

Laboratory **Anulab Industrial Testing and Analytical Laboratories, 212 km Milestone, NH-2, Nagla Rambaksh, Etmadpur, Agra, Uttar Pradesh**

Accreditation Standard **ISO/IEC 17025: 2005**

Certificate Number **TC-7072** (in lieu of T-0197 & T-0198)

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Validity **16.03.2018 to 15.03.2020**

Last Amended on **30.08.2018**

| Sl. | Product / Material of Test | Specific Test Performed | Test Method Specification against which tests are performed | Range of Testing / Limits of Detection |
|-----|----------------------------|-------------------------|---|--|
|-----|----------------------------|-------------------------|---|--|

CHEMICAL TESTING

| I. BUILDING MATERIALS | | | | |
|------------------------------|--|---|--|------------------------|
| 1. | Clays & Soil | pH Value | IS 2720 (Part 26) | 1 to 14 |
| | | Soluble Sulphates | IS 2720 (Part 27) BS 1377 (Part 3) | 10 mg/kg to 1000 mg/kg |
| | | Soluble Chlorides | BS 1377 (Part 3) | 10 mg/kg to 1000 mg/kg |
| | | Organic Matter | IS 2720 (Part 22) | 10 mg/kg to 1000 mg/kg |
| | | Soluble Solids | IS 2720 (Part 21) | 50 mg/kg to 5000 mg/kg |
| | | Calcium Carbonate | IS 2720 (Part 23) | 50 mg/kg to 1000 mg/kg |
| 2. | Fly ash | pH Value | Indian Roads Congress Publication SP 58-2001, IS 2720 (Part 26) | 1 to 14 |
| | | Water Soluble Sulphates | Indian Roads Congress Publication SP 58-2001, IS 2720 (Part 27), BS 1377 (Part 3) | 5 mg/kg to 1000 mg/kg |
| | | Water Soluble Chlorides | Indian Roads Congress Publication SP 58-2001, IS 2720 (Part 27), BS 1377 (Part 3) | 5 mg/kg to 1000 mg/kg |
| | | Water Soluble Solids | Indian Roads Congress Publication SP 58-2001, IS 2720 (Part 21) | 50 mg/kg to 5000 mg/kg |
| 3. | Cement OPC & PPC | Silica as SiO ₂ | IS 4032 | 15.0 % to 35.0 % |
| | | Lime as CaO | IS 4032 | 30.0 % to 65.0 % |
| | | Loss on Ignition-LOI | IS 4032 | 0.01 % to 10.0 % |
| | | Insoluble Residue-IR | IS 4032 | 0.01 % to 35.0 % |
| | | Iron as Fe ₂ O ₃ | IS 4032 | 1.0 % to 6.0 % |
| | | Alumina as Al ₂ O ₃ | IS 4032 | 1.0 % to 10 % |
| | Sulphuric Anhydride as SO ₃ | IS 4032 | 0.5 % to 5.0 % | |

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| | | Magnesia as MgO | IS 4032 | 0.5% to 10.0 % |
| | | Total Chlorides | IS 4032 | 0.01 % to 0.5 % |
| 4. | Rock Stone, Coarse & Fine Aggregate | Calcium Carbonate | BS 1377 (Part 3) | 25 % to 80.0 % |
| | | Sulphate as SO ₃ | BS 1377 (Part 3)/ IS 4032 | 0.001 to 2.0 |
| | | Total Chloride as Cl | IS 14959 (Part 2)/ BS 1377 (Part3) | 0.001 to 2.0 |
| II. | WATER | | | |
| 1. | Potable Ground Water & Drinking Water | pH value | IS 3025 (Part 11) | 4.0 to 12.0 |
| | | Sulphates as SO ₄ | IS 3025 (Part 24) | 10 mg/l to 3000 mg/l |
| | | Sulphites as SO ₃ | IS 3025 (Part 28) | 10 mg/l to 3000 mg/l |
| | | Chloride as Cl | IS 3025 (Part 32) | 5 mg/l to 3000 mg/l |
| | | Odour-Smell | IS 3025 (Part 5) | Qualitative |
| | | Taste- Palatability | IS 3025 (Part 7 & 8) | Qualitative |
| | | Total Hardness | IS 3025 (Part 21) | 05 mg/l to 3000 mg/l |
| | | Total Dissolved Solids- TDS | IS 3025 (Part 16) | 50 mg/l to 5000 mg/l |
| | | Calcium as Ca | IS 3025 (Part 40) | 05 mg/l to 300 mg/l |
| | | Magnesium as Mg | IS 3025 (Part 46) | 05 mg/l to 300 mg/l |
| | Total Alkalinity | IS 3025 (Part 23) | 25 mg/l to 600 mg/l | |
| 2. | Water for Construction Purposes | pH value | IS 3025 (Part 11) | 4.0 to 12.0 |
| | | Limits of Acidity | IS 3025 (Part 22)/ 1010 MORTH Specs.1010a | 0.1 ml to 10 ml |
| | | Limits of Alkalinity | IS 3025 (Part 23)/ 1010 MORTH Specs.1010b | 0.1 ml to 50 ml |
| | | Inorganic Solids | IS 3025 (Part 18) | 100 mg/l to 10000 mg/l |
| | | Organic Solids | IS 3025 (Part 18) | 10 mg/l to 500 mg/l |
| | | Sulphates as SO ₄ | IS 3025 (Part 24) | 10 mg/l to 3000 mg/l |
| | | Chloride as Cl | IS 3025 (Part 32) | 05 mg/l to 3000 mg/l |
| | | Suspended Matter | IS 3025 (Part 17) | 0.1 mg/l to 3000 mg/l |

