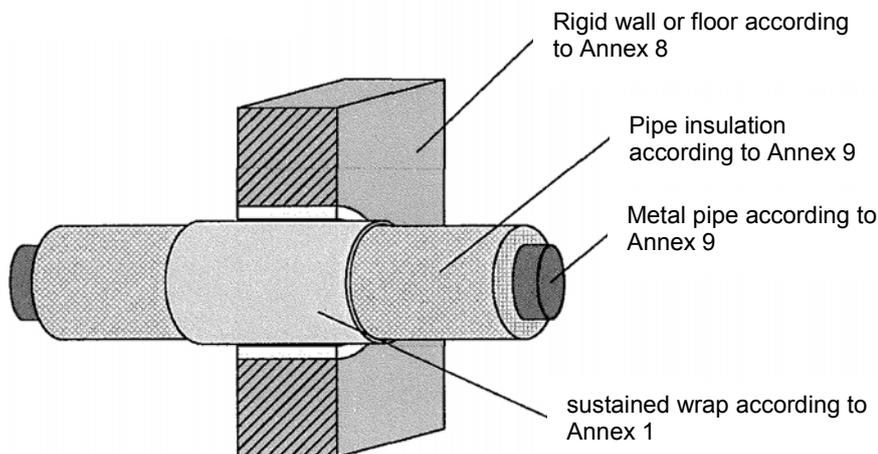
Dimensions in mm

PYROSTAT-UNI RM; PYROSTAT-UNI RMB; PYROSTAT-UNI RM/LT

**APPENDIX 1 – DESCRIPTION OF THE PRODUCT**  
Metal housing

Annex 2

**"PYROSTAT-UNI RM", Variant A**



Ø, d<sub>i</sub> and s see Annexes 10, 11 and 17

Dimensions in mm

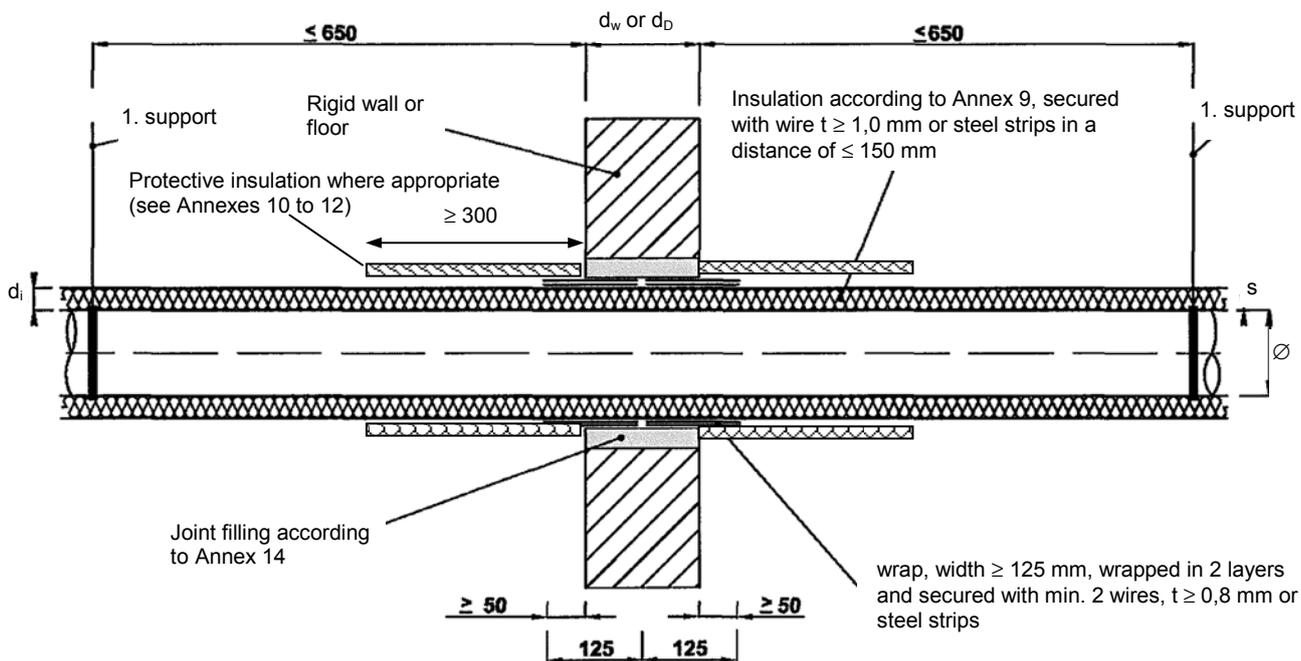
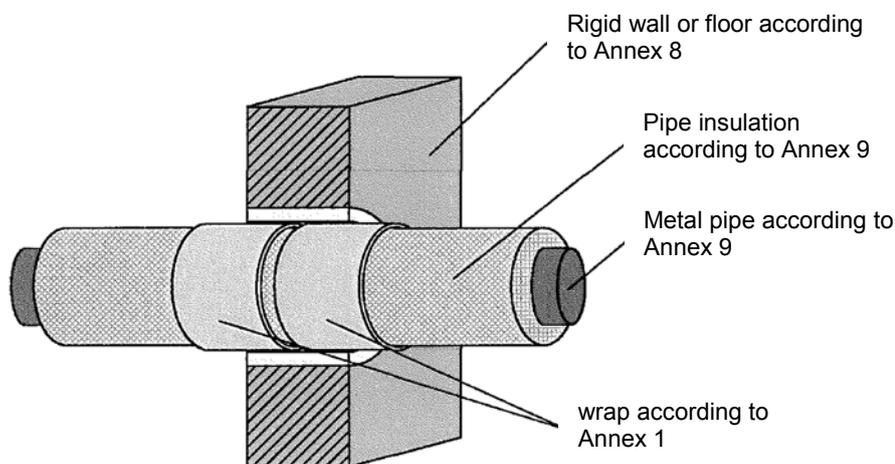
PYROSTAT-UNI RM; PYROSTAT-UNI RMB; PYROSTAT-UNI RM/LT

