Laboratory	**Om Metalab Services Pvt. Ltd., Plot No. 37, Tiny Industrial Co-op Estate Ltd., Undri-Pisoli Road, Kondhwa (BK), Pune, Maharashtra**
Accreditation Standard	**ISO/IEC 17025: 2005**
Certificate Number	**TC-7417** **Page 1 of 10**
Validity	**22.06.2018 to 21.06.2020** **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.	**METAL & ALLOYS**			
1.	**Low Alloy Steel**	Carbon	ASTME 415:2017 IS 8811:1998 (RA 2012) JIS G 1253 : 2013	0.020 % to 1.50 %
		Silicon	ASTME 415:2017 IS 8811:1998 (RA 2012) JIS G 1253 : 2013	0.050 % to 1.50 %
		Manganese	ASTME 415:2017 IS 8811:1998 (RA 2012) JIS G 1253 : 2013	0.030 % to 2.00 %
		Phosphorus	ASTME 415:2017 IS 8811:1998 (RA 2012) JIS G 1253 : 2013	0.006 % to 0.20 %
		Sulfur	ASTME 415:2017 IS 8811:1998 (RA 2012) JIS G 1253 : 2013	0.006 % to 0.30 %
		Chromium	ASTME 415:2017 IS 8811:1998 (RA 2012) JIS G 1253 : 2013	0.020 % to 3.50 %
		Molybdenum	ASTME 415:2017 IS 8811:1998 (RA 2012) JIS G 1253 : 2013	0.004 % to 1.0 %

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		Nickel	ASTME 415:2017 IS 8811:1998 (RA 2012) JIS G 1253 : 2013	0.010 % to 3.50 %
		Aluminium	ASTME 415:2017 IS 8811:1998 (RA 2012) JIS G 1253 : 2013	0.005 % to 0.40 %
		Cobalt	ASTME 415:2017 IS 8811:1998 (RA 2012) JIS G 1253 : 2013	0.006 % to 0.15 %
		Copper	ASTME 415:2017 IS 8811:1998 (RA 2012) JIS G 1253 : 2013	0.010 % to 1.0 %
		Vanadium	ASTME 415:2017 IS 8811:1998 (RA 2012) JIS G 1253 : 2013	0.001 % to 0.55 %
		Niobium	ASTME 415:2017 IS 8811:1998 (RA 2012) JIS G 1253 : 2013	0.003 % to 0.10 %
		Titanium	ASTME 415:2017 IS 8811:1998 (RA 2012) JIS G 1253 : 2013	0.005 % to 0.10 %
		Boron	ASTME 415:2017 IS 8811:1998 (RA 2012) JIS G 1253 : 2013	0.0003 % to 0.002 %

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		Tin	ASTME 415:2017 IS 8811:1998 (RA 2012) JIS G 1253 : 2013	0.005 % to 0.10 %
2.	**Stainless Steel**	Carbon	ASTM E 1086 :2014 IS 9879 : 1998 JIS G 1253 : 2013	0.015 % to 0.25 %
		Silicon	ASTM E 1086 :2014 IS 9879 : 1998 JIS G 1253 : 2013	0.17 % to 1.50 %
		Manganese	ASTM E 1086 :2014 IS 9879 : 1998 JIS G 1253 : 2013	0.10 % to 2.00 %
		Phosphorus	ASTM E 1086 :2014 IS 9879 : 1998 JIS G 1253 : 2013	0.005 % to 0.060 %
		Sulfur	ASTM E 1086 :2014 IS 9879 : 1998 JIS G 1253 : 2013	0.005 % to 0.050 %
		Chromium	ASTM E 1086 :2014 IS 9879 : 1998 JIS G 1253 : 2013	10.0 0 % to 26.00 %
		Molybdenum	ASTM E 1086 :2014 IS 9879 : 1998 JIS G 1253 : 2013	0.050 % to 4.00 %
		Nickel	ASTM E 1086 :2014 IS 9879 : 1998 JIS G 1253 : 2013	1.00 % to 25.00 %
		Aluminium	ASTM E 1086 :2014 IS 9879 : 1998 JIS G 1253 : 2013	0.005 % to 0.050 %
		Cobalt	ASTM E 1086 :2014 IS 9879 : 1998 JIS G 1253 : 2013	0.010 % to 0.25 %

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
		Copper	ASTM E 1086 :2014 IS 9879 : 1998 JIS G 1253 : 2013	0.010 % to 3.50 %
		Vanadium	ASTM E 1086 :2014 IS 9879 : 1998 JIS G 1253 : 2013	0.020 % to 0.35 %
		Niobium	ASTM E 1086 :2014 IS 9879 : 1998 JIS G 1253 : 2013	0.005 % to 1.00 %
		Titanium	ASTM E 1086 :2014 IS 9879 : 1998 JIS G 1253 : 2013	0.010 % to 0.50 %
		Lead	ASTM E 1086 :2014 IS 9879 : 1998 JIS G 1253 : 2013	0.002 % to 0.010 %
		Boron	ASTM E 1086 :2014 IS 9879 : 1998 JIS G 1253 : 2013	0.0006 % to 0.003 %
		Tin	ASTM E 1086 :2014 IS 9879 : 1998 JIS G 1253 : 2013	0.002 % to 0.020 %
		Tungsten	ASTM E 1086 :2014 IS 9879 : 1998 JIS G 1253 : 2013	0.050 % to 0.10 %
3.	**Cast Iron, Pig Iron, S G Iron**	Carbon	IS 15338: 2003 (RA 2013) JIS G 1253 : 2013	2.50 % to 4.50 %
		Silicon	IS 15338: 2003 (RA 2013) JIS G 1253 : 2013	1.70 % to 4.00 %
		Manganese	IS 15338: 2003 (RA 2013) JIS G 1253 : 2013	0.20 % to 1.00 %

