
Thermal insulation — Vocabulary

Isolation thermique — Vocabulaire

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[ISO 9229:2020](https://standards.iteh.ai/catalog/standards/sist/f0804157-3d0b-4c29-af3c-6c197da7d80b/iso-9229-2020)

<https://standards.iteh.ai/catalog/standards/sist/f0804157-3d0b-4c29-af3c-6c197da7d80b/iso-9229-2020>



iTeh STANDARD PREVIEW (standards.iteh.ai)

ISO 9229:2020

<https://standards.iteh.ai/catalog/standards/sist/f0804157-3d0b-4c29-af3c-6c197da7d80b/iso-9229-2020>



COPYRIGHT PROTECTED DOCUMENT

© ISO 2020

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Fax: +41 22 749 09 47
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

Contents

Page

Foreword	iv
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
3.1 Thermal insulation materials.....	1
3.2 Thermal insulation products.....	5
3.3 Form of supply.....	7
3.4 Thermal insulation, systems and applications.....	11
3.5 Thermal insulation components.....	13
3.6 Common terms.....	14
3.7 Testing and certification terms.....	16
Annex A (informative) Thermal insulation concept	18
Bibliography	19

iTeh STANDARD PREVIEW (standards.iteh.ai)

ISO 9229:2020

<https://standards.iteh.ai/catalog/standards/sist/f0804157-3d0b-4c29-af3c-6c197da7d80b/iso-9229-2020>

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 163, *Thermal performance and energy use in the built environment*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 88, *Thermal insulating materials and products*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This third edition cancels and replaces the second edition (ISO 9229:2007), which has been technically revised.

The main changes compared to the previous edition are as follows:

- revised ETICS definition;
- thorough review of cross-references with numerous new additions and corrections;
- double term entries have been either given their own terminology entries or identified as preferred and accepted terms;
- circular definitions have been corrected;
- pipe section superordinate concept changed as parent term and subordinate terms expanded to 1) concentric pipe section, 2) precision v-groove pipe section, 3) cut pipe section, 4) moulded pipe section;
- vapour barrier and vapour retarder definitions have been revised and clarified.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Thermal insulation — Vocabulary

1 Scope

This document provides a vocabulary of terms used in the field of thermal insulation that covers materials, products, components and applications. Some of the terms can have a different meaning when used in other industries or applications.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>

3.1 Thermal insulation materials

3.1.1

thermal insulation material

substance that is intended to reduce heat transfer and that derives its insulation properties from its chemical nature, its physical structure or both

3.1.2

cellular plastic

thermal insulation material (3.1.1) made from plastic, in which the density is reduced by the presence of numerous small cavities (cells), which may be interconnecting or not, dispersed throughout the material

3.1.2.1

expanded polystyrene

EPS

rigid *cellular plastic* (3.1.2) *thermal insulation material* (3.1.1) manufactured by moulding beads of expandable polystyrene or one of its co-polymers and that has a substantially closed-cell structure, filled with air

3.1.2.2

extruded polystyrene foam

XPS

rigid *cellular plastic* (3.1.2) *thermal insulation material* (3.1.1) made from polystyrene or one of its co-polymers, which has a closed-cell structure and is produced through an extrusion process

3.1.2.3

flexible elastomeric foam

FEF

pliable *thermal insulation product* (3.2.1) made of natural or synthetic rubber, or a mixture of the two, and containing other polymers and other chemicals that may be modified by organic or inorganic additives

3.1.2.4

phenolic foam

PF

rigid *cellular plastic* (3.1.2) *thermal insulation material* (3.1.1), the polymer structure of which is made primarily from the poly-condensation of phenol, its homologues and/or derivatives with aldehydes or ketones

3.1.2.5

polyethylene foam

PEF

semi-rigid or flexible *cellular plastic* (3.1.2) *thermal insulation material* (3.1.1) based on polymers derived mainly from ethylene and/or propylene