**APPENDIX 1 – DESCRIPTION OF THE PRODUCT**

Construction of pipe penetration seal "PYROSTAT-UNI RM", Variant A  
Installation in rigid walls or floors with a thickness of 150 mm

Annex 3

**"PYROSTAT-UNI RM", Variante B**



$\varnothing$ ,  $d_i$ ,  $d_w$  or  $d_D$  and  $s$  see Annexes 10, 11 and 17

Dimensions in mm

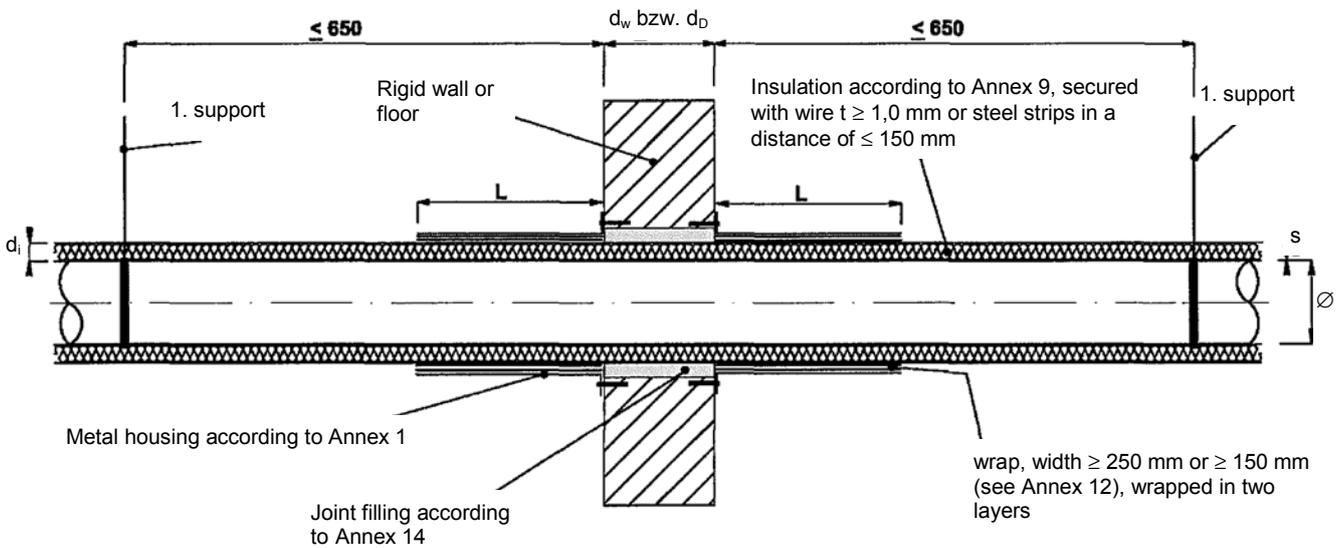
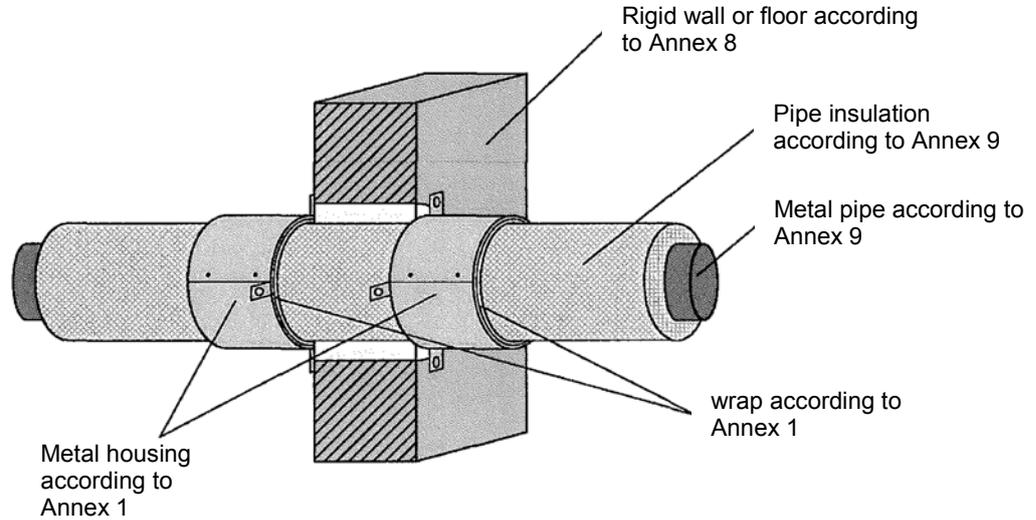
PYROSTAT-UNI RM; PYROSTAT-UNI RMB; PYROSTAT-UNI RM/LT

**APPENDIX 1 – DESCRIPTION OF THE PRODUCT**

Construction of pipe penetration seal "PYROSTAT-UNI RM", Variant B  
Installation in rigid walls or floors with a thickness  $\geq 150$  mm

