INTERNATIONAL STANDARD

ISO 19712-2

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Plastics — Decorative solid surfacing materials —

Part 2: Determination of properties — Sheet goods

Plastiques — Matériaux décoratifs massifs de revêtement de surface — Partie 2: Détermination des propriétés — Produits en feuilles

Reference number
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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

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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.

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 19712-2 was prepared by Technical Committee ISO/TC 61, *Plastics*, Subcommittee SC 11, *Products*.

ISO 19712 consists of the following parts, under the general title *Plastics — Decorative solid surfacing materials*:

- *Part 1: Classification and specifications*
- *Part 2: Determination of properties — Sheet goods*
- *Part 3: Determination of properties — Solid surface shapes*

Introduction

This part of ISO 19172 is intended for use by manufacturers, installers and specifiers of solid surfacing materials.

The test methods and minimum performance values presented have been related as closely as possible to end-use applications. The fabrication techniques employed may, however, have a bearing on product performance and service.

The performance requirements include impact resistance, structure, renewability, colourfastness, cleanability, stain resistance, water resistance, chemical resistance, bacterial and fungal resistance, and other significant properties.

Plastics — Decorative solid surfacing materials —

Part 2: Determination of properties — Sheet goods

SAFETY STATEMENT — Persons using this document should be familiar with normal laboratory practice, if applicable. This document does not purport to address all of the safety problems, if any, associated with its use. It is the responsibility of the user to establish appropriate safety and health practices and to ensure compliance with any regulatory conditions.

1 Scope

This part of ISO 19712 specifies the methods of test for determination of the properties of solid surfacing materials, as defined in Clause 3, in the form of sheets. These methods are primarily intended for testing the materials specified in ISO 19712-1.

The tests may be carried out on finished sheets, but are generally carried out on test specimens of a size sufficient to meet the requirements of the test, and of the same material and finish as the finished sheet.

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 105-A02, *Textiles — Tests for colour fastness — Part A02: Grey scale for assessing change in colour*

ISO 105-B02, *Textiles — Tests for colour fastness — Part B02: Colour fastness to artificial light: Xenon arc fading lamp test*

ISO 209:2007, *Aluminium and aluminium alloys — Chemical composition*

ISO 1770, *Solid-stem general purpose thermometers*

ISO 2039-1, *Plastics — Determination of hardness — Part 1: Ball indentation method*

ISO 2039-2, *Plastics — Determination of hardness — Part 2: Rockwell hardness*

ISO 3668, *Paints and varnishes — Visual comparison of the colour of paints*

ISO 4211:1979, *Furniture — Assessment of surface resistance to cold liquids*

ISO 4892:1981, *Plastics — Methods of exposure to laboratory light sources*[1)]

ISO 4892-1, *Plastics — Methods of exposure to laboratory light sources — Part 1: General guidance*

1) Withdrawn, but still used in certain Asian countries.

ISO 4892-2:2006, *Plastics — Methods of exposure to laboratory light sources — Part 2: Xenon-arc lamps*

ISO 9370, *Plastics — Instrumental determination of radiant exposure in weathering tests — General guidance and basic test method*

ISO 19712-1, *Plastics — Decorative solid surfacing materials — Part 1: Classification and specifications*

CIE Publication No. 85:1989, *Solar spectral irradiance*

ASTM D 2244, *Standard Practice for Calculation of Color Tolerances and Color Differences from Instrumentally Measured Color Coordinates*

ASTM D 2583, *Standard Test Method for Indentation Hardness of Rigid Plastics by Means of a Barcol Impressor*

3 Terms and definitions

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

3.1
solid surfacing material
SSM
material, composed of polymeric materials together with pigments and fillers, intended to be cast into sheets or shaped products

NOTE 1 The material is of the same composition throughout the whole thickness of the sheet or product.

NOTE 2 Sheets and products made from SSMs are repairable and renewable to the original finish.

NOTE 3 SSMs can also be fabricated into continuous sheets with inconspicuous seams.

4 Cleaning the test specimen surface

4.1 General

The surface to be tested shall be prepared prior to testing using the procedure specified in 4.3.