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
		Phosphorus	IS 15338: 2003 (RA 2013) JIS G 1253 : 2013	0.010 % to 0.10 %
		Sulfur	IS 15338: 2003 (RA 2013) JIS G 1253 : 2013	0.008 % to 0.040 %
		Chromium	IS 15338: 2003 (RA 2013) JIS G 1253 : 2013	0.020 % to 0.25 %
		Molybdenum	IS 15338: 2003 (RA 2013) JIS G 1253 : 2013	0.010 % to 0.30 %
		Nickel	IS 15338: 2003 (RA 2013) JIS G 1253 : 2013	0.010 % to 0.35 %
		Cobalt	IS 15338: 2003 (RA 2013) JIS G 1253 : 2013	0.007 % to 0.020 %
		Copper	IS 15338: 2003 (RA 2013) JIS G 1253 : 2013	0.010 % to 0.60 %
		Titanium	IS 15338: 2003 (RA 2013) JIS G 1253 : 2013	0.005 % to 0.030 %
		Tin	IS 15338: 2003 (RA 2013) JIS G 1253 : 2013	0.010 % to 0.10 %
4.	**High Speed Tool steel**	Carbon	JIS G 1253 : 2002	0.50 % to 1.50 %
		Silicon	JIS G 1253 : 2002	0.005 % to 1.50 %
		Manganese	JIS G 1253 : 2002	0.10 % to 2.00 %
		Phosphorus	JIS G 1253 : 2002	0.005 % to 0.10 %
		Sulfur	JIS G 1253 : 2002	0.005 % to 0.10 %
		Chromium	JIS G 1253 : 2002	3.00 % to 6.00 %
		Molybdenum	JIS G 1253 : 2002	0.20 % to 10.00 %

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
		Cobalt	JIS G 1253 : 2002	0.10 % to 10.00 %
		Vanadium	JIS G 1253 : 2002	0.10 % to 2.00 %
		Tungsten	JIS G 1253 : 2002	0.10 % to 22.00 %
5.	**Aluminum & its Alloy**	Copper	ASTM E 1251 : 2011 IS 11035 : 1984 (RA 2014)	0.010 % to 13.00 %
		Magnesium	ASTM E 1251 : 2011 IS 11035 : 1984 (RA 2014)	0.005 % to 2.00 %
		Silicon	ASTM E 1251 : 2011 IS 11035 : 1984 (RA 2014)	0.10 % to 18.00 %
		Iron	ASTM E 1251 : 2011 IS 11035 : 1984 (RA 2014)	0.10 % to 1.20 %
		Manganese	ASTM E 1251 : 2011 IS 11035 : 1984 (RA 2014)	0.010 % to 0.60 %
		Nickel	ASTM E 1251 : 2011 IS 11035 : 1984 (RA 2014)	0.005 % to 3.00 %
		Zinc	ASTM E 1251 : 2011 IS 11035 : 1984 (RA 2014)	0.010 % to 1.50 %
		Lead	ASTM E 1251 : 2011 IS 11035 : 1984 (RA 2014)	0.005 % to 0.35 %
		Tin	ASTM E 1251 : 2011 IS 11035 : 1984 (RA 2014)	0.010 % to 0.25 %
		Titanium	ASTM E 1251 : 2011 IS 11035 : 1984 (RA 2014)	0.005 % to 0.30 %

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
		Chromium	ASTM E 1251 : 2011 IS 11035 : 1984 (RA 2014)	0.010 % to 0.50 %
6.	**Copper & Copper Alloys**	Tin	BS EN 15079 :2015	0.005 % to 11.50 %
		Lead	BS EN 15079 :2015	0.001 % to 6.00 %
		Zinc	BS EN 15079 :2015	0.005 % to 40.00 %
		Iron	BS EN 15079 :2015	0.001 % to 5.00 %
		Nickel	BS EN 15079 :2015	0.010 % to 5.00 %
		Aluminium	BS EN 15079 :2015	0.001 % to 10.00 %
		Silicon	BS EN 15079 :2015	0.001 % to 0.10 %
		Arsenic	BS EN 15079 :2015	0.001 % to 0.10 %
		Manganese	BS EN 15079 :2015	0.001 % to 2.00 %
		Bismuth	BS EN 15079 :2015	0.001 % to 0.12 %
		Phosphorus	BS EN 15079 :2015	0.001 % to 0.20 %
7.	**Ferrous & Non Ferrous Alloys (PMI)**	Chromium	ASTM E 1476 - 04 (RA 2014)	Qualitative
		Manganese	ASTM E 1476 - 04 (RA 2014)	Qualitative
		Molybdenum	ASTM E 1476 - 04 (RA 2014)	Qualitative
		Nickel	ASTM E 1476 - 04 (RA 2014)	Qualitative
		Vanadium	ASTM E 1476 - 04 (RA 2014)	Qualitative
		Niobium	ASTM E 1476 - 04 (2014) (RA 2014)	Qualitative
		Copper	ASTM E 1476 - 04 (RA 2014)	Qualitative
		Tungsten	ASTM E 1476 - 04 (RA 2014)	Qualitative
		Lead	ASTM E 1476 - 04 (RA 2014)	Qualitative

