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Methods of test for motor vehicle paints —

Part 5: Gloss measurement

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Foreword

This Part of this British Standard has been prepared under the authority of the Automobile Industry Standards Committee and is based on Information Sheet No. 163 of the Society of Motor Manufacturers and Traders Ltd. (SMMT).

Tests for paints for general purposes are given in BS 3900[1)] and, wherever possible, reference to that standard has been made.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

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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 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)] BS 3900, "*Methods of test for paints*".

1 Scope

This Part of this British Standard describes methods of carrying out tests for specular reflection value and image clarity for paints for motor vehicles. General requirements are given and the necessary apparatus specified.

2 Test panels

Panels, 150 mm × 100 mm or other convenient size, specified and pretreated in accordance with the requirements of BS 3900, Part A3[2)] (note particularly Clause **2.2**) shall be coated in accordance with the requirements of BS 3900, Part A4[2)], with the paint system to be tested. Normally steel panels are used but it may be appropriate to use other substrates.

Particular care shall be taken to ensure that the panels are flat and that the paint film is free from blemishes such as ridges, flatting lines, dirt, "orange peel" effect, etc.

The panels shall be aged, under normal laboratory conditions for 7 days unless otherwise agreed.

3 Test no.1. specular reflection value

3.1 General. The test for specular reflection value shall be carried out generally in accordance with BS 3900, Part D2[3)], which specifies a 45° incident angle. However, as the angle of 45° is not so discriminating at high gloss levels as the 20° angle, this standard also provides for the use of variable angle instruments.

Any angle other than 45° shall be the subject of agreement between the paint supplier and the purchaser. It should be noted that the incident angle referred to in this standard is the angle formed between the beam of incident light and the perpendicular to the panel at the point of incidence.

This test method shall be used for all reference test purposes.

3.2 Procedure. The test shall be carried out in accordance with BS 3900, Part D2[4)] except that:

1) The galvanometer scale shall be set to 80 with reference to the standard black tile. This permits the convenient expression of gloss values higher than that of the reference tile.

2) When an angle other than 45° is used, a variable angle gloss head shall be set at the required angle.

4 Test no.2. assessment by image clarity

4.1 General. The test for assessment by image clarity is applicable to surfaces in the range from matt to gloss and provides an assessment of image clarity. It does not differentiate between high gloss finishes, but is particularly suitable for determining loss of gloss due to weathering.

4.2 Apparatus

4.2.1 The instrument as shown in Figure 1 and Figure 2 provides for a glass panel with transparent characters (the numeral screen) to be mounted vertically and to be illuminated from the rear. The images of the characters are reflected from the surface of the test panel. A mirror, free from double image, facilitates observation when the instrument is used on a test panel set at an angle.

4.2.2 Horizontal rows of characters on the numeral screen are identical in each row but vary from one row to the next in size and distance from the bottom edge (see Figure 3). Care should be taken to ensure that the characters are fully transparent. The characters reading from the top of the screen are 0, 8, S, 6, 5, 4 and 3, the lower edge of the row of 3's coinciding with the bottom edge of the screen.

NOTE The letter "S" is used instead of the Figure 7 which, because of its angular shape, would be more easily distinguished than the neighbouring Figure 6 and Figure 8 and the size and relationship of all the characters have been chosen following careful experiments.

4.2.3 The characters are illuminated by electric filament bulbs, the current being supplied via a switch by dry cells. A suitable arrangement consists of two 3.5 V, 0.15 A bulbs to BS 941[5)] Ref. No. 974 in parallel and three R20 cells to BS 397[6)] connected in series. A diffusing screen of 21 oz flashed opal glass to BS 952[7)] is placed between the light source and the printed plate. The intensity of the light source is not critical within reasonable limits.

4.3 Procedure. The instrument is placed on the surface to be tested and the reflected image of the printed plate is viewed either directly or in the mirror.

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2) BS 3900, Part A3, "*Preparation of panels prior to painting*".
Part A4, "*Notes for guidance on paint application*".
3) BS 3900, Part D2, "*Gloss (specular reflection value)*".
4) BS 3900, "*Methods of test for paints*", Part D2, "*Gloss (specular reflection value)*".
5) BS 941, "*Filament lamps for automobiles and cycles*".
6) BS 397, "*Primary cells and batteries*".
7) BS 952, "*Classification of glass for glazing and terminology for work on glass*".