IS 101-8-6 (1993): Methods of sampling and test for paints, varnishes and related products, Part 8: Tests for pigments and other solids, Section 6: Volume solids [CHD 20: Paints, Varnishes and Related Products]

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IS 101 (Part 8/Sec 6) : 1993
(Reaffirmed 2004)

भारतीय मानक

रोगनों, वार्निशों और सम्बद्ध उत्पादों के नमूने लेने और परीक्षण की पद्धतियां

भाग 8 वर्णकों और अन्य ठोसों के परीक्षण

अनुभाग 6 ठोस आयतन

Indian Standard

METHODS OF SAMPLING AND TEST FOR PAINTS, VARNISHES AND RELATED PRODUCTS

PART 8 TESTS FOR PIGMENTS AND OTHER SOLIDS

Section 6 Volume Solids

(First Reprint JUNE 1994)

UDC 667·612 : 531·731·2

BUREAU OF INDIAN STANDARDS
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NEW DELHI 110002

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Price Group 1

FOREWORD

This Indian Standard was adopted by the Bureau of Indian Standards, after the draft finalized by the Paints (Other than Industrial Paints) and Allied Products Sectional Committee had been approved by the Chemical Division Council.

This standard (Part 8/Sec 6) is one of a series dealing with methods of sampling and test for paints, varnishes and related products.

In reporting the result of a test or analysis made in accordance with this standard, if the final value, observed or calculated, is to be rounded off, it shall be done in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'.

Indian Standard

METHODS OF SAMPLING AND TEST FOR PAINTS, VARNISHES AND RELATED PRODUCTS

PART 8 TESTS FOR PIGMENTS AND OTHER SOLIDS

Section 6 Volume Solids

1 SCOPE

This standard (Part 8/Sec 6) prescribes the method to determine volume solids in paints and allied products.

2 OUTLINE OF THE METHOD

This method is intended to provide a measure of the volume of dry coating obtainable from a given volume of liquid coating. This volume is considered to be the most equitable means of comparing the coverage and the wet film thickness of the given paint.

3 APPARATUS

3.1 Analytical Balance — Sensitive to 0·1 mg.

3.2 Stainless Steel Disc

60 mm diameter and 0·70 mm thickness with a small hole 2 to 3 mm from the edge. A fine wire such as chromel is attached through the hole for suspending the disc in a liquid.

3.3 Weight Box

3.4 Beaker — 1 litre.

3.5 Mass per Litre Cup

3.6 Hot Air Oven — capable to maintain 105 ±2°C.

4 PROCEDURE

4.1 Dry the disc in an oven at 105°C for 10 minutes and cool. Weigh the disc in air. Let it be W_1 grams.

4.2 Suspend the disc in water and weigh again. Let it be W_2 grams.

4.3 Calculate the volume of the disc V as follows:

$$V = \frac{W_1 - W_2}{d}$$

where

d = is the density of the water at room temperature.

4.4 Determine the weight of non-volatile content of the liquid coating material by drying a known amount of paint at 105°C for 3 hours. Let it be W grams.

4.5 Determine the specific gravity of the paint to the nearest 0·001 g/ml by using mass per litre cup. Let it be P.

4.6 Dip the disc in the paint sample for 10 minutes and take out the disc. Allow the excess coating material to drain off. Blot the coating material off the bottom edge of the disc so that beads or drops do not dry on the bottom edge of the disc. Dry the disc at 105°C for 3 hours and cool. Weigh the coated disc in air. Let it be W_3 grams.

4.7 Suspend the coated disc in water and weigh again. Let it be W_4 grams.

5 CALCULATIONS

5.1 Calculate the volume of the coated disc V_1 as follows:

$$V_1 = \frac{W_3 - W_4}{d}$$

where

d = is the density of the water at room temperature

5.2 Calculate the volume of the dried coating as follows:

$$\text{Volume of dried coating, } (V_d) = V_1 - V$$

5.3 Calculate the volume of wet coating as follows:

$$V_w = \frac{W_3 - W_1}{W \times P}$$

where

W = grams of non-volatile matter in 1 g of wet coating

5.4 Calculate the percent volume solids of the paints as follows:

$$\frac{V_t - V}{V_w} \times 100 \quad OR \quad \frac{V_d}{V_w} \times 100$$

5.5 The percent volume solids of a paint is related to the covering capacity and wet film thickness in the following manner:

a) Theoretical coverage (m2/l)

$$= \frac{\text{Percent Volume Solids}}{\text{Dry film thickness (micron)}} \times 10$$

b) Wet film thickness (microns)

$$= \frac{\text{Dry film thickness (microns)}}{\text{Percent Volume Solids}} \times 100$$

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