BS EN 16783:2017

BSI Standards Publication

Thermal insulation products — Product category rules (PCR) for factory made and in-situ formed products for preparing environmental product declarations

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National foreword

This British Standard is the UK implementation of EN 16783:2017.

The UK participation in its preparation was entrusted to Technical Committee B/540, Energy performance of materials components and buildings.

A list of organizations represented on this committee can be obtained on request to its secretary.

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ISBN 978 0 580 86698 2

ICS 91.120.10

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This British Standard was published under the authority of the Standards Policy and Strategy Committee on 31 May 2017.

Amendments/corrigenda issued since publication

Date	Text affected

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 16783

April 2017

ICS 91.120.10

English Version

Thermal insulation products - Product category rules (PCR) for factory made and in-situ formed products for preparing environmental product declarations

Produits isolants thermiques - Règles régissant les catégories de produits (RCP) pour les produits manufacturés et formés en place, destinées à la préparation des déclarations environnementales des produits

Wärmedämmstoffe - Produktkategorieregeln (PCR) für werkmäßig hergestellte und an der Verwendungsstelle hergestellte Wärmedämmstoffe zur Erstellung von Umweltproduktdeklarationen

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European foreword

This document (EN 16783:2017) 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of an identical text or by endorsement, at the latest by October 2017, and conflicting national standards shall be withdrawn at the latest by October 2017.

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Introduction

This European Standard provides rules for the assessment and quantification of parameters describing the environmental impact of thermal insulation products to prepare environmental product declarations.

It defines complementary product category rules for thermal insulation products based on the core rules for all construction products established in EN 15804. These rules are intended to be used in conjunction with EN 15804.

These PCR apply to all CEN/TC 88 thermal insulation product Standards (EN 13162 to EN 13171, EN 14063-1, EN 14064-1, EN 14303 to EN 14309, EN 14313, EN 14314, EN 14315-1 to EN 14320, EN 14933, EN 14934, prEN 15100-1, EN 15101-1, EN 15501, EN 15599-1, EN 15600-1, EN 15732, EN 16069) in order to minimize intra-sectoral deviations. These PCR are also valid for thermal insulation products outside of CEN/TC88 and for thermal insulation products involved in other CEN TCs.

As in EN 15804, the results from the assessment are expressed following the modularity principle in a form that allows aggregation (addition) to provide complete information for construction works. These PCR do not deal with aggregation at the construction works level nor does it describe the rules for applying the environmental parameters in a construction works assessment.

The reduction in energy used and the reduction of emissions produced during the installed life of insulation products exceed by far the energy used and in most cases the emissions occurring during the production, installation and disposal processes. Clause 5.4 of this European Standard provides the rules for declaration of any such benefits as additional information.

NOTE The titles of the clauses in this European Standard follow the EN 15804 to enhance readability.

1 Scope

This European Standard provides the product category rules (PCR) for Type III environmental declarations (as in EN 15804) for factory made and *in situ* thermal insulation products.

Complementary to EN 15804, the PCR described in this European Standard:

— specify the declared unit to be used;

— define the system boundaries for thermal insulation products;

— specify/describe the default scenarios and rules for defining scenarios for certain life cycle information modules.

These PCR are intended to be used for cradle to gate, cradle to gate with options or cradle to grave assessment, provided the intention is properly stated in the system boundary description.

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 13172, *Thermal insulation products - Evaluation of conformity*

EN 15804:2012+A1:2013, *Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products*

EN 15942, *Sustainability of construction works - Environmental product declarations - Communication format business-to-business*

EN 15978, *Sustainability of construction works - Assessment of environmental performance of buildings - Calculation method*

EN ISO 9229, *Thermal insulation - Vocabulary (ISO 9229)*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN ISO 9229, EN 15804:2012+A1:2013 and the following apply.

3.1
biogenic carbon
carbon derived from/contained in biomass

3.2
biomass
material of biological origin excluding material embedded in geological formations and material transformed to fossilised material

4 Symbols and abbreviations

For the purpose of this document, the abbreviations given in EN ISO 9229 and EN 15804 and the abbreviations given in Annex A apply.

