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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~~Part 1. In particular, the different approval criteria needed for the different types of ISO documentsdocument should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC DirectivesIEC Directives, ~~Part 2~~Part 2 (see www.iso.org/directives)-www.iso.org/directives).

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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 — Vacuum insulation panels (VIPs) — Specification

1 Scope

This document:

- defines requirements for vacuum insulation panels (VIPs) with silica or glass fibre core, which are used for thermal insulation of buildings. ~~This document;~~
- outlines required product properties, their performance, test methods and rules for conformity evaluations, identification and labelling. ~~The document;~~
- provides a test method to determine ageing factors and the influence of the linear thermal bridges at the edges.

This document is applicable to all types of silica and glass fibre core VIPs, independent of the type of envelope. In the case of a glass fibre core VIP, it is only applicable to VIPs with desiccants whose service life is ≥ 25 years.

This document ~~does not address any specific installation and application requirements; is not applicable to:~~

- ~~This document does not cover any specific installation and application requirements;~~
- products intended to be used for the insulation of building equipment and industrial installations.

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 1182, *Reaction to fire tests for products — Non-combustibility test*
- ISO 1716, *Reaction to fire tests for products — Determination of the gross heat of combustion (calorific value)*
- ISO-3529-1, *Vacuum technology — Vocabulary — Part 1: General terms*
- ISO-3529-2, *Vacuum technology — Vocabulary — Part 2: Vacuum pumps and related terms*
- ISO-3529-3, *Vacuum technology — Vocabulary — Part 3: Total and partial pressure vacuum gauges*
- ISO 8301, *Thermal insulation — Determination of steady-state thermal resistance and related properties — Heat flow meter apparatus*
- ISO 8302, *Thermal insulation — Determination of steady-state thermal resistance and related properties — Guarded hot plate apparatus*

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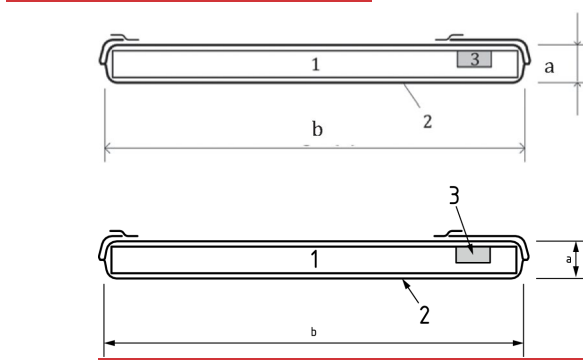
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Note 1 to entry: A schematic view of a VIP is shown in Figure 1.

Dimensions in millimetres



Key

- 1 core material
- 2 envelope
- 3 adsorbent
- ^a Thickness, *d* (3.1.17);(3.1.17).
- ^b Working length, *l*.

Figure 1 — Schematic view of VIP

3.1.2

silica core VIP

vacuum insulation panel (VIP) (3.1.1)(3.1.1) using fumed silica or other comparable silica powders as *core material* (3.1.4)(3.1.4)

3.1.3

glass fibre core VIP

vacuum insulation panel (VIP) (3.1.1)–(3.1.1) using glass fibre as *core material* (3.1.4);(3.1.4), and generally containing an *adsorbent* (3.1.8)(3.1.8)

3.1.4

core material

open porous insulation material constituting the main component inside the *vacuum insulation panel (VIP)* (3.1.1) *envelope* (3.1.5);(3.1.1)*envelope* (3.1.5)

3.1.5

envelope

barrier layer(s) of the *vacuum insulation panel (VIP)* (3.1.1)(3.1.1) resisting gas or vapour permeation into and securing the vacuum inside the VIP

3.1.6

metallized film

MF

laminated film containing a high barrier performance metallic thin layer produced by chemical/physical deposition

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3.1.7 aluminium foil laminated film
AF

laminated film containing aluminium foil as a gas barrier layer

3.1.8 adsorbent

material adsorbing either water vapour or dry air, or both, physically or chemically

3.1.9 desiccant

material added inside the *envelope* (3.1.5)(3.1.5) for the purpose of adsorbing water vapour

EXAMPLE CaO.

3.1.10 inner pressure

total gas pressure within the *vacuum insulation panel (VIP)* (3.1.1)(3.1.1)

3.1.11 working length

l_w
longer linear dimension of the major surface of the test specimen

Note_1_to_entry:-See [Figure 2.Figure 2.](#)

3.1.12 working width

w_w
shorter linear dimension of the major surface of the test specimen, measured at right angles to the *working length* (3.1.11)(3.1.11)

Note_1_to_entry:-See [Figure 2.Figure 2.](#)

3.1.13 core length

l_c
longer linear dimension of the *core material* (3.1.4)(3.1.4) of the test specimen

Note_1_to_entry:-See [Figure 2.Figure 2.](#)

3.1.14 core width

w_c
shorter linear dimension of the *core material* (3.1.4)(3.1.4) of the test specimen, measured at right angles to the *core length* (3.1.13)(3.1.13)

3.1.15 length of edge seal

l_2
longer linear dimension of the edge seal of the test specimen

Note_1_to_entry:-See [Figure 2.Figure 2.](#)

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3.1.16 width of edge seal

w_2
shorter linear dimension of the edge seal of the test specimen, measured at right angles to the *edge seal length* (3.1.19)(3.1.19)

Note 1 to entry: See Figure 2. Figure 2.

