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Thermal insulation products — Rigid nano-microporous insulation for industrial applications — Specification

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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*, Subcommittee SC 3, *Thermal insulation products, components and systems*.

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.

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Thermal insulation products — Rigid nano-microporous insulation for industrial applications — Specification

1 Scope

This document specifies the requirements for factory-made rigid nano-microporous insulation, which are used for the thermal insulation of industrial applications on surface at temperatures from 100 °C to 1 150 °C. This document specifies insulation that exhibits thermal insulating performance through nano-sized pore composite material comprising a blend of inorganic powder, fibres and opacifiers. The products are delivered as board or pipe section type.

This document describes product characteristics and includes procedures for testing, evaluation of conformity, marking and labelling.

This document does not specify the required level of a given property to be achieved by a product to demonstrate fitness for purpose in a particular application. The levels required for a given application are to be found in regulations or non-conflicting standards.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 8302, *Thermal insulation — Determination of steady-state thermal resistance and related properties — Guarded hot plate apparatus*

ISO 8497, *Thermal insulation — Determination of steady-state thermal transmission properties of thermal insulation for circular pipes*

ISO 9229, *Thermal insulation — Vocabulary*

ISO 12624, *Thermal insulating products for building equipment and industrial installations — Determination of trace quantities of water-soluble chloride, fluoride, silicate, sodium ions and pH*

ISO 13787, *Thermal insulation products for building equipment and industrial installations — Determination of declared thermal conductivity*

ISO 29465, *Thermal insulating products for building applications — Determination of length and width*

ISO 29466, *Thermal insulating products for building applications — Determination of thickness*

ISO 29469:2022, *Thermal insulating products for building applications — Determination of compression behaviour*

ISO 29470, *Thermal insulating products for building applications — Determination of the apparent density*

3 Terms, definitions, symbols and abbreviated terms

For the purposes of this document, the terms and definitions given in ISO 9229 and the following apply.

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

— ISO Online browsing platform: available at https://www.iso.org/obp

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— IEC Electropedia: available at https://www.electropedia.org/

3.1 Terms and definitions

3.1.1
inorganic powder
base ingredient of microporous thermal insulation such as fumed silica composed of SiO_2 or fumed Al_2O_3

3.1.2
nano-microporous
composite material that comes in the form of fibre reinforced inorganic powder containing nano-micropores

3.1.3
rigid nano-microporous
type of nano-microporous thermal insulation formed as board or pipe section

3.2 Symbols and units

Symbol	Quantity	Unit
l	length	mm
b	width	mm
t	thickness	mm
λ	thermal conductivity	W/(m·K)
λ_D	declared thermal conductivity as determined by ISO 13787, and expressed with three significant digits	W/(m·K)
S_b	deviation from squareness of boards on length	mm
S_d	deviation from squareness of boards on thickness	mm
S_p	deviation from squareness for pipe sections	mm
S_{max}	deviation from flatness	mm
S_{lin}	deviation from linearity	mm
ρ_a	apparent density	kg/m^3
ρ_D	nominal density	kg/m^3

3.3 Abbreviated terms

3.3.1 Abbreviated terms for general usage

Abbreviated term	Meaning
RMI	rigid nano-microporous insulation
ITT	initial type test
FPC	factory production control

3.3.2 Abbreviated terms for declared properties

Abbreviated term	Declared property
CS(10\Y)	declared level for compressive stress at 10 % deformation
Cl	declared level for chloride content
T	declared level for thickness

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