INTERNATIONAL STANDARD

ISO 4898

First edition
1984-11-01

AMENDMENT 4
2000-04-01

Cellular plastics — Specification for rigid cellular materials used in the thermal insulation of buildings

AMENDMENT 4

Plastiques alvéolaires — Spécifications des matériaux rigides utilisés dans l'isolation thermique des bâtiments
AMENDEMENT 4

Reference number
ISO 4898:1984/Amd.4:2000(E)

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.

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 734 10 79
E-mail copyright@iso.ch
Web www.iso.ch

Printed 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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

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 Amendment may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

Amendment 4 to International Standard ISO 4898:1984 was prepared by Technical Committee ISO/TC 61, *Plastics*, Subcommittee SC 10, *Cellular plastics*.

It should be noted that ISO 4898:1984 has two Addenda (Addendum 1 and Addendum 2), published in 1988 (Amendments were previously referred to as Addenda). Addendum 3 has been withdrawn.

Cellular plastics — Specification for rigid cellular materials used in the thermal insulation of buildings

AMENDMENT 4

Add the following annex to the existing text of ISO 4898:1984.

Annex B
(normative)

System of third-party certification of conformity of rigid cellular plastic boards

B.1 Scope

This annex describes a system of third-party certification of conformity of rigid cellular plastic boards. The purpose of the annex is to provide uniform methods and a minimum level for certification to facilitate mutual recognition.

Certification of conformity means the declaration that the product is deemed to satisfy the requirements defined in ISO 4898. This assumption is based on factory quality control and third-party inspection.

B.2 Normative reference

The following normative document contains provisions which, through reference in this text, constitute provisions of this annex. For dated references, subsequent amendments to, or revisions of, this publication do not apply. However, parties to agreements based on this annex are encouraged to investigate the possibility of applying the most recent edition of the normative document indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

ISO/IEC Guide 22:1996, *General criteria for supplier's declaration of conformity.*

B.3 Terms and definitions

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

B.3.1
product
cellular plastic insulating material in a form ready for its installation for use, including any facings or coatings

B.3.2
consignment
quantity of packages or boards of the same category delivered at one time

NOTE The quantity may contain one or more inspection lots or parts of an inspection lot.

B.3.3
inspection lot
definite quantity of packages (product items) manufactured under conditions which are presumed uniform, and that are submitted for inspection and accepted or rejected as a whole, depending on the quality found by inspection of representative samples drawn from the lot

B.3.4
sample
one or more items taken from an inspection lot and intended to provide information on the lot and possibly to serve as a basis for decision on the lot, the items of the sample being selected at random without regard to their quality

B.3.5
test specimen
single item or part of an item used for a test

B.3.6
sampling plan
plan according to which sample size, frequency of testing, etc., is defined in order to obtain information and possibly to reach a decision for conformity control purposes

B.3.7
factory quality control
all control measures carried out by the manufacturer (process control) necessary to maintain and regulate the quality of the current production in conformity with specified requirements

B.3.8
conformity control
performance of control methods to prove whether a product can be accepted as conforming to specified requirements

B.3.9
acceptance testing
tests to be carried out to prove whether a product can be accepted as conforming to specified requirements

B.3.10
lot testing
system under which a lot, represented by a specified number of items of the product, is tested and the result used to judge the measure of conformity of the lot with the specification

B.3.11
manufacturer's declaration of conformity
action by which a manufacturer declares under his own responsibility, by means of a "declaration of conformity", that the product is in conformity with the specification

B.3.12
certification of conformity
delivery of a document issued by a third party, independent of the manufacturer, stating that the product is in conformity with the specification

B.3.13
verification
validation by a third party, independent of the manufacturer, of the manufacturer's declaration of conformity

B.3.14
certification body
body that conducts certification

NOTE A certification body may operate its own testing and inspection activities or oversee these activities carried out on its behalf by other bodies.

[ISO Guide 2:1996]

B.3.15
third party
person or body that is recognized as being independent of the parties involved, as concerns the issue in question

[ISO Guide 2:1996]

B.4 Description of the certification system

The certification system is based on the following elements:

a) to be performed by the manufacturer:

   1) factory production control,

   2) regular testing of factory samples;

b) to be performed by the certification body:

   1) initial inspection of the plant and of the factory quality,

   2) initial type testing of the product,

   3) audit testing of samples taken in the factory,

   4) surveillance, assessment and approval of factory quality control (routine inspection).

B.5 General provisions of the certification system

B.5.1 General

There shall be a contractual arrangement between the manufacturer and the certification body which provides for the administration of a system of certification complying with this annex.

The certification body, which is responsible for type testing, initial inspection and surveillance (routine inspection and audit testing) of the factory, shall have the necessary competence, impartiality and integrity to fulfill these tasks.

The certification body shall operate in accordance with ISO/IEC Guide 22. The certification body shall be fully accredited for the purpose by its national accreditation system, where such a system exists.

For the mutual recognition of the accreditation system between countries, see ISO/IEC Guide 65.

B.5.2 Mark of conformity

Each product covered by this specification scheme shall be marked with a mark of conformity on the label in accordance with Addendum 2 of ISO 4898:1984. As soon as and provided that the manufacturing unit has passed the initial inspection and the product has passed the initial type testing, the certification body shall authorize the use of the mark of conformity.

