BRITISH STANDARD

BS 3962-5: 1980

Methods of test for

Finishes for wooden furniture —

Part 5: Assessment of surface resistance to cold oils and fats

UDC 684.4.041.059.1:667.638.6:620.179.111.1

Cooperating organizations

The Pigments, Paints and Varnishes Standards Committee, under whose direction this British Standard was prepared, consists of representatives from the following Government departments and scientific and industrial organizations:

British Colour Makers' Association
Builders' Merchants' Federation
Consumers' Association*
Department of the Environment (Building Research Establishment)
Department of the Environment (PSA)*
Department of Industry (Chemicals and Textiles)
Department of Industry (Laboratory of the Government Chemist)
Greater London Council
London Transport Executive
Ministry of Defence
Oil and Colour Chemists' Association
Paint Research Association
Paintmakers' Association of Great Britain Ltd*
Post Office
Royal Institute of British Architects
Society of Chemical Industry
Titanium Pigment Manufacturers' Technical Committee
White Lead Manufacturers' Association
Zinc Development Association
Zinc Pigment Development Association

The organizations marked with an asterisk in the above list, together with the following, were directly represented on the committee entrusted with the preparation of this British Standard:

Association of County Councils
British Woodworking Federation
Department of Education and Science
Department of the Environment (Joint Fire Research Organisation of the Department of the Environment and Fire Offices Committee)
Furniture Industry Research Association

This British Standard, having been prepared under the direction of the Pigments, Paints and Varnishes Standards Committee was published under the authority of the Executive Board and comes into effect on 30 May 1980

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Amendments issued since publication

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Contents

Foreword

This Part of this British Standard has been prepared under the direction of the Pigments, Paints and Varnishes Standards Committee as one of a series of standard methods for testing and assessing the performance of finishes for wooden furniture. BS 3962-5 was first published in 1972 in the series of standard methods for testing the performance of clear finishes for wooden furniture. An increase in the use of pigmented finishes for furniture has now made it desirable to broaden the scope of the test method to include such finishes. In addition the opportunity has been taken to amend the rating code to align with international practice.

The method is designed to test finishes for wooden furniture on which oils and fats may be spilt. It provides a method for comparing different finishes, but can also be used to determine whether or not a sample complies with the requirements detailed in a product specification or other document.

In view of the diversity of woods and finishing systems used in the furniture industry, it is impracticable to specify a uniform standard test substrate and method of preparation of the finishing system. These should be the subject of agreement between the purchaser and the supplier. This method seeks only to stipulate a standard procedure for testing a wooden panel coated with the appropriate finishing system.

Although the rating system used has been made as objective as possible, it still contains a large subjective component. Consequently, to cater for the inherent variability present when subjective decisions have to be made, it is recommended that not fewer than five observers should examine and assess the tested surface. Subject to agreement between the purchaser and the supplier, fewer observers may be used provided that these observers are experienced in this type of assessment. The rating in each test is the median value of the assessment of the observers, the assessments being determined by a procedure which is described in detail in clause **8**. A series of such tests may be carried out using several different oils or fats as agreed between the purchaser and the supplier.

No attempt has been made to assess the ease with which the finish may be restored.

This Part of this British Standard describes a method of test only, to which reference may be made in a specification in which test conditions and acceptable performance levels have been specified. A statement that a wood finishing system complies with the requirements of BS 3962 should not be used, as it is meaningless.

Other Parts of this standard are:

— *Part 1: Assessment of low angle glare by measurement of specular gloss at 85°*;

— *Part 2: Assessment of surface resistance to wet heat;*

— *Part 3: Assessment of surface resistance to dry heat;*

— *Part 4: Assessment of surface resistance to cold liquids;*

— *Part 6: Assessment of resistance to mechanical damage.*

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Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 4, an inside back cover 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.

1 Scope

1.1 This Part of this British Standard describes a method of test for assessing the resistance of a wood finishing system to marking by a cold oil or fat in contact with the finished surface.

NOTE For the purposes of this British Standard, the terms "wood" and "wooden" include the range of materials manufactured from wood, e.g. blockboard, particle board, etc., used in the furniture industry.

1.2 The test may be used either as a means of comparing a number of finishing systems or as a control check test to ensure that a specified performance level is being achieved or maintained.

2 References

The titles of the publications referred to in this standard are listed on the inside back cover.

