Methods of test for motor vehicle paints —

Part 11: Resistance to blistering

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Contents

Foreword

This Part of this British Standard has been prepared under the authority of the Automobile Industry Standards Committee and is based on Information Sheets Nos. 57 and 144 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.

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Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 10 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.

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1) BS 3900, "*Methods of tests for paints*",
Part A3, "*Preparation of panels prior to painting*",
Part A4, "*Notes for guidance on paint application*",
Part F2, "*Resistance to humidity under condensation conditions*".

1 Scope

This Part of this British Standard specifies methods used for testing the resistance to blistering of paints for motor vehicles.

2 Test panels

For Tests 1, 2 and 3, test panels 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 but it may be appropriate to use other substrates.

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

3 Test methods

3.1 Test 1. Humidity cabinet, cycling. The humidity cabinet cycling test is intended to provide information regarding the behaviour of a paint film or paint system under conditions of deliberately induced condensation.

The method employed and the apparatus used shall be that described in BS 3900-F2[2)].

3.2 Test 2. Humidity cabinet, non-cycling

3.2.1 The humidity cabinet, non-cycling test is intended to provide information regarding the behaviour of a paint film or paint system under conditions of continuous high humidity.

Theoretically, any non-cycling test cabinet will cause condensation on panels only if these are cold when inserted into the cabinet and no drying of the condensed moisture can take place in an atmosphere of 100 % relative humidity. Conversely, if the panels are hot at the commencement of the test, or if they are heated together with the whole cabinet, no condensation should take place.

In practice, however, some cycling occurs owing to the impossibility of obtaining perfect insulation of the apparatus, the nature of the cycle depending on the order of heat losses and on the temperature of the surrounding air.

3.2.2 *Test cabinet.* The cabinet shall be capable of producing and maintaining an atmosphere of not less than 96 % relative humidity at a temperature of 38 ± 1 °C.

The cabinet shall be constructed of non-corrosive material and shall have provision for heating and controlling temperature within the limit stated under test conditions. The most convenient way of heating and humidifying is to place electrical resistance heaters in a layer of water which should cover the whole base of the apparatus.

3.3 Test 3. Water immersion test

3.3.1 The water immersion test shall consist of the immersion of painted panels in a bath of distilled water. The temperature of the water shall be 38 ± 1 °C throughout the test. The water shall be circulated in order to obtain uniformity of temperature.

Fresh water shall be used for each batch of panels, or alternatively, the water shall be changed every 500 h if the apparatus is in continuous operation.

The test panels shall be immersed in the water bath and examined regularly for evidence of blistering. The duration of the test shall be subject to agreement between the purchaser and the paint supplier.

3.3.2 Any suitable apparatus may be used which provides the conditions outlined in **3.3.1**. The tanks and panel supports shall be made from an inert material e.g. glass or a suitable plastics material. It is important to ensure that the panels are at least 20 mm distant from each other.

3.3.3 Any panel shall be deemed to have failed the test when blisters are visible to the naked eye, but blisters within 10 mm of the panel edges shall be ignored.

3.4 Test 4. Humidity room. The humidity room test is intended for the assessment of paint performance on large units like complete automobile bodies.

The room, irrespective of its size, shall be so constructed as to exclude practically all influence of external changes in temperature.

A convenient way of raising and maintaining the temperature at the required level with an atmosphere permanently saturated with water vapour, is to employ in the room water-filled tanks equipped with thermostatically controlled immersion heaters.

[2)] BS 3900, "*Methods of tests for paints*",
Part A3, "*Preparation of panels prior to painting*",
Part A4, "*Notes for guidance on paint application*",
Part F2, "*Resistance to humidity under condensation conditions*".