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| III. | METALS & ALLOYS | | | |
| 1. | Cast Iron & Pig Iron | Carbon | IS 12308 (Part 11) | 1.50% to 4.50 % |
| | | Silicon | IS 12308 (Part 6) | 0.50% to 3.50 % |
| | | Manganese | IS 12308 (Part 10) | 0.20 %to 5.00 % |
| | | Sulphur | IS 12308 (Part 2) | 0.005% to 0.25 % |
| | | Phosphorous | IS 12308 (Part 5) | 0.01% to 0.50 % |
| | | Nickel | IS 12308 (Part 7) | 0.01% to 30.0 % |
| 2. | Plain Steel & Alloy Steel | Chromium | IS 12308 (Part 8) | 0.01% to 10.0 % |
| | | Carbon | ASTM E415 | 0.01% to 1.1 % |
| | | Silicon | ASTM E415 | 0.01 to 1.54 % |
| | | Manganese | ASTM E415 | 0.01% to 2.00 % |
| | | Sulphur | ASTM E415 | 0.01% to 0.055% |
| 3. | Copper Alloys (Brass) | Phosphorous | ASTM E415 | 0.01% to 0.85 % |
| | | Copper | IS 3685 | 50.0 % to 90.0 % |
| | | Lead | IS 3685 | 0.01% to 10.0 % |
| | | Tin | IS 3685 | 0.005% to 10.0 % |
| | | Manganese | IS 3685 | 0.05% to 6.0 % |
| | | Nickel | IS 3685 | 0.001% to 36.0 % |
| | | Silicon | IS 3685 | 0.001% to 3.00 % |

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MECHANICAL TESTING

| I. | BUILDING MATERIALS | | | |
|----|-----------------------------|--|----------------------------------|----------------------|
| 1. | Coarse Aggregates | Particle Shape & Size | IS 2386 (Part 1) | 0.075 mm to 100 mm |
| | | Materials Finer - 0.075 mm | IS 2386 (Part 1) | 0.1 % to 100 % |
| | | Flakiness Index | IS 2386 (Part 1) | 0.1% to 100 % |
| | | Elongation Index | IS 2386 (Part 1) | 0.1% to 100 % |
| | | Combined Flakiness & Elongation Indices | IS 2386 (Part 1) | 0.1% to 100 % |
| | | Deleterious Substances Material | IS 2386 (Part 2) | 0.1 % to 50 % |
| | | Specific Gravity | IS 2386(Part 3) | 0.5 to 5.0 |
| | | Water Absorption | IS 2386 (Part 3) | 0.05 % to 100 % |
| | | Bulk Density | IS 2386 (Part 3) | 0.5 kg/l to 5.0 kg/l |
| | | Aggregate Impact Value | IS 2386 (Part 4)/ IS 5640 | 0.5 % to 100 % |
| | | Los Angeles Abrasion Value | IS 2386 (Part 4) | 0.5 % to 100 % |
| | | Aggregate Crushing Value | IS 2386 (Part 4) | 0.5 % to 100 % |
| | | Soundness by Na ₂ SO ₄ | IS 2386 (Part 5) | 0.5 % to 10 % |
| | | Soundness by MgSO ₄ | IS 2386 (Part 5) | 0.5 % to 100 % |
| | | Mortar Making Properties | IS 2386 (Part 6) | 0.1% to 100 % |
| | Alkali Aggregate Reactivity | IS 2386 (Part 7) | 10 milimole/l to 1000 milimole/l | |
| | Petrographic Examination | IS 2386 (Part 8) | Qualitative | |
| | 10 % Fines Value-TFV | BS 812 (Part 111) | 1.0 kN to 450 kN | |
| | Polished Stone Value-PSV | BS 812 (Part 114)/ ASTM E303/ EN 1097 | 2 SPV to 150SPV | |
| | Stripping Value Test | IS 6241 | 0.1% to 100 % | |