4.2 Materials

4.2.1 Cellulose sponge.

4.2.2 Non-abrasive cleanser, containing a bleaching agent.

4.2.3 Water.

4.2.4 Clean, absorbent, lint-free material.

4.3 Procedure

Clean the surface using a damp sponge and non-abrasive cleanser containing a bleaching agent, scrubbing the surface with light hand pressure for up to 1,0 min/m^2. Rinse the prepared surface with water and dry with clean, absorbent, lint-free material.

5 Surface defects

5.1 Procedure

The entire finished surface of a suitable-size sheet shall be rubbed with a sponge and a 50 % solution of tap water and water-soluble black or blue-black ink after the surface has been washed and dried as described in 4.3. When inspecting coloured sheets, contrasting-coloured ink shall be used. The ink shall be wiped from the surface with a damp cloth and the surface dried before inspection.

5.2 Method of inspection of surface

After being inked in accordance with 5.1, the surface of the sheet shall be inspected with the unaided eye for defects and blemishes from a distance of between 305 mm and 610 mm, using a light source giving an illumination intensity of (1 615 ± 540) lx near the surface to be inspected.

5.3 Performance requirements

The finished surfaces of sheets shall be free from cracks, chipped areas, pinholes and blisters.

Spots, dirt and similar surface blemishes are admissible provided the total area covered by such blemishes is not more than 1,0 mm^2/m^2 of sheet surface. The blemishes may be concentrated in one place or scattered over the sheet.

5.4 Test report

The test report shall include the following information:

a) a reference to this part of ISO 19712;

b) the name and type of product;

c) whether the surface was free from cracks, chipped areas, etc.;

d) whether the area covered by spots, dirt, etc., was more than 1,0 mm^2/m^2 of sheet surface;

e) any deviation from the method specified;

f) the date of the test.

6 Consistency of colour

6.1 Test apparatus and materials

6.1.1 Tabletop, approximately 760 mm above the floor.

6.1.2 Overhead white fluorescent lights, with the bulbs positioned parallel to the line of sight and providing an illumination intensity of 800 lx to 1 100 lx at the tabletop.

6.1.3 Manufacturer's recommended seam adhesive.

6.1.4 Manufacturer's recommended abrasives and random orbital sander.

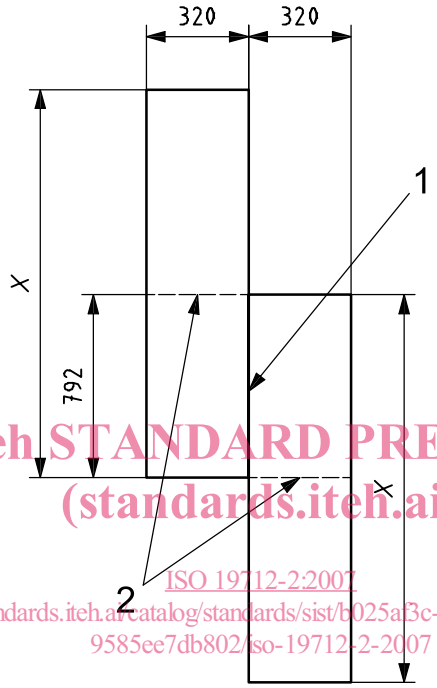
6.2 Test specimens

Two specimens shall be prepared, one from the beginning of the lot and the other from the end of the lot.

For each test specimen, cut two strips, each 320 mm wide, from the full width of the sheet and bond the strips together, offset by 792 mm, with the manufacturer's recommended adhesive as shown in Figure 1. The strips shall be bonded in the same direction as they were removed from the sheet. Cut off the two unbonded portions of the panel thus prepared to give a (640 ± 0,5) mm × (792 ± 0,5) mm specimen with a bond seam running down the centreline between the midpoints of the 640-mm-long sides as shown in Figure 2. Finish the seamed specimen by sanding with an orbital sander.

The seam shall be made and finished in strict accordance with the manufacturer's recommendations for the fabrication and finishing of seamed panels.

