INTERNATIONAL STANDARD

ISO 9229

Third edition
2020-06

Thermal insulation — Vocabulary

Isolation thermique — Vocabulaire

Reference number
ISO 9229:2020(E)

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

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

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 SiO_2, 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/m^3 and not more than 2 000 kg/m^3

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)

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