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| | | Retained Tensile Strength/Indirect Tensile Test- ITS | AASHTO T 283 ASTM D6931 | 1.0 % to 100 % |
| | | Marshall Stability Test | AASHTO T245/ ASTM D6927/ ASTM D5581 | 1.0 kN to 100 kN |
| | | Binder Content Test | Appendix 5C, IRC SP 11/ ASTM D6307 | 0.01% to 30 % |
| | | Cerchar Abrasiveness Index | ASTM D7625/ ISRM Method | 0.5 to 100 |
| | | Fractured Faces | ASTM D 5821 | 1.0 % to 100 % |
| | | Marshall Mix-Resilient Modules Test | Asphalt Institute MS-2 , MORTH Specs 2013 V th Rev/ASTM D4123/ D7369 | 50 MPa to 30000 MPa |
| 2. | Fine Aggregates | Particle Shape & Size | IS 2386 (Part 1) | 0.075 mm to 10 mm |
| | | Materials Finer - 0.075 mm | IS 2386 (Part 1) | 0.1 % to 100 % |
| | | Deleterious Substances Material | IS 2386 (Part 2) | 0.1 % to 50 % |
| | | Specific Gravity | IS 2386(Part 3) | 0.5 to 5.0 |
| | | Water Absorption | IS 2386 (Part 3) | 0.05 % to 20 % |
| | | Bulk Density | IS 2386 (Part 3) | 0.5 kg/l to 5.0 kg/l |
| | | Soundness by Na ₂ SO ₄ | IS 2386 (Part 5) | 0.5 % to 10 % |
| | | Soundness by MgSO ₄ | IS 2386 (Part 5) | 0.5 % to 100 % |
| | | Mortar Making Properties | IS 2386 (Part 6) | 0.1 % to 100 % |
| | | Alkali Aggregate Reactivity | IS 2386 (Part 7) | 10 milimole/l to 1000 milimole/l |
| | | Petrographic Examination | IS 2386 (Part 8) | Qualitative |
| | | Sand Equivalent Value | IS 2720 (Part 37) | 01 % to 100 % |
| 3. | Bitumen (Paving, Industrial & Modified-PMB/ CRMB/HiMA) | Specific Gravity | IS 1202 | 0.50 to 1.50 |
| | | Flash Point | IS 1448 (Part 69) | 25 °C to 400 °C |
| | | Softening Point | IS 1205 | 30 °C to 150 °C |
| | | Penetration Test | IS 1203 | Upto 400 div |

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|-----------|----------------------------|--|--|--|
| | | Ductility Test | IS 1208 | 10 cm to 100 cm |
| | | Loss on Heating | IS 1212 | 0.01 % to 10 % |
| | | TFOT/RTFOT | IS 9382/ ASTM D2872 | 1% to 100 % |
| | | Matter Soluble in TCE | IS 1216 | 0.1% to 100 % |
| | | Absolute Viscosity at 60°C | IS 1206 (Part 2) | 50 Poise to 6000 Poise |
| | | Kinematic Viscosity at 135°C (for VG) & 150°C (for Modified) | IS 1206 (Part 3)/ ASTM D4402 | 50 cSt to 1000 cSt |
| | | Water Content Test | IS 1211 | 0.1% to 10 % |
| | | Mineral Matter Ash | IS 1217 | 0.01% to 10% |
| | | Elastic Recovery | IS 15462, Annex 2, IRC:SP: 53-2010 | 01% to 100 % |
| | | Complex Modulus-G* and Shear Modules G/sing-DSR | Annex 1, IRC:SP:53/ ASTM D7405/ ASTM D7175 AASHTO T315/ IS 15462 | 0.01kPa to 100 kPa |
| | | Phase Angle-sin DSR | Annex 1, IRC:SP:53/ ASTM D7405/ ASTM D7175 AASHTO T315/ IS 15462 | 0.005 to 90 |
| | | Frass Breaking Point | IS 9381 | Upto -30 °C |
| 4. | Antistripping Agent | Pour Point | IS 1448 (Part 10) Sec 2 | 1.0 °C to 150 °C |
| | | Separation Test- Under Water | IS 14982 Annex C | Qualitative |
| | | Boiling Water Test | ASTM D3625/IS 14982 Annex D | Qualitative |
| | | Solubility in HDO | IS 14982, Annex A | 0.1 % to 100 % |
| | | Solubility in LDO | IS 14982, Annex A | 0.1% to 100 % |
| | | Thermal Stability at 163°C | IS 14982, Annex B | Qualitative |
| | | Retained Stability- Wet Strength | IS 14982, Annex E | 0.5 % to 100 % |
| 5. | Bitumen Emulsions | Residue on 600 micron Sieve | Annex B, IS 8887 | 0.01% to 10 % |

