
**Rigid cellular plastics — Thermal
insulation products for buildings —
Specifications**

*Plastiques alvéolaires rigides — Produits d'isolation thermique pour
bâtiments — Spécifications*

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[ISO 4898:2004](#)

<https://standards.iteh.ai/catalog/standards/sist/ba016a61-c911-454c-88c4-74f20f0e4049/iso-4898-2004>



PDF disclaimer

This PDF file may contain embedded typefaces. In accordance with Adobe's licensing policy, this file may be printed or viewed but shall not be edited unless the typefaces which are embedded are licensed to and installed on the computer performing the editing. In downloading this file, parties accept therein the responsibility of not infringing Adobe's licensing policy. The ISO Central Secretariat accepts no liability in this area.

Adobe is a trademark of Adobe Systems Incorporated.

Details of the software products used to create this PDF file can be found in the General Info relative to the file; the PDF-creation parameters were optimized for printing. Every care has been taken to ensure that the file is suitable for use by ISO member bodies. In the unlikely event that a problem relating to it is found, please inform the Central Secretariat at the address given below.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[ISO 4898:2004](#)

<https://standards.iteh.ai/catalog/standards/sist/ba016a61-c911-454c-88c4-74f20f0e4049/iso-4898-2004>

© ISO 2004

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

Published in Switzerland

Contents

Page

Foreword.....	iv
1 Scope.....	1
2 Normative references	1
3 Terms and definitions	2
4 Sizes and dimensional-tolerance requirements	3
5 Physical-property requirements	4
5.1 Categories.....	4
5.2 Subcategories	4
5.3 Limiting quality values	4
5.4 Burning characteristics	4
6 Sampling	4
7 Ageing and conditioning	5
7.1 Ageing	5
7.2 Conditioning	5
8 Test methods.....	5
8.1 Linear dimensions	5
8.2 Density	5
8.3 Compressive strength	5
8.4 Thermal conductivity	6
8.5 Dimensional stability/compressive creep properties at elevated temperature	6
8.6 Water vapour permeability	6
8.7 Water absorption.....	6
8.8 Bending load at break.....	7
9 Conformity control.....	7
10 Labelling and marking of products	7
11 Reporting requirements	7
Annex A (normative) Amendments to ISO 12576-1.....	11

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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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.

ISO 4898 was prepared by Technical Committee ISO/TC 61, *Plastics*, Subcommittee SC 10, *Cellular plastics*.

This second edition cancels and replaces the first edition (ISO 4898:1984), which has been technically revised.

ITEH STANDARD PREVIEW

(standards.iteh.ai)

[ISO 4898:2004](https://standards.iteh.ai/catalog/standards/sist/ba016a61-c911-454c-88c4-74f20f0e4049/iso-4898-2004)

<https://standards.iteh.ai/catalog/standards/sist/ba016a61-c911-454c-88c4-74f20f0e4049/iso-4898-2004>

Rigid cellular plastics — Thermal insulation products for buildings — Specifications

1 Scope

This International Standard specifies requirements and methods of testing for three categories of rigid cellular plastics thermal-insulation products for buildings. It covers rigid cellular plastics in the form of flat or profiled boards, with or without natural skins. They may also be faced or laminated with foil, plastic or metal films or sheets, mineral coatings, paper, cardboard or other materials.

This International Standard is not applicable to materials used for the thermal insulation of pipes and vessels, for impact sound absorption or for acoustical insulation.

This International Standard covers the following cellular materials used in the thermal insulation of buildings:

RC/PS	based on polystyrene;
RC/PUR	based on polyurethanes made with isocyanates (concerning isocyanurates, see 3.3);
RC/PF	based on phenolic polymer.

The limiting quality values in this International Standard are for use only in the specification of materials between purchaser and supplier, and are not intended to be used for design purposes.

Additional requirements for special applications may be added to those specified in this International Standard by agreement between purchaser and supplier.