Dimensions in millimetres



Key

1 seam
2 cut lines

X = full width of sheet

Figure 1 — Fabrication of seamed panel from which specimen is cut

Dimensions in millimetres

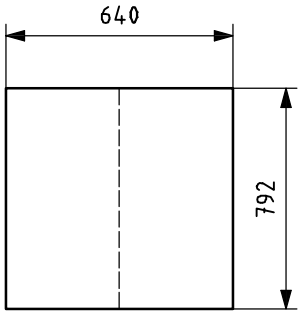


Figure 2 — Seamed specimen

6.3 Test procedure

Place a specimen on the table face up and view it under the illumination defined in 6.1.2 at an eye-to-specimen distance of 760 mm to 910 mm. View the specimen at angles of approximately 45° and 75°.

6.4 Performance requirement

There shall be no noticeable base colour change along the length of the seam.

6.5 Test report

The test report shall include the following information:

a) a reference to this part of ISO 19712;

b) the name and type of product;

c) whether there was any noticeable base colour change along the seam;

d) any deviation from the method specified;

e) the date of the test.

7 Load test

7.1 Clamping frame

The clamping frame for conducting the load test shall be constructed so as to provide an area measuring (610 ± 0,6) mm × (762 ± 0,6) mm over which the test specimen is unsupported.

7.2 Test specimen

A seamed specimen shall be used for the test. The specimen shall be fabricated as specified in 6.2.

7.3 Test method

Mount the seamed specimen in the clamping frame so that it is held securely at the four corners of the specimen and so that the seam runs between the midpoints of the 762-mm-long sides of the unsupported area inside the clamping frame (see Figure 3).

Apply a load of 1 334 N to the midpoint of the specimen via a weight distribution disc 203 mm in diameter resting on a 13 mm thick layer of sponge rubber or other suitable soft material located between the disc and the specimen surface. Leave the load in place for (2,5 ± 0,5) min to allow for settlement of the clamping frame and any initial slip in the fasteners. Then remove it.

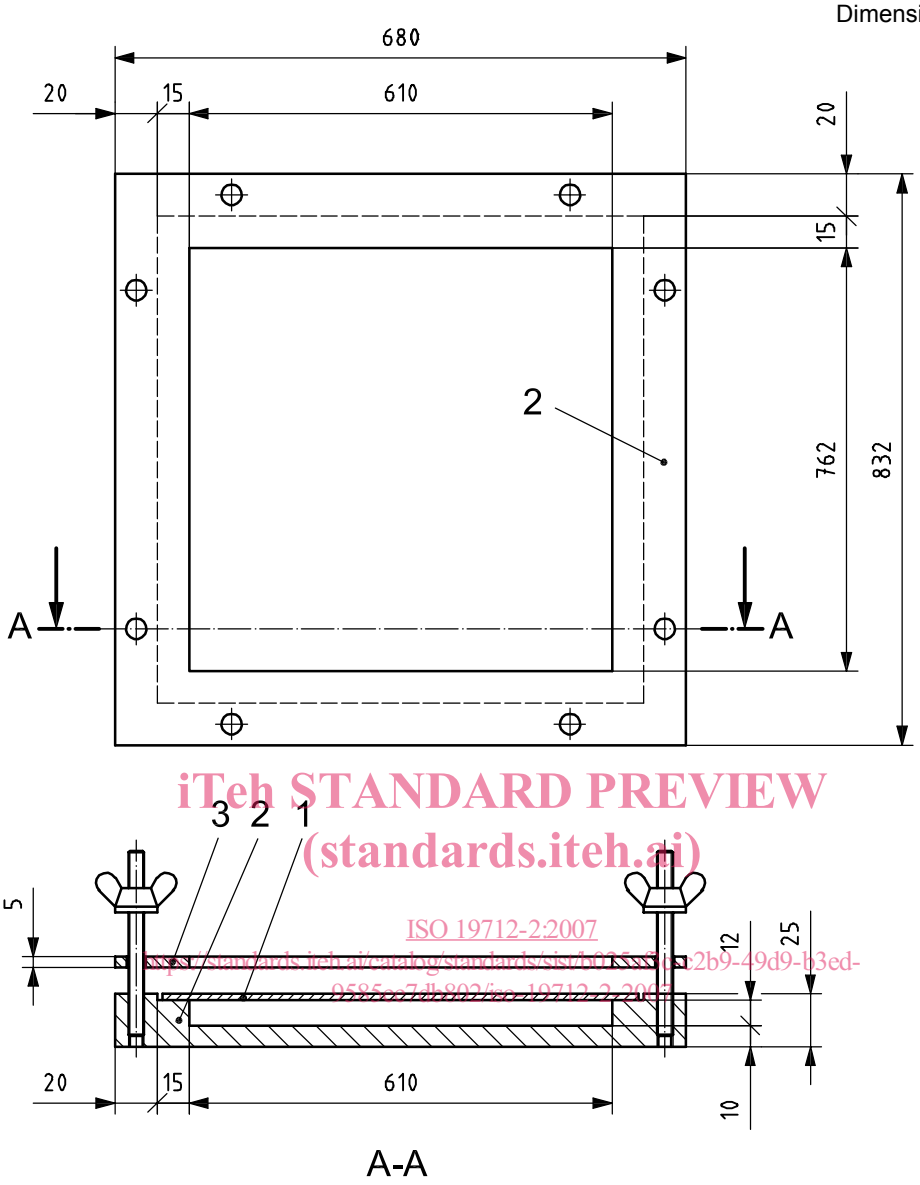
(12,5 ± 2,5) min after removal of the load, reapply the 1 334 N load for not less than 1,5 min or more than 2 min.