5 General aspects

5.1 Objective of the complementary PCR for insulation products

As in EN 15804 and the Scope of this European Standard.

5.2 Types of EPD with respect to life cycle stages covered

These PCR identify three main families of EPD:

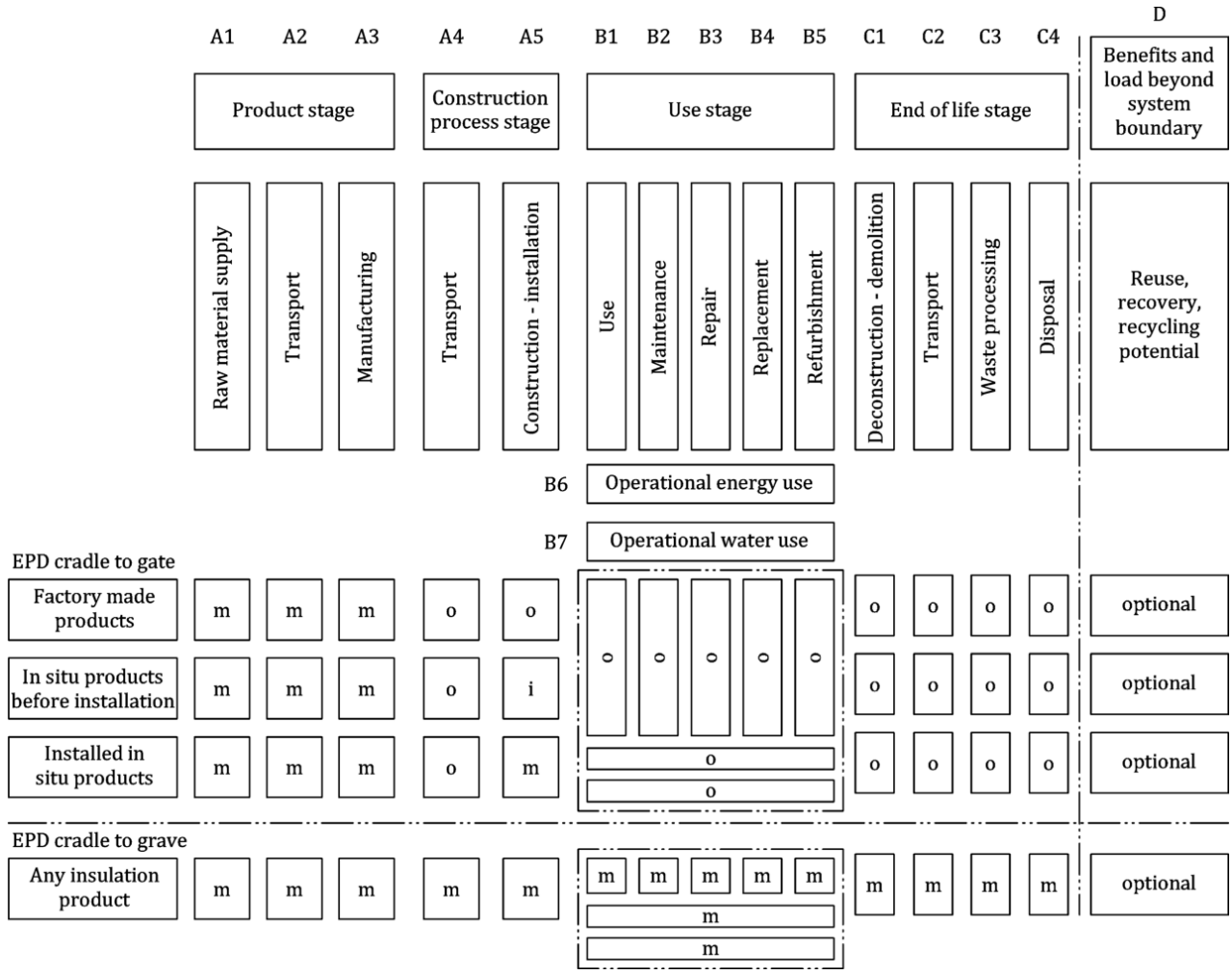
1) EPD for factory made insulation products;

2) EPD for products intended to be used as *in situ* insulation products excluding installation;

3) EPD for products to be used as *in situ* insulation products including installation.