Annex 4

**"PYROSTAT-UNI RMB"**



Ø, d<sub>i</sub>, d<sub>w</sub> or d<sub>D</sub>, L and s see Annexes 12 and 17

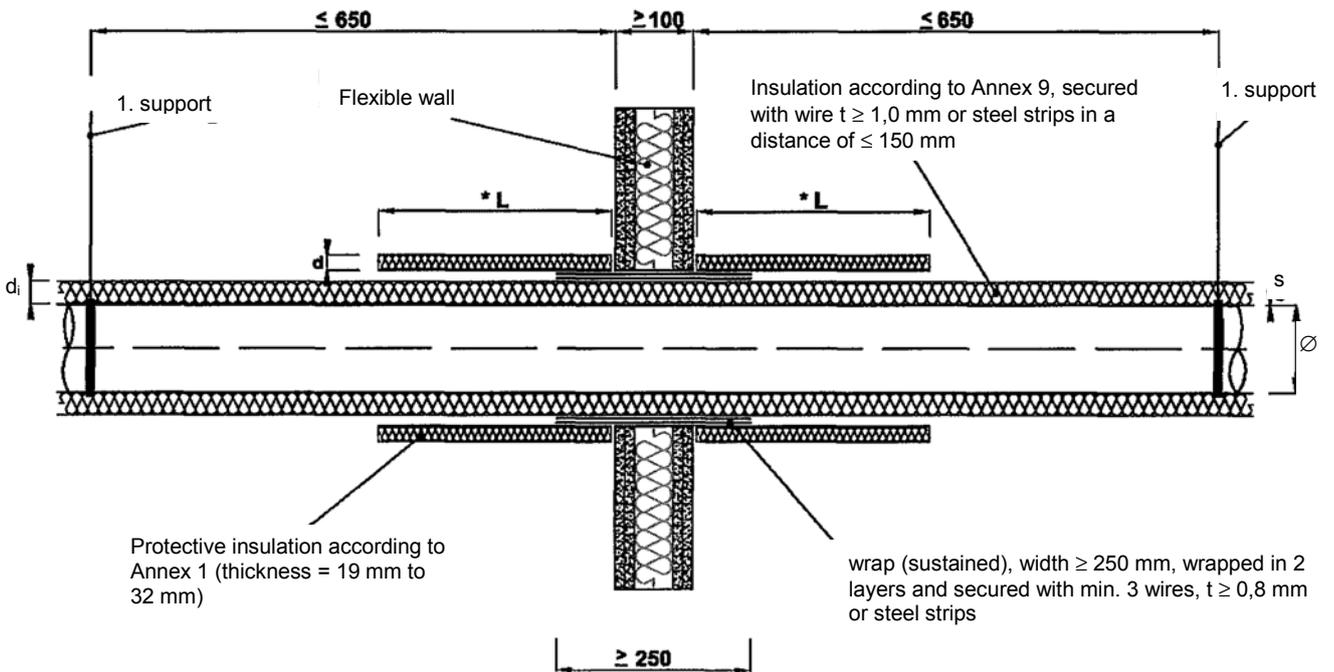
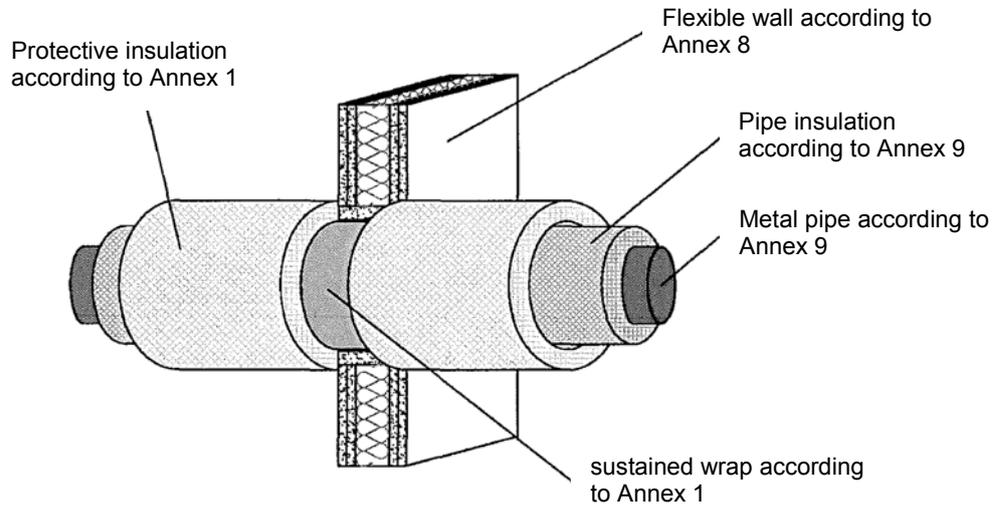
Dimensions in mm

PYROSTAT-UNI RM; PYROSTAT-UNI RMB; PYROSTAT-UNI RM/LT

**APPENDIX 1 – DESCRIPTION OF THE PRODUCT**  
Construction of pipe penetration seal "PYROSTAT-UNI RMB"  
Installation in rigid walls or floors with a thickness ≥ 150 mm

