



**उत्पाद मैनुअल**  
**सड़क चिह्नांकन के लिए तैयार मिश्रित रंग रोगन –विशिष्टि**  
**IS 164:2023 के अनुसार**

**PRODUCT MANUAL**  
**FOR READY MIXED PAINT FOR ROAD MARKING**  
**ACCORDING TO IS 164: 2023**

विभिन्न उत्पादों के लिए भारतीय मानक ब्यूरो (अनुरूपता मूल्यांकन) विनियम, 2018 की योजना- I के तहत प्रमाणन के संचालन में अभ्यास और पारदर्शिता के संचालन में पारदर्शिता सुनिश्चित करने के लिए इस उत्पाद मैनुअल का उपयोग सभी क्षेत्रीय / शाखा कार्यालयों और लाइसेंसधारियों द्वारा संदर्भ सामग्री के रूप में किया जाएगा। दस्तावेज़ का उपयोग बीआईएस प्रमाणन लाइसेंस/प्रमाणपत्र प्राप्त करने के इच्छुक संभावित आवेदकों द्वारा भी किया जा सकता है।

This Product Manual shall be used as reference material by all Regional/Branch Offices & licensees to ensure coherence of practice and transparency in operation of certification under Scheme-I of Bureau of Indian Standards (Conformity Assessment) Regulations, 2018 for various products. The document may also be used by prospective applicants desirous of obtaining BIS certification licence/certificate.

|    |                                                     |   |                                                                                                                                                                                                                                                                                                                    |
|----|-----------------------------------------------------|---|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. | उत्पाद<br>Product                                   | : | IS 164 : 2023                                                                                                                                                                                                                                                                                                      |
|    | शीर्षक<br>Title                                     | : | READY MIXED PAINT FOR ROAD MARKING - —<br>Specification<br>सड़क चिह्नांकन के लिए तैयार मिश्रित रंग रोगन— विशिष्टि                                                                                                                                                                                                  |
|    | संशोधनों की संख्या<br>No. of Amendments             | : | NIL                                                                                                                                                                                                                                                                                                                |
| 2. | नमूना दिशानिर्देश<br>Sampling Guidelines:           |   |                                                                                                                                                                                                                                                                                                                    |
| a) | कच्चा माल<br>Raw material                           | : | No specific requirement                                                                                                                                                                                                                                                                                            |
| b) | समूहीकरण दिशानिर्देश<br>Grouping guidelines         | : | IS 164:2023 specifies two types of ready mixed paint for road marking-<br>a) Type 1 — Light duty road marking paint for city/rural road marking<br>b) Type 2 — Heavy duty road marking paint for highways and airport runway marking<br>Each type is to be tested separately to be covered in the scope of Licence |
| c) | नमूने का आकार<br>Sample Size                        | : | 3x500ml                                                                                                                                                                                                                                                                                                            |
| 3. | परीक्षण व उपकरणों की सूची<br>List of Test Equipment | : | Please refer ANNEX –A<br>कृपया Annex-ए देखें                                                                                                                                                                                                                                                                       |

|    |                                                                                                                                                                                                           |   |                                               |
|----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|-----------------------------------------------|
| 4. | निरीक्षण और परीक्षण की स्कीम<br>Scheme of Inspection and Testing                                                                                                                                          | : | Please refer ANNEX –B<br>कृपया Annex-बी देखें |
| 5. | एक दिन में संभावित परीक्षण<br>Possible tests in a day :                                                                                                                                                   |   |                                               |
|    | All tests (on conditioned samples as applicable)                                                                                                                                                          |   |                                               |
| 6. | लाइसेंस का दायरा /Scope of the Licence :                                                                                                                                                                  |   |                                               |
|    | IS 164 :2023 के अनुसार मानक मुहर का उपयोग करने के लिए लाइसेन्स निम्नलिखित कार्यक्षेत्रके लिए प्रदान किया जाता है<br>“Licence is granted to use Standard Mark as per IS 164:2023 with the following scope: |   |                                               |
|    | उत्पाद का नाम<br>Name of the product                                                                                                                                                                      |   | READY MIXED PAINT FOR ROAD MARKING            |
|    | Type                                                                                                                                                                                                      |   | Type 1 and/ or 2                              |