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
		Zirconium	ASTM E 1476 - 04 (RA 2014)	Qualitative
		Bismuth	ASTM E 1476 - 04 (RA 2014)	Qualitative
		Silver	ASTM E 1476 - 04 (RA 2014)	Qualitative
		Antimony	ASTM E 1476 - 04 (RA 2014)	Qualitative
		Tin	ASTM E 1476 - 04 (RA 2014)	Qualitative
		Cobalt	ASTM E 1476 - 04 (RA 2014)	Qualitative
		Titanium	ASTM E 1476 - 04 (RA 2014)	Qualitative
		Zinc	ASTM E 1476 - 04 (RA 2014)	Qualitative
		Iron	ASTM E 1476 - 04 (RA 2014)	Qualitative

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

MECHANICAL TESTING

I.	**MECHANICAL PROPERTIES OF METALS**			
1.	**Metallic Materials**	Brinell Hardness Test	IS 1500 (Part 1): 2013 ASTM E 10: 2017 ASTM A 370: 2017	100 HBW to 450 HBW (10/3000) 100 HBW to 450 HBW (5/750) 50 to 200 HBW (10/500)
		Rockwell Hardness Test Scale A Scale B Scale C	IS 1586 (Part 1): 2012 ASTM E 14: 2017 ASTM A 370: 2017	20 HRA to 88 HRA 20 HRB to 100 HRB 20 HRC to 70 HRC
		MicroVickers Hardness Test	IS 1501-2013(Part 1) ISO 6501 -1-1997 ASTM E 384-2017 ASTM A 370-2017	50 HV 0.2 to 700 HV 0.2 50 HV 1.0 to 700 HV 1.0
2.	**Ferrous & Non Ferrous**	Tensile Test Tensile Strength 0.2 % Proof Stress Yield Strength % Elongation % Reduction in Area	ASTM E 8/8M : 2016 ASTM A 370: 2017 IS 1608 : 2005 (RA 2011) ISO-6892-1998 ASME Section IX-2017	(2kN to 600 kN) 100 MPa to 2000MPa 100 MPa to 1800MPa 100 MPa to 1800MPa 0.20 % to 90 % 1.00 % to 90 %
3.	**Metallic Material**	Charpy Impact Test V Notch	IS 1757: (Part 1) 2014	2 J to 300 J (Ambient Temperature to - 100 °C)
4.	**Metallic Material (Ferrous & Non Ferrous)**	Bend Test	IS 1599: 2012 (RA 2017) ASTM A 370: 2017	Qualitative Mandrel dia (4,6,8,10,12,16,20,24, 28, 32,34,36, 40,50 mm)
5.	**Metallic Material (Ferrous Bolts & Nuts)**	Proof Load Test	IS 1367 (Part 6): 1994 (2010) ASTM A 370: 2017	Qualitative M6,M8, M10, M12, M14,M20, M24, M30, M36

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
6.	**Metallic Material (Ferrous & Non Ferrous-Pipes & Tubes)**	Flattening Test	IS 2328: 2005 (RA 2011) ASTM A 370: 2017	Qualitative OD: Up to 400 mm
II.	**METALLOGRAPHY TEST**			
1.	**Steel Stainless & Steel Iron Castings**	Average Grain Size by Comparison method	ASTM E 0112:2013 ASTM A 247 : 2017 IS 4748:2009 (RA 2017)	Grain size 1 to 10 Qualitative
2.	**Case Hardened Material**	Case Depth Micro hardness method	IS 6416 : 1998 (RA 2012)	0.05 mm to 10 mm
3.	**Ferrous Material& their Alloys**	Microscopic method	IS 6416 : 1998 (RA 2012)	0.1mm to 4.00mm
4.	**Ferrous Material & their Alloys**	Decarb Layer Microscopic Method	IS 6396 : 2000 (RA 2012) ASTM E 1077 : 2014	0.01 mm to 1.00 mm
5.	**Ferrous Material & their Alloys**	Non metallic inclusion rating Method A	IS 4163 : 2004 (RA 2017) ASTM E45:2013	Qualitative (Magnification: 100X)
6.	**Carbon & Alloy Steel, Stainless Steel, Cast Iron**	Micro structural analysis	ASM Handbook Volume No. 9 IS 7754 : 1975 (RA 2003)	Qualitative (Magnification: 100X, 200X,400X,800X)