BRITISH STANDARD

BS 3900-E7: 1974
[Falling ball impact] Incorporating Amendment Nos. 1 and 2

CONFIRMED
JUNE 1986

Methods of Test for Paints —

Part E7: Resistance to impact (falling ball test)

It is recommended that this Part be read in conjunction with the general information in the Introduction to BS 3900 issued separately (revised edition published March 1969)

Confirmed
October 2008

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Foreword

NOTE This Part describes a procedure based on DEF/1053 "Standard methods of testing paint, varnish, lacquer and related products", Method No. 17(c) "Resistance to impact — Falling ball".

Other related Parts of BS 3900 are:

— *Part E3: "Impact (falling weight) resistance", which describes a method where the depth of indentation of the test panel is controlled, whereas in this Part (E7) there is no control of the depth of indentation;*

— *Part E8: "Resistance to impact (pendulum test)", which describes a method in which resistance to a single-blow impact by a pendulum is determined.*

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Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 and 2 and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

Amendments issued since publication

Amd. No.	Date of issue	Comments
2518	April 1978	
6909	February 1992	Indicated by a sideline in the margin

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Content

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1 Scope

This Part describes a procedure for determining the resistance to impact of a single-coat film or a multicoat system of paints, varnishes, or related products, using a free falling ball.

The method is specifically intended to test products on substrates which are not significantly distorted in the test.

2 Supplementary information

The method of test described below requires to be completed, for any particular application, by the following supplementary information. This information is to be derived from the British Standard or other specification for the product under test or, where appropriate, is to be the subject of agreement between the interested parties.

1) Material and surface preparation of substrate.

2) Method of application of test coating to substrate.

3) Thickness, in micrometres, of dry coating, including method of measurement in accordance with BS 3900-C5[1)], and whether it is a single-coat film or a multicoat system.

4) Duration and conditions of drying of the coated panel (or conditions of stoving and ageing, if applicable) before testing.

5) Whether the test is to be carried out with the test coating facing upwards or downwards.

6) The test requirements the material has to meet.

3 Apparatus

3.1 *Hardened steel ball,* approximately 60 mm in diameter and of mass 900 ± 10 g, unless otherwise specified.

3.2 *Device,* e.g. an electromagnet for holding and releasing the steel ball at a specified height above the test panel.

3.3 *Supporting frame,* on which the test panel rests in a horizontal position so as to leave an area 180 mm × 180 mm unsupported.

4 Sampling

A representative sample of the product to be tested (or of each product in the case of a multicoat system) shall be taken as described in BS 3900-A1[2)]. The sample(s) shall then be examined and prepared for testing as described in BS 3900-A2[3)].

5 Test panel

5.1 Material and dimensions. Unless otherwise specified or agreed, the test panel shall be of burnished steel, approximately 200 mm × 200 mm and at least 5 mm thick, complying with the requirements of BS 1449-1[4)], HRP 43/25.

5.2 Preparation and coating of panel. Unless otherwise specified, the test panel shall be prepared as described in BS 3900-A3[5)] and shall then be coated with the product or system under test by a method agreed between the interested parties (see clause **2**).

5.3 Drying the test panel. The coated test panel shall be dried (or stoved and aged) for the specified time and under the specified conditions and, unless otherwise specified, shall be conditioned at a temperature of 23 ± 2 °C and a relative humidity of 50 ± 5 % for a minimum of 16 h. The test procedure shall then be carried out as soon as possible.

5.4 Thickness of coating. The thickness, in micrometres, of the dry coating shall be determined by the method specified, using one of the procedures in BS 3900-C5[6)].

6 Procedure

6.1 Place the panel on the supporting frame with the test coating facing upward or downwards as specified. Release the steel ball and allow it to fall freely from a height of 3 m, unless otherwise specified, so that it strikes the panel approximately in the centre. Repeat this procedure so that the second point of impact is as close to the first as possible and, in any case, is not more than 20 mm from it.

6.2 Remove the panel from the supporting frame and examine the coating for signs of cracking, flaking and detachment from the substrate.

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1) BS 3900-C5 “Determination of film thickness”
2) BS 3900-A1 “Sampling”.
3) BS 3900-A2 “Examination and preparation of samples for testing”.
4) BS 1449, “Steel plate, sheet and strip”, Part 1 “Carbon steel plate, sheet and strip”.
5) BS 3900-A3 “Standard panels for paint testing”.
6) BS 3900-C5 “Determination of film thickness”.

7 Test report

The test report shall contain at least the following information:

1) A reference to this British Standard.

2) Type and identification of the coating under test.

3) The items of supplementary information referred to in Clause **2**.

4) The British Standard or other document supplying the information referred to in Clause **7** 3) above.

5) Any deviation, by agreement or otherwise, from the standard test procedure described.

6) The results of the test in terms of the stated requirements.

7) Date of the test.

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