Laboratory	**ELCA Quality Systems and Calibrations Pvt. Ltd., Plot No. S-152, S-Block, Bhosari MIDC, Pimpri Chinchwad Industrial Area, Bhosari, Pune, Maharashtra**
Accreditation Standard	**ISO/IEC 17025: 2017**
Certificate Number	**TC-5744** **Page 1 of 31**
Validity	**15.04.2019 to 14.04.2021** **Last Amended on --**

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.	**HAZARDOUS & RESTRICTED CHEMICALS**			
1.	**Electrotechnical Products**	Cadmium	IEC 62321-3-1: 2013	10 mg/kg to 100 mg/kg
		Hexavalent Chromium (Spot Test)	IEC 62321: 2008	Qualitative Visual inspection
		Lead	IEC 62321-3-1: 2013	10 mg/kg to 40000 mg/kg
		Mercury	IEC 62321-3-1: 2013	10 mg/kg to 1000 mg/kg
		Total Bromine	IEC 62321-3-1: 2013	10 mg/kg to 1000 mg/kg
		Total Chromium	IEC 62321-3-1: 2013	10 mg/kg to 1000 mg/kg
II.	**METALLIC COATINGS & TREATMENT SOLUTIONS**			
1.	**Coated Metallic Material**	Mass of Zinc Coating	IS 6745:2016	1 g/mÂ² to 1000 g/mÂ²
		Uniformity of Zinc Coating	IS 2633: 2016	Qualitative Visual Inspection
III.	**CORROSION TEST**			
1.	**Salt Spray Test**	Salt spray testing	ASTM B117: 2018	Qualitative Visual Inspection
		Salt spray testing	ISO 9227: 2012	Qualitative Visual Inspection
IV.	**METALS & ALLOYS**			
1.	**(Non- Ferrous) Aluminum& Its Alloys**	Chromium	IS 11035: 2014	0.01 % to 0.35 %
		Chromium	ASTM E1251: 2017	0.01 % to 0.35 %
		Copper	ASTM E1251: 2017	0.01 % to 5.5 %
		Copper	IS 504 (Pt-3) , Cl.6: 2018	0.2 % to 6.0 %

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		Copper	IS 11035: 2014	0.010 % to 5.5 %
		Iron	IS 11035: 2014	0.19 % to 1.3 %
		Iron	IS 504 (Pt-2) , Cl.6: 2018	0.1 % to 3.0 %
		Iron	ASTM E34 , sec 221- 231, By AAS): 2018	0.10 % to 3.0 %
		Iron	ASTM E1251: 2017	0.19 % to 1.3 %
		Lead	ASTM E1251: 2017	0.0033 % to 0.50 %
		Lead	IS 11035: 2014	0.0033 % to 0.50 %
		Magnesium	IS 11035: 2014	0.001 % to 3.0 %
		Magnesium	ASTM E1251: 2017	0.001 % to 3.0 %
		Magnesium	IS 504 (Pt-6): 2018	0.02 % to 12.0 %
		Manganese	IS 504 (Pt-5): 2018	0.10 % to 1.5 %
		Manganese	ASTM E1251: 2017	0.0046 % to 0.9 %
		Manganese	IS 11035: 2014	0.0046 % to 0.9 %
		Nickel	IS 11035: 2014	0.0082 % to 0.8 %
		Nickel	ASTM E1251: 2017	0.0082 % to 0.8 %
		Nickel	IS 504 (Pt-7) : 2018	0.1 % to 4.0 %
		Silicon	IS 504 (Pt-1) ,Cl.7: 2018	0.03 % to 13.0 %
		Silicon	ASTM E1251: 2017	0.21 % to 12.0 %
		Silicon	IS 11035: 2014	0.21 % to 12 %
		Tin	IS 11035: 2014	0.0054 % to 0.30 %
		Tin	ASTM E1251: 2017	0.0054 % to 0.3 %
		Titanium	WI/CHE/03 Issue No 03Feb 02: 2018	0.0068 % to 0.35 %
		Zinc	ASTM E1251: 2017	0.02 % to 3.25 %
		Zinc	IS 504 (Pt-4), Cl 6.3:2018	0.10 % to 3.0 %
		Zinc	IS 11035: 2014	0.02 % to 3.25 %
2.	**Carbon Steel (Low Carbon, Medium Carbon & High Carbon Steel)**	Aluminum	ASTM E-415: 2017	0.004 % to 0.35 %
		Aluminum	IS 8811: 2012	0.004 % to 0.35 %
		Carbon	ASTM E-415: 2017	0.044 % to 1.5 %
		Carbon	IS 8811: 2012	0.044 % to 1.5 %
		Carbon	ASTM E1019: 2018	0.01to 1.00

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		Chromium	ASTM E350,sec 220-229, by AAS: 2018	0.06to 1.0
		Chromium	ASTM E350,sec 230-238,By AAS: 2018	0.05 % to 4.0 %
		Chromium	IS 228(Pt 6): 2014	0.10 % to 2.5 %
		Chromium	ASTM E-415: 2017	0.04 % to 3.0 %
		Chromium	IS 8811: 2012	0.04to 3.0
		Copper	IS 228 (Pt 15): 2014	0.050 % to 5.0 %
		Copper	IS 8811: 2012	0.010 % to 0.7 %
		Copper	ASTM E-415: 2017	0.010 % to 0.70 %
		Copper	ASTM E350, sec 279-288, By AAS:2018	0.004 % to 0.5 %
		Hydrogen	ASTM E1019: 2018	0.00054 % to 0.001%
		Manganese	IS 8811: 2012	0.08 % to 1.7 %
		Manganese	ASTM E-415: 2017	0.08 % to 1.7 %
		Manganese	IS 228(Pt 2): 2018	0.10 % to 1.5 %
		Manganese	ASTM E350, Sec 269-278, By AAS:2018	0.005 % to 2.0 %
		Molybdenum	IS 228(Pt 7): 2018	0.10 % to 2.0 %
		Molybdenum	ASTM E-415: 2017	0.025 % to 1.0 %
		Molybdenum	IS 8811: 2012	0.025 % to 1.0 %
		Nickel	IS 8811: 2012	0.02 % to 4.0 %
		Nickel	ASTM E-415: 2017	0.02 % to 4.0 %
		Nickel	ASTM E350, sec 318-328, By AAS:2018	0.003 % to 0.5 %
		Nickel	IS 228 (Pt 5): 2014	0.10 % to 5.0 %
		Nickel	ASTM E350, sec 180-187, By AAS:2018	0.10 % to 5.0 %
		Niobium	IS 8811: 2012	0.005 % to 0.09 %
		Niobium	ASTM E-415: 2017	0.005 % to 0.09 %
		Nitrogen	ASTM E1019: 2018	0.0047 % to 0.11 %
		Oxygen	ASTM E1019: 2018	0.0028 % to 0.022 %