3.1.2.6

polyurethane foam

PUR

rigid or semi-rigid *cellular plastic* (3.1.2) *thermal insulation material* (3.1.1) with a substantially closed-cell structure based on polyurethanes

3.1.2.7

urea formaldehyde foam

UF

cellular plastic (3.1.2) *thermal insulation material* (3.1.1) with a substantially open-cell structure, based on an amino resin made by the polycondensation of urea with formaldehyde

3.1.2.8

expanded polyvinyl chloride

rigid or semi-rigid *cellular plastic* (3.1.2) *thermal insulation material* (3.1.1) based on vinyl chloride polymers expanded to form a cellular structure consisting substantially of closed cells

3.1.2.9

polyisocyanurate foam

PIR

rigid *cellular plastic* (3.1.2) *thermal insulation material* (3.1.1) with a substantially closed-cell structure based on polymers mainly of the isocyanurate type

3.1.3

cellular glass

CG

rigid *thermal insulation material* (3.1.1) made from expanded glass with a closed-cell structure

3.1.4

calcium silicate

CS

thermal insulation material (3.1.1) comprised of calcium oxide and silicon dioxide, normally reinforced by incorporating fibres

3.1.5

aluminosilicate wool

ASW

amorphous high temperature insulating wool (HTIW) predominantly produced by melting a combination of Al_2O_3 and SiO_2 , and may contain ZrO_2 and Cr_2O_3

3.1.6

magnesia

thermal insulation material (3.1.1), composed principally of basic magnesium carbonate that incorporates fibre as a reinforcing agent

iTeh STANDARD PREVIEW

(standards.iteh.ai)

ISO 9229:2020

<https://standards.iteh.ai/catalog/standards/sist/f0804157-3d0b-4c29-af3c-6c197da7d80b/iso-9229-2020>

3.1.7**expanded clay**

lightweight granular *thermal insulation material* (3.1.1), having a cellular structure formed by expanding clay minerals by heat

3.1.8**expanded perlite****perlite**

lightweight granular *thermal insulation material* (3.1.1), manufactured from naturally occurring volcanic rock, expanded by heat to form a cellular structure

3.1.9**exfoliated vermiculite****vermiculite**

thermal insulation material (3.1.1) that results from expanding or exfoliating a natural micaceous mineral by heating

3.1.10**diatomaceous insulation**

thermal insulation material (3.1.1) composed mainly of the skeletons of diatoms (cellular siliceous particles of microscopic size)

Note 1 to entry: It is available in the form of a powder, bonded or granular material. See *diatomaceous brick* (3.2.10).

3.1.11**expanded rubber**

cellular rubber *thermal insulation material* (3.1.1) having closed cells, made from a solid rubber compound

3.1.12**cellulose insulation****CI**

fibrous *thermal insulation material* (3.1.1) derived from paper, paperboard stock or wood

3.1.13**cork**

protective layer of the cork oak tree (*Quercus Suber* L), which can be periodically removed from its trunk and branches to provide the raw material for cork products

3.1.14**fibrous insulation**

thermal insulation material (3.1.1) composed of naturally occurring or manufactured fibres

3.1.15**wood wool****WW**

thermal insulation material (3.1.1) composed of long shavings of wood

3.1.16**hemp wool****HW**

thermal insulation material (3.1.1) composed of hemp fibres

3.1.17**sheep wool**

thermal insulation material (3.1.1) composed of sheep wool fibres

3.1.18**mineral fibre**

thermal insulation material (3.1.1) composed of non-metallic inorganic fibres

3.1.18.1

ceramic fibre

inorganic fibres manufactured from metal oxides or clays

3.1.19

mineral wool

MW

fibrous *thermal insulation material* (3.1.1) manufactured from molten rock, slag or glass

3.1.19.1

glass wool

mineral wool (3.1.19) manufactured predominantly from natural sand or molten glass

3.1.19.2

stone wool

mineral wool (3.1.19) manufactured predominantly from molten naturally occurring igneous rock