10 min after removal of the load, measure the residual deflection of the midpoint of the specimen with a deflectometer or other suitable device capable of measuring deflections of up to 0,25 mm.

7.4 Performance requirement

There shall be no cracks in the surface of the specimen when inspected after inking as described in 5.1 and 5.2. The maximum residual deflection shall not exceed 0,25 mm after removal of the load.

Dimensions in millimetres



Key

1 specimen
2 lower metal frame
3 upper metal frame, thickness 5 mm

Figure 3 — Clamping frame for load test (see 7.1)

7.5 Test report

The test report shall include the following information:

a) a reference to this part of ISO 19712;

b) the name and type of product;

c) whether cracks were formed in the surface of the specimen;

d) whether the maximum residual deflection exceeded 0,25 mm;

e) any deviation from the method specified;

f) the date of the test.

8 Resistance to impact by large-diameter ball

8.1 Principle

A specimen taken from the sheet under test is covered with a sheet of carbon paper and subjected to the impact of a steel ball, which is allowed to fall from a known height. Impact resistance is expressed as the maximum drop height which can be achieved without incurring visible surface cracking or producing an imprint greater than a specified maximum diameter.

8.2 Apparatus

8.2.1 Free-fall test apparatus, of the type shown in Figure 4, or an equivalent which will produce the same results.

8.2.2 Polished steel ball, of mass (324 ± 5,0) g and diameter (42,8 ± 0,2) mm, having no damaged or flattened areas on its surface.

8.2.3 Specimen clamping frame, conforming to Figure 5.

8.3 Test specimens

Specimens shall measure (230 ± 0,5) mm × (230 ± 0,5) mm × the thickness of the sheet under test.

8.4 Procedure

The test shall be carried out in the laboratory atmosphere, and in cases of dispute it shall be carried out at (23 ± 2) °C.

Clamp a specimen in the clamping frame (8.2.3) and place the assembly on the solid base of the free-fall test apparatus (8.2.1). Cover the specimen with a sheet of carbon paper with its coated face in contact with the decorative surface. Adjust the height scale so that its base is touching the face of the specimen.