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**ANNEX A****List of Test Equipment*****Major test equipment required to test as per the Indian Standard***

| <b><u>S. No</u></b> | <b>Tests used in with Clause Reference</b> | <b>Test Equipment/Chemicals</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|---------------------|--------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1.                  | Application, 5.2                           | Standard bituminous surface shall be prepared as prescribed in CI 7.2.<br>Flat Brush (as per IS 384) of a suitable size /Spray Gun with adjustable size nozzle cap<br>Thermometer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 2.                  | Durability, 5.3                            | Standard Bituminous Surface prepared as prescribed in 7.2.3 and 7.2.3.2<br>Rubber Hose, Pressure Gauge<br>Spray with water supply through hose and arrangement for temperature control of water                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 3.                  | Lead Restriction, 5.4                      | <p><b><u>Electrolysis Method</u></b><br/>Reagents, Ammonium nitrate, copper sulphate, Nitric acid, hydrogen peroxide<br/>Equipment: Electrolysis apparatus with platinum gauze anode, Silica Basin, Muffle Furnace (for ashing the paint), Weighing Balance, , Drying/Air Oven, beakers and other laboratory glassware, desiccator</p> <p><b><u>Molybdate method</u></b><br/>Reagent: Dilute Nitric Acid, Ammonium Acetate Solution (lead free), Dilute Sulphuric Acid, Conc. Sulphuric Acid, ethyl alcohol, paper pulp pad, glacial acetic acid, ammonium para molybdate, porcelain filtering crucible, ammoniacal 2 percent ammonium nitrate solution<br/>Equipment : Oven, muffle furnace, hot plate</p> <p><b><u>Sulphide method</u></b><br/>Hydrochloric acid, containing 0.25 percent by mass of Hydrogen chloride, Water Bath, No. 42 Whatman FilterPaper, 500 ml evaporating basin, sand-bath, Kipp's apparatus (for evolving H<sub>2</sub>S gas) (IS Hydrogen Sulphide Gas, Hydrogen Sulphide Water<br/>Equipment: Mechanical shaker, oven</p> <p><b><u>Atomic Absorption Spectroscopy</u></b><br/>Atomic absorption spectrophotometer, Muffle furnace, hot plate, Standard solution</p> <p><b><u>Inductively Coupled Plasma-Optical emission Spectrometry</u></b></p> |

|     |                                                                            |                                                                                                                                                                                                                                                                                                                |
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|     |                                                                            | inductively coupled plasma optical (or atomic) emission spectrometer (ICP-OES or ICP-AES)<br>Electric hot plate<br>Microwave extraction apparatus<br>Analytical balance,                                                                                                                                       |
| 4.  | Drying Time, 5.5                                                           | Silver sand (IS 101 Part 3 / Sec 1)<br>Soft Haired Brush<br>Stopwatch<br>Paint Brush<br>Power Cable Paper<br>Weighing balance<br>Arrangement to maintain standard atmospheric conditions of 27 +/- 2°C and 60 +/- 5 percent relative humidity.                                                                 |
| 5.  | Consistency, 5.5                                                           | Palette Knife/Metal Rod<br>Paint Brush<br>Glass Panels<br>Standard bituminous surface (7.2 of IS 164)                                                                                                                                                                                                          |
| 6.  | Finish, 5.5                                                                | Mild Steel/Concrete/Wood Panel<br>Brush or Sprayer<br>Arrangement for drying panel in vertical position in dust free atmosphere<br>Approved sample<br>Opacity tester                                                                                                                                           |
| 7.  | Colour, 5.5                                                                | Artificial illumination by means of a colour matching booth as per CI 5.2 of IS 101 (Part 4/Sec 2) : 2021,<br>Observer as per CI 6<br>Test Panels and Reference Standards<br>Conditioning chamber                                                                                                              |
| 8.  | Wet Opacity, 5.5                                                           | Substrate<br>Film Applicators<br>Reflectometer<br>Conditioning chamber<br>Weighing balance                                                                                                                                                                                                                     |
| 9.  | Recoating Property, 5.5                                                    | Standard bituminous surface<br>Paint Brush/Sprayer                                                                                                                                                                                                                                                             |
| 10. | Resistance to bleeding, 5.5                                                | standard bituminous surface as specified in 7.2<br>Metal panels of sizes 150 mm × 100 mm × 0.8 mm as prescribed in 2 of IS 101 (Part 1/Sec 3)<br>Paint Brush/Sprayer<br>Silicon Carbide Paper, Grade 400<br>Black and White Charts<br>Agreed Medium<br>White Overcoating Composition<br>IS 101 (Part 7/Sec 4). |
| 11. | a) Viscosity, KU 5.5<br>b) Viscosity in KU after accelerated stability 5.5 | Stromer Viscometer method<br>Stromer Viscometer with the paddle rotter<br>Beaker , 500 ml capacity 85 mm diameter<br>Thermometer 110 C with 0.5 C division<br>Weights 5 to 1000 g.                                                                                                                             |

