

INTERNATIONAL STANDARD

ISO 9933

First edition
1995-03-01

AMENDMENT 1
2004-09-15

Products in fibre-reinforced cement — Long corrugated or asymmetrical section sheets and fittings for roofing and cladding —

AMENDMENT 1

iTeh **STANDARD PREVIEW**

(standard in french)
*Produits en ciment renforcé par des fibres — Plaques ondulées ou
nervurées longues et leurs accessoires pour couvertures et
revêtements —*

ISO 9933:1995/Amd 1:2004

<https://standards.iteh.ai/en/ISO/9933/1995/Amd/1/2004/7e5ed70d-fd8f-407e-a62c-f4ea41f853d/iso-9933-1995-amd-1-2004>



Reference number
ISO 9933:1995/Amd.1:2004(E)

© ISO 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 9933:1995/Amd 1:2004](https://standards.iteh.ai/catalog/standards/sist/7e5ed70d-fd8f-407e-a62c-f4ea41f853d/iso-9933-1995-amd-1-2004)

<https://standards.iteh.ai/catalog/standards/sist/7e5ed70d-fd8f-407e-a62c-f4ea41f853d/iso-9933-1995-amd-1-2004>

© 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

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.

Amendment 1 to ISO 9933:1995 was prepared by Technical Committee ISO/TC 77, *Products in fibre reinforced cement*.

iTeh STANDARD PREVIEW (standards.iteh.ai)

[ISO 9933:1995/Amd 1:2004](https://standards.iteh.ai/catalog/standards/sist/7e5ed70d-fd8f-407e-a62c-f4ea41f853d/iso-9933-1995-amd-1-2004)

<https://standards.iteh.ai/catalog/standards/sist/7e5ed70d-fd8f-407e-a62c-f4ea41f853d/iso-9933-1995-amd-1-2004>

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[ISO 9933:1995/Amd 1:2004](https://standards.iteh.ai/catalog/standards/sist/7e5ed70d-fd8f-407e-a62c-f4ea41f853d/iso-9933-1995-amd-1-2004)

<https://standards.iteh.ai/catalog/standards/sist/7e5ed70d-fd8f-407e-a62c-f4ea41f853d/iso-9933-1995-amd-1-2004>

Products in fibre-reinforced cement — Long corrugated or asymmetrical section sheets and fittings for roofing and cladding —

AMENDMENT 1

Page 2, Clause 4

The following designations have been changed:

- L_1 Upper estimation at 95 % confidence level of the result M_1 in the warm water test and in the soak dry test.
- L_s Lower estimation at 95 % confidence level of the result M_2 in the warm water test and in the soak dry test.
- M_1 Average value of the test result of the control specimen of the first lot for the warm water test and the soak dry test.
- M_2 Average value of the test result of the specimens after the warm water test and the soak dry test.

Page 7

Add a new subclause, 5.4.3.6

5.4.3.6 Soak dry

<https://standards.iteh.ai/catalog/standards/sist/7e5ed70d-fd8f-407e-a62c-f4ea41f853d/iso-9933-1995-amd-1-2004>

When tested as specified in 5.5.9.6, any visible cracks, delaminations or other defects in the sheets shall not be of such a degree as to affect their performance in use. The specimens shall exhibit a ratio L as defined in 5.5.9.6.4 of not less than 0,70. This is equivalent to a decrease in load of no more than 15 % when the coefficient of variation is 15 %.

Page 7

Add a new subclause, 5.4.4

5.4.4 Reaction to fire

The details of the specifications and acceptance criteria of reaction to fire may be defined by national standards.

Page 7, subclause 5.5.1

Replace the text by:

5.5.1 Acceptance tests

The following acceptance tests shall be carried out at the manufacturer's works on sheets as-delivered, the maturity of which is guaranteed by the manufacturer.

Sampling levels and acceptance criteria shall be defined by national standards. In the absence of national documents, the sampling levels and acceptance criteria shall be as defined in ISO 390, and the minimum value of any parameter shall be subject to an AQL of 4 %.

Page 7, subclause 5.5.2

Replace the text by:

5.5.2 Type-tests

A type-test is concerned with the approval of a new product and/or a fundamental change in formulation and/or method of manufacture, the effects of which cannot be predicted on the basis of former experience.

The test shall be performed on the as-delivered product.

The test is required to demonstrate conformity of a generic product to a specification but is not required for each production batch.

When type-tests are carried out, the product shall also be subjected to the acceptance tests to ensure that it complies with the requirements of this International Standard.