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		Phosphorus	IS 8811: 2012	0.0043 % to 0.08 %
		Phosphorus	ASTM E-415: 2017	0.0043 % to 0.08 %
		Phosphorus	ASTM E350 Sec 172- 179: 2018	0.02 % to 0.25 %
		Phosphorus	IS 228(Pt 3): 2018	0.010 % to 0.25 %
		Silicon	IS 228(Pt 8): 2014	0.10 % to 2.0 %
		Silicon	ASTM E-415: 2017	0.046 % to 1.0 %
		Silicon	IS 8811: 2012	0.046 % to 1.0. %
		Sulphur	ASTM E-415: 2017	0.0026 % to 0.06 %
		Sulphur	IS 8811: 2012	0.0026 % to 0.06 %
		Sulphur	ASTM E1019: 2018	0.010 % to 0.35 %
		Titanium	ASTM E415: 2017	0.001 % to 0.2 %
		Titanium	IS 8811: 2012	0.001 % to 0.2 %
		Vanadium	ASTM E-415: 2017	0.008 % to 0.5 %
		Vanadium	IS 8811: 2012	0.008 % to 0.5 %
3.	**(Non- Ferrous) Cobalt Alloys**	Chromium	ASTM E1476: 2014	Qualitative
		Cobalt	ASTM E1476: 2014	Qualitative
		Iron	ASTM E1476: 2014	Qualitative
		Molybdenum	ASTM E1476: 2014	Qualitative
		Tungsten	ASTM E1476: 2014	Qualitative
4.	**(Non-Ferrous) Copper & Its Alloys**	Aluminium	WI/CHE/03 Issue No 03 Feb 02: 2018	0.11 % to 11.0 %
		Aluminum	IS 3685 : 2018	0.10 % to 12.0 %
		Antimony	WI/CHE/03 Issue No 03 Feb 02: 2018	0.0007 % to 0.35 %
		Copper	ASTM E478: 2017	40.00 % to 99.99 %
		Copper	IS 4027(Pt-1) : 2018	40.00 % to 99.99 %
		Copper	IS 3685: 2018	40.00 % to 99.99 %
		Copper	IS 440: 2018	40.00 % to 99.99 %
		Copper	WI/CHE/03 Issue No 03 Feb 02: 2018	56 % to 98 %

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
		Iron	IS 440: 2018	0.10 % to 3.0 %
		Iron	IS 4027 (Pt-8): 2018	0.1 % to 3.0 %
		Iron	IS 3685: 2018	0.10 % to 3.0 %
		Iron	WI/CHE/03 Issue No 03 Feb 02: 2018	0.005 % to 4.0 %
		Lead	WI/CHE/03 Issue No 03 Feb 02: 2018	0.0054 % to 3.0 %
		Lead	IS 4027 (Pt-1): 2018	0.10 % to 10.00 %
		Lead	ASTM E 478: 2017	0.10 % to 10.0 %
		Lead	IS 3685: 2018	0.10 % to 10.0 %
		Manganese	IS 3187: 2018	0.10 % to 2.5 %
		Manganese	WI/CHE/03 Issue No 03 Feb 02: 2018	0.097 % to 1.22 %
		Nickel	WI/CHE/03 Issue No 03 Feb 02: 2018	0.002 % to 30 %
		Nickel	ASTM E478, Sec 55- 62: 2017	4.0 % to 50.0 %
		Nickel	IS 440: 2018	4.0 % to 50.0 %
		Nickel	IS 3685: 2018	0.1 % to 10.0 %
		Oxygen	ASTM E2575: 2008	0.00236to 0.07
		Phosphorus	WI/CHE/03 Issue No 03 Feb 02: 2018	0.005 % to 1.20 %
		Phosphorus	IS 4027 (Pt-3): 2018	0.010to 0.6
		Silicon	WI/CHE/03 Issue No 03 Feb 02: 2018	0.019 % to 0.6 %
		Tin	WI/CHE/03 Issue No 03 Feb 02: 2018	0.0013 % to 10.0 %
		Zinc	WI/CHE/03 Issue No 03 Feb 02: 2018	0.003 % to 9.0 %
		Zinc	ASTM E478 , sec 47- 54: 2017	2.0 % to 40.0 %

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		Zinc	IS 3685: 2018	0.2 % to 40.00 %
5.	**(Non-Ferrous) Nickel & Its Alloys**	Aluminium	WI/CHE/03 Issue No 03 Feb 02: 2018	0.1 % to 6.25 %
		Carbon	WI/CHE/03, Issue No: 3 Feb 02: 2018	0.02 % to 0.25 %
		Chromium	WI/CHE/03 Issue No 03 Feb 02: 2018	0.006 % to 22.0 %
		Cobalt	WI/CHE/03 Issue No 03 Feb 02: 2018	0.005 % to 15.0 %
		Copper	WI/CHE/03 Issue No 03 Feb 02: 2018	0.22 % to 32.0 %
		Iron	WI/CHE/03 Issue No 03 Feb 02: 2018	1.0 % to 35.0 %
		Manganese	WI/CHE/03 Issue No 03 Feb 02: 2018	0.1 % to 1.26 %
		Molybdenum	WI/CHE/03 Issue No 03 Feb 02: 2018	0.007 % to 16.00 %
		Niobium	WI/CHE/03 Issue No 03 Feb 02: 2018	0.05 % to 5.0 %
		Phosphorus	WI/CHE/03 Issue No 03 Feb 02: 2018	0.008 % to 0.05 %
		Sulphur	WI/CHE/03 Issue No 03 Feb 02: 2018	0.002 % to 0.041 %
		Titanium	WI/CHE/03 Issue No 03 Feb 02: 2018	0.003 % to 5.00 %
		Vanadium	WI/CHE/03 Issue No 03 Feb 02: 2018	0.001 % to 1.0 %
6.	**Cast Iron**	Carbon	ASTM E1999: 2018	3.0 % to 4.5 %
		Carbon	ASTM E1019: 2018	1.25 % to 3.5 %
		Chromium	IS 12308 (Pt 8): 2018	0.10 % to 1.0 %
		Chromium	ASTM E351,sec 218-228, By AAS: 2018	0.10 % to 1.0 %

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
		Chromium	IS 12308 (Pt 8), ByAAS: 2018	0.10 % to 1.0 %
		Chromium	ASTM E1999: 2018	0.03 % to 0.3 %
		Copper	ASTM E1999: 2018	0.02 % to 0.04 %
		Copper	IS 12308 (Pt 12):2018	0.10 % to 0.50 %
		Copper	ASTM E351, sec 81- 88, By AAS: 2013	0.03 % to 7.5 %
		Hydrogen	ASTM E1019: 2018	0.00054 % to 0.001%
		Manganese	ASTM E1999: 2018	0.04 % to 1.0 %
		Manganese	IS 12308 (Pt 10):2018	0.2 % to 7.0 %
		Manganese	ASTM E351, sec 152-159,By AAS:2013	0.10 % to 3.5 %
		Molybdenum	ASTM E 351, sec 196-207, By AAS:2013	0.10 % to 1.5 %
		Molybdenum	ASTM E1999: 2018	0.01 % to 1.2 %
		Nickel	ASTM E1999: 2018	0.04 % to 0.15 %
		Nickel	IS 12308 (Pt 7): 2018	0.5 % to 2.5 %
		Nickel	ASTM E351, sec 168-175, By AAS:2013	0.10 % to 2.5 %
		Nitrogen	ASTM E1019: 2018	0.0047 % to 0.11 %
		Oxygen	ASTM E1019: 2018	0.0028 % to 0.022 %
		Phosphorus	ASTM E1999: 2018	0.015 % to 1.0 %
		Phosphorus	IS 12308 (Pt 5): 2018	0.010 % to 0.5 %
		Phosphorus	ASTM E351, sec 160-167: 2013	0.02 % to 0.9 %
		Silicon	IS 12308 (Pt 6): 2018	0.10 % to 6.0 %
		Silicon	ASTM E351,sec 46-52 ,: 2013	0.10 % to 6.0 %
		Silicon	ASTM E1999: 2018	1.2 % to 3.5 %
		Sulphur	ASTM E1999: 2018	0.01 % to 0.1 %
		Sulphur	ASTM E1019: 2018	0.05 % to 0.25 %