Annex 5

**"PYROSTAT-UNI RM-LT"**



$\varnothing$ ,  $d_i$ ,  $d_w$  or  $d_D$ , \*L and s see Annexes 13 and 17

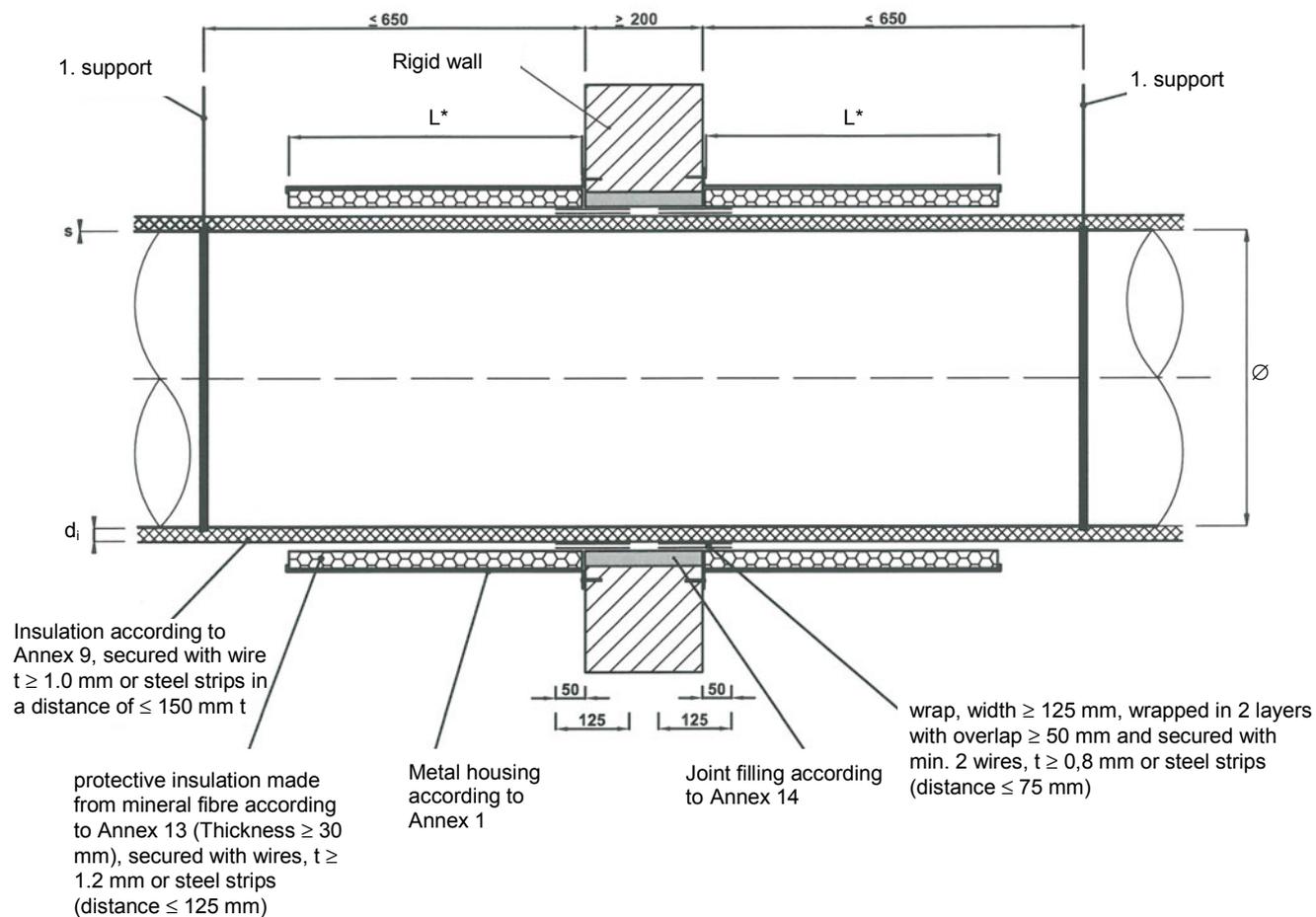
Dimensions in mm

PYROSTAT-UNI RM; PYROSTAT-UNI RMB; PYROSTAT-UNI RM/LT

**APPENDIX 1 – DESCRIPTION OF THE PRODUCT**  
Construction of pipe penetration seal "PYROSTAT-UNI RM-LT"  
Installation in flexible walls with a thickness  $\ge 100$  mm

Annex 6

### "PYROSTAT-UNI RM/RMB"



\* protective insulation made from mineral fibre (see Annex 1):  
 $L \geq 500$  mm for  $\emptyset \leq 508.0$  mm  
 $L \geq 750$  mm for  $\emptyset \leq 813.0$  mm

PYROSTAT-UNI RM; PYROSTAT-UNI RMB; PYROSTAT-UNI RM/LT

#### APPENDIX 1 – DESCRIPTION OF THE PRODUCT

Construction of pipe penetration seal "PYROSTAT-UNI RM/RMB"  
 Installation in rigid walls with a thickness  $\geq 200$  mm

Annex 7

The pipe penetration seal may be used in

**Rigid walls**

- of masonry, concrete, reinforced concrete or aerated concrete
- Density  $\geq 630 \text{ kg/m}^3$
- Thickness  $\geq 100 \text{ mm}$
- Thickness  $\geq 150 \text{ mm}$  or  $\geq 200 \text{ mm}$  (depending on the type of seal, the required fire resistance period and the services to be sealed off: see Annexes 10, 12 and 13)
- The walls shall be classified according to EN 13501-2 corresponding to the required fire resistance period.

**Flexible walls**

- The penetration seal shall be installed in flexible walls of post and beam construction with a steel substructure and lining on both sides composed of non-combustible (class A1 or A2-s1,d0 according to EN 13501-1) cement- or gypsum-bonded boards at least 12.5 mm thick (e.g. 'Type DF' Gypsum board according to EN 520) and also with internal stone wool insulating sheets at least 40 mm thick (class A1 or A2-s1,d0 according to EN 13501-1, raw density  $\geq 100 \text{ kg/m}^3$ ). The width of the cavity between the internal wall insulation and the wall lining must be no greater than 15 mm.

The penetration seal may also be installed in other flexible walls with a steel substructure and lining on both sides composed of non-combustible (class A1 or A2-s1,d0 according to EN 13501-1) cement or GBP sheets and with internal stone wool insulation (e.g. raw density of inner insulation  $< 100 \text{ kg/m}^3$ , other insulation than mineral wool, cavity between the wall insulation and wall lining  $> 15 \text{ mm}$ ) of fire resistance class EI 90 according to EN 13501-2. Fehler! Textmarke nicht definiert. when the opening has a reveal made of non-combustible (class A1 or A2 s1,d0 according to EN 13501-1) cement- or gypsum-bonded boards (pipe shells) which are at least 12.5 mm thick.

- Flexible walls with a wood stud substructure and a lining on both sides made from min. 2 layers of 12,5 mm thick cementitious or gypsum based slabs with a fire reaction class A1 or A2 according to EN 13501-1

The distance between the wood substructure and the seal shall be  $\geq 100 \text{ mm}$  and the cavity between the linings of the wall, the wood substructure and the opening reveal shall be tightly clogged with mineral wool of fire reaction class A1 or A2 according to EN 13501-1 in a depth of  $\geq 100 \text{ mm}$ .

- Thickness  $\geq 100 \text{ mm}$
- The walls shall be classified according to EN 13501-2 corresponding to the required fire resistance period.