3 Principle

Oil or fat is placed on the surface of the test panel and is removed after 24 h. The test area is then gently rubbed first with a soft absorbent cloth moistened with dilute cleansing liquid and then with another moistened with water. The surface is finally wiped dry with a soft clean absorbent cloth and examined visually for signs of marking. The degree of marking of a test area is assessed by a number of observers by reference to a descriptive numerical rating code. The median value of the individual assessments determines the rating to be given to the finishing system for the specified test oil or fat.

4 Apparatus and reagent

4.1 *Viewing cabinet.* A suitable viewing cabinet is shown in Figure 1, and is constructed of approximately 15 mm thick blockboard, or other suitable material. The interior shall be painted matt black. A 25 mm diameter hole is cut in the sloping side and a 60 W frosted lamp is positioned on the hinged platform so that the lamp rests directly over the hole.

4.2 *Cleansing liquid,* with the following composition:

	percentage by mass
a) the sodium salt of an alkyl ($C_{10} - C_{14}$) aryl sulphonate;	12.5
b) polyoxyethylene ethers of primary or secondary alcohols, having between 8 and 16 carbon atoms, condensed with 5 to 15 molecules of ethylene oxide per molecule of alcohol and having a cloud point of 25° to 75 °C in 1 % (*m*/*m*) aqueous solution[a];	12.5
c) ethanol[b];	5.0
d) distilled or deionized water;	70.0

[a] The determination of cloud point is described in BS 3762.
[b] Ethanol may be replaced for this purpose by industrial methylated spirits, 74° OP, complying with the requirements of BS 3591. It should be noted that the use of industrial methylated spirits is governed by The Methylated Spirits Regulations, 1952 (SI 1952, no. 2230). It is not permissible to use duty-free ethanol, received under the provisions of the Customs and Excise Act 1952, section 111, for purposes for which industrial methylated spirits is an acceptable alternative to ethanol.

The concentrated liquid shall be stored in a glass bottle in a cool dark place and should be used within 1 year of preparation.

A diluted liquid is used in the test containing 15 ml of the above cleansing liquid in 1 litre of distilled or deionized water. It is essential that this dilute solution be freshly prepared on the day of use.

5 Test substances

The test substances shall be agreed between the purchaser and the supplier.

6 Preparation of test surface

6.1 Test panel. The test panel shall be of an agreed wooden substrate, substantially flat and of a size sufficient to comply with the requirements of **7.1** regarding the separation of the small amounts of test substances.

Example: for three test substances, the minimum size of panel required is 130 mm × 180 mm.

It is recommended that a sufficient area be prepared to allow for extra tests, if required.

6.2 Finishing of test panel. Apply the full finishing system by the appropriate method of application to an agreed wooden substrate, suitably prepared and complying with the dimensions specified in **6.1**. The application rates of the individual coats of material, the drying period and conditions and the surface preparation between coats, e.g. sanding, shall be agreed between the purchaser and the supplier.

6.3 Ageing of test panel. Allow the final coat to age at a room temperature not lower than 15 °C with free access of air for an agreed period before test. The period shall be not less than 28 days except for special purposes, in which case the period shall be agreed between the purchaser and the supplier.

7 Test procedure

7.1 Application of the test. Place on the panel the appropriate number of pools of oil or pats of fat, each approximately 25 mm in diameter and at 23 ± 2 °C. At least two test areas per test substance shall be used, so arranged that no area has its centre nearer than 40 mm to any edge of the panel and the minimum distance between area centres is 50 mm.

Note, by any suitable method, the test positions of each substance and ensure that the test positions for a particular test substance are as random as possible, and that they do not lie on the same grain structure, if this is visible.

Leave the panel undisturbed in an atmosphere free from draughts at 23 ± 2 °C for 24 h.

After this period of time, remove the oil or fat from the panel with soft absorbent paper or cloth. Wash the test surface by lightly rubbing it, first with a soft absorbent cloth moistened with the diluted cleansing liquid (**4.2**) and then with another moistened only with water. Finally, carefully wipe the surface dry with a clean, soft absorbent cloth.

Wash and dry in the same way an area on the test panel that has not been exposed to the test oils or fats (reference area).

7.2 Examination of test panel

7.2.1 Carefully compare each test area with the reference area in the viewing cabinet (**4.1**), using normal corrected vision, by the following procedure.

Position the panel so that the test area to be examined is equidistant from the sides and about 550 mm from the back of the cabinet. Move the eye to bring the reflection of the lamp alongside the test area and further move it to cause the reflection to travel round the test area. In this way, any markings may be seen.