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7.	**Ferritic Steel**	Carbon	IS 9879: 2015	0.095 % to 0.30 %
		Chromium	IS 9879: 2015	9.0 % to 24 %
		Copper	IS 9879: 2015	0.05 % to 0.5 %
		Hydrogen	ASTM E1019: 2018	0.00054 % to 0.001 %
		Manganese	IS 9879: 2015	0.38 % to 1.0 %
		Molybdenum	IS 9879: 2015	0.66 % to 1.0 %
		Nickel	IS 9879: 2015	0.25 % to 2.0 %
		Nitrogen	ASTM E1019: 2018	0.0047 % to 0.11 %
		Oxygen	ASTM E1019: 2018	0.0028 % to 0.022 %
		Phosphorus	IS 9879: 2015	0.015 % to 0.03 %
		Silicon	IS 9879: 2015	0.3 % to 1.0 %
		Sulphur	IS 9879: 2015	0.02 % to 0.03 %
8.	**Iron & its Alloys**	Chromium	ASTM E1476: 2014	Qualitative
		Manganese	ASTM E1476: 2014	Qualitative
		Molybdenum	ASTM E1476: 2014	Qualitative
		Nickel	ASTM E1476: 2014	Qualitative
		Niobium	ASTM E1476: 2014	Qualitative
		Titanium	ASTM E1476: 2014	Qualitative
		Vanadium	ASTM E1476: 2014	Qualitative
9.	**Stainless Steel**	Manganese	ASTM E1086: 2014	0.27 % to 12.0 %
10.	**Austenitic Stainless Steel**	Hydrogen	ASTM E1019: 2018	0.00054 % to 0.001%
		Nitrogen	ASTM E1019: 2018	0.0047 % to 0.11 %
		Oxygen	ASTM E1019: 2018	0.0028 % to 0.022 %
11.	**Stainless Steel**	Carbon	ASTM E1086: 2014	0.01 % to 0.9 %
		Carbon	ASTM E1019: 2018	0.010 % to 0.15 %
		Chromium	ASTM E353, sec 212-220, By Wet :2014	12 % to 35.00 %
		Chromium	ASTM E1086: 2014	15 % to 26 %
		Copper	ASTM E1086: 2014	0.0091 % to 0.9 %
		Copper	ASTM E353, sec 82- 89,By AAS: 2014	0.010 % to 5.0 %
		Manganese	ASTM E353 ,By AAS):	0.10 % to 2.0 %

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
			2014	
		Molybdenum	ASTM E 353, sec 190-201, By AAS:2014	0.10 % to 1.5 %
		Molybdenum	ASTM E1086: 2014	0.014 % to 10.0 %
		Nickel	ASTM E1086: 2014	2.77 % to 26.0 %
		Nickel	ASTM E353, sec 172-179 ,By Wet):2014	0.10 % to 48.0 %
		Phosphorus	ASTM E353 ,sec 164-171: 2014	0.02 % to 0.35 %
		Phosphorus	ASTM E1086: 2014	0.0041 % to 0.1 %
		Silicon	ASTM E1086: 2014	0.27 % to 2.0 %
		Silicon	ASTM E353, sec 46- 52: 2014	0.20 % to 4.0 %
		Sulphur	ASTM E1019: 2018	0.010 % to 0.3 %
		Sulphur	ASTM E1086: 2014	0.005 % to 0.2 %
12.	**(Non-Ferrous) Titanium & Its Alloys**	Aluminium	WI/CHE/03 Issue No 03 Feb 02: 2018	0.005 % to 7.0 %
		Carbon	WI/CHE/03 Issue No 03 Feb 02: 2018	0.01 % to 0.012 %
		Copper	WI/CHE/03 Issue No 03 Feb 02: 2018	0.001 % to 0.02 %
		Hydrogen	ASTM E1447: 2016	0.001 % to 0.02 %
		Iron	WI/CHE/03 Issue No 03 Feb 02: 2018	0.15 % to 2.21 %
		Iron	ASTM E1476: 2014	Qualitative
		Manganese	WI/CHE/03 Issue No 03 Feb 02: 2018	0.001 % to 0.04 %
		Molybdenum	WI/CHE/03 Issue No 03 Feb 02: 2018	0.001 % to 1.23 %
		Molybdenum	ASTM E1476: 2014	Qualitative
		Nitrogen	ASTM E1409: 2013	0.003 % to 0.036 %

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
		Oxygen	ASTM E1409: 2013	0.05 % to 0.2 %
		Silicon	WI/CHE/03 Issue No 03 Feb 02: 2018	0.001 % to 0.3 %
		Tungsten	WI/CHE/03 Issue No 03 Feb 02: 2018	0.002 % to 0.38 %
		Vanadium	WI/CHE/03 Issue No 03 Feb 02: 2018	0.005 % to 4.10 %
		Vanadium	ASTM E1476: 2014	Qualitative
V.	**PAINTS & SURFACE COATING**			
1.	**Resistance to Household Chemicals**	Resistance to Household Chemicals	ASTM D1308: 2013	Qualitative
2.	**Water Resistance**	Water Resistance	ASTM D870:2015	Qualitative
		Water Resistance	ASTM D1735:2014	Qualitative
		Water Resistance	ASTN D 2247:2015	Qualitative
		Water Resistance	ASTM D4585/D4585M: 2018	Qualitative
VI.	**PLASTIC & RESINS**			
1.	**Plastics & Polymers**	Ash Content	ASTM D5630: 2013	0.2 % to 80 %
		Flammability	UL 94: 2017	Qualitative :HB, V0 to V2
2.	**Resins**	Ash Content	ASTM D5630: 2013	0.2 % to 80 %
		Flammability	UL 94: 2017	Qualitative :HB, V0 to V2
VII.	**RUBBER & RUBBER PRODUCTS**			
1.	**Rubber Products**	Ash Content	IS 3400 (Part 22):2013	0.2 % to 70.0 %
		Polymer Identification	IS 3400 (Part 22):2013	Qualitative

MECHANICAL TESTING

Sl.	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 METALS**			
1.	**Ferrous Material, Alloys & Products**	Charpy Impact U notch (Temp : - 196Â°C to 30 Â° C)	IS 1499: 2015	2 J to 240 J
		Case Depth by hardness Traverse method	IS 6416: 2018	0.01 mm to 25 mm
		Charpy Impact U notch (Temp : - 196Â°C to 30 Â° C)	ASTM E 23: 2016	2 J to 240 J
		Charpy Impact U notch (Temp : - 196Â°C to 30 Â° C)	EN ISO 148 (Part 1):2016	2 J to 240 J
		Charpy Impact V notch (Temp : - 196Â°C to 30 Â°C)	IS 1757 Part 1: 2014	2 J to 240 J
		Charpy Impact V notch (Temp : - 196Â°C to 30 Â°C)	ASTM E 23: 2016	2 J to 240 J
		Charpy Impact V notch	ASTM A 370: 2017	2 J to 240 J