To be in compliance with this European Standard, the declaration of the product stage modules A1-A3 is required as a minimum for those thermal insulation products that have their applicable technical characteristics (e.g. thermal resistance) at the factory gate. In addition, for *in situ* formed thermal insulation products that establish their applicable technical characteristics after activities on site, the declaration of Module A5 “installation” of the construction process stage is also required. The declaration of the modules of the other life cycle stages is optional.

For each of these EPD, mandatory and voluntary stages to be covered are described as in Figure 1.



Key

m mandatory

o optional

i mandatory provision of scenario description and technical information

Figure 1 — Modules

1) EPD for factory made thermal insulation products:

— a cradle to gate EPD: modules A1, A2 and A3 mandatory;

— a cradle to gate EPD with options: modules A1, A2 and A3 mandatory, the other modules optional (i.e. cradle to gate and selected further life cycle stages) ;

— a cradle to grave EPD: modules A to C mandatory

2) EPD for products intended to be used as *in situ* thermal insulation excluding installation:

— a cradle to gate EPD: modules A1, A2 and A3 mandatory and a mandatory description of a scenario for module A5 including the necessary activities to obtain the final insulation product out of the product;

— a cradle to gate EPD with options: modules A1, A2 and A3 mandatory, a mandatory description of a scenario for module A5 including the necessary activities to obtain the final insulation product out of the product. The other modules optional (i.e. cradle to gate and selected further life cycle stages);

— a cradle to grave EPD: modules A to C mandatory.

3) EPDs for products to be used as *in situ* thermal insulation products including installation:

— a cradle to gate EPD with options: modules A1, A2, A3 and A5 mandatory, the other modules optional (i.e. cradle to gate and selected further life cycle stages);

— a cradle to grave EPD: modules A to C mandatory.

5.3 Comparability of EPD for construction products

In principle, the comparison of products on the basis of their EPD is defined by the contribution they make to the environmental performance of the construction works. Consequently comparison of the environmental performance of construction products using the EPD information shall be based on the product's use in and its impacts on the construction works, and shall consider the complete life cycle (all information modules).

NOTE This is especially true for insulation products of which their main purpose is to reduce the energy consumption in the use stage of buildings. Since the reduction of the environmental impacts due to energy savings during the use stage is in most cases much higher than the environmental impacts of the insulation products themselves, it makes more sense to focus on good performance on building level during use than on comparing insulation products.

End use applications are defined in Annex A. Cradle to grave analyses shall describe all relevant requirements for the end-use application of the product.

5.4 Additional information

As in EN 15804 and additional Annex A of this European Standard.

If benefits of insulation products due to energy saving during the installed life are reported in relation to the environmental performance of a building, they shall be reported as additional information. The environmental impacts shall be calculated using EN 15978. The benefit is the difference between the impacts of at least two insulation levels for the same building considered over the whole life cycle. The scenarios shall be fully described in the EPD and sufficient information given to the verifier to verify this.

5.5 Ownership, responsibility and liability for the EPD

A manufacturer or a group of manufacturers are the sole owners and have liability and responsibility for an EPD.

5.6 Communication formats

The communication format of the EPD shall be in accordance with EN 15942.

6 Product Category Rules for LCA

6.1 Product category

The product category referred to in this document includes all the thermal insulation products.

6.2 Life cycle stages and their information modules to be included

As in EN 15804 and in addition Clause 5.2 of this European Standard.

6.3 Calculation rules for the LCA

6.3.1 Functional unit

As in EN 15804 and in addition clause 5.2 of this European Standard, a functional unit shall contain the R-value for the applications as listed in Annex A. If the R-value is not relevant for a specific civil engineering application, the relevant function for that application shall be defined instead.