7.2.2 Carefully compare each test area with the reference area, either in good diffuse daylight with an illumination of at least 2 000 lx, or in artificial daylight in a colour matching booth complying with the requirements of BS 3900-D1. Note any signs of discoloration, change in lustre or other defects in the test area.

8 Assessment and reporting of results

8.1 Rating code. By comparison with the reference area, rate the test areas for each test substance by the methods described in **7.2.1** and **7.2.2**, according to the following code:

Appearance of test area	Rating
No visible change	5
Slight change in lustre or a few isolated marks just visible	4
Complete test area just distinguishable	3
Marked change in appearance	2
Complete or partial removal of film	1

Report any colour change separately.

NOTE 1 Intermediate ratings, e.g. 3 – 2 or 2½, should not be used.

NOTE 2 These ratings now align with international practice. This has the effect of increasing each numerical rating by 1 unit from that given in the previous edition of this standard (e.g. a rating of 3 in this edition corresponds to a rating of 2 previously).

8.2 Operation of rating code. It is recommended that each test area be rated according to the code given in **8.1** by at least five observers. The rating for a test area shall be the largest rating value which is equalled, or exceeded, by the majority of observers, e.g.:

individual ratings 1, 2, 3, 3, 3; test area rating: 3

individual ratings 1, 2, 2, 3, 3; test area rating: 2

Duplicate test areas for each test substance shall be assessed separately. If the results differ, carry out a further test and report the discrepancy.

8.3 Reporting of results. The test report shall include at least the following information:

a) a reference to this Part of this British Standard, i.e. BS 3962-5;

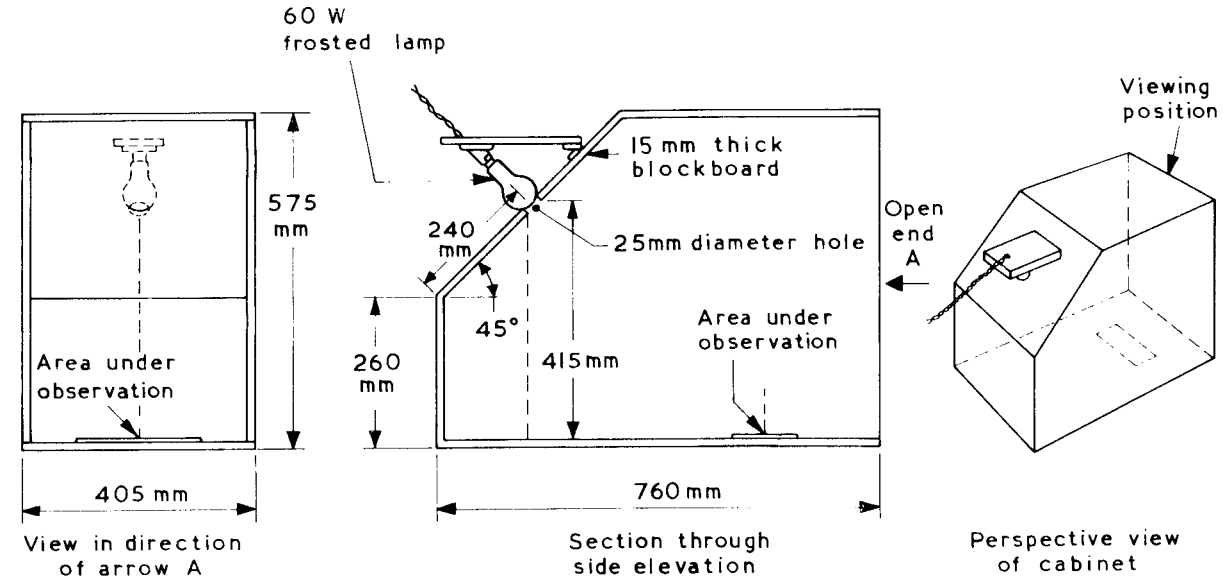
b) identification of the coating under test;

c) the product specification or other document supplying the test requirements and performance levels, if any;

d) any deviation, by agreement or otherwise, from the specified test procedure, including the duration and the reasons, if known, for a special ageing period of less than 28 days;

e) the required performance level and the result for each test substance, and any abnormality of results between the examination methods **7.2.1** and **7.2.2**;

f) the date of the test.



NOTE All the dimensions are approximate

Figure 1 — Viewing cabinet

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Publications referred to

BS 3591, *Industrial methylated spirits.*
BS 3762, *Methods of sampling and testing detergents.*
BS 3900, *Methods of test for paints.*
BS 3900-D1, *Visual comparison of the colour of paints.*

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