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
		(Temp : - 196Â°C to 30 Â°C)		
		Charpy Impact V notch (Temp : - 196Â°C to 30 Â°C)	EN ISO 148 (Part 1):2016	2 J to 240 J
		Hardness by Brinell method (HBW 10/3000)	IS 1500 (Part 1): 2013	100 HBW to 450 HBW
		Hardness by Brinell method (HBW 10/3000)	ASTM E 10: 2017	100 HBW to 450 HBW
		Hardness by Brinell method (HBW 10/3000)	ISO 6506 (Part 1):2014	100 HBW to 450 HBW
		Hardness by Brinell method (HBW 2.5/187.5)	IS 1500 (Part 1): 2013	100 HBW to 450 HBW
		Hardness by Brinell method (HBW 2.5/187.5)	ASTM E 10: 2017	100 HBW to 450 HBW
		Hardness by Brinell method (HBW 2.5/187.5)	ISO 6506 (Part 1):2014	100 HBW to 450 HBW
		Hardness by Brinell method (HBW 5/750)	IS 1500 (Part 1): 2013	100 HBW to 450 HBW
		Hardness by Brinell method (HBW 5/750)	ASTM E 10: 2017	100 HBW to 450 HBW
		Hardness by Brinell method (HBW 5/750)	ISO 6506 (Part 1):2014	100 HBW to 450 HBW
		Izod Impact	IS 1598: 2015	4 J to 168 J
		Jominy end quench hardenability (Distance 1.5mmto 55mm)	IS 3848: 2009	20 HRC to 65 HRC
		Jominy end quench hardenability (Distance 1.5mmto 60mm)	ASTM A 255: 2014	20 HRC to 65 HRC
		Rockwell Hardness HRA	IS 1586 (Part 1): 2018	20 HRA to 90 HRA
		Rockwell Hardness HRA	ISO 6508 (Part 1):2016	20 HRA to 90 HRA
		Rockwell Hardness HRA	ASTM E 18: 2017	20 HRA to 90 HRA

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
		Rockwell Hardness HRBW	IS 1586 (Part 1): 2018	20 HRBW to 100 HRBW
		Rockwell Hardness HRBW	ISO 6508 (Part 1):2016	20 HRBW to 100 HRBW
		Rockwell Hardness HRBW	ASTM E 18: 2017	20 HRBW to 100 HRBW
		Rockwell Hardness HRC	IS 1586 (Part 1): 2018	20 HRC to 65 HRC
		Rockwell Hardness HRC	ISO 6508 (Part 1):2014	20 HRC to 65 HRC
		Rockwell Hardness HRC	ASTM E 18: 2017	20 HRC to 65 HRC
		Superficial Hardness HR 15N	IS 1586 (Part 1): 2018	70 HRN to 94 HRN
		Superficial Hardness HR 15N	ISO 6508 (Part 1):2016	70 HRN to 94 HRN
		Superficial Hardness HR 15N	ASTM E 18: 2017	70 HRN to 94 HRN
		Superficial Hardness HR 15TW	IS 1586 (Part 1): 2018	67 HRTW to 93 HRTW
		Superficial Hardness HR 15TW	ISO 6508 (Part 1):2016	67 HRTW to 93 HRTW
		Superficial Hardness HR 15TW	ASTM E 18: 2017	67 HRTW to 93 HRTW
		Superficial Hardness HR 30N	IS 1586 (Part 1): 2018	42 HRN to 86 HRN
		Superficial Hardness HR 30N	ISO 6508 (Part 1):2016	42 HRN to 86 HRN
		Superficial Hardness HR 30N	ASTM E 18: 2017	42 HRN to 86 HRN
		Superficial Hardness HR 30TW	IS 1586 (Part 1): 2018	29 HRTW to 82 HRTW
		Superficial Hardness HR 30TW	ISO 6508 (Part 1):2016	29 HRTW to 82 HRTW
		Superficial Hardness HR 30TW	ASTM E 18: 2017	29 HRTW to 82 HRTW

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
		Superficial Hardness HR 45N	IS 1586 (Part 1): 2018	25 HRN to 67 HRN
		Superficial Hardness HR 45N	ISO 6508 (Part 1):2016	25 HRN to 67 HRN
		Superficial Hardness HR 45N	ASTM E 18: 2017	25 HRN to 67 HRN
		Superficial Hardness HR 45TW	IS 1586 (Part 1): 2018	41 HRTW to 71 HRTW
		Superficial Hardness HR 45TW	ISO 6508 (Part 1):2016	41 HRTW to 71 HRTW
		Superficial Hardness HR 45TW	ASTM E 18: 2017	41 HRTW to 71 HRTW
2.	**Ferrous Materials, Alloys & Products, Welds & Welded Products**	Micro Vickers Hardness (HV 0.1)	IS 1501 (Part 1): 2013	50 HV to 1200 HV
		Micro Vickers Hardness (HV 0.1)	ASTM E 92: 2017	50 HV to 1200 HV
		Micro Vickers Hardness (HV 0.1)	ASTM E 384: 2017	50 HV to 1200 HV
		Micro Vickers Hardness (HV 0.1)	ISO 9015 (Part 2):2011	50 HV to 1200 HV
		Micro Vickers Hardness (HV 0.2)	IS 1501 (Part 1): 2013	50 HV to 1200 HV
		Micro Vickers Hardness (HV 0.2)	ASTM E 92: 2017	50 HV to 1200 HV
		Micro Vickers Hardness (HV 0.2)	ASTM E 384: 2017	50 HV to 1200 HV
		Micro Vickers Hardness (HV 0.2)	ISO 9015 (Part 2): 2011	50 HV to 1200 HV
		Micro Vickers Hardness (HV 0.3)	IS 1501 (Part 1): 2013	50 HV to 1200 HV
		Micro Vickers Hardness (HV 0.3)	ASTM E 92: 2017	50 HV to 1200 HV
		Micro Vickers Hardness	ASTM E 384: 2017	50 HV to 1200 HV

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
		(HV 0.3)		
		Micro Vickers Hardness (HV 0.3)	ISO 9015 (Part 2):2011	50 HV to 1200 HV
		Micro Vickers Hardness (HV 0.5)	IS 1501 (Part 1): 2013	50 HV to 1200 HV
		Micro Vickers Hardness (HV 0.5)	ASTM E 92: 2017	50 HV to 1200 HV
		Micro Vickers Hardness (HV 0.5)	ASTM E 384: 2017	50 HV to 1200 HV
		Micro Vickers Hardness (HV 0.5)	ISO 9015 (Part 2):2011	50 HV to 1200 HV
		Micro Vickers Hardness (HV 1)	IS 1501 (Part 1): 2013	50 HV to 1200 HV
		Micro Vickers Hardness (HV 1)	ASTM E 92: 2017	50 HV to 1200 HV
		Micro Vickers Hardness (HV 1)	ASTM E 384: 2017	50 HV to 1200 HV
		Micro Vickers Hardness (HV 1)	ISO 9015 (Part 2):2011	50 HV to 1200 HV
		Vickers Hardness (HV 10)	ISO 1501 (Part 1):2013	50 HV to 700 HV
		Vickers Hardness (HV 10)	ISO 6507 (Part 1):2018	50 HV to 700 HV
		Vickers Hardness (HV 10)	ASTM E 92: 2017	50 HV to 700 HV
		Vickers Hardness (HV 10)	ISO 9015 (Part 1):2011	50 HV to 700 HV
		Vickers Hardness (HV 30)	IS 1501 (Part 1): 2013	50 HV to 700 HV
		Vickers Hardness (HV 30)	ISO 6507 (Part 1):2018	50 HV to 700 HV
		Vickers Hardness (HV 30)	ASTM E 92: 2017	50 HV to 700 HV
		Vickers Hardness (HV 30)	ISO 9015 (Part 1):2011	50 HV to 700 HV
		Vickers Hardness (HV 5)	IS 1501 (Part 1): 2013	50 HV to 700 HV
		Vickers Hardness (HV 5)	ISO 6507 (Part 1):2018	50 HV to 700 HV
		Vickers Hardness (HV 5)	ASTM E 92: 2017	50 HV to 700 HV
		Vickers Hardness (HV 5)	ISO 9015 (Part 1):2011	50 HV to 700 HV
3.	**Reinforced**	Rebend Test	IS 1786: 2013	Qualitative