The mark of conformity shall include reference to ISO 4898 and indicate the certification body.

B.6 Specification

The certification is based on the required properties (see clause 5 of this International Standard) and the marking of the product (see Addendum 2).

B.7 Task of the manufacturer

B.7.1 Factory production control

Factory production control means the permanent internal control of production exercised by the manufacturer or his agent under the responsibility of the manufacturer himself.

The purpose of the control is to ensure that current production conforms with this International Standard.

Factory production control comprises all operational techniques and all other measures necessary to maintain and regulate the quality of the product. It consists of continuous process monitoring, inspections and tests and the utilization of their results with regard to equipment, raw-material constituents, manufacturing processes and the product itself, taking account of the corresponding requirements given in this International Standard.

All necessary facilities, equipment and personnel shall be available to carry out the necessary inspections and tests, as indicated above. This requirement is also deemed to be fulfilled if the manufacturer or his agent involves, by means of a contract, a subcontractor having the necessary facilities, equipment and personnel.

The nature, extent and frequency of testing will depend on the specific conditions of the plant and production line.

Normally, the testing shall be performed in accordance with the test methods given in the specifications. For certain properties, indirect test methods may also be used, provided a correlation can be established between the specified property x (the property to be determined) and another property y. In the indirect test, the property y is measured instead of the property x (e.g. density instead of thermal conductivity). In this case, the sampling plan and the compliance criteria for the indirect property y shall be specified after taking into account the correlation between properties x and y defined by the manufacturer to the satisfaction of the certification body.

If property x is to be correlated with more than one other property, the correlation shall be established in a similar fashion with each.

The correctness of the regression relationship between the specified property and the indirect test value shall be examined at certain intervals, e.g. during the audit test carried out by the certification body. The examination shall also take place each time the production conditions change (e.g. when a new manufacturing procedure is introduced). The examination of the correctness of the relationship shall be carried out separately for each place of production which operates under the same conditions.

The coefficients in the relationship between x and y as well as the residual standard deviation σ are determined by means of adequate preliminary-test and regression calculations. The test values for x and y as well as the accompanying rules for deciding these values shall be coordinated on the basis of the calculated regression relationship. At the same time, it shall be ensured that the statistical probability remains the same for both test schedules. If σ_x is known, the number of samples n_y for the indirect test shall be determined in accordance with the equation

$$n_y = \left(1 + \frac{v}{v-2} \times \frac{s_\varepsilon^2}{\sigma_x^2}\right) \times n_x$$

where

n_y is the number of specimens tested in the indirect test (property y);

v is the number of pairs of values (x, y) which it was possible to use in the calculation of the regression coefficients a and b ($x = a + by + \varepsilon = x_{\text{ind}} + \varepsilon$);

s_ε is the estimated value of the residual standard deviation σ_ε for the difference $\varepsilon = x - x_{\text{ind}}$;

σ_x is the standard deviation of property x;

n_x is the number of specimens tested in the direct test (property x).

For further information on the statistical evaluation, see ISO 2854.

For the production of boards as specified in this International Standard, the certification body shall determine the appropriate frequency of testing and the appropriate frequency of inspections to be performed by the manufacturer for each production unit, taking account of the individual circumstances. In any case, the frequency shall not be less than the normal minimum frequency as shown for the different materials in the relevant tables:

Table B.1 for control of raw and constituent materials and the process;

Table B.2 for control of test equipment;

Tables B.3 to B.6 for control of the finished product.

In exceptional circumstances, e.g. where supported by adequate statistical data, the certification body may accept lower frequencies.

Table B.1 — Minimum frequency of testing and inspection for control of raw and constituent materials and the production process

General: All checks on homogeneous raw materials and the process shall be agreed between the producer and the certification body in accordance with the main principles given below. This shall be considered as basic information about the condition of the production. The raw material shall be checked by the material producer (supplier) for each produced batch. The manufacturer of the boards shall carry out random checks on the composition of the raw material supplied if it is delivered with a supplier's declaration only, unless the raw material is delivered under a certification scheme in which case such checks will not normally be necessary.	
For RC/PS-M	The foaming and moulding characteristics (pre-expansion, moulding panels or blocks, density) and the production of boards shall be checked continuously.
For RC/PS-E	The foaming characteristics and the production of boards shall be checked continuously.
For RC/PUR	The foaming characteristics (time, density) and the foaming process during production shall be checked continuously.
For RC/PF	The foaming characteristics (time, density) and the foaming process during the production of foam blocks shall be checked continuously.

Table B.2 — Minimum frequency for calibration of test equipment

Equipment for determination of:	Frequency
Mass	The weighing system (balance) shall be checked every month against “calibrated masses”.
Dimensions/squareness	No special requirements.
Thermal conductivity λ	Once a month (heat flow) using an internal reference sample; once a year combined with an external check carried out by an independent laboratory.
Mechanical properties, dimensional changes, temperature measurements	Once a year by an external body.
Burning characteristics	As specified by national regulations or ISO requirements, whichever gives the higher frequency.
The calibration shall be repeated if any test equipment is repaired or if a failure occurs. The frequency may be modified if supported by statistical quality-control data.	