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| | | Saybolt Furol Viscosity | IS 3117 | 05 s to 300 s |
| | | Coagulation of Emulsion | Annex C, IS 8887 | Qualitative |
| | | Storage Stability after 24h | Annex D, IS 8887 | 0.05 % to 80 % |
| | | Particle Charge | Annex E, IS 8887 | +ve to -ve |
| | | Coating Ability & Water Resistance | Annex F, IS 8887 | Qualitative |
| | | Stability to Mixing with cement | Annex G, IS 8887 | 0.01 % to 5.0 % |
| | | Miscibility with Water | Annex H, IS 8887 | Qualitative |
| | | Residue by Evaporation | Annex J, IS 8887 | 0.1 % to 90 % |
| | | Distillation % by Volume | IS 1448(Part 18) | 0.1 % to 100 % |
| 6. | Cement | Consistency Test | IS 4031 (Part 4) | 20 % to 40 % |
| | | Setting Time- Initial | IS 4031 (Part 5) | 10 Minute to 120 Minute |
| | | Setting Time-Final | IS 4031 (Part 5) | 30 Minute to 600 Minute |
| | | Compressive Strength | IS 4031 (Part 6) | 02 MPa to 120 MPa |
| | | Soundness- Le-Chatelier | IS 4031 (Part 3) | 0.005 mm to 10 mm |
| | | Soundness- Autoclave | IS 4031 (Part 3) | 0.005 % to 20 % |
| | | Fineness by Blaine's Air Permeability Method | IS 4031 (Part 2) | 10 m ² /kg to 500 m ² /kg |
| | | Specific Gravity | IS 4031 (Part 11) | 0.5 to 5.0 |
| | | Fineness by Dry Sieving | IS 4031 (Part 1) | 0.5 % to 100 % |
| 7. | Curing Compound | Water Retention | ASTM C 156 | 0.5 % to 100 % |
| | | Surface Drying Time | ASTM C 309 | 01 minute to 600 minute |
| | | Curing Efficiency | BS 7542 | 01 % to 100 % |
| 8. | Admixture | Dry Material Content | IS 9103 | 0.5 % to 80 % |
| | | Ash Content | IS 9103 | 0.1 to 15.0 |
| | | Relative Density | IS 9103 | 0.5 to 1.50 |
| | | Chloride Ion Content | IS 9103/ IS 6925 | 0.01 % to 0.5% |
| | | pH value | IS 9103 | 4.0 to 12.0 |
| 9. | Thermoplastic Road Marking Material- | Titanium Dioxide Test | ASTM D 4797 | 0.1 % to 80 % |
| | | CaCO ₃ & Inert Fillers | ASTM D 4797 | 0.1 % to 80 % |
| | | Luminance Test | AASHTO M249/ | 1 % to 100% |