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
	Deformed Steel Bar			Angle of Bend 135Â°, Angle of Rebend 157.5Â°. Bar Size in "mm". Dia 6 to 38.Mandrel size in mm Dia. 24-304
4.	**Steel Plates**	Through thickness test- % of reduction in area	ASTM A 370: 2017	10 % to 90 %
		Through Thickness test-% of reduction area	ASTM A 770: 2018	10 % to 90 %
5.	**Steel, Pipes, Tubes**	Bend Test	IS 2329: 2017	Qualitative OD in "mm". 10 to 61.Mandrel size in mm Dia,120-732
		Bend Test	ASTM A 370: 2017	Qualitative OD in "mm". 10 to 61.Mandrel size in mm Dia,120-732
		Crushing Strength	IS 3601: 2017	Qualitative :Visual Inspection
		Drift Expansion	IS 2335: 2017	Qualitative Angle : 45Â° & 60Â°, OD in"mm". 10 to 150
		Drift Expansion Test	ISO 8493: 2014	Qualitative Angle : 45Â° & 60Â°, OD in"mm". 10 to 150
		Flanging Test	IS 2330: 2017	Qualitative OD in "mm". 10 to 100
		Flanging Test	ASTM A 370: 2017	Qualitative OD in "mm". 10 to 100
		Flaring Test	ASTM A 370: 2017	Qualitative OD in "mm". 10 to 150
		Flattening Test	IS 2328: 2018	Qualitative

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
				OD in "mm".6 to 660
		Flattening Test	ASTM A 370: 2017	Qualitative OD in "mm". 6 to 660
		Flattening Test	ISO 8492: 2013	Qualitative OD in "mm". 6 to 660
6.	**Threaded Fasteners (Nut)**	Proof Load	IS 1367 (Part 6): 2015	Qualitative :5 KN to 600 KN (Fasteners Size : M6 to M39)
		Proof Load	ASTM A 370: 2017	Qualitative :5 KN to 600 KN (Fasteners Size : M6 to M39)
		Proof Load	ISO 898 (Part 2):2012	Qualitative :5 KN to 600 KN (Fasteners Size :M6 to M39)
7.	**Non-Ferrous Metals, Alloys & Products**	Hardness by Brinell method (HBW 2.5/187.5)	IS 1500 (Part 1): 2013	100 HBW to 450 HBW
		Hardness by Brinell method (HBW 2.5/187.5)	ASTM E 10: 2017	100 HBW to 450 HBW
		Hardness by Brinell method (HBW 2.5/187.5)	ISO 6506 (Part 1):2014	100 HBW to 450 HBW
		Rockwell Hardness HRBW	IS 1586 (Part 1): 2018	20 HRBW to 100 HRBW
		Rockwell Hardness HRBW	ISO 6508 (Part 1):2016	20 HRBW to 100 HRBW
		Rockwell Hardness HRBW	ASTM E 18: 2017	20 HRBW to 100 HRBW
		Superficial Hardness HR 15TW	IS 1586 (Part 1): 2018	67 HRTW to 93 HRTW
		Superficial Hardness HR 15TW	ISO 6508 (Part 1):2016	67 HRTW to 93 HRTW
		Superficial Hardness HR 15TW	ASTM E 18: 2017	67 HRTW to 93 HRTW

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
		Superficial Hardness HR 30TW	IS 1586 (Part 1): 2018	29 HRTW to 82 HRTW
		Superficial Hardness HR 30TW	ISO 6508 (Part 1):2016	29 HRTW to 82 HRTW
		Superficial Hardness HR 30TW	ASTM E 18: 2017	29 HRTW to 82 HRTW
		Superficial Hardness HR 45TW	IS 1586 (Part 1): 2018	41 HRTW to 71 HRTW
		Superficial Hardness HR 45TW	ISO 6508 (Part 1):2016	41 HRTW to 71 HRTW
		Superficial Hardness HR 45TW	ASTM E 18: 2017	41 HRTW to 71 HRTW
8.	**Non-Ferrous Metals, Alloys & Products, Welds & Welded Products**	Micro Vickers Hardness (HV 0.1)	IS 1501 (Part 1): 2013	50 HV to 1200 HV
		Micro Vickers Hardness (HV 0.1)	ASTM E 92: 2017	50 HV to 1200 HV
		Micro Vickers Hardness (HV 0.1)	ASTM E 384: 2017	50 HV to 1200 HV
		Micro Vickers Hardness (HV 0.1)	ISO 9015 (Part 2):2011	50 HV to 1200 HV
		Micro Vickers Hardness (HV 0.2)	IS 1501 (Part 1): 2013	50 HV to 1200 HV
		Micro Vickers Hardness (HV 0.2)	ASTM E 92: 2017	50 HV to 1200 HV
		Micro Vickers Hardness (HV 0.2)	ASTM E 384: 2017	50 HV to 1200 HV
		Micro Vickers Hardness (HV 0.2)	ISO 9015 (Part 2):2011	50 HV to 1200 HV
		Micro Vickers Hardness (HV 0.3)	IS 1501 (Part 1): 2013	50 HV to 1200 HV
		Micro Vickers Hardness (HV 0.3)	ASTM E 92: 2017	50 HV to 1200 HV
		Micro Vickers Hardness	ASTM E 384: 2017	50 HV to 1200 HV

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
		(HV 0.3)		
		Micro Vickers Hardness (HV 0.3)	ISO 9015 (Part 2):2011	50 HV to 1200 HV
		Micro Vickers Hardness (HV 0.5)	IS 1501 (Part 1): 2013	50 HV to 1200 HV
		Micro Vickers Hardness (HV 0.5)	ASTM E 92: 2017	50 HV to 1200 HV
		Micro Vickers Hardness (HV 0.5)	ASTM E 384: 2017	50 HV to 1200 HV
		Micro Vickers Hardness (HV 0.5)	ISO 9015 (Part 2):2011	50 HV to 1200 HV
		Micro Vickers Hardness (HV 1)	IS 1501 (Part 1): 2013	50 HV to 1200 HV
		Micro Vickers Hardness (HV 1)	ASTM E 92: 2017	50 HV to 1200 HV
		Micro Vickers Hardness (HV 1)	ASTM E 384: 2017	50 HV to 1200 HV
		Micro Vickers Hardness (HV 1)	ISO 9015 (Part 2):2011	50 HV to 1200 HV
		Vickers Hardness (HV 10)	IS 1501 (Part 1): 2013	50 HV to 700 HV
		Vickers Hardness (HV 10)	ISO 6507 (Part 1):2018	50 HV to 700 HV
		Vickers Hardness (HV 10)	ASTM E 92: 2017	50 HV to 700 HV
		Vickers Hardness (HV 10)	ISO 9015 (Part 1):2011	50 HV to 700 HV
		Vickers Hardness (HV 30)	IS 1501 (Part 1): 2013	50 HV to 700 HV
		Vickers Hardness (HV 30)	ISO 6507 (Part 1): 2018	50 HV to 700 HV
		Vickers Hardness (HV 30)	ASTM E 92:2017	50 HV to 700 HV
		Vickers Hardness (HV 30)	ISO 9015 (Part 1):2011	50 HV to 700 HV
		Vickers Hardness (HV 5)	IS 1501 (Part 1): 2013	50 HV to 700 HV
		Vickers Hardness (HV 5)	ISO 6507 (Part 1):2018	50 HV to 700 HV
		Vickers Hardness (HV 5)	ASTM E 92: 2017	50 HV to 700 HV
		Vickers Hardness (HV 5)	ISO 9015 (Part 1):2011	50 HV to 700 HV
		Micro Vickers Hardness	IS 1501 (Part 1): 2013	50 HV to 1200 HV