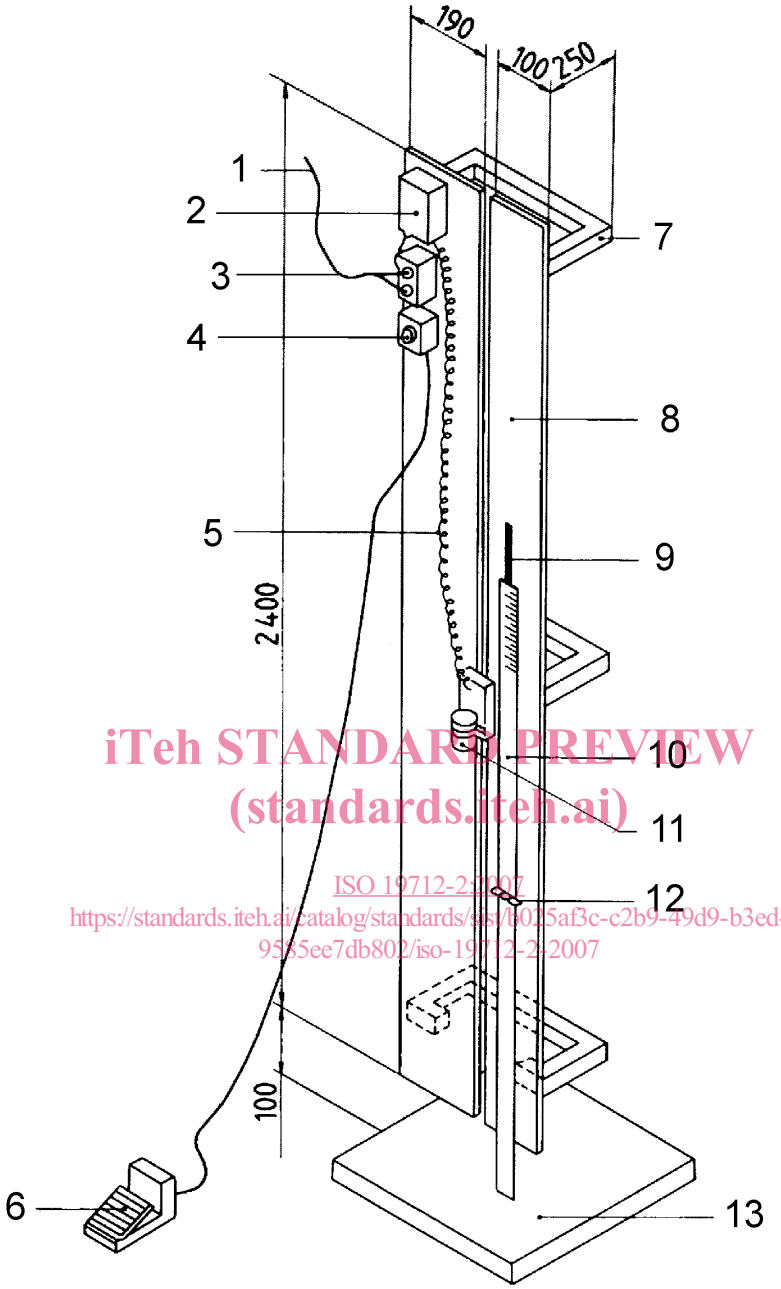
Position the electromagnet at any arbitrary height (the specification limit for the material under test is a useful starting point).

Place the steel ball (8.2.2) on the energized electromagnet. Operate the release mechanism so that the ball falls on the specimen, catching the ball on the first rebound so that multiple impacts do not occur.

Examine the impact spot. If cracking is evident, or the carbon imprint is greater than the diameter specified in ISO 19712-1, lower the electromagnet and repeat the test. If no cracking is evident and the imprint is smaller than the specified diameter, raise the electromagnet and repeat the test. The distance between points of impact, and between points of impact and the edge of the specimen, shall be at least 50 mm. For referee purposes, only one impact per specimen shall be made, with the point of impact as near as possible to the centre of the specimen.

Repeat the above procedure, as necessary, to determine the impact resistance, which is defined as the maximum height for which no visible surface cracking, or imprint greater than the specified diameter, occurs in five successive strikes.