**Rigid floors**

- of masonry, concrete, reinforced concrete or aerated concrete
- density  $\geq 630 \text{ kg/m}^3$
- thickness  $\geq 150 \text{ mm}$  or  $\geq 200 \text{ mm}$  (depending on the particular penetration seal version and the services to be sealed off: see Annexes 11 and 12)
- The floors shall be classified according to EN 13501-2 corresponding to the required fire resistance period. Note: This ETA do not cover the installation of the seal in special walls, i.e. in sandwich panel constructions.

PYROSTAT-UNI RM; PYROSTAT-UNI RMB; PYROSTAT-UNI RM/LT

**APPENDIX 2 – FIELD OF APPLICATION**  
Walls and floors

Annex 8

### General

- For application on adjacent pipes the distance between the pipes shall be at least 50 mm (measured between the insulations).
- For wall applications, the first support of the pipes shall be at a distance of  $\leq 650$  mm on both sides of the wall. The supports shall be made from materials of class A1 or A2 according to EN 13501-1 in their essential parts.

### Type of services

Type	Description
Insulated metal pipes	<ul style="list-style-type: none"> <li>➤ Pipes made from steel or copper with outside pipe diameters and pipe wall thicknesses (depending on the particular version, the type and thickness of the building element, the required fire resistance period, the insulation material and the insulation thickness) according to Annex 2</li> <li>➤ Insulation made from synthetic rubber (materials according to the table below) and a thickness (depending on the particular version, the type and thickness of the building element, the required fire resistance period, the pipe material and the pipe dimensions) according to Annex 2. The joints between the individual sections of the pipe insulation must be connected in accordance with the manufacturer's specifications. The longitudinal edges of the pipe insulation shall completely covered over their entire length with a self-adhesive synthetic rubber tape approx. 3 mm*.</li> <li>➤ When installed in floors and when using the "PYROSTAT-UNI RM" variant, the pipe penetration seal may also be used with steel pipes with an external diameter of 108 mm and pipe wall thicknesses from 2.0 mm to 14.2 mm, which must have a 20 mm thick insulation of "ISOVER-Lamellenmatte ML 3", manufacturer: Saint-Gobain Isover G+H AG, Ludwigshafen, Germany, density 23-30 kg/m<sup>3</sup>. The junctions between the individual sections of the pipe insulation must be joined in accordance with the manufacturer's specifications.</li> </ul>

\* Optionally devices according to Annex 14, Section 1.4 may be applied.

### Type of insulation

Material	Product name	manufacturer	density [kg/m <sup>3</sup> ]
Synthetik-rubber	"Armaflex AF"	Armocell GmbH, 48153 Münster, Germany	62-66
	"KAIFLEX KK"	Wilhelm Kaimann GmbH & Co. KG, 33161 Hövelhof, Germany	65-77
Polyisocyanurat (PIR) according to EN 13165**	"puren-PIR Class C"	puren GmbH, 88662 Überlingen, Germany	29-35
	"Bauder PIR Class C"	Paul Bauder GmbH & Co. KG, 70499 Stuttgart, Germany	31-39
Mineral fibre	"Klimarock"	Deutsche Rockwool Mineralwoll GmbH & Co. OHG, 45952 Gladbeck, Germany	40-50

\*\* where appropriate with a sheet steel cladding made from corrosion resistant steel (type 1.4301 or type 1.4571 stainless steel according to EN 10029 or type S235JRG2 (1.0038) galvanized steel according to EN 10025) plate thickness  $\geq 0.8$  mm.

PYROSTAT-UNI RM; PYROSTAT-UNI RMB; PYROSTAT-UNI RM/LT

**APPENDIX 2 – FIELD OF APPLICATION**  
Overview of the installations

Annex 9

### "PYROSTAT-UNI RM" – wall installation

wall/floor/ thickness	Pipe material	∅ [mm]	s** [mm]	d <sub>i</sub> [mm]	Insulation material
<b>EI 90 (without protective insulation)</b>					
Rigid walls ≥ 150 mm	Steel, stainless steel, cast iron, copper	≤ 28,0	≥ 1,0	13-19	Synthetic rubber according to Annex 9
		≤ 42,0	≥ 1,5		
		≤ 89,0	≥ 2,0	100	
	Steel, stainless steel, cast iron	≤ 108,0	≥ 2,0	19-39	
		≤ 114,3	≥ 3,2	25-100	
		≤ 159,0	≥ 4,0	32	
		≤ 323,9	≥ 5,6	100	
	Steel, stainless steel, cast iron, copper	≤ 28,0	≥ 1,0	30-100	
≤ 89,0		≥ 2,0			
≤ 323,9		≥ 5,6			
Rigid walls ≥ 200 mm	Steel, stainless steel, cast iron, copper	≤ 54,0	≥ 1,5	13-100	Synthetic rubber according to Annex 9
		≤ 89,0	≥ 2,0		
		≤ 108,0	≥ 2,0		
	≤ 114,3	≥ 3,2			
	≤ 160,0	≥ 4,0			
	<b>EI 90 (with protective insulation)</b>				
Rigid walls ≥ 150 mm *	Steel, stainless steel, cast iron	≤ 326,0	≥ 3,0	100	Synthetic rubber according to Annex 9
Rigid walls ≥ 200 mm ***	Steel, stainless steel, cast iron	≤ 168,3	≥ 4,0	19	
		≤ 323,9	≥ 5,0	19-25	
<b>EI 120 (without protective insulation)</b>					
Rigid walls ≥ 200 mm	Steel, stainless steel, cast iron	≤ 326,0	≥ 3,0	40-100	PIR with sheet steel cladding according to Annex 9
	Stainless steel	≤ 204,0	≥ 2,0		

\* protective insulation made from synthetic rubber (see Annex 1); d= 19 mm; l ≥ 300 mm

\*\* maximum pipe wall thickness: 14,2 mm

\*\*\* protective insulation made from synthetic rubber (see Annex 1); d= 19 mm, l ≥ 300 mm for ∅ ≤ 168,3 mm; d=25 mm, l ≥ 300 mm for ∅ > 168,3 mm and ≤ 323,9 mm