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
		(HV 0.05)		
		Micro Vickers Hardness (HV 0.05)	ASTM E 92: 2017	50 HV to 1200 HV
		Micro Vickers Hardness (HV 0.05)	ASTM E 384: 2017	50 HV to 1200 HV
		Micro Vickers Hardness (HV 0.05)	ISO 9015 (Part 2):2011	50 HV to 1200 HV
9.	**Ferrous Materials, Alloys & Products, Welds and Welded Products**	Micro Vickers Hardness (HV 0.05)	IS 1501 (Part 1): 2013	50 HV to 1200 HV
		Micro Vickers Hardness (HV 0.05)	ASTM E 92: 2017	50 HV to 1200 HV
		Micro Vickers Hardness (HV 0.05)	ASTM E 384: 2017	50 HV to 1200 HV
		Micro Vickers Hardness (HV 0.05)	ISO 9015 (Part 2):2011	50 HV to 1200 HV
10.	**Steels, Reinforced Deformed Steel Bar, Cast Iron, Welds & Welded Test Specimens, Aluminium Materials, Alloys & Products, Copper Materials, Alloys & Products and Other Non Ferrous Metals, Alloys and Products (Nickel, Titanium)**	Bend Test	IS 1599 : 2017	Qualitative :Angle of Bend 90Â°,180Â°.Mandrel Size in "mm". Dia 10, 12, 16, 20, 24,28, 32, 40, 50, 84upto 130
		Bend Test	ASTM A 370: 2017	Qualitative Angle of Bend 90Â°, 180Â°.Mandrel size in "mm". Dia 10, 12, 16, 20, 24,28, 32, 40, 50 ,84upto 130
		Bend Test	ASTM E 290: 2014	Qualitative Angle of Bend 90Â°, 180Â°.Mandrel Size in "mm". Dia 10, 12, 16, 20, 24,28, 32, 40, 50,84 upto130

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
		Bend Test	EN ISO 5173: 2011	Qualitative Angle of Bend 90Â°, 180Â°.Mandrel Size in "mm". Dia 10, 12, 16, 20, 24,28, 32, 40, 50 ,84upto 130
		Tensile Test (Elongation) : Load 1 KN to 580 KN	IS 1608 (Part 1): 2018	2 % to 80 %
		Tensile Test (Elongation) : Load 1 KN to 580 KN	ASTM A 370: 2017	2 % to 80 %
		Tensile Test (Elongation) : Load 1 KN to 580 KN	ASTM E8/8M: 2016	2 % to 80 %
		Tensile Test (Elongation) : Load 1 KN to 580 KN	ISO 6892 (Part 1):2016	2 % to 80 %
		Tensile Test (Elongation) : Load 1 KN to 580 KN	ISO 898 (Part 1):2013	2 % to 80 %
		Tensile Test (Reduction Area) : Load 1 KN to 580 KN	IS 1608 (Part 1): 2018	2 % to 90 %
		Tensile Test (Reduction Area) : Load 1 KN to 580 KN	ASTM A 370: 2017	2 % to 90 %
		Tensile Test (Reduction Area) : Load 1 KN to 580 KN	ASTM E8/8M: 2016	2 % to 90 %
		Tensile Test (Reduction Area) : Load 1 KN to 580 KN	ISO 6892 (Part 1):2016	2 % to 90 %
		Tensile Test (Reduction Area) : Load 1 KN to 580 KN	ISO 898 (Part 1):2013	2 % to 90 %
		Tensile Test (Ultimate Tensile Strength) : Load 1	ASTM A 370: 2017	30 MPa to 1700 MPa

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
		KN to 580 KN		
		Tensile Test (Ultimate Tensile Strength) : Load 1 KN to 580 KN	IS 1608 (Part 1): 2018	30 MPa to 1700 MPa
		Tensile Test (Ultimate Tensile Strength) : Load 1 KN to 580 KN	ASTM E8/8M: 2016	30 MPa to 1700 MPa
		Tensile Test (Ultimate Tensile Strength) : Load 1 KN to 580 KN	ISO 6892 (Part 1):2016	30 MPa to 1700 MPa
		Tensile Test (Ultimate Tensile Strength) : Load 1 KN to 580 KN	EN ISO 4136: 2012	30 MPa to 1700 MPa
		Tensile Test (Ultimate Tensile Strength) : Load 1 KN to 580 KN	ISO 898 (Part 1):2013	30 MPa to 1700 MPa
		Tensile Test (Ultimate Tensile Strength) : Load 1 KN to 580 KN	ASME SEC IX: 2017	30 MPa to 1700 MPa
		Tensile Test (Yield Stress : 0.01% to 1% Proof Stress) : Load 1 KN to 580 KN	IS 1608 (Part 1): 2018	50 MPa to 1500 MPa
		Tensile Test (Yield Stress 0.01% to 1% Proof Stress) : Load : 1 KN to 580 KN	ASTM A 370: 2017	50 MPa to 1500 MPa
		Tensile Test (Yield Stress 0.01% to 1% Proof Stress) : Load : 1 KN to 580 KN	ASTM E8/8M: 2016	50 MPa to 1500 MPa
		Tensile Test (Yield Stress	EN ISO 4136: 2012	50 MPa to 1500 MPa

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
		0.01% to 1% Proof Stress) : Load 1 KN to 580 KN		
		Tensile Test (Yield Stress 0.01% to 1% Proof Stress) : Load 1 KN to 580 KN	ISO 898 (Part 1):2013	50 MPa to 1500 MPa
		Tensile Test (Yield Stress 0.01% to 1% Proof Stress) : Load 1 KN to 580 KN)	ISO 6892 (Part 1):2016	50 MPa to 1500 MPa
		Tensile Test (Yield Stress) : Load 1 KN to 580 KN	ASME SEC IX: 2017	50 MPa to 1500 MPa
		Tensile Test at elevated temperature (Elongation) : Load 1 KN to 250 KN	ASTM E 21: 2017	2 % to 80 %
		Tensile test at elevated temperature (Elongation) : Load 1 KN to 250 KN	ISO 6892 (Part 2):2018	2 % to 80 %
		Tensile Test at elevated temperature (Reduction area) : Load 1 KN to 250 KN	ASTM E 21: 2017	2 % to 90 %
		Tensile Test at elevated temperature (Reduction Area) : Load 1 KN to 250 KN	ISO 6892 (Part 2):2018	2 % to 90 %
		Tensile Test at elevated temperature (Ultimate Tensile Strength) : Load 1 KN to 250 KN	ASTM E 21: 2017	30 MPa to 1700 MPa
		Tensile Test at elevated	ISO 6892 (Part 2):2018	30 MPa to 1700 MPa