|     |                                                                                                             |                                                                                                                                                                                                                                                                                                                        |
|-----|-------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|     |                                                                                                             | Constant temperature bath to maintain temperature of sample to $27 \pm 0.5$ °C                                                                                                                                                                                                                                         |
| 12. | Mass in kg/10 litre, 5.5                                                                                    | Metal or glass pycnometer<br>Analytical Balance<br>Thermometer with LC of 0.2°C<br>Temperature controlled chamber or Water Bath<br>(IS 101 Part 1: Sec 7:2020)                                                                                                                                                         |
| 13. | Keeping Properties, 5.5                                                                                     | Spatula $45 \pm 1$ g with Square blade 120mm in length and approx. 20 mm width<br>Nylon Paint brush 25 mm<br>Test Surface: smooth surface paper chart coated with varnish or lacquer                                                                                                                                   |
| 14. | Early wash out resistance, min less than 5.5                                                                | Environment chamber maintained ( $23 \pm 2$ ) ( $90 \pm 3$ )<br>Clean Glass Panel,<br>arrangement for measurement of the thickness of paint                                                                                                                                                                            |
| 15. | No pick up time, min, Max 5.5                                                                               | Clean Glass Panel<br>Apparatus as per H.1 of Annex H<br>arrangement for measurement of the thickness of paint<br>Environment/conditioning chamber<br>rag saturated with acetone<br>Stop watch                                                                                                                          |
| 16  | Non Volatile matter, Min, percent 5.5                                                                       | Centrifuge Tubes, 50 ml, heavy-walled.<br>Water Bath<br>Laboratory Oven, capable of being maintained at $105 \pm 2$ .<br>Analytical Balance, sensitive up to 1 mg<br>Centrifugal Machine, capable to swirl at minimum 3 000 rpm                                                                                        |
| 17  | Volume solid min 5.5                                                                                        | Analytical Balance - Sensitive to 0-1 mg.<br>Stainless Steel Disc -60 mm diameter and 0.70 mm thickness with a small hole 2 to 3 mm from the edge.<br>Weight Box,<br>Beaker - 1 litre.<br>Mass per Litre Cup<br>Hot Air Oven - capable to maintain $105 \pm 2$ °C.                                                     |
| 18  | Taber Abrasion resistance, mg weight loss after 500 cycles using CS10 Wheel with 500 g on each load Max 5.5 | Taber Abrasion Machine<br>Vacuum pick up nozzle of 8 mm diameter<br>Weighing balance of minimum 200 g capacity and least count of 0.1 mg<br>Fine Emery paper<br>Arrangement for measurement of the thickness of paint<br>Film applicator<br>Abrasive Wheels –CS-10<br>Oven<br>Mild Steel panel 4inch x 4 inch x 1.2 mm |
| 19  | Scrub resistance 5.5                                                                                        | Straight Line Washability Machine<br>Nylon Bristle Brush<br>Black poly (vinyl chloride) or poly (vinyl acetate) copolymer sheets, 165 x 432 mm dimension                                                                                                                                                               |