2 Normative references

The following referenced documents are indispensable for the application 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 291, *Plastics — Standard atmospheres for conditioning and testing*

ISO 472, *Plastics — Vocabulary*

ISO 844, *Rigid cellular plastics — Determination of compression properties*

ISO 845, *Cellular plastics and rubbers — Determination of apparent (bulk) density*

ISO 1040, *Building construction — Modular coordination — Multimodules for horizontal coordinating dimensions*

ISO 1209-1, *Cellular plastics, rigid — Flexural tests — Part 1: Bending test*

ISO 1663, *Rigid cellular plastics — Determination of water vapour transmission properties*

ISO 1923, *Cellular plastics and rubbers — Determination of linear dimensions*

ISO 4898:2004(E)

ISO 2796, *Cellular plastics, rigid — Test for dimensional stability*

ISO 2896, *Rigid cellular plastics — Determination of water absorption*

ISO 7616, *Cellular plastics, rigid — Determination of compressive creep under specified load and temperature conditions*

ISO 7850, *Cellular plastics, rigid — Determination of compressive creep*

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*

ISO 11561:1999, *Ageing of thermal insulating materials — Determination of the long-term change in thermal resistance of closed-cell plastics (accelerated laboratory test methods)*

ISO 12576-1:2001, *Thermal insulation — Insulating materials and products for buildings — Conformity control systems — Part 1: Factory-made products*

3 Terms and definitions

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

**3.1
RC**
rigid cellular material

<https://standards.iteh.ai/catalog/standards/sist/ba016a61-c911-454c-88c4-74f20f0e4049/iso-4898-2004>

**3.2
RC/PS**
rigid cellular plastic material that has been expanded or extruded from polystyrene or its copolymers

NOTE 1 For the purposes of this International Standard, these materials are divided into two types, RC/PS-M and RC/PS-E (see 3.2.1 and 3.2.2).

NOTE 2 RC/PS-M and RC/PS-E used for thermal-insulation purposes have a cellular structure consisting substantially of closed cells.

**3.2.1
RC/PS-M**
board, expanded from expandable polystyrene beads, which is moulded to shape or cut from continuously or discontinuously produced block

**3.2.2
RC/PS-E**
board produced by the continuous extrusion process, either with or without natural surface skins

**3.3
RC/PUR**
rigid cellular plastic material based on polyurethane or urethane/isocyanurate polymers

NOTE 1 For definitions of **polyisocyanurate plastic**, **polyurethane** and **urethane plastic**, see ISO 472.

NOTE 2 RC/PUR used for thermal-insulation purposes has a cellular structure consisting substantially of closed cells.

3.4

RC/PF

rigid cellular plastic material based on condensation products of a phenol and formaldehyde, such as resols and novolacs, together with hardeners and other additives, for example surfactants, blowing agents and fillers

NOTE RC/PF used for thermal-insulation purposes has a cellular structure consisting substantially of closed cells (subcategory A) or with a higher content of open cells (subcategory B) which affects the thermal conductivity.

4 Sizes and dimensional-tolerance requirements

4.1 Board materials shall be supplied in dimensions agreed between purchaser and supplier or in accordance with ISO 1040. Boards shall be flat.

4.2 Dimensional tolerances for length, width and rectangularity shall conform to the requirements specified in Table 1.

Table 1 — Tolerances for dimensions and rectangularity

Length or width	Tolerance on length or width (see Note 1)	Rectangularity tolerances based on differences in diagonal measurements (see Notes 2 and 3)
mm	mm	mm
< 1 000	± 8	5
> 1 000	± 10	5

NOTE 1 If more restrictive tolerances are required, these shall be agreed between purchaser and supplier.

NOTE 2 Tolerance categories for diagonal measurements are based on the board length (not width).

NOTE 3 Rectangularity may also be determined by equivalent methods such as the use of a rectangular pattern.

4.3 Dimensional tolerances for thickness shall conform to the requirements specified in Table 2.

Table 2 — Tolerances for thickness

Thickness	Tolerance (see Note 1)
mm	mm
less than 50	± 2
50 to 75 (incl.)	± 3
> 75 to 100 (incl.)	± 3 (see Note 2)
> 100	To be agreed between purchaser and supplier

NOTE 1 If more restrictive tolerances are required, these shall be agreed between purchaser and supplier.

NOTE 2 For RC/PS-E with natural skins, the thickness tolerance for this thickness category shall be ± 4 mm.