3.1.19.3

slag wool

mineral wool (3.1.19) manufactured predominantly from molten furnace slag

3.1.20

loose wool

mineral wool (3.1.19) or other materials of a woolly consistency, with or without a *binder* (3.5.8), and having a random fibre orientation

3.1.21

polycrystalline wool

PCW

wool consisting of fibres produced by the sol-gel method, whose fibres are subsequently heat treated to achieve the polycrystalline structure

iTeh STANDARD PREVIEW
(standards.iteh.ai)

ISO 9229:2020
<https://standards.iteh.ai/catalog/standards/sist/f0804157-3d0b-4c29-af3c-6c197da7d80b/iso-9229-2020>

3.1.22

alkaline-earth-silicate wool

AES

amorphous high temperature insulating wool (HTIW) predominantly produced by melting a combination of CaO, MgO and SiO₂, with low biopersistence

3.1.23

asbestos fibre

fibre obtained by the separation into fine filaments of naturally occurring mineral silicates, which possess a crystalline structure

WARNING — Asbestos fibres are not generally recommended for use in the manufacture of *thermal insulation products* (3.2.1) because of their known health hazards. Refer to national regulations.

Note 1 to entry: Products related to asbestos carry the names of chrysotile, crocidolite, amosite, tremolite, actinolite and anthophyllite.

3.1.24

carbon fibre

organic fibres that have been carbonized, but not thermally stabilized, and consist essentially of carbon

3.1.25

cellular concrete

thermal insulation material (3.1.1) composed of concrete containing a substantial number of small air cells

3.1.25.1

insulating castable refractory

cellular concrete (3.1.25) that contains a suitably graded, insulating refractory aggregate

3.1.26**foamed slag concrete**

cellular concrete (3.1.25) with foamed slag as aggregate

3.1.27**foamed slag aggregate**

furnace slag treated to produce *lightweight aggregate* (3.2.5)

3.1.28**graphite fibre**

carbon fibre (3.1.24) that has been thermally stabilized at temperatures up to the graphitization temperature

3.1.29**aerated autoclaved concrete****AAC**

porous *thermal insulation material* (3.1.1) produced by solidifying a mortar consisting of silica sand (pure quartz), cement, lime and water under high pressured steam

3.1.30**insulating concrete**

concrete in the oven-dry condition having a density of not less than 800 kg/m³ and not more than 2 000 kg/m³

Note 1 to entry: Insulating concrete may be cured by autoclaving.

[SOURCE: EN 206:2013+A1:2016, 3.1.4.1]

3.1.31**insulating plaster**

thermal insulation material (3.1.1) composed of plaster that contains *lightweight aggregate* (3.2.5)

3.1.32**perlite plaster**

thermal insulation material (3.1.1) composed of plaster that contains *expanded perlite* (3.1.8) aggregate

3.1.33**microporous insulation**

thermal insulation material (3.1.1) in the form of compacted powder or fibres with an average interconnecting pore size comparable to or below the mean free path of air molecules at standard atmospheric pressure

Note 1 to entry: Microporous insulation may contain opacifiers to reduce the amount of radiant heat transmitted.

3.1.34**unbonded insulation**

loose *thermal insulation material* (3.1.1) manufactured without *binder* (3.5.8)

3.1.35**polyester fibre insulation**

man-made fibrous *thermal insulation material* (3.1.1) made from polyester fibres, with or without the addition of adhesive *binders* (3.5.8) applied during the manufacturing process

3.2 Thermal insulation products**3.2.1****thermal insulation product**

thermal insulation material (3.1.1) in its finished form, including any *facings* (3.5.1) or *coatings* (3.5.4)

3.2.2

composite insulation product

thermal insulation product (3.2.1) made from two or more layers of different *thermal insulation materials* (3.1.1), in which each layer of insulation is bonded to the adjacent layer(s)

Note 1 to entry: See also *composite insulation* (3.4.13).