|    |                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|----|-------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    |                                                                   | <p>Abrasive Scrub Medium</p> <p>Brass shims.</p> <p>Arrangement for measurement of the thickness of paint</p> <p>Film applicator</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 20 | Resistance to accelerated weathering. 5.5                         | Accelerated weathering apparatus as per L-1.1 of Annex L<br>asbestos cement panels as per L-1 of Annex L                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| 21 | Flexibility 5.5                                                   | <p><b><u>Bend test</u></b></p> <p>Type 1 (CI 2.2.2) /Type 2 (CI 2.2.3) apparatus</p> <p>Test panels</p> <p>Conditioning chamber and arrangement to carry out test at <math>27 \pm 2^{\circ}\text{C}</math> and <math>65 \pm 5</math> percent relative humidity</p> <p>Magnifying glass</p> <p><b><u>Scratch hardness test</u></b></p> <p>Mechanized apparatus as per CI 3.2.1/Hand operated apparatus as per CI 3.2.2</p> <p>Needle as per CI 3.2.3</p> <p>Test panels</p> <p>Conditioning chamber</p> <p>Load of 1000g</p> <p><b><u>Cupping test</u></b></p> <p>Cutting apparatus as per CI 4.2</p> <p>Panels</p> <p>Conditioning chamber</p> |
| 22 | VOC percent, max 5.5                                              | <p>Gas chromatograph as per CI 6.1</p> <p>Oven, CI 6.2</p> <p>Detector, CI 6.3</p> <p>Capillary Coloumn, CI 6.4</p> <p>Injection syringe</p> <p>Gas filters</p> <p>Internal standard</p> <p>Surrogate standard</p> <p>Marker compound</p> <p>Performance criteria compound</p> <p>Calibration compounds</p> <p>Extraction solvent</p>                                                                                                                                                                                                                                                                                                          |
| 23 | Resistance to wear, h 5.5                                         | <p>Bituminous surface 6mm thick , 300- diameter disc</p> <p>Fractional horse power motor</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 24 | Toxic metals (Cadmium, chromium (VI) and their compounds) 5.6.2.2 | Atomic absorption Spectrophotomer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

*The above list is indicative only and may not be treated as exhaustive.*

**Annex- B**  
**Scheme of Inspection and Testing**

**1. LABORATORY** - A laboratory shall be maintained which shall be suitably equipped (as per the requirement given in column 2 of Table 1) and staffed, where different tests given in the specification shall be carried out in accordance with the methods given in the specification.

**1.1** The manufacturer shall prepare and implement a calibration plan for the test equipment.

**2. TEST RECORDS** –The manufacturer shall maintain test records for the tests carried out to establish conformity.

**3. PACKING AND MARKING**–The Standard Mark, as given in the Schedule of the license shall be printed on each container provided always that the material in each container on which this Mark is thus applied conforms to every requirement of the specification.

3.1 Packing and Marking shall be done as per the provisions of the standard. In addition, the following details shall be marked on labels affixed to each container:

i) Licence No. (CM/L.....)

ii) BIS website details: 'For BIS certification details please visit [www.bis.gov.in](http://www.bis.gov.in)' .

3.2 The containers shall also comply with the requirements as per CI 6.3 of the IS. The container (excluding those containing water-based paint) shall be marked 'HIGHLY FLAMMABLE LIQUID' in red letters).

**4. CONTROL UNIT** – For the purpose of this scheme, the entire quantity of the paint of the same colour and type produced in a batch mixer at a time shall constitute a control unit.

**5. LEVELS OF CONTROL**- The test and inspection as indicated in Table 1 and at the levels of control specified therein, shall be carried out on the whole production of the factory which is covered by this Scheme of testing and appropriate records and charts maintained in accordance with paragraph 2 above.

5.1 All the production which conforms to the Indian Standard and covered by this license shall be marked with the BIS Standard Mark.

**6. REJECTIONS**– Disposal of non-conforming product shall be done in such a way so as to ensure that there is no violation of provisions of BIS Act, 2016.