6.3.2 Declared unit

The declared unit is defined as:

For batts, boards and similar:

1 m^2 thermal insulation product for a specific R_D-value of the product as placed on the market intended to be used for any of the application(s) listed in Annex A or used as generic insulation. Calculation rules can be added for other R_D -values.

Conversion factors may be added to translate from m^2 and R-value to one or more of the other required unit types in EN 15804: item, mass (kg), length (m), volume (m^3).

For pipe sections:

1 m^1 thermal insulation pipe section product with the declared lambda, diameter and thickness, as placed on the market or used to insulate a pipe. Calculation rules can be supplied to account for the various thicknesses, diameters and densities.

Conversion factors may be added to translate from m^1 to one or more of the other required unit types in EN 15804: item, mass (kg), area (m^2), volume (m^3).

For civil engineering applications:

1 m^3 thermal insulation product with the declared lambda, as placed on the market intended to be used for the application(s) listed in Annex A or used as generic insulation.

Conversion factors may be added to translate from m^3 to one or more of the other required unit types in EN 15804: item, mass (kg), area (m^2).

Grouping of products shall follow the rules of EN 13172, but should ensure that any deviations due to intra- or extrapolation are less than 25 %, as described in Clause 6.3.6 of this European Standard.

6.3.3 Reference service life (RSL)

As in EN 15804.

A RSL linked to a specific application defined in Annex A can be declared. The parameters used to determine the RSL such as in use conditions etc., shall be declared in line with the applicable ISO standards (as in EN 15804).

NOTE The thermal performance characteristics of thermal insulation products are usually based on a minimum of 50 years.

6.3.4 System boundaries

6.3.4.1 General

As in EN 15804.

6.3.4.2 Product stage

As in EN 15804.

6.3.4.3 Construction stage

For the A4 module:

If module A4 is addressed in the EPD for transport from the production gate to the construction site, the following information shall be provided to specify the transport scenarios used or to support development of the scenarios at the construction works level:

— values that are based on real and verifiable delivery data;

— the capacity of the truck used in the calculation, which by default is defined by the volume that can be loaded;

— the average distance and capacity utilization;

— the return transport scenario, which by default is “empty return”.

For the A5 module:

As in EN 15804.

Ancillary materials shall be taken into account with a scenario linked to one of the applications defined in Annex A.

Waste percentage can be determined or a default waste percentage of 2 % can be taken for the insulation products during installation.

If equipment is used to install the insulation product, the environmental impact of using this equipment (e.g. energy, additives, lubricants, cleaning, etc.) shall be taken into account.

6.3.4.4 Use stage

6.3.4.4.1 General

As in EN 15804.

6.3.4.4.2 B1 to B5 Use stage information modules related to the building fabric

B1 to B5 modules are only possible if linked to one or more applications listed in Annex A.

— B1: as in EN 15804

— B2: Thermal insulation products do not require maintenance during use in standard conditions and if correctly applied. The default environmental impacts are in this case assumed to be zero;

— B3: Thermal insulation products are not repaired during use in standard conditions and if correctly applied. The default environmental impacts are in this case assumed to be zero;

— B4:as in EN 15804;

— B5: as in EN 15804.

6.3.4.4.3 B6 to B7 Use stage information modules related to the operation of the building

— B6: Insulation products do not use energy during use of the building. The default environmental impacts are zero;

NOTE Thermal insulation products reduce the energy consumption of buildings or industrial installations and thus have a positive contribution to the environment. See Clause 5.4 Additional information.

— B7: Insulation products do not use water during use of the building. The default environmental impacts are zero.

6.3.4.5 End-of-life stage

As in EN 15804.

In addition, demolition and deconstruction scenarios shall be justified and can vary with the different applications listed in Annex A and with geographical location.

Thermal insulation products can be sorted and separated for recycling or for energy recovery. Scenarios can vary with the different applications listed in Annex A and with geographical location.