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| | Hot Applied & Cold Applied | | ASTM E2302 | |
| | | Skid Resistance Test | BS EN 1436 | 1 SRV to 100 SRV |
| | | Cracking Resistance Test | AASHTO T250 | Qualitative |
| | | Softening Point- R&B | ASTM D 36 | 30 °C to 150 °C |
| | | Flow Resistance Test | AASHTO T250 | 01 to 50 |
| | | Yellowness Index Test | AASHTO M249/ASTM E2302 | 0.01 to 10.0 |
| | | Coeff. of Retro-reflection | ASTM E1710/BS EN 1436 | 1.0 mcd/m ² /lux to 1000 mcd/m ² /lux |
| 10. | Retroreflective Signboards/ Road Stud | Coeff. of Retro-reflection (R _L & Q _D) | ASTM E810 / ASTM E1709 | 10 mcd/m ² /lux to 1000 mcd/m ² /lux |
| 11. | Concrete | Compressive Strength | IS 516 | 01 MPa to 120 MPa |
| | | Flexural Strength | IS 516 | 0.5 MPa to 10 MPa |
| | | Water Absorption-WA | BS 1881 (Part 122) | 0.10 % to 30% |
| 12. | Fresh Concrete Mix | Slump-Consistency | IS 1199 | Upto 300 mm |
| | | Compaction Factor | IS 1199, Cl. 5.2 | 0.01 to 1.0 |
| | | Density | IS 1199 | 1.5 kg/m ³ to 5.0 kg/m ³ |
| 13. | Bricks-Common Burnt (Clay & Lime/ Flyash) | Length of 20 No. | IS 1077 clause 6.2.1 | 3000 mm to 5000 mm |
| | | Width of 20 No. | IS 13757 clause 6.2.1 | 1500 mm to 2500 mm |
| | | Height of 20 No. | IS 12894 clause 6.2.1 | 500 mm to 2000 mm |
| | | Compressive Strength | IS 3495 (Part 1) | 2 MPa to 40 MPa |
| | | Water Absorption | IS 3495 (Part 2) | 0.5 % to 60% |
| | | Efflorescence Test | IS 3495 (Part 3) | Qualitative |
| | | Warpage Test | IS 3495 (Part 4) | 1.0 mm to 15 mm |
| 14. | Paver Blocks | Visual Inspection | IS 15658 Clause 7 | Qualitative |
| | | Dimensions | IS 15658 Annex B | 25 mm to 500 mm |
| | | Water Absorption | IS 15658 Annex C | 0.10 % to 40% |
| | | Compressive Strength | IS 15658 Annex D | 5.0 MPa to 80 MPa |
| | | Abrasion Resistance | IS 15658 Annex E | 100 mm ³ to 15000 mm ³ |
| | | Tensile Splitting Strength | IS 15658 Annex F | 0.1 MPa to 30 MPa |
| | | Flexural Strength | IS 15658 Annex G | Upto 10 MPa |
| | | Breaking Load | IS 15658 Annex G | Upto 2000 kN |

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| | | Thickness of Wearing Layer | IS 15658 Clause 6.2.3 | 0.01 mm to 20 mm |
| 15. | Ceramic Tiles | Water Absorption | IS 13630 (Part 2)/ ISO 10545 (Part 3) | 0.1 % to 30 % |
| | | Modulus of Rupture | IS 13630 (Part 6)/ ISO 10545 (Part 4) | 0.1 MPa to 50MPa |
| | | Crazing Resistance | IS 13630 (Part 9)/ ISO 10545 (Part 11) | Qualitative |
| | | Chemical Resistance | IS 13630 (Part 7&8)/ ISO 10545 (Part 13&14) | Qualitative |
| | | Linear Thermal Expansion | IS 13630 (Part 4)/ ISO 10545 (Part 8) | 0.005 mm to 10 mm |
| | | Moisture Expansion | IS 13630 (Part 3)/ ISO 10545 (Part 10) | 0.01 mm to 10 mm |
| 16. | Cement Concrete Tiles | Dimensions Test | IS 1237 Clause 7 | 10 mm to 300 mm |
| | | Flatness of Tile Surface | IS 1237 Annex B | 0.05 % to 20 % |
| | | Perpendicularity | IS 1237 Annex C | 0.05 % to 10 % |
| | | Straightness | IS 1237 Annex D | 0.05 % to 10 % |
| | | Water Absorption-WA | IS 1237 Annex E | 0.10 % to 50 % |
| | | Wet Transverse Strength | IS 1237 Annex F | 0.1 MPa to 10MPa |
| | | Resistance to Wear | IS 1237 Annex G | 100 mm ³ to 15000 mm ³ |
| II. | SOIL & ROCK | | | |
| 1. | Soil (Fly Ash, GSB, WBM, WMM, CTSB, RAP, Blanket) | Moisture Content | IS 2720 (Part 2) | 0.1 % to 50 % |
| | | Grain Size Analysis-Wet | IS 2720 (Part 4) | 0.001 mm to 100 mm |
| | | Liquid Limit | IS 2720 (Part 5) | 5 % to 80 % |
| | | Plastic Limit | IS 2720 (Part 5) | 5 % to 80 % |
| | | California Bearing Ratio-CBR | IS 2720 (Part 16)/ AASHTO T 193-13 | 0.5 % to 100 % |
| | | Light Compaction | IS 2720 (Part 7) | 1.3 g/cm ³ to 3.0 g/cm ³ |
| | | Heavy Compaction | IS 2720 (Part 8) | 1.3 g/cm ³ to 3.0 g/cm ³ |
| | | Free Swell Index | IS 2720 (Part 40) | 1.0 % to 50 % |