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
		temperature (Ultimate Tensile Strength) : Load 1 KN to 250 KN		
		Tensile Test at elevated temperature (Yield Stress 0.01% to 1% Proof Stress) : Load 1 KN to 250 KN	ASTM E 21: 2017	50 MPa to 1500 MPa
		Tensile Test at elevated temperature (Yield Stress 0.01% to 1% Proof Stress) : Load 1 KN to 250 KN)	ISO 6892 (Part 2):2018	50 MPa to 1500 MPa
II.	**METALLOGRAPHY TEST**			
1.	**Ferrous Materials, Alloys & Products**	Distribution of Graphite Type & size by comparison method	IS 7754: 2012	Qualitative:Magnification : 100X
		Distribution of Graphite Type & size by comparison method	ASTM A 247: 2016	Qualitative:Magnification : 100X
		Distribution of Graphite Type & size by comparison method	ISO 945 (Part 1):2008	Qualitative Magnification : 100X
2.	**Ferrous Materials, Alloys & Products (Austenitic Stainless Steel)**	Resistance to inter granular corrosion test practice " A " by comparison method	ASTM A 262: 2015	Qualitative Magnification : 250 X & 500 X
		Resistance to inter granular corrosion test practice " B "	ASTM A 262: 2015	0.1 mpy to 100 mpy
		Resistance to inter granular corrosion test	ASTM A 262: 2015	0.1 mpy to 100 mpy

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
		practice " C "		
		Resistance to inter granular corrosion test practice " E "	ASTM A 262: 2015	Qualitative :Bend Angle : 180Â°/1TMagnification: 20X
		Resistance to inter granular corrosion test practice " F "	ASTM A 262: 2015	0.1 mpy to 100 mpy
3.	**Ferrous Materials, Alloys & Products (Bearing Steels)**	Carbide rating by comparison method	SEP 1520: 1998	Qualitative Magnification : 100 X to 1000 X
4.	**Ferrous Materials, Alloys & Products (Duplex, Austenite- Ferrite & Stainless Steel)**	Detecting presence of detrimental intermetalic phases by comparison method	ASTM A 923: 2014	Qualitative Magnification : 400 X & 500 X
5.	**Ferrous Materials, Alloys & Products (Stainless Steel)**	Ferrite Content and FN number by ferrite scope (0.1 FN to 110 FN)	ASTM A 800/800 M: 2014	0.1 FN to 110 FN
6.	**Ferrous Materials, Alloys & Products (Stainless Steels & Duplex Steels Related Alloys)**	Pitting and crevice corrosion test (Magnification : 20 X max, Practice A,B,C,D, E & F)	ASTM G 48: 2015	0.0003 gm/cmÂ² to 75 gm/cmÂ²
7.	**Ferrous Materials, Alloys & Products (Steel & Stainless Steel)**	Estimation of Average grain size by comparison, intercept and plainimetic method (Microscope)	ASTM E 112: 2013	Qualitative Magnification : 100X
		Estimation of Average grain size by comparison, intercept and plainimetic method (Microscope)	IS 4748: 2012	Qualitative Magnification : 100X
		Estimation of Average grain size by comparison,	EN ISO 643: 2012	Qualitative Magnification : 100X

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
		intercept and plainimetic method (Microscope)		
8.	**Ferrous Materials, Alloys & Products (Steel Bars, Billets, Blooms, Forging Of Carbon & Low Alloy Steel Castings, Sheets, Plates) Welds & Welded Test Specimens**	Macro Structure Analysis	ASTM E 381: 2017	Qualitative Magnification: 5 X to 45 X
		Macro Structure Analysis	IS 11371: 2007	Qualitative Magnification: 5 X to 45 X
		Macro Structure Analysis	IS 13015: 2018	Qualitative Magnification: 5 X to 45 X
9.	**Ferrous Materials, Alloys & Products (Steel)**	Case depth measurement by microscopic method (Magnification : 100X)	IS 6416 : 2012	0.01 mm to 3 mm
		Determination of Depth of Decarburization (Magnification : 100 X to 1000X)	IS 6396: 2018	0.01 mm to 3 mm
		Determination of Depth of Decarburizaton (Magnification : 100 X to 1000 X)	ASTM E 1077: 2014	0.01 mm to 3 mm
10.	**Ferrous Materials, Alloys & Products (Steel, Welds & Welded Test Specimens)**	Micro Structure Analysis	ASM Handbook Vol 9: 2004	Qualitative :Magnification : 50X, 200X, 500X & 1000X
		Micro Structure Analysis	ASTM E 407:2015	Qualitative Magnification : 50X, 200X, 500X & 1000X
		Micro Structure Analysis	IS 7739 (Part 1, 2, 5):2010	Qualitative Magnification : 50X, 200X, 500X & 1000X

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
11.	**Ferrous Materials, Alloys & Products (Steels, Reinforced Deformed Steel Bar, Cast Iron)**	Determination of coating thickness by duloscope	ASTM B 499: 2014	2 Âµm to 500 Âµm
		Determination of Coating thickness by microscopic method (Magnification : 1000X max)	IS 3203 : 2014	2 Âµm to 500 Âµm
12.	**Ferrous Materials, Alloys & Products (Wrought Nickel, Rich Chromiumbearing Alloys)**	Ferric Sulfate-Sulfuric Acid Test, Practice A	ASTM G 28: 2015	0.1 mpy to 100 mpy
		Mixed Acid-Oxidizing Salt Test, Practice B	ASTM G 28: 2015	0.1 mpy to 100 mpy
13.	**Ferrous materials, alloys & products (Wrought Steels)**	Determination of inclusion rating by method "A" to "D"	ASTM E 45: 2018	Qualitative :Thin & Heavy (A, B, C & D :0.5 to 3)Magnification : 100X
		Determination of inclusion rating by method "A" to "D"	IS 4163: 2012	Qualitative :Thin & Heavy (A, B, C & D :0.5 to 3)Magnification : 100X
		Determination of inclusion rating by method "A" to "D"	DIN 50602: 2009	Qualitative :Thin & Heavy (A, B, C & D :0.5 to 3)Magnification : 100X
14.	**Ferrous Materials, Alloys & Products, Non Ferrous Material, Alloys & Products, Welds & Welded Products**	Determination of Volume Fraction	ASTM E 562: 2011	1 % to 95 %
		Macro Structure Analysis	ASME Sec IX: 2017	Qualitative Magnification: 5 X to 45 X
		Macro Structure Analysis	AWS D1.1: 2015	Qualitative Magnification: 5 X to 45 X
		Macro Structure Analysis	EN ISO 15614: 2017	Qualitative Magnification: 5 X to 45 X
		Macro Structure Analysis	ASTM E 340: 2015	Qualitative Magnification: 5 X to 45 X
		Macro Structure Analysis	EN 287 (Part 1): 2011	Qualitative Magnification: 5 X to 45 X

