

Laboratory	Accurate Laboratory Services, Plot No. 71/1-B7, General Block, MIDC Bhosari, Bhosari-Pimpri Road, Pune, Maharashtra		
Accreditation Standard	ISO/IEC 17025: 2005		
Discipline	Mechanical Testing	Issue Date	02.07.2015
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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.	Ferrous & Non Ferrous Metals and Alloys	Brinell Hardness	IS 1500: 2013 ISO 6506-1: 2014 ASTM A 370: 2014 ASTM E 10: 2014 ASME (Sec II)-A:SA 370: 2013	95 HBW to 400 HBW
		Rockwell Hardness	IS 1586 Part 1: 2012 ISO 6508-1: 2005 ASTM A 370: 2014 ASTM E 18: 2014a ASME (Sec II)-A:SA 370: 2013 Diamond Cone (60 kgf) Steel Ball (100 kgf) Diamond Cone (150 kgf) Diamond Cone (15 kgf) Diamond Cone (30 kgf) Diamond Cone (45 kgf) Steel Ball (15 kgf) Steel Ball (30 kgf) Steel Ball (45 kgf)	20 HRA to 88 HRA 20 HRBW to 100 HRBW 20 HRC to 70 HRC 70 HR15N to 94 HR15N 42 HR30N to 90 HR30N 25 HR45N to 70 HR45N 67 HR15TW to 93 HR15TW 29 HR30TW to 82 HR30TW 41 HR45TW to 72 HR45TW
		Vicker's Hardness including Micro Hardness	IS 1501: 2013 ISO 6507-1: 2005 ASTM A 370: 2014 ASTM E 384: 2012 ASME (Sec II)-A: SA 370: 2013	50 HV0.1 to 700 HV0.1 50 HV0.5 to 700 HV0.5 50 HV1 to 700 HV1 50 HV5 to 700 HV5 50 HV10 to 700 HV10 50 HV30 to 700 HV30
		Portable Hardness Test (Leeb Hardness)	ASTM A 956: 2012	Qualitative
		Charpy Impact	IS 1499: 1977 (RA 2003) IS 1757: 1988 (RA 2003)	Upto 300 J (Ambient Temperature to (-)196 °C)

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	Ferrous & Non Ferrous Metals and Alloys	Charpy Impact	ISO 148-1: 2010 ASTM A 370: 2014 ASTM E 23: 2012C ASME (Sec II)-A: SA 370: 2013	Upto 300 J (Ambient Temperature to (-)196 °C)
		Izod Impact	IS 1598: 1977 (RA 2003)	0 to 168 J (at Ambient Temperature)
		Ultimate Tensile Strength	IS 1608: 2005	4 N to 400 kN
		Yield Strength	ISO 6892-1: 2009	(Flat 0.1 mm to 30 mm
		0.2 % Proof Stress	ASTM A 370: 2014	Round: 10 mm to 40 mm)
		% Elongation	ASTM E 8: 2013a	1 % to 85 %
		% Reduction in Area	ASME (Sec II)-A:SA 370: 2013	10 % to 85 %
		Ultimate Tensile Strength	IS 1608: 2005	5 N to 1000 kN
		Yield Strength	ISO 6892-1: 2009	(Flat 0.1 mm to 65 mm
		0.2 % Proof Stress	ASTM A 370: 2014	Round: 10 mm to 70 mm)
		% Elongation	ASTM E 8: 2013a	1 % to 85 %
		% Reduction in Area	ASME (Sec II)-A:SA 370: 2013	10 % to 85 %
		Bend Test	IS 1599: 2012 ISO 7438: 2005 ASTM A 370: 2014 ASTM E 290: 2014 ASME (Sec II)-A:SA 370: 2013	Qualitative (Mandrel Diameter: 2 mm to 125 mm Max)
	2. Ferrous and Non Ferrous - Pipes and Tubes	Flattening Test	IS 2328: 2005	Qualitative (Outer Diameter:400 mm)
			ASTM A 370: 2014	
			ASTM A 530: 2012	
			ASTM A 999: 2014	
			ASTM B 111: 2011	
			ASME (Sec II)-A: SA 370: 2013	

