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| Laboratory | Inspection Survey & Surveillance (India) Pvt. Ltd., 327, R. N. Guha Road, Dum Dum, Kolkata, West Bengal | | |
| Accreditation Standard | ISO/IEC 17025: 2005 | | |
| Discipline | Mechanical Testing | Issue Date | 06.07.2015 |
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| S. No. | Product / Material of Test | Specific Test Performed | Test Method Specification against which tests are performed | Range of Testing / Limits of Detection |
|---------------|---|--|--|--|
| I. | MECHANICAL PROPERTIES OF MATERIALS | | | |
| 1. | Metals & Alloys | Breaking Load Tensile Test Tensile Stress Yield Stress Proof Stress % Elongation % Reduction in Area | IS 1608: 2005 IS 10810 (Part 2): 84 (RA 2011) ASTM A 370: 2014 ASTM E-8M/13a BS EN ISO 6892-1: 2009 AWS B4.0M: 2010 | 0.1 kN to 600 kN |
| | | Hardness Test by Vickers | IS 1501: 2002 (RA 2007) IS 12783: 89 (RA 2009) ISO 6507 (Part 1): 1997 EN 1043-1: 1995 ASTM E-92/82: 2003 | 50 HV 1 to 1000 HV 1 150 HV 5 to 500 HV 5 190 HV 10 to 600 HV 10 600 HV 10 to 1000 HV 10 130 to 1000 HV 30 |
| | | Hardness test by Brinell | IS 1500: 2005 ASTM A-370: 2010 ASTM E-10: 14 ISO 6506-1: 1999 | Upto 650 HBW 10/3000 Upto 450 HBW 5/750 |
| | | Hardness Test by Rockwell | IS 1586: 2000 (RA 2010) ASTM A-370: 2014 ASTM E-18: 14 | HRA 20 to 90 |
| | | Hardmetals - Rockwell Hardness Test (Scale A) | IS 5652 (Part 1): 93 (RA 2009) | HRB 20 to 100 HRC 20 to 70 |

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| | Metals & Alloys | Bend Test | IS 1599/2012 IS 277: 2003 (RA 2013) ASTM A 370: 2014 ASTM E 290/ ASTM E 290: 2013 ISO 5173: 2009(E) | 90 °, 180 °, 135 °, 157.5 ° & Close Bend (Mandrel dia 1.0 mm to 216 mm) |
| | | Charpy Impact test | IS 1757: 1988 (RA 2009) ISO 148-1: 2009 ASTM E-23-12c and ASTM A-370: 2014 | Max. 300 J (From Ambient temperature upto minus 50 °C as required) |
| 2. | Split Pin | Resistance to Bending | IS 2486 (Part 4): 81 (RA 2006) | 75 ° (11 mm to 24 mm dia) |
| 3. | Steel Rod, Rivets and Bolts | Shear Test | IS 5242: 79 (RA 2010) IS 6639: 72 (RA 2005) IS 12427: 2001 (RA 2011) AS/NSZ 1559: 1997 | For Single Shear 12 mm to 27 mm dia For Double Shear 6 mm to 30 mm dia |
| | | Head Soundness Test | IS 10102: 1982 (RA 2010) IS 1367 (Part 3): 2002 ISO 898-1: 1999 | 60 ° 60 °, 80 ° |
| 4. | Steel Tubes and Sockets | Flattening Test | IS 2328: 2005 (RA 2010) ASTM A 370: 2010 ASTM A 450/450 M: 2010 ASTM A 530/530M/04a: 2010 ASTM A 1016/A 1016M: 2010 | 300 mm OD Pipe (max.) |
| | | Crushing Strength test | BS 6323 (Part 1 to 8) IS 3601: 2006 | Tube dia upto 100 mm |