PYROSTAT-UNI RM; PYROSTAT-UNI RMB; PYROSTAT-UNI RM/LT

#### APPENDIX 2 – FIELD OF APPLICATION

Pipe penetration seal "PYROSTAT-UNI RM" – Dimensions of the pipes for wall installation

Annex 10

### "PYROSTAT-UNI RM" – floor installation

wall/floor/ thickness	Pipe material	∅ [mm]	s** [mm]	d <sub>i</sub> [mm]	Insulation material
<b>EI 90 (without protective insulation)</b>					
floors ≥ 150 mm	Steel, stainless steel, cast iron, copper	≤ 28	≥ 1,0	13-100	Synthetic rubber according to Annex 9
		≤ 54	≥ 1,5		
		≤ 88,9	≥ 2,0		
	Steel, stainless steel, cast iron	≤ 108	≥ 2,0	13-100	
		≤ 114,3	≥ 3,2	19-100	
		≤ 160,0	≥ 4,0	50-100	
		≤ 323,0	≥ 5,6	100	
floors ≥ 200 mm	Steel, stainless steel, cast iron, copper	≤ 28	≥ 1,0	9-100	
		≤ 54	≥ 1,5	13-100	
		≤ 88,9	≥ 2,0		
	Steel, stainless steel, cast iron	≤ 108	≥ 2,0	19-100	
		≤ 114,3	≥ 3,2		
		≤ 159,0	≥ 4,0		
		≤ 274,0	≥ 5,0	100	
	≤ 323,0	≥ 5,6	100		
Stainless steel	≤ 204,0	≥ 2,0	25-100		
<b>EI 120 (without protective insulation)</b>					
floors ≥ 200 mm	Steel, stainless steel, cast iron, copper	≤ 28	≥ 1,0	40-100	PIR according to Annex 9
		≤ 88,9	≥ 2,0		
	Steel, stainless steel, cast iron	≤ 326,0	≥ 3,2		
	Stainless steel	≤ 204,0	≥ 2,0		
<b>EI 120 (with protective insulation *)</b>					
floors ≥ 200 mm	Steel, stainless steel, cast iron	≤ 274,0	≥ 5,0	19-25	Synthetic rubber according to Annex 9
		≤ 326,0	≥ 5,6	19-25	

\* protective insulation made from synthetic rubber (see Annex 1); d= 19 mm; l ≥ 300 mm

\*\* maximum pipe wall thickness: 14,2 mm

PYROSTAT-UNI RM; PYROSTAT-UNI RMB; PYROSTAT-UNI RM/LT

#### APPENDIX 2 – FIELD OF APPLICATION

Pipe penetration seal "PYROSTAT-UNI RM" – Dimensions of the pipes for floor installation

Annex 11

## "PYROSTAT-UNI RMB"

Wrapping in two layers (width of the wrap: 250 mm)

wall/floor/ thickness	Pipe material	∅ [mm]	s* [mm]	d <sub>i</sub> [mm]	Insulation material
<b>EI 90 (without protective insulation)</b>					
Rigid walls ≥ 150 mm	Steel, stainless steel, cast iron	≤ 159	≥ 4,0	25-50	Synthetic rubber according to Annex 9
		≤ 323,0	≥ 5,6	50	
Rigid walls ≥ 200 mm	Steel, stainless steel, cast iron, copper	≤ 88,9	≥ 2,0	25	
		≤ 159,0	≥ 4,0	25-50	
		≤ 323,9	≥ 5,6	50	
floors ≥ 150 mm	Steel, stainless steel, cast iron	≤ 108,0	≥ 2,0	19-100	
		≤ 159,0	≥ 4,0	13-100	
<b>EI 120 (without protective insulation)</b>					
Rigid walls ≥ 150 mm	Steel, stainless steel, cast iron, copper	≤ 89,0	≥ 2,0	25	Synthetic rubber according to Annex 9

Wrapping in one layer (width of the wrap: 150 mm)

wall/floor/ thickness	Pipe material	∅ [mm]	s* [mm]	d <sub>i</sub> [mm]	Insulation material
<b>EI 90 (without protective insulation)</b>					
Rigid walls ≥ 150 mm	steel	≤ 159	≥ 4,0	25	Synthetic rubber according to Annex 9

\* maximum pipe wall thickness: 14,2 mm

PYROSTAT-UNI RM; PYROSTAT-UNI RMB; PYROSTAT-UNI RM/LT

### APPENDIX 2 – FIELD OF APPLICATION

Pipe penetration seal "PYROSTAT-UNI RMB" – Dimensions of the pipes

Annex 12

### "PYROSTAT-UNI RM-LT"

wall/floor/ thickness	Pipe material	∅ [mm]	s* [mm]	d <sub>i</sub> [mm]	Insulation material
<b>EI 90 (with protective insulation **)</b>					
Flexible walls ≥ 100 mm	Steel, stainless steel, cast iron, copper	≤ 28,0	≥ 1,0	9-32	Synthetic rubber according to Annex 9
		≤ 42,0	≥ 1,5	13-32	
		≤ 89,0	≥ 2,0	32	
	Steel, stainless steel, cast iron	≤ 54	≥ 1,5	13	
		≤ 114,3	≥ 3,2	32-50	
		≤ 159,0	≥ 4,0	50-100	
		≤ 219	≥ 5,6	32	

\* maximum pipe wall thickness: 14,2 mm

\*\* protective insulation made from synthetic rubber (see Annex 1):

d= 19 mm; l ≥ 300 mm for ∅ ≤ 160 mm or

d= 19 mm; l ≥ 400 mm for ∅ > 160 mm/ ≤ 219 mm

### "PYROSTAT-UNI RM/RMB"

wall/floor/ thickness	Pipe material	∅ [mm]	s* [mm]	d <sub>i</sub> [mm]	Insulation material
<b>EI 90 (with protective insulation**)</b>					
Rigid walls ≥ 200 mm	Steel, stainless steel, cast iron	≤ 508,0	≥ 6,3	25	Synthetic rubber according to Annex 9
		≤ 813,0	≥ 6,3	25	

