BRITISH STANDARD AUTOMOBILE SERIES

BS AU 148-6: 1969

Methods of test for motor vehicle paints —

Part 6: Hardness

UDC 629.113;667.613:620.178

Foreword

This Part of this British Standard has been prepared under the authority of the Automobile Industry Standards Committee and in based on Information Sheet No. 143 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.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

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.

This British Standard, having been approved by the Automobile Industry Standards Committee, was published under the authority of the Executive Board of the Institution on 31 March 1969

The following BSI reference relates to the work on this standard
Committee reference AUE/-

ISBN 0 580 05268 0

1) BS 3900, "*Methods of test for paints*",
Part A3, "*Preparation of panels prior to painting*".
Part A4, "*Notes for guidance on paint application*".

Amendments issued since publication

Amd. No.	Date	Comments

Contents

1 Scope

This Part of this British Standard describes a method for the hardness testing of paints for motor vehicles using the following methods:

1) Pencil method.
2) Persoz pendulum method.
3) Wallace micro-hardness method.
4) Pyramid micro-hardness method.

Tables for obtaining hardness numbers from ocular readings in the Diamond pyramid test are given.

2 Test panels

2.1 Test panels, when used, shall be 150 mm × 100 mm or other convenient size, specified and pretreated in accordance with the requirements of BS 3900-A3[2)] (note particularly Clause **2.2**) and shall be coated, in accordance with the requirements of BS 3900-A4[2)], with the paint system to be tested. Normally steel panels are used.

2.2 Particular care shall be taken to ensure that the panels are flat and that the paint film is substantially free from blemishes such as ridges, brush marks and "orange-peel" effect.

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

Test panels are not normally used for the "pencil" method which is primarily intended for use in the production shop.

3 Pencil method

A range from 2B to 6H of high quality drawing pencils, such as the makes specified below[3)], or their equivalent, is required. The pencils shall be sharpened to a point with a pencil sharpener. The softest pencil shall be held normal to the paint film to be tested and pressed sufficiently to make the point crumble. Without altering the pressure, the pencil is drawn across the paint film for a distance of 6 mm. This procedure shall be repeated with pencils of higher grades of hardness until the paint film is scratched or penetrated. The grade of hardness of the pencil used immediately before that which caused scratching or penetration shall be taken as the hardness of the paint film. The figures of 2 determinations shall be recorded.

4 Persoz pendulum method

4.1 The pendulum, which is supported on the test panel with the steel balls resting on the surface under test, is made to swing through an arc of slightly more than 12°. The time for the amplitude of the oscillation to decrease from 12° to 4° is determined and represents the Persoz Pendulum Hardness.

4.2 The average of 3 determinations which do not differ by more than 5 % shall be recorded.

4.2.1 Before commencing the test, the instrument shall be so placed that the pendulum, when at rest, points to zero.

4.2.2 The test shall be carried out in draught-free surroundings.

4.2.3 The test shall be carried out at 21 ± 1 °C on test panels which have been conditioned for 24 h at 21 ± 1 °C and 65 ± 5 % relative humidity.

5 Wallace micro-hardness test[4)]

5.1 Test Instrument. The test instrument shall comply with the following details:

Sensitivity		To be adjusted according to maker's instructions
Indentor		1.6 mm diameter ball
Primary load		0.25 g applied for 15. s
Support for secondary load		5 g (aluminium disc not supplied with instrument)
Secondary loads	(1)	10 g
	(2)	200 g
i.e. Total loading	(1)	15.25 g applied for 30 s
	(2)	205.25 g applied for 30 s
Dial indicator		Reading 0.0025 mm (0.0001 in)
Instrument ratio		20 : 1

5.2 Test Procedure. The following procedure shall be carried out:

1) The location of the instrument should be as vibration free as possible and a "warming up" period of 10 min should be allowed before use.

2) Secure the specimen on the instrument table by means of the vacuum holder.

[2)] BS 3900, "*Methods of test for paints*",
Part A3, "*Preparation of panels prior to painting*".
Part A4, "*Notes for guidance on paint application*".
[3)] "Venus" — American Pencil Co.
"Turquoise Drawing" — Eagle Pencil Co.
"Microtomic Van Dyke" — Eberhard Faber.
[4)] An instrument which has been found suitable is Tester H.7. manufactured by H.W. Wallace and Co. Ltd. of Croydon.