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| | Steel Tubes and Sockets | Drift Expansion Test | IS 2335: 2005 (RA 2010) IS 1239 (Part 2): 2011 ISO 8492: 1998 | Upto 200 mm Ø max. |
| 5. | Spring Lock Washers | Compression test | IS 3063: 94 (RA 2010) DIN 127: 87 | Upto 600 kN |
| 6. | Steel Reinforcement Bar | Rebend Test | IS 1786: 2008 (RA 2013) | 6 mm to 32 mm dia. Bar 135 °, 157.5 ° |
| | | Weight per meter run | IS 1786: 2008 (RA 2013) | 0 to 12 kg |
| 7. | Aluminium Wire | Reverse Bend Test | IS 1716: 85 (RA 2010) | 2.50 mm dia. (max.) 0 ° to 180 ° |
| 8. | Steel Fasteners | Tensile Test Proof load test | IS 1367 (Part 3): 2002 IS 1367 (Part 6): 94 (RA 2004) IS 1367 (Part 14): 2002 ASTM A 193/A 193M: 2010 ASTM A 194/A 194M: 2010 ASTM F 606M: 2009 ASTM A 370: 2010 ISO 898 (Part 1): 99 ISO 898 (Part 2): 92 ISO 3506-1: 1997 AS/NZS/4291.1: 95 AS/NZS/1559: 97 AS 1112: 80 EN 10164: 2004(E) | 12,000 N to 6,00,000 N load |

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| 9. | Copper Tube | Doubling over test | IS 2501: 95 (RA 2006) | Close bend to 180° bend 200 mm outside dia.(max.) |
| 10. | Welded Test Coupon and Ferrous & Non Ferrous Material | Macro Examination | IS 11371: 85 (RA 2007) IS 12037: 87 (RA 2007) IS 13015: 99 (RA 2007) ASTM E-381: 01 (RA 2012) ASME (Sec IX): 2013 IS 7307 (Part 1): 74 (RA 2008) IS 7310 (Part 1): 74 (RA 2010) IS 7318 (Part 1 & 2): 74 (RA 2008) IS 3600 (Part 9): 85 (RA 2008) API-1104: 2013 | (Qualitative) 10 x 10 x 10 x |
| | | Micro Structural Analysis | IS 7739 (Part 1): 75 (RA 2007) E-3 ASM Metal Handbook-Atlas of Microstructure-8 th edition | (Qualitative) 100 x 1000 x |

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| 11. | Weld test Coupons (Butt Weld & Fillet Weld) | Transverse Tensile Test Root Bend Test Face Bend Test Side Bend Test Nick Break Test All weld Tensile Test Hardness of PMT, HAZ & Weld Fillet weld fracture test | ASME (Sec IX): 2013 ASME (Sec II): 2010 ASTM A 370: 2014 ANSI/AWS-D1.1: 2006 AWS B4.0M: 2010 ASME B31.3: 2004 API 1104: 2013 IS 7307 (Part 1): 1974 (RA 2008) IS 7310 (Part 1): 1974 (RA 2010) IS 7318 (Part 1 & 2): 1974 (RA 2008) IS 3600 (Part 3): 2009 IS 3600 (Part 5): 1983 (RA 2010) IS 3600 (Part 6): 1983 (RA 2008) IS 3600 (Part 8): 1985 (RA 2008) ISO 15614-1: 2008 ISO 4136: 2012 ISO 5173: 2009 ISO 9606-1: 2012 EN 287-1: 2008 EN 895: 95 EN 910: 1996 EN 1043-1: 1995 EN 1321: 1996 ISO 17639: 2003 E | Qualitative |
| 12. | Steel | Grain Size Total Case Depth | IS 4748: 2009 ASTM E112: 2013 IS 6416: 88 (RA 2007) | 100 x / Grain Size No. 1 to 8 100 x Upto 4 mm |