\* maximum pipe wall thickness: 14,2 mm

\*\* protective insulation made from mineral fibre (see Annex 1):

d= ≥ 30 mm, l ≥ 500 mm for ∅ ≤ 508,0 mm

d= ≥ 30 mm, l ≥ 750 mm for ∅ ≤ 813,0 mm

in addition metal housing according to Annex 1

PYROSTAT-UNI RM; PYROSTAT-UNI RMB; PYROSTAT-UNI RM/LT

#### APPENDIX 2 – FIELD OF APPLICATION

Pipe penetration seal "PYROSTAT-UNI RM-LT" and "PYROSTAT-UNI RM/RMB" -  
Dimensions of the pipes

Annex 13

## INSTALLATION OF THE PENETRATION SEAL

### 1. General

- 1.1 Before installing the penetration seal it shall be checked that all conditions (e.g. type and thickness of the wall or floor, type and dimensions of the services and the ambient conditions) comply with the provisions of Section 1.2 and Appendices 1 and 2.
- 1.2 It shall be ensured that the assumptions under which the fitness for use was evaluated are complied with (see Section 4.1).
- 1.3 The wrap shall be trimmed according to the external diameter of the insulated pipe – and must have a width depending on the variant used.
- 1.4 In cases where the longitudinal edges of the pipe insulation are not completely covered over their entire length with a self-adhesive synthetic rubber tape approx. 3 mm thick (see Annex 9), steel wires or steel bands must be applied in the vicinity of the penetration seals to prevent these from opening in the case of fire. The wires or bands must have a minimum thickness of 1 mm. The wires or bands must be applied within 500 mm ("PYROSTAT-UNI RM" and "PYROSTAT-UNI RM-LT" pipe penetration seals) or 1000 mm ("PYROSTAT-UNI RMB" pipe penetration seals) on both sides of the wall or floor with a maximum clearance of 150 mm to each other. It is not necessary to apply these fastenings in the wrap area.

### 2. Installation of the pipe penetration seal "PYROSTAT-UNI RM" – Variant A

- 2.1 The pipe penetration seal may be installed in 150 mm thick walls or floors.
- 2.2 A wrap according to Annex 1 with a minimum width of at least 250 mm must be wrapped in two layers around the insulated pipe as specified in Annex 9 and fastened with at least 3 steel wires or straps at distances  $\leq 125$  mm, whereby at least one wire or strap must lie 30 mm from the wall or floor surface on both sides. The wrap must be installed symmetric to the wall or floor so that it passes through the wall or floor uninterruptedly projecting at least 50 mm on both sides (see Annex 3).
- 2.3 The remaining cavities in the wall or floor shall be completely filled with a gap filling material according to Annex 1.
- 2.4 If applicable, an additional piece of insulation made from synthetic rubber according to Annex 1 (so-called "protective insulation") shall be applied to the insulated pipe/the wrap on both sides of the wall or floor flush to the surface of the building element (see Annexes 3 (lower Figure), 10 and 11 and Section 7).

### 3. Installation of the pipe penetration seal "PYROSTAT-UNI RM" – Variant B

- 3.1 The pipe penetration seal may be installed in  $\geq 150$  mm thick walls or floors.
- 3.2 Two wraps according to Annex 1 with a minimum width of at least 125 mm must be wrapped in two layers around the insulated pipe according to Annex 9 and fastened with at least 2 steel wires or straps at distances  $\leq 60$  mm, whereby at least one wire or strap must lie 30 mm from the wall or floor surface on both sides. The wraps must be installed so that they penetrate at least 75 mm into the wall or floor on both sides (see Annex 4).
- 3.3 The remaining cavities in the wall or floor shall be completely filled with a gap filling material according to Annex 1.
- 3.4 If applicable, an additional piece of insulation made from synthetic rubber according to Annex 1 (so-called "protective insulation") shall be applied to the insulated pipe/the wrap on both sides of the wall or floor flush to the surface of the building element (see Annexes 4 (lower Figure), 10 and 11 and Section 7).

PYROSTAT-UNI RM; PYROSTAT-UNI RMB; PYROSTAT-UNI RM/LT

### APPENDIX 3 – INSTALLATION OF THE PENETRATION SEAL (I)

Annex 14

**4. Installation of the pipe penetration seal "PYROSTAT-UNI RMB"**

- 4.1 The pipe penetration seal may be installed in  $\geq 150$  mm thick walls or floors.
- 4.2 Two wraps according to Annex 1 with a minimum widths of at least 250 mm must be wrapped in two layers around the insulated pipe according to Annex 9. The width may be reduced to 150 mm provided that the pipe dimensions and pipe insulation thicknesses comply with Annex 12, lower table. The wraps must be installed flush to the wall or floor (see Annex 5).
- 4.3 The remaining cavities in the wall or floor shall be completely filled with a gap filling material according to Annex 1. In addition, a metal housing according to Annex 1 is to be fastened to the wall or floor on both sides using appropriate fasteners; when fixing the housing with anchors the required edge distances shall be observed.

**5. Installation of the pipe penetration seal "PYROSTAT-UNI RM-LT"**

- 5.1 The pipe penetration seal may be installed in  $\geq 100$  mm thick flexible walls.
- 5.2 One wrap according to Annex 1 with a width equal to the wall thickness plus 150 mm - but at least 250 mm – shall be wrapped in two layers around the insulated pipe according to Annex 9 and fastened with steel wires or straps on both sides at a distance of 60 mm to the wall surface.
- 5.3 The wrap must pass through the wall projecting 75 mm on both sides (see Annex 6). All remaining cavities in the wall must be completely filled with mineral wool according to Annex 1, apparent density  $\geq 100$  kg/m<sup>3</sup>. The wall lining area may be optionally filled with a 25 mm thick outer layer of gypsum or bonding compound.
- 5.4 In addition to this a piece of insulation made from synthetic rubber according to Annex 1 (so-called "protective insulation") shall be applied to the insulated pipe/the wrap on both sides of the wall flush to the surface of the wall (see Annex 6 and Section 7).