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| | | Shrinkage Limit | IS 2720 (Part 6) | 1.0 % to 50 % |
| | | Relative Density | IS 2720 (Part 14) | 0.5 g/cm ³ to 3.0 g/cm ³ |
| | | Elastic Modulus -EV2 Test (Site Test) | DIN 18134/RDSO GE-14 | 10 N/mm ² to 400 N/mm ² |
| | | Triaxial Shear Test | IS 2720 (Part 11&12) | ∅ = 1° to 50° C= Upto 10 kg/cm ² |
| | | Direct Shear Test | IS 2720 (Part 13) | ∅ = 1° to 50° C= Upto 10 kg/cm ² |
| | | Coefficient of Interface Friction | IS 13326 (Part 1)/ ASTM D5321 | 1° to 50° |
| | | Pull out Coefficient-Large Shear Box | ASTM D6706 | 1 kN/m to 100 kN/m |
| III. | MECHANICAL PROPERTIES OF METALS | | | |
| 1. | Reinforcement Steel Bar | Diameter | IS 1786 Clause 6.3 | 4 mm to 40 mm dia |
| | | Mass per meter | IS 1786 Clause 7.1 | 0.10 kg/m to 9.86 kg/m |
| | | Tensile Strength | IS 1608 (Part 1) | 20 kN to 450 kN |
| | | Yield Stress | IS 1608 (Part 1) | 20 kN to 450 kN |
| | | Percentage Elongation | IS 1608 (Part 1) | 20 mm to 300 mm |
| | | Reduction in Area | IS 1608 (Part 1) | 0.5 % to 80 % |
| | | Bend Test | IS 1599 | Qualitative (Mandrel Diameter: 8, 10, 12, 15, 16, 18, 20, 24, 25, 28, 30, 32, 35, 36, 40, 42, 48, 50, 56, 60, 64, 70, 72, 75, 80, 84, 96, 100, 108, 112, 120, 125, 128, 135, 140, 144, 150, 160, 168, 175, 180, 192, 196, 200, 216 to 240 in mm) |

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| Sl. | Product / Material of Test | Specific Test Performed | Test Method Specification against which tests are performed | Range of Testing / Limits of Detection |
|-----------|---|---|---|---|
| | | Re-bend Test | IS 1786 | Qualitative (Mandrel Diameter: 8, 10, 12, 15, 16, 18, 20, 24, 25, 28, 30, 32, 35, 36, 40, 42, 48, 50, 56, 60, 64, 70, 72, 75, 80, 84, 96, 100, 108, 112 , 120, 125, 128, 135, 140, 144, 150, 160, 168, 175, 180, 192, 196, 200, 216, 240 in mm) |
| | | Pull-out Test | IS 2770 (Part 1) | 1.0 kN to 500 kN |
| 2. | Prestressing Strands | Diameter | IS 14268, Annex A-2 | 1.0mm to 20 mm |
| | | Cross Sectional Area | IS 14268, Annex B-1 | 3.0 mm ² to 360 mm ² |
| | | Mass per Unit/Lay Length | IS 14268, Annex B-2/A-2 | 0.1 kg to 15 kg |
| | | Diameter of Outer Wire | IS 14268, Annex A-3 | 1.0 kN to 500 kN |
| | | Diameter of Central Wire | IS 14268, Annex A-3 | 0.01 mm to 20mm |
| | | Breaking Strength | IS 1608 & IS 14268, Clause 6.2.2 | 1 kN to 500 kN |
| | | Proof Load | IS 1608 & IS 14268, Clause 6.2.3 | 1 kN to 500 kN |
| | | Load Test on Anchorage-Relaxation Test-100H | BS EN ISO 10138-3 IS 14268:2017 Clause 6.2.4 | 1.0 kN to 2000kN |
| 3. | Structural Steel, Metal Beam Crash Barriers & Weldment Steel | Thickness | IS 2062, Clause 15 & Clause 15 | 0.01 mm to 300mm |
| | | Cross sectional Area | IS 2062, Clause 15 & Clause 15 | 10 mm ² to 2500 mm ² |
| | | Mass per meter | IS 2062, Clause 15 & Clause 18 | 0.10 kg/m to 40.0 kg/m |
| | | Tensile Strength | IS 1608 | 1 kN to 500 kN |
| | | Yield Stress | IS 1608 | 1 kN to 500 kN |
| | | Percentage Elongation | IS 1608 | 20 mm to 300 mm |