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| | Steel | Inclusion Rating | ASTM-E-45: 13 IS 4163: 2004 (RA 2010) ISO 4967: 1998 | Qualitative 100 x |
| | | Depth of Decarburized layer | IS 6396: 2000 (RA 2007) (100 x to 500 x) ASTM E-1077: 14 | Upto 4 mm (>1.2 micron) (100X to 500X) |
| 13. | Electro Plated Material | Coating Thickness | IS 3203: 82 (RA 2010) (Upto 1000 x) IS 1573: 86 (RA 2010) | 100 x to 1000 x/ 0 to 4 mm (>1.2 micron) |
| 14. | Austenite Stainless Steel | Susceptibility to Inter Granular Corrosion Test | ASTM A 262: 2010 Practice-A, B, C, E & F IS 10461 (Part 1) (RA 2010) IS 10461 (Part 2) (RA 2007) | 200 x & 400 x |
| II. PLASTICS, RUBBER AND LEATHER | | | | |
| 1. | Moulded and Extruded Rubber & Polymeric Products | Tensile Strength and Elongation | IS 13360 (Part 5/Sec.3): 1999 (RA 2004) IS 13360 (Part 5/Sec.2): 1996 (RA 2008) IS 1998: 62 (RA 2008) IS 2221: 62 (RA 2010) IS 3400 (Part 1): 2012 IS 443: 75 (RA 2012) IS 2530: 63 (RA 2008) ISO 3268: 78 E ISO.R.527-2/1966 IRS T-37/82 IRS T-47/2006 ASTM.D-638 ASTM.D-412 | 5 MPa to 450 MPa 10 % to 500 % |

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| | Moulded and Extruded Rubber & Polymeric Products | Compressive Strength | IS 13360 (Part 5/Sec.8): 2013 IS 1998: 62 (RA 2008) | 10 MPa to 700 MPa |
| | | Hardness Shore 'A' | IS 13360 (Part 5/Sec.11): 2013 IS 3400 (Part 23): 2002 (RA 2012) | 5° to 95° |
| | | Hardness Shore 'D' | IS 13360 (Part 5/Sec.11): 2013 IS 3400 (Part 23): 2002 (RA 2012) | 5° to 95° |
| | | Rockwell Hardness | IS 13360 (Part 5/Sec.13): 1992 | 82 to 130 |
| | | Cross Breaking Strength | IS 2221: 62 (RA 2010) IS 13360 (Part 5/Sec.7): 1996 (RA 2008) IS 1998: 62 (RA 2008) IS 2036: 95 (RA 2010) Appn. 'A' ISO 178: 2005 | 10 MPa to 450 MPa |
| | | Flexural strength | ASTM.D-792 | |
| | | Accelerated Ageing Test at 50 °C to 300 °C for a period of 24 hrs to 168 hrs. | IS 3400 (Part 4): 2012 | Tensile Strength: 5-200 MPa Elongation: 50-500% Hardness Shore-A: 40-95° |
| | | Modulus (relaxed) at 100% elongation | IRS T-37/82 IRS T-47/2006 | 5 MPa to 125 MPa |
| | | Compression Set at Specified Temp. | IS 3400 (Part 10): 1977 (RA 2008) | 5 % to 100 % |

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| | Moulded and Extruded Rubber & Polymeric Products | Tension Set | IS 3400 (Part 13): 1983 (RA 2008) | 10 % to 300 % |
| | | Angular Tear Strength | IS 3400 (Part 17): 1974 (RA 2008) | 10 N/mm to 100 N/mm |
| | | Compressibility and recovery | IS 4253 (Part 2): 2008 | 5 % to 65 % |
| | | Full Thickness Breaking strength and elongation of Belts | IS 1891 (Part 1): 94 (RA 2008) | 0 to 100 % 12 Kn/m to 60 Kn/m |
| | | Adhesion of Rubber to Metal | IS 3400 (Part 14): 1984 (RA 2008) | 4 N/mm to 30 N/mm |
| | | Adhesion of Rubber to Fabric | IS 3400 (Part 5): 1986 (RA 2008) IS 3400 (Part 24): 2001 | 4 N/mm to 30 N/mm |

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