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
15.	**Non Ferrous Material, Alloys & Products, Welds & Welded Products**	Determination of coating thickness by duloscope	ASTM B499: 2014	2 Â Âµmto 500 Â Âµm
		Determination of coating thickness by microscopic method (Magnification : 1000X max)	IS 3203: 2014	2 Âµm to 500 Âµm
		Estimation of Average grain size by comparison, intercept and plainimetic method (Microscope)	ASTM E 112: 2013	Qualitative Magnification : 100X
		Estimation of Average grain size by comparison, intercept and plainimetic method (Microscope)	IS 4748: 2012	Qualitative Magnification : 100X
		Estimation of Average grain size by comparison, intercept and plainimetic method (Microscope)	EN ISO 643: 2012	Qualitative Magnification : 100X
		Micro Structure Analysis	ASM Handbook Vol 9: 2004	Qualitative Magnification : 50X, 200X, 500X & 1000X
		Micro Structure Analysis	ASTM E 407: 2015	Qualitative Magnification : 50X, 200X, 500X & 1000X
		Micro Structure Analysis	IS 7739 (Part 1 to 4, 6to 11): 2010	Qualitative Magnification : 50X, 200X, 500X & 1000X
16.	**Painted, Plated, Coated Panels & Products**	Determination of coating thickness by microscopic method (Magnification : 1000 X max)	IS 3203 : 2014	2 Âµm to 500 Âµm
		Dry Film Thickness	ASTM B 499: 2014	2 Âµm to 500 Âµm
17.	**Welds & Welded**	Determination of coating	IS 3203: 2014	2 Âµm to 500 Âµm

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
	Test Specimens	thickness by microscopic method (Magnification : 1000 X max)		
		Determination of coating thickness by dualoscope	ASTM B 499: 2014	2 Âµm to 500 Âµm
18.	**Painted, Plated, Coated Panels & Products**	Adhesion Test (Tape Test)	ASTM D 3359: 2017	Qualitative :Visual Inspection
		Adhesion Test (Tape Test)	ISO 2409 : 2013	Qualitative :Visual Inspection
		Conical Mandrel Bend Test	ASTM D 522/ASTM D 522M: 2017	Qualitative :Lever moving angle 180Â°Specimen bending angle 135Â°
		Gloss Test at 20Â°	ASTM D 523: 2018	10 GU to 90 GU
		Gloss Test at 60Â°	ASTM D 523: 2018	10 GU to 90 GU
		Impact Resistance	ASTM D 2794: 2010	Qualitative Visual Inspection
		Pencil Hardness	ASTM D 3363: 2011	Qualitative
III.	**PLASTICS AND PLASTIC PRODUCTS**			
1.	**Fibre Reinforced Plastic Products**	Barcol Hardness	ASTM D 2583: 2013	10to 80
		Specific Gravity	ASTM D 792: 2013	0.05to 4.0
		Tensile Strength	ASTM D 638: 2014	5 N/mmÂ² to 500 N/mmÂ²
		Tensile Strength	ASTM D 882: 2018	5 N/mmÂ² to 300 N/mmÂ²
		Tensile Strength	IS 10810 (Part 7):2016	5 N/mmÂ² to 300 N/mmÂ²
		Elongation at break	ASTM D 638: 2014	10 % to 500 %
		Elongation at Break	ASTM D 882: 2018	10 % to 500 %
		Elongation at Break	IS 10810 (Part 7):2016	10 % to 500 %

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
		Charpy Impact Strength	ASTM D 6110: 2018	10 J/mto 3000 J/m
		Compression Strength	ASTM D 695: 2015	5 N/mmÂ² to 500 N/mmÂ²
		Density	ASTM D 792: 2013	0.05 g/cc to 4.0 g/cc
		Flexural Strength	ASTM D 790: 2017	5 N/mmÂ² to 600 N/mmÂ²
		Hardness Shore D	ASTM D 2240: 2015	25 D to 95 D
		Izod impact strength	ASTM D 256:2010	10Jm to 3000Jm
		Lap Shear strength	BS 4994 :1987	5 N/mm2 to 200N/mm2
		Water Absorption	ASTM D 570: 2018	0.01 % to 10 %
2.	**Plastic Materials & Products**	Adhesive Strength	ASTM D 3330/ASTM D 3330M: 2010	5 N/mmto 300 N/mm
		Barcol Hardness	ASTM D 2583: 2013	10to 80
		Charpy Impact Strength	ASTM D 6110: 2018	10 J/mto 3000 J/m
		Compression Strength	ASTM D 695: 2015	5 N/mmÂ² to 500 N/mmÂ²
		Density	ASTM D 792: 2013	0.05 g/cc to 4.0 g/cc
		Elongation at break	ASTM D 638: 2014	10 % to 500 %
		Elongation at Break	ASTM D 882: 2018	10 % to 500 %
		Elongation at Break	IS 10810 (Part 7):2016	10 % to 500 %
		Flexural Strength	ASTM D 790: 2017	5 N/mmÂ² to 600 N/mmÂ²
		Hardness Shore A	ASTM D 2240: 2015	25 A to 95 A
		Hardness Shore D	ASTM D 2240: 2015	25 D to 95 D
		Heat Deflection Temperature	ASTM D 648: 2018	50 Â°C to 200 Â°C
		Izod Impact Strength	ASTM D 256: 2010	10 J/mto 3000 J/m
		Melt Flow Index	ASTM D 1238: 2013	0.1 g/10 min to 60 g/10 min
		Specific Gravity	ASTM D 792: 2013	0.05to 4.0
		Tensile Strength	ASTM D 638: 2014	5 N/mmÂ² to 500 N/mmÂ²
		Tensile Strength	ASTM D 882: 2018	5 N/mmÂ² to 300 N/mmÂ²

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
		Tensile Strength	IS 10810 (Part 7):2016	5 N/mmÂ² to 300 N/mmÂ²
		Vicat Softening Temperature	ASTM D 1525: 2017	50 Â°C to 200 Â°C
		Water Absorption	ASTM D 570: 2018	0.01 % to 10 %
IV.	**RUBBER AND RUBBER PRODUCTS**			
1.	**Rubber Products**	Accelerated Ageing at 40Â°C to 250Â°C	IS 3400 (Part 4): 2017	Qualitative
		Cold Resistance	IS 3400 (Part 18):2017	Qualitative 50Â°C to 0Â°C
		Compression Set	IS 3400 (Part 10):2013	5 % to 90 %
		Density	IS 3400 (Part 9): 2014	0.05 g/cc to 3.0 g/cc
		Dimensional Change of Rubber Product	IS 3400 (Part 6): 2017	-50 % to 150 %
		Elongation at Break	IS 3400 (Part 1): 2012	10 % to 900 %
		Hardness Shore A	ASTM D 2240: 2015	25 A to 95 A
		Hardness Shore A	IS 3400 (Part 23):2012	25 A to 95 A
		Ozone Resistance	IS 3400 (Part 20):2013	Qualitative :50 pphmto 250 pphm
		Resistance to Liquid	IS 3400 (Part 6): 2017	Qualitative
		Specific Gravity	IS 3400 (Part 9): 2014	0.05to 3.0
		Tear Strength	IS 3400 (Part 17):2013	5 Kg/cmto 500 Kg/cm
		Tensile Strength	IS 3400 (Part 1): 2012	1 N/mmÂ² to 30 N/mmÂ²
		Volume Change of Rubber Product	IS 3400 (Part 6): 2017	-50 % to 150 %
2.	**Others**	Elongation at break	IS10810 (part 7):1984	10 % to 900 %
		Tensile strength	IS 10810 (Part 7):1984	1 N/mmÂ² to 30 N/mmÂ²