6.3.4.6 Benefits and loads beyond the product system boundary in module D

Recycling and recovery scenarios shall be justified and can vary with the different applications listed in Annex A.

6.3.5 Criteria for the exclusion of inputs and outputs

As in EN 15804.

6.3.6 Selection of data

As in EN 15804.

In addition, grouping of products and declaring average values is allowed without reporting differences, if the differences in each impact category are lower than 25 %. In other cases the differences in the impact categories shall be reported together with average values.

6.3.7 Data quality requirements

As in EN 15804.

6.3.8 Developing product level scenarios

As in EN 15804.

6.3.9 Units

As in EN 15804.

6.4 Inventory analysis

As in EN 15804. Further guidance can also be found in CEN/TR 16970.

6.5 Impact assessment

As in EN 15804.

Further guidance on how to deal with biogenic carbon is given in CEN/TR 16970.

7 Content of the EPD

As in EN 15804.

In addition to EN 15804:2012+A1:2013, 7.2.2 “Rules for declaring LCA information per module”: Module A5 “installation” shall be addressed in the EPD for *in situ* formed thermal insulation products that establish their applicable technical characteristics after activities on site.

In addition to EN 15804:2012+A1:2013, 7.3.2.2 “A5, Installation in the building”: As module A5 shall be declared for *in situ* formed thermal insulation products that establish their applicable technical characteristics after activities on site, the calculated parameters addressed to Module A5 shall be specified according to EN 15804:2012+A1:2013, Table 8 and be included in the EPD.

8 Project report

As in EN 15804.

9 Verification and validity of an EPD

As in EN 15804.

NOTE As mentioned in Annex ZA of the thermal insulation Standards (EN 13162 to EN 13171, EN 14063–1, EN 14064–1, EN 14303 to EN 14309, EN 14313, EN 14314, EN 14315–1 to EN 14320, EN 14933, EN 14934, EN 15100–1, EN 15101–1, EN 15501, EN 15599–1, EN 15600–1, EN 15732, EN 16069), System 3 level is valid for all properties of thermal insulation products, except reaction to fire in some cases.

Annex A
(normative)

Applications for thermal insulation

This Standard recommends to EPD owners to provide additional technical information, describing technical conditions underlying scenarios and characterizing the product's technical and functional performance during the optional life cycle stages „construction, use and the end of life" for any scenario based calculations of the LCA based parameters.

NOTE Type of anchors, glues, protection layers.

Table A.1 — Applications for thermal insulation in buildings

Area of Application	Designation	Application description
Ceiling, Roof, floor	DAD	External insulation of warm pitched roof or ceiling insulation, protected against weathering, insulation under cover
	DAA	External insulation of flat roof or ceiling, protected against weathering, insulation under water proofing
	DUK	External insulation of the roof, exposed to the weather (inverted roof)
	DZ	Insulation between the rafters, two-shell roof, top floor ceiling not readily walkable but accessible
	DI	Interior insulation of the ceiling (underside) or the roof, insulation under the rafters / supporting structure, false ceiling etc.
	DEO	Interior insulation of the ceiling or floor plate (top side) below floor screed without acoustic dampening requirements
	DES	Interior insulation of the ceiling or floor plate (top side) below screed with acoustic dampening requirements
	VR	Thermal insulation between rafters, ventilated space directly above thermal insulation
Wall	WAB	External wall insulation behind covers (incl. ventilated façades)
	WAA	External wall insulation behind seal
	WAP	External Thermal Insulation Composite System with render
	WZ	Insulation of double-leaf walls, cavity wall insulation
	WH	Insulation of wood frame and wood panel construction
	WI	Interior wall insulation (insulation of walls from inside)
	WTH	Insulation between the house partition walls with sound insulation requirements (between adjacent houses)
	WTR	Insulation of partitioning walls (within one house)
Perimeter	PW	External thermal insulation of walls in contact with soil (outside of the water proofing)
	PB	External thermal insulation under the floor panel in contact with soil (outside of water proofing)
	FI	Thermal insulation as horizontal ground frost insulation