Dimensions in millimetres

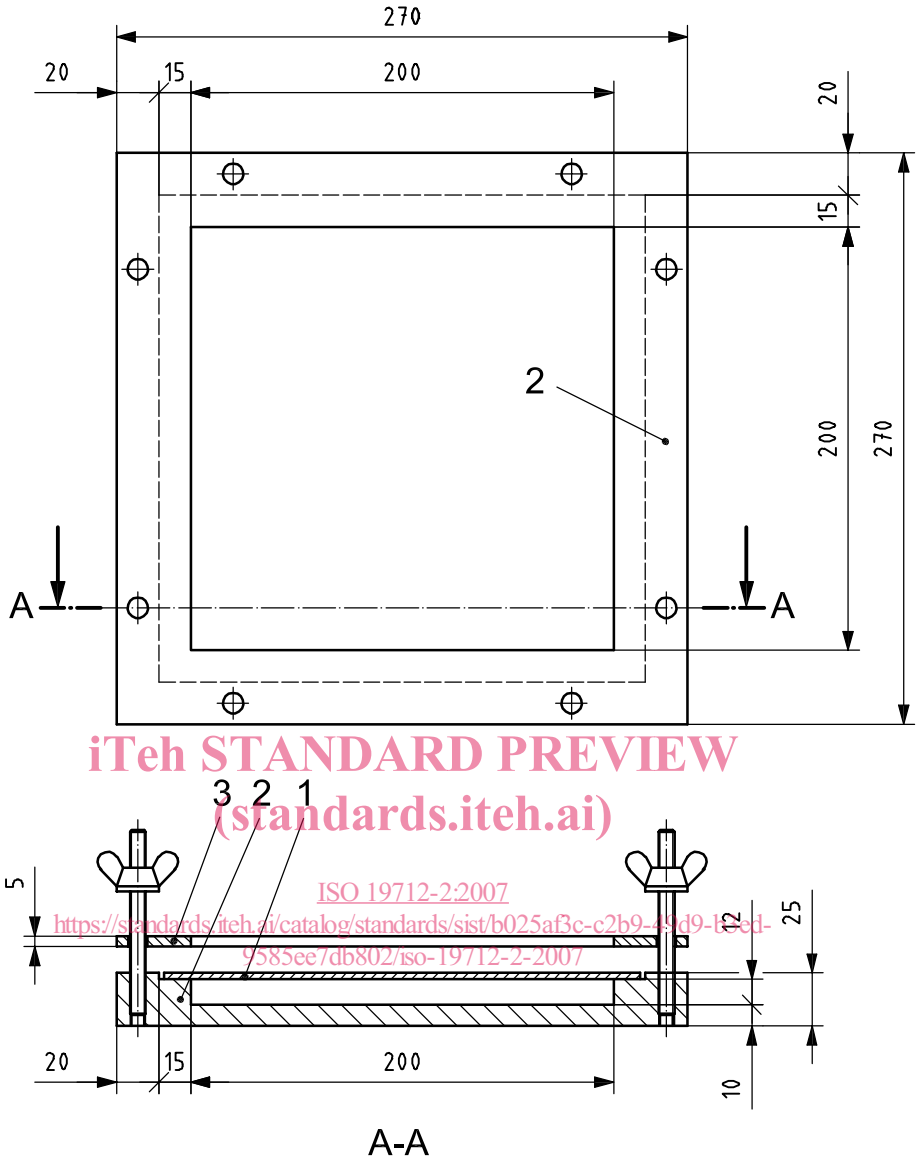


Key

1 electric power supply
2 transformer and rectifier
3 junction box with two-pin socket
4 junction box with indicator light
5 coiled wire lead
6 foot treadle switch
7 angle iron brackets (attached firmly to wall or column, plumb and perpendicular to base plate)
8 mounting board for test apparatus (medium- or high-density chipboard)
9 6-mm-wide slot
10 slidable machinist's steel scale
11 electromagnet on sliding mount
12 wing nut
13 450 mm × 450 mm × 20 mm steel base plate, levelled and set firmly to floor, and projecting out far enough in front of the stand for the whole of the clamping frame holding the test specimen (see Figure 5) to be placed on it

Figure 4 — Resistance to impact by large-diameter ball (see 8.2.1)

Dimensions in millimetres



Key

1 specimen
2 lower metal frame
3 upper metal frame, thickness 5 mm

Figure 5 — Clamping frame for resistance to impact by large-diameter ball (see 8.2.3)