**TABLE 1 LEVELS OF CONTROL**  
(Cl.5 of Scheme of Testing and Inspection)

| Test Details  |                                                 |             |                                    | Level of Control                                                               |                |                                                               |         |
|---------------|-------------------------------------------------|-------------|------------------------------------|--------------------------------------------------------------------------------|----------------|---------------------------------------------------------------|---------|
| Clause        | Requirement                                     | Test Method |                                    | Test equipment requirement<br>R: required (or)<br>S: Sub-contracting permitted | No. of Samples | Frequency                                                     | Remarks |
|               |                                                 | Clause      | Reference                          |                                                                                |                |                                                               |         |
| 5.2           | Applications                                    | Annex B     | -do-                               | R                                                                              | one            | Each ControlUnit                                              |         |
| 5.3           | Durability                                      | Annex C     | -do-                               | R                                                                              | -do-           | -do-                                                          |         |
| 5.4           | Lead Restriction                                | -           | IS: 101 (Part 8/Sec 5)             | S                                                                              | -do-           | Whenever there is change in consignment/batch of raw material |         |
| 5.5 & table 1 | i) Drying time<br>a) surface dry<br>b) Hard dry | -           | IS 101 (Part 3/Sec 1)              | R                                                                              | One            | Each control unit                                             |         |
|               | ii) Consistency                                 | Annex D     | IS 164:2023                        | R                                                                              | One            | -do-                                                          |         |
|               | iii) Finish                                     | -           | IS: 101(Part 3/Sec 4)              | R                                                                              | One            | -do-                                                          |         |
|               | iv) Colour                                      | -           | IS 101(Part 4/Sec 2)               | R                                                                              | One            | -do-                                                          |         |
|               | v) Wet Opacity                                  | -           | IS101(Part 4/sec 1)                | R                                                                              | One            | -do-                                                          |         |
|               | vii) Recoating property                         | Annex E     | IS 164:2023                        | R                                                                              | One            | -do-                                                          |         |
|               | vi) Resistance to bleeding                      | Annex F     | IS 164:2023 & IS 101(Part 7/Sec 4) | R                                                                              | One            | -do-                                                          |         |

|  |                                             |         |                       |   |     |                    |  |
|--|---------------------------------------------|---------|-----------------------|---|-----|--------------------|--|
|  | Viscosity, KU                               | -       | IS 101 (Part 1/Sec 5) | R | One | -do-               |  |
|  | Viscosity in KU after accelerated stability | -       | IS 101 (Part 1/Sec 5) | R | One | -do-               |  |
|  | Mass in kg/10 liter                         | -       | IS 101(Part 1/Sec 7)  | R | One | -do-               |  |
|  | Keeping properties                          | -       | IS 101(Part 6/Sec 2)  | R | One | Once in a year     |  |
|  | Early wash out resistance, min              | Annex G | IS 164:2023           | R | One | Each control unit  |  |
|  | No pick up time, min, Max                   | Annex H | IS 164:2023           | R | One | -do-               |  |
|  | Non Volatile matter,                        | -       | IS 101 (Part 8/Sec 2) | R | One | -do-               |  |
|  | Volume solid,                               | -       | IS 101 (Part 8/Sec 6) | R | One | -do-               |  |
|  | Taber Abrasion resistance,                  | Annex J | IS 164:2023           | S | One | Once in six months |  |
|  | Scrub resistance                            | Annex K | IS 164:2023           | S | One | -do-               |  |
|  | Resistance to accelerated weathering,       | Annex L | IS 164:2023           | S | One | -do-               |  |
|  | Flexibility                                 | -       | IS 101 (Part 5/Sec 2) | S | One | -do-               |  |
|  | VOC,                                        | -       | IS 101 (Part 2/Sec 4) | S | One | -do-               |  |
|  | Resistance to wear                          | Annex M | IS 164:2023           | S | One | -do-               |  |
|  | toxic metals                                |         | IS 164:2023           | S | One | -do-               |  |

Note 1: Whether test equipment is required or sub-contracting is permitted in column 2 shall be decided by the Bureau and shall be mandatory. Sub-contracting is permitted to a laboratory recognized by the Bureau or Government laboratories empaneled by the Bureau

Note 2: Levels of control given in column 3 are only recommendatory in nature. The manufacturer may define the control unit/batch/lot and submit his own levels of control in column 3 with proper justification to the Head BO