Table A.3 — Applications for thermal insulation in civil engineering

Area of Application	Designation	Application description
Civil Engineering	CI	Civil Engineering
	LWF	Light-weight fill
	ILB	Insulation under load-bearing structure

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EN 13163, *Thermal insulation products for buildings – Factory made products of expanded polystyrene (EPS) – Specification*

EN 13164, *Thermal insulation products for buildings – Factory made products of extruded polystyrene foam (XPS) – Specification*

EN 13165, *Thermal insulation products for buildings – Factory made rigid polyurethane foam (PUR) products – Specification*

EN 13166, *Thermal insulation products for buildings – Factory made products of phenolic foam (PF) – Specification*

EN 13167, *Thermal insulation products for buildings – Factory made cellular glass (CG) products – Specification*

EN 13168, *Thermal insulation products for buildings – Factory made wood wool (WW) products – Specification*

EN 13169, *Thermal insulation products for buildings – Factory made products of expanded perlite (EPB) – Specification*

EN 13170, *Thermal insulation products for buildings – Factory made products of expanded cork (ICB) – Specification*

EN 13171, *Thermal insulating products for buildings – Factory made wood fibre (WF) products – Specification*

EN 14063-1, *Thermal insulation products for buildings - In-situ formed expanded clay lightweight aggregate products - Part 1: Specification for the loose-fill products before installation*

EN 14064-1, *Thermal insulation products for buildings - In-situ formed loose-fill mineral wool (MW) products - Part 1: Specification for the loose-fill products before installation*

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*

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*

EN 14315-1, *Thermal insulating products for buildings - In-situ formed sprayed rigid polyurethane (PUR) and polyisocyanurate (PIR) foam products - Part 1: Specification for the rigid foam spray system before installation*

EN 14316-1, *Thermal insulation products for buildings - In-situ thermal insulation formed from expanded perlite (EP) products - Part 1: Specification for bonded and loose-fill products before installation*

EN 14317-1, *Thermal insulation products for buildings - In-situ thermal insulation formed from exfoliated vermiculite (EV) products - Part 1: Specification for bonded and loose-fill products before installation*

EN 14318-1, *Thermal insulating products for buildings - In-situ formed dispensed rigid polyurethane (PUR) and polyisocyanurate (PIR) foam products - Part 1: Specification for the rigid foam dispensed system before installation*

EN 14319-1, *Thermal insulating products for building equipment and industrial installations - In-situ formed dispensed rigid polyurethane (PUR) and polyisocyanurate foam (PIR) products - Part 1: Specification for the rigid foam dispensed system before installation*

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prEN 15100-1, *Thermal insulating products for buildings - In-situ formed urea-formaldehyde foam (UF) products - Part 1: Specification for the foam system before installation*

EN 15101-1, *Thermal insulation products for buildings - In-situ formed loose fill cellulose (LFCI) products - Part 1: Specification for the products before installation*

EN 15501, *Thermal insulation products for building equipment and industrial installations - Factory made expanded perlite (EP) and exfoliated vermiculite (EV) products - Specification*

EN 15599-1, *Thermal insulation products for building equipment and industrial installations - In-situ thermal insulation formed from expanded perlite (EP) products - Part 1: Specification for bonded and loose-fill products before installation*

EN 15600-1, *Thermal insulation products for building equipment and industrial installations - In-situ thermal insulation formed from exfoliated vermiculite (EV) products - Part 1: Specification for bonded and loose-fill products before installation*

EN 16069, *Thermal insulation products for buildings – Factory made products of polyethylene foam (PEF) – Specification*

EN 15732, *Light weight fill and thermal insulation products for civil engineering applications (CEA) - Expanded clay lightweight aggregate products (LWA)*

EN 14933, *Thermal insulation and light weight fill products for civil engineering applications - Factory made products of expanded polystyrene (EPS) - Specification*

CEN/TR 16970, *Sustainability of construction works - Guidance for the implementation of EN 15804*

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