**6. Installation of the pipe penetration seal "PYROSTAT-UNI RM/RMB"**

- 6.1 The pipe penetration seal may be installed in  $\geq 200$  mm thick rigid walls.
- 6.2 Two wraps according to Annex 1 with a minimum width of at least 125 mm must be wrapped in two layers around the insulated pipe according to Annex 9 and fastened with at least 2 steel wires or straps at distances  $\leq 60$  mm, whereby at least one wire or strap must lie 30 mm from the wall surface on both sides. The wraps must be installed so that they penetrate at least 75 mm into the wall on both sides (see Annex 7).
- 6.3 The remaining cavities in the wall shall be completely filled with a gap filling material according to Annex 1.
- 6.4 In addition to this a piece of insulation made from mineral fibre according to Annex 1 (so-called "protective insulation") and a metal housing according to Annex 2 shall be applied to the insulated pipe/the wrap on both sides of the wall flush to the surface of the wall (see Annex 6 and Section 7). The metal housing is to be fastened to the wall using appropriate fasteners; when fixing the housing with anchors the required edge distances shall be observed.

**7. Installation of the protective insulation**

If applicable, an additional piece of insulation according to Annex 1 (so-called "protective insulation") shall be applied to the insulated pipe/the wrap on both sides of the wall or floor flush to the surface of the building element. This protective insulation shall have a thickness and length (depending on the seal variant and the dimensions of the service) as specified in Annexes 10 to 13. The longitudinal seams of the protective insulation must be covered over their entire length with self-adhesive tape (corresponding to the insulation made from approx. 3 mm thick synthetic rubber or aluminum tape). The free end of the protective insulation must also be fixed to the pipe insulation using this type of tape.

PYROSTAT-UNI RM; PYROSTAT-UNI RMB; PYROSTAT-UNI RM/LT

**APPENDIX 3 – INSTALLATION OF THE PENETRATION SEAL (II)**

Annex 15

 XXXX	<p>"CE"-Zeichen / "CE" marking</p>
<p>G+H Isolierung GmbH □ Bürgermeister-Grünzweig- Straße 1 □ 67059 Ludwigshafen DEUTSCHLAND/GERMANY</p> <p>13</p> <p>XXXX-CPD-XXXX</p>	<p>Identifizierungsnummer der notifizierten Stelle (für Konformitätsbescheinigungssystem 1) / Identification number of notified certification body (for system of conformity 1)</p>
<p>ETA-10/0013 ETAG 026 – Teil 2/Part 2</p> <p>Rohrabschottung/ Pipe Penetration Seal "PYROSTAT-UNI RM..." Dämmschichtbildende Komponente/ intumescent component "PYROSTAT-UNI" Nutzungskategorie/ use category Z<sub>2</sub></p>	<p>Name und Anschrift des Herstellers oder seines autorisierten Vertreters (verantwortliche juristische Person) / Name and address of the producer (legal entity responsible for the manufacturer)</p> <p>Die letzten beiden Ziffern des Jahres, in dem die CE- Kennzeichnung angebracht wurde / Two last digits of year of affixing CE marking</p> <p>Nummer des EG-Konformitätszertifikats / Number of EC certificate of conformity</p> <p>Nummer der ETA / ETA number</p> <p>Nummer der Leitlinie / ETAG number</p> <p>Produktbezeichnung (Handelsname) / Designation of the product (trade name)</p> <p>Produktbezeichnung der Komponente (Handelsname) / Designation of the component (trade name)</p> <p>Nutzungskategorie / use category</p>
<p>Für weitere relevante Produktmerkmale (z.B. Feuerwiderstandsklasse, Abgabe gefährlicher Stoffe) s. ETA-10/0013/ See ETA-10/0013 for other relevant characteristics (i.e. fire resistance class, dangerous substances)</p>	
<p>PYROSTAT-UNI RM; PYROSTAT-UNI RMB; PYROSTAT-UNI RM/LT</p>	
<p><b>APPENDIX 4 – EXAMPLE FOR CE MARKING AND ADDITIONAL INFORMATION</b></p>	
<p>Annex 16</p>	

### Abbreviations

**FWKL:** maximum fire resistance class; If installed in building elements of the same type, thickness, density and with the same structure, but with a lower fire resistance class, the fire resistance class of the pipe penetration seal is reduced to the fire resistance class of the building element.

**d<sub>w</sub>:** wall thickness

**d<sub>D</sub>:** floor thickness

**d<sub>i</sub>:** insulation thickness

**Ø:** outer diameter of the pipe

**s:** pipe wall thickness

**C/U:** pipe end configuration "capped/uncapped" (fire test with closed pipe ends in the furnace and open ends outside)

### Standards

**EN 13501-2:2010-02** Fire classification of construction products and building elements – Part 2: Classification using test data from resistance to fire tests, excluding ventilation services

**EN 13501-1:2007** Fire classification of construction products and building elements – Part 1: Classification using test data from reaction to fire tests

**prEN 1366-3:07/2007** Document from CEN TC 127 for formal vote (document N 185); title see EN 1366-3:2009-07

**EN 1366-3:2009-07** Fire resistance tests for service installations – Part 3: Penetration seals

**DIN 4102-17:1990-12** Brandverhalten von Baustoffen und Bauteilen; Schmelzpunkt von Mineralfaser-Dämmstoffen; Begriffe, Anforderungen, Prüfung

### Other Documents

**ETAG 026-2** Guideline for European Technical Approval of Fire Stopping and Fire Sealing Products, Part 2, Penetration Seals (edition January 2008)

**EOTA TR 024** Characterisation, Aspects of Durability and Factory Production Control for Reactive Materials, Components and Products (edition November 2006)

PYROSTAT-UNI RM; PYROSTAT-UNI RMB; PYROSTAT-UNI RM/LT

**APPENDIX 5 – ABBREVEATIONS AND REFERENCE DOCUMENTS**

Annex 17