

ISO/TC 163

Secretariat: SIS

Voting begins on:
2020-03-13

Voting terminates on:
2020-05-08

Thermal insulation — Vocabulary

Isolation thermique — Vocabulaire

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Reference number
ISO/FDIS 9229:2020(E)

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Published in Switzerland

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Foreword

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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, 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

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

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

Note 1 to entry: 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 2 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: It may be cured by autoclaving.

[SOURCE: EN 206:2013/+A1:2016]

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

3.2.3.5

spray-applied polyisocyanurate

PIR (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