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	Ferrous and Non Ferrous - Pipes and Tubes	Flaring / Drift Expansion Test	IS 2335 : 2008 ISO 8493: 1998 ASTM A 370: 2014 ASTM A 450: 2010 ASME (Sec II)-A: SA 370: 2013	Qualitative (Outer Diameter: 100 mm Mandrel 45 ° to 60 °)
		Crushing Strength	IS 3601: 2006 ASTM A 370: 2014 ASME (Sec II)-A: SA 370: 2013	Qualitative (5 N to 1000 kN)
3.	Ferrous and Non Ferrous Bolts and Nuts	Proof Load Test	IS 1367 (Part 3): 2002 IS 1367 (Part 6): 1994 ISO 898-1: 1999 ISO 898-2: 1992 ASTM F 606: 2014a	Qualitative (0.5 kN to 1000 kN)
4.	Ferrous & Non-Ferrous Metals Components or Assemblies	Breaking/ Push/ Pull Load Test	IS 1608: 2005 ISO 6892-1: 2009 ASTM A 370: 2014 ASME (Sec II)-A: SA 370: 2013	Qualitative (5 N to 1000 kN)
5.	Ferrous & Non-Ferrous Metals (Sheet Metal)	Erichsen Cupping	IS 10175: 2012 ISO 20482: 2003 ISO 8490: 1986	0.2 mm to 2.00 mm
6.	Steel Springs	Compression/Load Test	IS 7906: 1989 (RA 2009)	Qualitative (5 N to 1000 kN Height: Upto 800 mm)
7.	Ferrous Metals	Hardenability Test	IS 3848: 1981 ASTM A 255: 2014	Qualitative

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8.	Ferrous & Non Ferrous Metals Weldments for procedure and performance qualifications	Transverse Tensile	ASME (Sec IX): 2013 AWS D1.1: 2010 AWS D1.2: 2008 ASTM A 370: 2014 ASME (Sec II)-A: SA 370: 2013 EN 895: 1995 ISO 4136: 2012 ISO 15614-1: 2004; Amd. 2: 2012 IS 3600-3: 2009 IS 3600-4: 1984	5 N to 1000 kN (Flat - 0.1 mm to 65 mm Round 10 mm to 70 mm)
		Bend Test	ASME (Sec IX): 2013 AWS D1.1: 2010 AWS D1.2: 2008 ASTM E 190: 2014 ISO 5173: 2010; Amd. 1: 2011 IS 3600-5: 1983 IS 3600-6: 1983 IS 3600-7: 1985	Qualitative (Mandrel Diameter: 2 mm to 125 mm Max)
		Hardness Test	ASME (Sec IX): 2013 AWS D1.1: 2010 AWS D1.2: 2008 EN 1043-1: 1995 ISO 9015-1: 2011	50 HV1 to 700 HV1 50 HV5 to 700 HV5 50 HV10 to 700 HV10
		Charpy Impact	ASME (Sec IX): 2013 IS 3600-2: 1985 EN 875: 1995 ISO 9016: 2012	Upto 300 J (Ambient Temperature to (-) 196 °C)
		Fracture Test	ASME (Sec IX): 2013 AWS D1.1: 2010 ISO 15614-1: 2012 IS 3600-8: 1985	Qualitative (Magnification: 7X, 10X, 20X, 30X, 40X & 45X)

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II. METALLOGRAPHY				
1.	Ferrous & Non Ferrous Metals Weldments for procedure and performance qualifications	Macro or Micro Structural Test	ASME (Sec IX): 2013 AWS D1.1: 2010 EN 1321: 1997 ISO 17639: 2013 IS 3600-9: 1985	Qualitative (Magnification: 7X, 10X, 20X, 30X, 40X & 45X)
2.	Cast Irons/Grey Irons/Malleable Iron/Ductile Iron/ SG Iron	Micro structural Analysis	IS 7754 : 1975 (RA 2003) ASM Metal Handbook - Volume 9 ASTM A 247: 2010 ISO 945-1: 2008	Qualitative (Magnification: 100X, 200X, 500X & 1000X)
3.	Multiphase Metals and Alloys	Determination of volume Fraction of Phases	ASTM E 562: 2011	3 % to 90 % (Magnification: 100X, 200X & 500X)
4.	Steels	Inclusion Rating (A to D)	IS 4163: 2004 ISO 4967: 1998 ASTM E 45 (Method A): 2013	Upto 3 mm (Magnification: 100X)
		Determination of Depth of Decarburized Layer	IS 6396: 2000 ASTM E 1077:01(2005) ISO 3887: 2003	0.001 mm to 2.00 mm (Magnification: 100X, 200X, 500X & 1000X)
		Measurement of Case Depth By Micro hardness method	IS 6416: 1988 (RA 2003) ISO 2639: 2002 IS 1501: 2002	100 HV to 800 HV (0.001 mm to 2.00 mm)
5.	Ferrous & Non Ferrous Metals, Steel Bars, Billets, Blooms, Forging of Carbon and Low Alloys Steel	Macro Structural Analysis	IS 11371: 1985 (RA 2007) IS 13015: 1991 (RA 2007) ASTM E 381: 2012	Qualitative (Magnification: 7X, 10X, 20X, 30X, 40X & 45X)