3.2.3

in-situ thermal insulation product

thermal insulation product (3.2.1) produced or taking its final form at the site of application and that achieves its properties after installation

3.2.3.1

blowing wool

granulated wool (3.2.3.2) or *loose-fill insulation* (3.3.22) for application or installation by pneumatic equipment

3.2.3.2

granulated wool

thermal insulation product (3.2.1) obtained by mechanically processing *mineral wool* (3.1.19) or other materials of a woolly consistency into pieces having a rounded but irregular shape

3.2.3.3

granulated cork

thermal insulation product (3.2.1) composed of fragments of *cork* (3.1.13) obtained by grinding and/or milling raw cork, corkwood or cut pieces

3.2.3.4

spray-applied polyurethane

cellular *polyurethane foam* (3.1.2.6) *thermal insulation product* (3.2.1), which is *foamed in-situ insulation* (3.4.5)

<https://standards.iteh.ai/catalog/standards/sist/f0804157-3d0b-4c29-af3c-6c197da7d80b/iso-9229-2020>

3.2.3.5

spray-applied polyisocyanurate

polyisocyanurate foam (3.1.2.9) *thermal insulation product* (3.2.1), which is *foamed in-situ insulation* (3.4.5)

3.2.3.6

injected urea formaldehyde foam

urea formaldehyde *cellular plastic* (3.1.2) *thermal insulation product* (3.2.1) [see *UF* (3.1.2.7)], which is *foamed in-situ insulation* (3.4.5)

3.2.4

lamella product

<insulation> product made from fibrous materials in which the general orientation of the fibres is perpendicular to the major surfaces

3.2.5

lightweight aggregate

<insulation> material or product composed of porous expanded granules

3.2.6

expanded perlite board

EPB

rigid insulation board manufactured from *expanded perlite* (3.1.8), reinforcing fibres and binding agents

3.2.7

wood wool slab

WW slab

rigid *thermal insulation product* (3.2.1) manufactured from loose *wood wool* (3.1.15), bonded with a *binder* (3.5.8) and compressed to its final thickness

3.2.8**insulating cement**

mixture of dry-fibrous and/or powdery materials that, when mixed with water, develop a plastic consistency and dry in place

3.2.9**wood fibre product**

thermal insulation product (3.2.1) manufactured from wood fibres, with or without the addition of a bonding agent, compressed to its finished form with or without the application of heat

3.2.10**diatomaceous brick**

fired *insulating brick* (3.3.19) composed mainly of the skeletons of diatoms

Note 1 to entry: See *diatomaceous insulation* (3.1.10).

3.2.11**millboard**

dense board made from cellulosic and/or other fibres

3.2.12**pouring wool**

granulated fibrous *thermal insulation product* (3.2.1) for manual application or pouring

Note 1 to entry: See *loose-fill insulation* (3.3.22) and *poured application* (3.4.15).

3.2.13**backing insulation**

thermal insulation material (3.1.1) or *thermal insulation product* (3.2.1) that is shielded from high temperature and/or abrasive conditions by a more heat-resistant and/or protective material

ISO 9229:2020

3.3 Form of supply

<https://standards.iteh.ai/catalog/standards/sist/f0804157-3d0b-4c29-af3c-6c197da7d80b/iso-9229-2020>

3.3.1**block**

<insulation> product generally of rectangular cross-section and with a thickness not significantly smaller than the width

3.3.2**insulated concrete form****ICF**

system of formwork made with a rigid *thermal insulation product* (3.2.1) that stays in place as a permanent interior and exterior substrate for walls, floors, and roofs

Note 1 to entry: The forms are filled with concrete.

3.3.3**board****slab**

<insulation> rigid or semi-rigid *thermal insulation product* (3.2.1) of rectangular shape and cross-section in which the thickness is uniform and substantially smaller than the other dimensions

Note 1 to entry: They may also be supplied in tapered form.