3.1.17 thickness
 d

linear dimension measured perpendicularly to the length and width plane

3.1.18 surface area

A_{sur}
area of gas permeation plane of the test specimen

Note 1 to entry: A_{sur} shall be determined by Formulae (1) and (2).

metallized film (MF) (3.1.6) on both sides:

Note 1 to entry A_{sur} shall be determined by Formulae (1) and (2).
- metallized film (MF) (3.1.6) on both sides:
 $A_{sur} = l_2 \times w_2 \times 2$ (1)

MF on single side:

- MF on single side:
 $A_{sur} = l_2 \times w_2$ (2)

3.1.19 edge seal length

l_{es}
total length of the edge seal of the test specimen

Note 1 to entry: l_{es} shall be determined by Formula (3). Formula (3).

$l_{es} = l_2 \times 2 + w_2 \times 2$

Dimensions in millimetres

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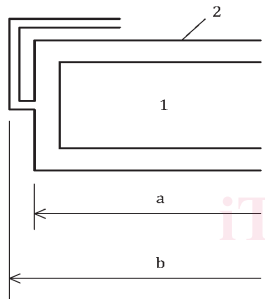
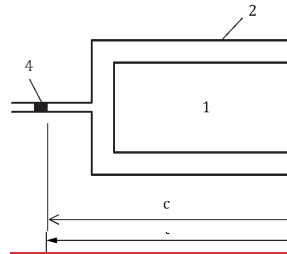
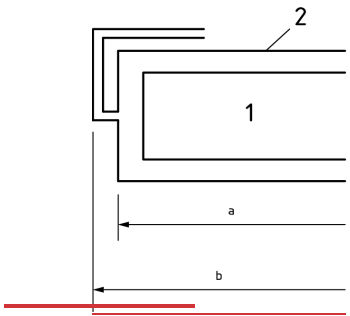
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e) VIP: edge seal (4), length of edge seal (c) b]

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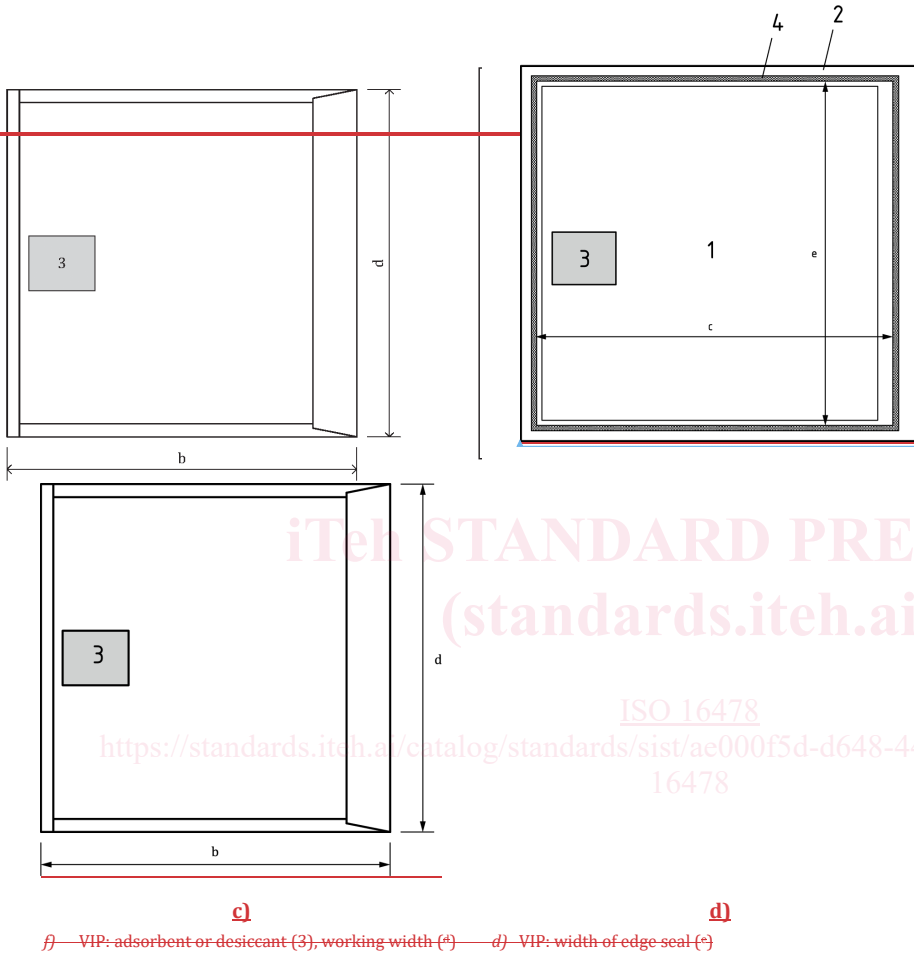
e) VIP: core (1), envelope (2), core length (a), working length (b) a]

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Key

- 1 core material (3.1.4)(3.1.4)
- 2 envelope (3.1.5)(3.1.5)
- 3 adsorbent or desiccant
- 4 edge seal
- a* Core length, l_c , (3.1.13),(3.1.13).
- b* Working length, l_{wf} , (3.1.11),(3.1.11).
- c* Length of edge seal, l_{es} , (3.1.15),(3.1.15).
- d* Working width, w_w , (3.1.12),(3.1.12).
- e* Width of edge seal, w_{es} , (3.1.16)(3.1.16).

Figure 2 — Dimensions of a VIP

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