IS 101-8-2 (1990): Methods of sampling and test for paints, varnishes and related products, Part 8: Tests for pigments and other solids, Section 2: Pigments and non-volatile matter [CHD 20: Paints, Varnishes and Related Products]

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भारतीय मानक

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

2007

भाग 8 वर्णकों और अन्य ठोसों के परीक्षण

अनुभाग 2 वर्णक और अवाष्पशील पदार्थ

(तीसरा पुनरीक्षण)

*Indian Standard*

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

**PART 8 TESTS FOR PIGMENTS AND OTHER SOLIDS**

**Section 2 Pigments and Non-Volatile Matter**

*( Third Revision )*

First Reprint AUGUST 1992

UDC 667·613 : 543·813



BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

*January* 1991

**Price Group 1**

# AMENDMENT NO. 1 FEBRUARY 1998
# TO
# IS 101 ( Part 8/Sec 2 ) : 1990 METHODS OF SAMPLING AND TEST FOR PAINTS, VARNISHES AND RELATED PRODUCTS

## PART 8 TESTS FOR PIGMENTS AND OTHER SOLIDS

### Section 2 Pigments and Non-Volatile Matter

*( Third Revision )*

( *Page* 1, *clause* **2.1**, IS 534 : 1974 ) — Substitute the following for the existing:

'IS 1839 : 1961 Specification for toluene, reagent grade'.

( *Page* 1, *clause* **5.1** ) — Substitute the following for the existing clause:

'**5.1 Toluene**, *see* IS 1839 : 1961.'

( *Page* 1, *clauses* **6.1** *and* **6.2**, *line* 1 ) — Subsititute 'toluene' *for* 'benzene'.

( CHD 020 )

Reprography Unit, BIS, New Delhi, India

# AMENDMENT NO. 2 MARCH 1999
# TO
# IS 101 ( PART 8/SEC 2 ) : 1990 METHODS OF SAMPLING AND TEST FOR PAINTS, VARNISHES AND RELATED PRODUCTS

## PART 8 TESTS FOR PIGMENTS AND OTHER SOLIDS

### Section 2 Pigments and Non-Volatile Matter

*( Third Revision )*

( *Page* 2, *clause* 7.1.3, *line* 2 ) — Substitute 'flat bottom flask' *for* 'conical flask'.

( *Page* 2, *clause* 7.2.1, *line* 4 ) — substitute 'flat bottom flask' *for* 'conical flask'.

( CHD 20 )

Reprography Unit, BIS, New Delhi, India

# AMENDMENT NO. 3 JANUARY 2008
# TO
# IS 101 (PART 8/SEC 2) : 1990 METHODS OF SAMPLING AND TEST FOR PAINTS, VARNISHES AND RELATED PRODUCTS

## PART 8 TESTS FOR PIGMENTS AND OTHER SOLIDS

## Section 2 Pigments and Non-Volatile Matter

*( Third Revision )*

(*Cover page and page* 1, *Title*) — Substitute 'Section 2 Pigments, Non-Volatile Vehicle and Non-Volatile Matter' *for* 'Section 2 Pigments and Non-Volatile Matter' and wherever it appears subsequently.

(*Page* 1, *clause* **4.5**) — Add the following at the end:

'**4.6 Flat Bottom Dish**, diameter 75 mm, made of glass or aluminium.

**4.7 Hollow Glass Tube**, 30 cm in length and 2 mm in diameter.'

(*Page* 2, *clause* **7.2.2**) — Insert the following at the end:

'**7.3 Non-Volatile Matter Content**

**7.3.1** Take a petri dish of diameter (approximately 10 cm). Weigh it ($w_1$).

Now take about 2 g of paint sample and place it on the already weighed petri dish and immediately reweigh it ($w_2$).

Now spread it evenly by moving the Petri dish. Place it in an oven, already maintained at a temperature of 105 ± 2°C for 3 h.

The petri dish is removed, cooled and reweighed ($w_3$).

$$\text{Percent, NVC} = \frac{w_3 - w_1}{w_2 - w_1} \times 100$$

where

$w_1$= mass, in g, of petri dish;

$w_2$= mass, in g, of petri dish and paint sample before heating; and

$w_3$= mass, in g, of petri dish and paint sample after heating.'

'D 20)

Reprography Unit, BIS, New Delhi, India

# AMENDMENT NO. 4 SEPTEMBER 2010
# TO
# IS 101 (PART *8*/Sec 2) : 1990 METHODS OF SAMPLING AND TEST FOR PAINTS, VARNISHES AND RELATED PRODUCTS

## PART 8 TESTS FOR PIGMENTS AND OTHER SOLIDS

### Section 2 Pigments, Non-Volatile Vehicle and Non-Volatile Matter

**(*Third Revision*)**

*(Cover page, Title)* — Substitute 'अनुभाग 2 वर्णक, अवाष्पशील वाहन और अवाष्पशील पदार्थ' *for* 'अनुभाग 2 वर्णक और अवाष्पशील पदार्थ'.