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| Sl. | Product / Material of Test | Specific Test Performed | Test Method Specification against which tests are performed | Range of Testing / Limits of Detection |
|-----|----------------------------|---|---|---|
| | | Reduction in Area | IS 1608 | 0.5 % to 80 % |
| | | Bend Test | IS 1599 | Qualitative (Mandrel Diameter: 8, 10, 12, 15, 16, 18, 20, 24, 25, 28, 30, 32, 35, 36, 40, 42, 48, 50, 56, 60, 64, 70, 72, 75, 80, 84, 96, 100, 108, 112, 120, 125, 128, 135, 140, 144, 150, 160, 168, 175, 180, 192, 196, 200, 216, 240 mm) |
| | | Impact Test-Charpy V-Notch | IS 1757(Part 1) | 1.0 J to 200 J |
| | | Rockwell Hardness | IS 1586 (Part 1) | 20 HRB to 100 HRB & 20 HRC to 70 HRC |
| | | Vickers Hardness | IS 1501 (Part 1) | 4.98 HV 10 to 2971 HV 10 13.9 HV 30 to 2964 HV 30 |
| | | Galvanization Thickness/Mass of coating | IS 6745 | 50 g/m ² to 900 g/m ² |
| | | Anodized Thickness | IS 5523 | 05 micron to 100 micron |
| | | Tensile Strength | API 1104 CL. 5.6.2/ ASME BPVC IX-, QW 150 | 1.0 kN to 500 kN |
| | | Nick Break | API 1104 CL. 5.6.3/ ASME BPVC IX-, QW 172 | 1.0 kN to 500 kN |
| | | Hardness | API 1104 CL. B.2.4.4.3/ ASME BPVC IX-, QW 290.5 | 4.98 HV 10 to 2971 HV 10 |
| | | Impact Test- Charpy | API 1104 CL. A.2/ ASME BPVC IX-, QW 171 | 10 J to 200 J |
| | | Bend Test-Face & Root | API 1104: CL. 5.6.425.65/ ASME BPVC IX, QW 160 | Qualitative (Mandrel Diameter: 8, 10, 12, 15, 16, 18, 20, |

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|-----|---|---|---|---|
| | | | | 24, 25, 28, 30, 32, 35, 36, 40, 42, 48, 50, 56, 60, 64, 70, 72, 75, 80, 84, 96, 100, 108, 112, 120, 125, 128, 135, 140, 144, 150, 160, 168, 175, 180, 192, 196, 200, 216 to 240 in mm |
| | | Transverse Load Test | Cl.10.2.2.1, RDSO Manual for Flash Butt Welding | 20 kN to 6000 kN |
| | | Shear Test Rivets/Bars | IS 5242 | 1.0 kN to 500 kN |
| | | Hot Compression/Dump Test | IS 1148 | Qualitative |
| 4. | Steel Rivets | Diameter | IS 1929 IS 10102 | 1.0 mm to 50 mm |
| | | Head Soundness Test | IS 1148 | Qualitative |
| 5. | Bridge Bearings- Elastomeric, Pot, Pot-cum-PTFE, Pin Metallic Guide, Spherical & Cylindrical | Shear Modulus | IRC 83 (Part 2)/ ASTM D4014/ EN 1337-3 | 0.1 MPa to 5.0 MPa |
| | | Elastic Modulus- Compression Stiffness | IRC 83 (Part 2)/ EN 1337-3 | 1x10 ³ to 40x10 ⁶ |
| | | Stripping /Adhesion Strength- Bond Shear Strength | IRC 83 (Part 2)/ EN 1337-3 | Qualitative |
| | | Ultimate Comp. Strength | IRC 83 (Part 2)/ EN 1337-3 | 5 MPa to 125 MPa |
| | | Load Test-Vertical/ Horizontal | IRC 83 (Part 3)/ IRC 83(Part 4) EN 1337-5 | 20 kN to 6000 kN |
| | | Friction Test | IRC 83 (Part 3)/ IRC 83 (Part 4) EN 1337-5 | 0.005 to 5.0 |
| | | Rotation Test | IRC 83 (Part 3)/ IRC 83(Part4)/ EN 1337-5 | 0.1° to 10° |