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6.	Ferrous & Non Ferrous Metals & Alloys	Macro Structural Analysis	ASTM E 340: 2013	Qualitative (Magnification: 7X, 10X, 20X, 30X, 40X & 45X)
		Coating thickness by Microscopical method	IS 3203: 1982 (RA 2006) ISO 1463: 2003 ASTM B 487: 1985 (2013)	0.001 mm to 2.00 mm (Magnification: 100X, 200X & 500X)
		Estimation of Grain Size by Microscopic method	IS 4748: 2009 ISO 643: 2012 ASTM E 112: 2013	Qualitative (ASTM Grain Size: 0 to 10, Magnification: 100X)
		Micro structural Analysis	IS 7739 (Part 1,3,4,5): 1975 (RA 2003) IS 11959: 1987 (RA 2004) ASTM E407: 2007e1 ASM Metal Handbook - Volume 9	Qualitative (Magnification: 100X, 200X, 500X & 1000X)
7.	Stainless Steel	Intergranular Corrosion Test Practice - A	ASTM A 262: 2014	Qualitative (Magnification: 250X)
		Practice – B	ASTM A 262: 2014	1 MPY to 2500 MPY
		Practice – C	ASTM A 262: 2014	1 MPY to 2500MPY
		Practice – E	ASTM A 262: 2014	Qualitative (Magnification: 250X)
		Practice – F	ASTM A 262: 2014	1 MPY to 2500 MPY
		Huey Test	IS 10461-1: 1994 (RA 2002) ISO 3651-1: 1998	1 MPY to 2500 MPY
		MonyPenny Strauss Test	IS 10461-2: 1994 (RA 2002) ISO 3651-2: 1998	1 MPY to 2500 MPY

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8.	Wrought Nickel, Rich Chromium Bearing Alloys	Susceptibility to Intergranular Corrosion Practice A	ASTM G 28: 2008	1 MPY to 2500 MPY
		Susceptibility to Intergranular Corrosion Practice B	ASTM G 28: 2008	1 MPY to 2500 MPY
9.	Duplex Austenitic/Ferritic Stainless Steels	Detrimental Intermetallic Phase	ASTM A 923 (Method C): 2014	1 MDD to 2500 MDD
III. PLASTIC RUBBER & LEATHER				
1.	Plastic & Its Products	Tensile Strength	ASTM D 638: 2010	5 MPa to 300 MPa
		Elongation at Break	ASTM D 638: 2010	0.5 % to 100 %
		Hardness in Shore 'D'	ASTM D 2240: 2005 (RA 2010)	10 to 90
		Density	ASTM D 792: 2013	0.4 g/cc to 5 g/cc
		Specific Gravity	ASTM D 792: 2013	0.4 to 5
2.	Rubber & Its Products	Tensile Strength	IS 3400 (Part 1): 2012 ASTM D 412: 2006 (RA 2013)	Minimum: 2 MPa
		Elongation at Break	IS 3400 (Part 1): 2012 ASTM D 412: 2006 Reapproved 2013	10 % to 1000 %
		Accelerated Ageing in air	IS 3400 (Part 4): 2012 ASTM D 573: 2004 (RA 2010)	50 °C to 350 °C
		Compression Set at Constant Strain	IS 3400 (Part 10): 1977(1993) ASTM D 395: 2014	2 % to 60 %

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	Rubber & Its Products	Hardness in Shore 'A'	ASTM D 2240: 2005 (RA 2010)	20 to 90
		Density	IS 3400 (Part 9): 2008 ASTM D 297: 2013	0.5 g/cc to 3 g/cc
		Specific Gravity	IS 3400 (Part 9): 2008 ASTM D 297: 2013	0.5 to 3

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