5 Physical-property requirements

5.1 Categories

Physical property requirements are organized into product categories to meet purchaser and supplier needs over a range of end-use applications.

Category I Suitable for non-load-bearing applications such as wall and cavity insulation, vented roofs, cavity wall insulation and similar applications.

Category II Suitable for limited load-bearing applications such as in built-up roofs, under floors and comparable applications, where elevated temperatures may be encountered and where compressive creep resistance is required. Products in this category may also be used for applications listed in category I.

Category III Suitable for load-bearing applications such as in parking decks, floors of cold-storage areas and comparable applications requiring a higher level of compressive strength and compressive creep resistance. Products in this category may also be used for applications listed in categories I and II.

5.2 Subcategories

Product property categories are further divided into subcategories (A, B, C) on the basis of thermal-conductivity values. All thermal-conductivity specification values given for the subcategories in the tables are maximum values.

Thermal-conductivity values given in the tables shall be used only as limiting quality values for specification of materials between purchaser and supplier. They shall not be used for design purposes.

5.3 Limiting quality values

RC/PS materials shall conform to the limiting quality values for physical properties as specified in Table 3.

RC/PUR materials shall conform to the limiting quality values for physical properties as specified in Table 4.

RC/PF materials shall conform to the limiting quality values for physical properties specified in Table 5.

5.4 Burning characteristics

It is recognized that there is a need to consider the burning characteristics of these materials in their intended application. Therefore, until such time as International Standards become available, individual national practice should be followed.

NOTE Due to compositional and processing parameters, some RC/PF materials may exhibit smouldering combustion (pinking).

6 Sampling

6.1 For density determinations, ten full-size boards are required.

6.2 For all other physical-property determinations and for dimensional measurements, at least three full-size boards are required.

7 Ageing and conditioning

7.1 Ageing

7.1.1 There is no requirement to age materials faced with impermeable, hole-free facings.

NOTE For example, metal coverings of about 50 µm thickness have been found to meet this facing requirement.

7.1.2 All materials without impermeable, hole-free facings shall be aged under ambient conditions for a minimum of 28 days from the date of manufacture. Thermal-conductivity test specimens shall be aged with all surfaces exposed to the ambient air.

7.2 Conditioning

Prior to dimensional measurements and physical-property testing, the test specimens shall be conditioned, with all surfaces exposed, for a minimum of 48 h at (23 ± 2) °C and (50 ± 5) % relative humidity. This 48 h conditioning period may be incorporated as the final two days of the 28-day ageing period.

ISO 11561:1999 has, in Annex A, an analytic model for calculating design values for thermal conductivity after ageing, based on a so-called “slicing and scaling” technique, and, in Annex B, methods for ageing at elevated temperatures faced products.

8 Test methods

iTeh STANDARD PREVIEW
(standards.iteh.ai)

8.1 Linear dimensions

The linear dimensions shall be measured in accordance with ISO 1923 for each of three boards. If the material has a surface facing, lamination or natural skin, the dimensions shall be determined without removing them.

<https://standards.iteh.ai/catalog/standards/sist/ba016a61-c911-454c-88c4-74f20f0e4049/iso-4898-2004>

A minimum of five measurements shall be made for each dimension. Each single value shall be within the tolerances specified in 4.2 and 4.3.

8.2 Density

Density measurement is optional for all materials in countries where a system of class identification has been established.

Density shall be determined in accordance with ISO 845 on each of ten full-size boards and reported as the average of the ten specimens. The average density of the ten specimens shall be equal to or greater than the minimum required and no single specimen shall be less than 90 % of the minimum requirement.

When the natural skin of the material forms an integral part of the product in its end use, the surface skin shall not be removed prior to the determination of the density. For those materials with surface facing, lamination or coating, the density shall be determined for the core material after removing such facing, lamination or coating.

8.3 Compressive strength

The compressive strength or the compressive stress at 10 % deformation or yield, whichever occurs first, shall be determined in accordance with ISO 844. Specimens shall be tested with natural skin integral to the final product, surface facing, lamination or coating, unless surface irregularities require removal of such surfaces for uniform loading.

The compressive strength shall be measured in the direction normal to the surface of the board.