These type-tests are

- a) mechanical characteristics: deflection (compulsory), see 5.5.8;
- b) impermeability (compulsory), see 5.5.9.1;
- c) frost resistance (optional), see 5.5.9.2;
- d) warm water (optional), see 5.5.9.4;
- e) heat-rain (compulsory), see 5.5.9.5;
- f) soak dry (optional), see 5.5.9.6.

ITeH STANDARD PREVIEW
(standards.iteh.ai)
<https://standards.iteh.ai/catalog/standards/sist/7e5ed70d-fd8f-407e-a62c-f4ea41f853d/iso-9933-1995-amd-1-2004>

Page 8, subclause 5.5.4.3

Replace the text by:

5.5.4.3 Procedure

Lay the sheet flat on the surface as shown in Figure 3, ensuring that the valley of every corrugation is in contact with it.

To measure the length, take three measurements: one in the middle and one approximately 50 mm from each side or further to avoid mitred corners (see Figure 3).

To measure the width, take three measurements: one in the middle and one approximately 50 mm from each side or further to avoid mitred corners (see Figure 3).

Any other measurement method with an equal or greater accuracy may be used.

Page 11, subclause 5.5.2.1

Replace the text by:

5.5.5.2.1 Micrometer, with hemicylindrical plates as shown in Figure 6, accurate to 0,05 mm. Other measurement devices giving an accuracy equal or higher may be used.

Page 13, subclause 5.5.8.3

Replace the text by:

5.5.8.3 Procedure

The determination of mechanical properties shall be carried out on preconditioned specimens in ambient or wet conditions or as specified by national standards.

In the absence of national standards, type testing shall be carried out on wet preconditioned specimens.

Condition specimens in accordance with Table 4.

Table 4 — Conditioning

Test	Conditioning
Acceptance test, wet	24 h \pm 1 h immersion in water
Acceptance test, ambient	24 h to 72 h in ambient laboratory conditions
Type test	Prior to the bending test, 7 d \pm 1 d in ambient laboratory conditions followed by 24 h immersion in water

The specimen is placed on the supports (the smooth face in compression) at right angles with the corrugations and loaded at midspan by the flat beam evenly distributing the load applied to its centre, after interposition of the strips of felt or soft material.

The breaking load (3.6) shall occur between 10 s and 45 s after the beginning of loading.

Measure the deflection at midspan under 20 % and 70 % of the load which specifies the class.

Page 16, subclause 5.5.9.5.1

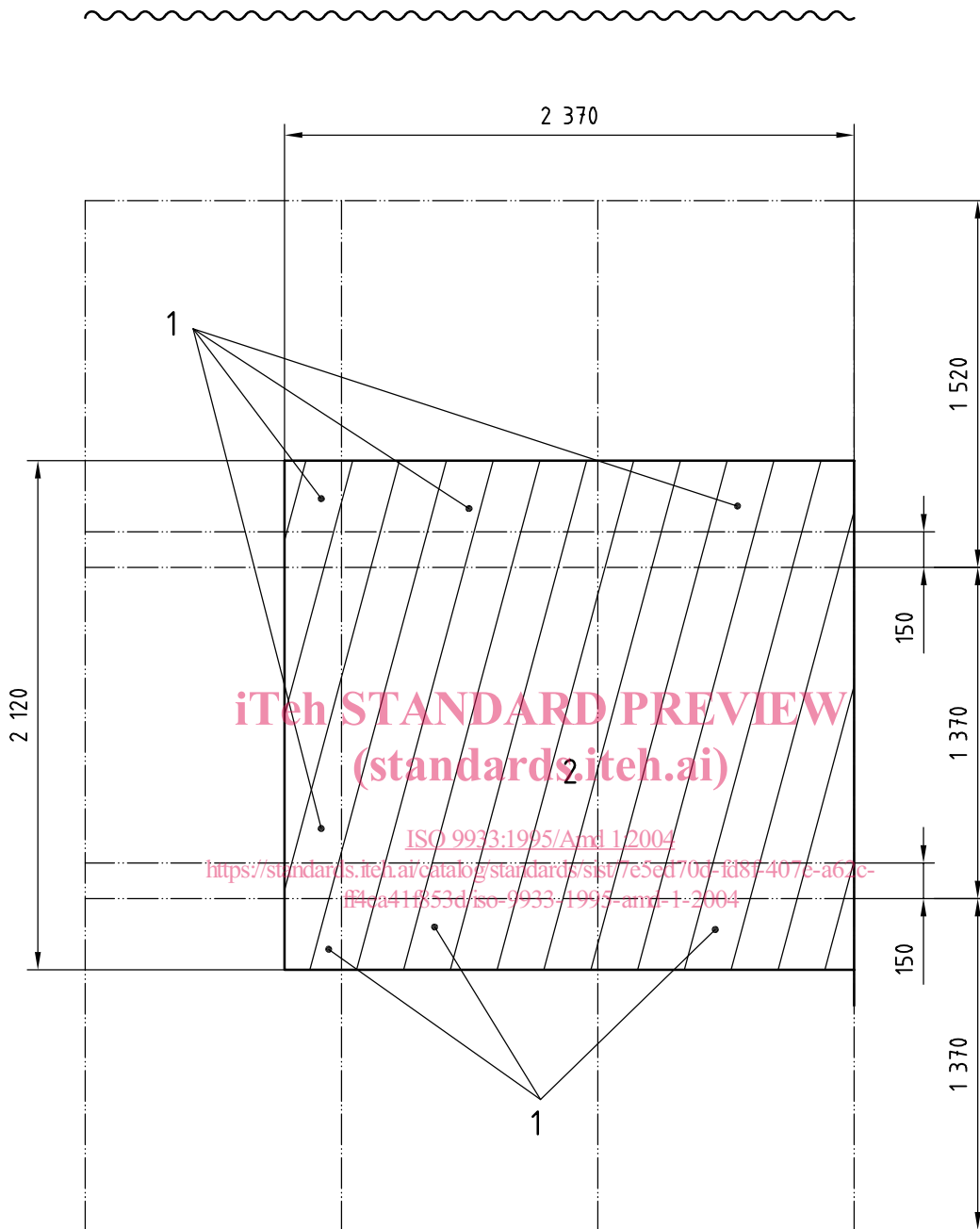
Replace the text by the following and add Figure 11.