(CHD 20)

Reprography Unit, BIS, New Delhi, India

## FOREWORD

This Indian Standard ( Part 8/Sec 2 ) ( Third Revision ) was adopted by the Bureau of Indian Standards on 29 January 1990 after the draft finalized by the Paints and Allied Products Sectional Committee had been approved by the Chemical Division Council.

This standard is one of a series dealing with sampling and testing of paints, varnishes and related products. This standard supersedes **27** of IS 101 : 1964 'Methods of test for ready mixed paints and enamels ( *second revision* )'.

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 2 Pigments and Non-Volatile Matter

*( Third Revision )*

## 1 SCOPE

**1.1** This standard ( Part 8/Sec 2 ) prescribes the methods of sampling and test for determination of pigment and non-volatile matter content in paints, varnishes and other related products.

## 2 REFERENCES

**2.1** The following Indian Standards are necessary adjuncts to this standard.

| *IS No.* | *Title* |
|---|---|
| 101 ( Part 1/Sec 1 ) : 1986 | Methods of sampling and test for paints, varnishes and related products: Part 1 Tests on liquid paints ( general and physical ), Section 1 Sampling ( *third revision* ) |
| 170 : 1986 | Specification for acetone ( *third revision* ) |
| 517 : 1967 | Specification for methanol ( methyl alcohol ) ( *first revision* ) |
| 534 : 1974 | Specification for benzene ( *second revision* ) |
| 1745 : 1978 | Specification for petroleum hydrocarbon solvents ( *second revision* ) |

## 3 SAMPLING

**3.1** A representative sample of the material shall be drawn as prescribed in IS 101 ( Part 1/ Sec 1 ) : 1986.

## 4 APPARATUS

**4.1 Centrifuge Tubes**, 50 ml, heavy-walled.

**4.2 Water Bath**

**4.3 Laboratory Oven**, capable of being maintained at 105 ± 2°C.

**4.4 Analytical Balance**, sensitive up to 1 mg.

**4.5 Centrifugal Machine**, capable to swirl at minimum 3 000 rpm.

## 5 REAGENTS

**5.1 Benzene**, *see* IS 534 : 1974.

**5.2 Methyl Alcohol**, *see* IS 517 : 1967.

**5.3 Acetone**, *see* IS 170 : 1986.

**5.4 Petroleum Hydrocarbon Solvent**, *see* IS 1745 : 1978.

## 6 EXTRACTION MIXTURES

**6.1** Mix 5 parts of benzene ( *see* **5.1** ), 4 parts of methyl alcohol ( *see* **5.2** ) and 1 part of acetone ( *see* **5.3** ) and use after drying over dehydrated sodium sulphate. This solvent mixture ensures maximum retention of pigment but does not fully extract resins and bodied oils.

**6.2** A mixture of equal parts of benzene ( *see* **5.1** ) and petroleum hydrocarbon solvent ( *see* **5.4** ). This is a good solvent for resins and bodied oils, but extra fine pigments do not settle well in this mixture.

## 7 PROCEDURE

### 7.1 Pigment Content

**7.1.1** Weigh accurately 15 to 20 g of the well mixed material into a weighed centrifuged tube. Add 20 to 30 ml of appropriate extraction mixture ( *see* **6** ) and mix thoroughly using a glass rod, shaking vigorously or by use of a mechanical shaker.

**7.1.2** After mixing, rinse the glass rod thoroughly with the extraction mixture in the centrifuge tube. Whirl the tube at a minimum speed of 3 000 rev/min until maximum separation is effected. Decant the liquid and repeat the process twice or more, if required.

**7.1.3** Keep all extracted liquid in a weighed 250 ml conical flask. Place the tube containing the pigment on the water bath for half an hour for the solvents to escape. Keep it in an oven at 105 ± 2°C and weigh after drying to constant mass.

NOTE — For pigment analysis, grind the contents of the tube in a mortar to a fine homogeneous powder and keep it in a well stoppered bottle.

**7.1.4** *Calculation*

$$\text{Pigment, percent by mass} = \frac{M_1 - M_2}{S} \times 100$$

where

$M_1$ = mass of the tube plus pigment,

$M_2$ = mass of the tube, and

$S$ = mass of the paint sample taken.

## 7.2 Non-volatile Vehicle Content

**7.2.1** This determination is to be carried out only if satisfactory separation of pigment can be effected by the procedure prescribed in **7.1**. Distil off the solvent from the conical flask and heat the flask to constant mass in an oven at 105 ± 2°C. Allow it to cool to room temperature and reweigh. The difference in mass gives the non-volatile vehicle content.

**7.2.2** Calculate the non-volatile vehicle content and express as percent on the mass of the material taken for test. Add 0·3 to the value of non-volatile vehicle content, obtained as above, as allowance for inextractable material.

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**Bureau of Indian Standards**

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