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|-----|---|-------------------------|---|---|
| | | Hardness | IS 3400 (Part 2) | 30 IRHD to 80 IRHD |
| | | Tensile Strength | IS 3400 (Part 1) | 1 kN to 5 kN |
| | | Elongation at Break | IS 3400 (Part 1) | 5 % to 600 % |
| | | Compression Set Test | IS 3400 (Part 10) | 0.1 % to 30 % |
| | | Density | IS 3400 (Part 9) | 0.5 g/cm ³ to 2.50 g/cm ³ |
| | | Ash Content | IS 3400 (Part 22) | 0.1 % to 50 % |
| | | Accelerated Ageing | IS 3400 (Part 4) | 1 hour to 120 hour |
| | | Hardness | IS 3400 (Part 2) | 30 IRHD to 80 IRHD |
| | | Tensile Strength | IS 3400 (Part 1) | 01 kN to 5 kN |
| | | Elongation at Break | IS 3400 (Part 1) | 5 % to 600 % |
| | | Adhesion Strength | IS 3400 (Part 14) | 0.1 kN/m to 50 kN/m |
| 6. | Steel Pipe | Flattening Test | IS 2328 | Qualitative |
| 7. | Sheathing Ducts- GI Sheet HDPE/ PP, DWC & Void Formers | Dimensions | IRC 18-2000, Annex A1 fib Bulletin 7-2000 | 20mm to 30mm |
| | | Workability Test | App. 1800/I Test A MORTH Specs. 2001, IRC 18-2000, Annex A3 fib Bulletin 7-2000 | Qualitative |
| | | Transverse Load Rating | App. 1800/I Test B MORTH Specs. 2001, IRC 18-2000, Annex A4 fib Bulletin 7-2000 | 1.0 kN to 500kN |
| | | Tension Load Test | App. 1800/I Test C MORTH Specs. 2001, IRC 18-2000, Annex A5 fib Bulletin 7-2000 | 1.0 kN to 1000kN |
| | | Water Loss Test | App. 1800/I Test D MORTH Specs. 2001, IRC 18-2000, Annex A6 fib Bulletin 7-2000 | Qualitative |
| | | Bond Strength Test | Cl. 1, App. 1B, IRC 18-2000, Annex A8 fib Bulletin 7-2000 | 10 kN to 3000 kN |
| | | Compression Test | Cl. 2, App. 1B, IRC 18- 2000, Annex A7 fib Bulletin 7-2000 | 1.0 kN to 2000 kN |
| | | Rodent Repellency Tests | TEC GR No. GR/DWC- 34/01 Sep 2007 & Annexure G, RDSO/SPN/204/2011 | Qualitative |

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|------------|-------------------------------|---|---|--|
| | | Radial Stiffness Rigidity | ASTM D 2412 | 0.1 kN to 50kN |
| IV. | PLASTIC & POLYMERS | | | |
| 1. | PVC Pipe | Visual Appearance | IS 4985 Clause 10.1 | Qualitative |
| | | Outside Diameter-OD | IS 12235 (Part 1) | 50 mm to 200 mm |
| | | Wall Thickness | IS 12235 (Part 2) | 0.001 mm to 20 mm |
| | | Reversion Test | IS 12235 (Part 5) Sec.1 | 0.5 % to 10 % |
| | | Vicat Softening Point | IS 6307 | 30 °C -250 °C |
| | | Density | IS 13360 (Part 3) Sec1 | 1.10 g/cm ³ to 1.75 g/cm ³ |
| | | Sulphated Ash Content | Annex-B, IS 4985 | 0.10 % to 20 % |
| | | Hydrostatic Pressure Test at 27 °C for 1 hour | IS 12235 (Part 8) Sec-1 | 0.5 kg/cm ² to 100kg/cm ² |
| | | Resistance to External Blows at 0 °C | IS 4985 Annex-C | Qualitative |