5.5.9.5.1 Preparation of specimens

The test specimens shall be prepared from 9 sheets. The effective area submitted to the heat rain test shall be between 3 m² and 5 m². At least 2 full size sheets, laid in order to provide full side and end overlaps, shall be tested. Suitable cut sections of sheets shall be used as starters to realize at least 1 side lap and 2 end laps of the 2 full size tested sheets (see Figure 11).

Sheets longer than 2,50 m shall be cut down to 2,50 m and shall not be tested with end laps.

Dimensions in millimetres



Key

- 1 starters
- 2 effective testing area

Figure 11 — Example of 9 long sheets 177 mm × 51 mm (length 1 520 mm) with 150 mm overlap

Page 17, subclause 5.5.9.5.2.1

Replace the text by:

5.5.9.5.2.1 A vertical suitable frame, for testing both façade and roofing products.

For roofing products only, national standards may specify another inclination of the frame.

Page 17, subclause 5.5.9.5.2.2

Replace the text by:

5.5.9.5.2.2 A heating device, calibrated in order to maintain a black body³⁾ surface temperature of 60 °C ± 5 °C for façades and of 70 °C ± 5 °C for roofs on the surface at the crown of the corrugation. It should provide an approximately uniform power output during the whole heating period.

The heating device should be capable of attaining the specified surface temperature within 15 min.

Page 17, subclause 5.5.9.5.2.3

Replace the text by:

5.5.9.5.2.3 A water-sprinkling device, with an output of approximately:

— 1,0 l/min/m² for façades,

— 2,5 l/min/m² for roofs,

delivering water at an ambient temperature higher than 5 °C.

Page 17

ISO 9933:1995/Amd 1:2004
<https://standards.iteh.ai/catalog/standards/sist/7e5ed70d-fd8f-407e-a62c-f4ea41f853d/iso-9933-1995-amd-1-2004>

Add a new subclause, 5.5.9.6

5.5.9.6 Soak dry

5.5.9.6.1 Preparation of the specimens

Cut 20 specimens longitudinally from the central axis of a complete sheet involving 2 corrugations or, if the sheet is too narrow, one complete corrugation is acceptable. Longitudinal cutting shall be carried out from the axis of the valley with a minimum supplementary edge of 20 mm.

Specimens may be transversally cut to a length allowing a free span × 15 the height of the corrugations.

5.5.9.6.2 Apparatus

5.5.9.6.2.1 Ventilated oven, capable of attaining a temperature of 60 °C ± 5 °C and a relative humidity less than 20 % with a full load of specimens within 6 h.

5.5.9.6.2.2 Water bath, filled with water at an ambient temperature greater than 5 °C.

5.5.9.6.2.3 Bending test machine, as specified in 5.5.8.2.

3) For the definition of a blackbody see ASTM E 638-78. For this test an aluminium plate of 1 mm thickness painted with a matt black paint is used as a blackbody.

The measurement device is a thermocouple or a similar device fixed on the surface of the aluminium plate.