Laboratory	**Rajkot Metlab Services, National Highway No. 27, Rajkot, Gujarat**		
Accreditation Standard	**ISO/IEC 17025: 2005**		
Certificate Number	**TC-5212**	**Page 1 of 5**	
Validity	**09.11.2017 to 08.11.2019**	**Last Amended on 15.11.2017**	

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.	**METALS & ALLOYS**			
1.	**Carbon and low alloy steel**	Carbon	ASTM E 415-2017	0.16% to 1.17%
		Silicon	IS 8811-1998 (RA 2012)	0.08% to 0.45%
		Manganese		0.52% to 2.00%
		Phosphorous		0.018% to 0.048%
		Sulfur		0.009% to 0.044%
		Chromium		0.012% to 1.23%
		Molybdenum		0.06% to 0.50%
		Nickel		0.03% to 1.50%
		Copper		0.01% to 0.20%
		Aluminum		0.023% to 0.043%
		Vanadium		0.015% to 0.57%
2.	**Austenitic Stainless steel**	Carbon	ASTM E1086-2014	0.01% to 0.17%
		Silicon	IS 9879-1998 (RA 2015)	0.29% to 0.70%
		Manganese		0.21% to 1.80%
		Phosphorous		0.005% to 0.047%
		Sulfur		0.005% to 0.03%
		Chromium		10.60% to 27.00%
		Molybdenum		0.01% to 2.20%
		Nickel		5.00% to 22.00%
		Copper		0.01% to 1.1%
3.	**Cast Iron**	Carbon	ASTM E1999-2011	3.10% to 4.10%
		Silicon	IS 15338-2003 (RA 2008)	0.97% to 2.50%
		Manganese		0.30% to 2.60%
		Chromium		0.44% to 1.70%
		Molybdenum		0.01% to 0.12%
		Nickel		0.80% to 3.90%
		Copper		0.10% to 2.20%
		Titanium		0.08% to 0.44%
		Vanadium		0.01% to 0.34%

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
4.	**Stainless Steel**	PMI test	ASTM E 1476-04	Qualitative
		Chromium		
		Copper		
		Molybdenum		
		Nickel		

Laboratory	**Rajkot Metlab Services, National Highway No. 27, Rajkot, Gujarat**		
Accreditation Standard	**ISO/IEC 17025: 2005**		
Certificate Number	**TC-5212**	**Page 3 of 5**	
Validity	**09.11.2017 to 08.11.2019**	**Last Amended on 15.11.2017**	

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.	**Ferrous & Non Ferrous Metals Steel, Cast Iron & Alloy, Cu & Cu Alloy, Al & Al Alloy, Ni & Ni Alloy**	**Tensile Test**		
		UTS	ASTM A370-2017 IS 1608-2005(RA2011) ASTM E8-2016a ISO 6892 (Part 2): 2016 API-1104: 2013 ASME-Sec IX-2017 IS1786:2008 (RA 2013) ISO 4136: 2012	200 to 2000 Mpa
		0.2% Proof Stress		160 to 1800 Mpa
		1% Proof Stress		(4 kN to 400 kN)
		Yield Stress		
		% Elongation		2.0% to 80%
		%Reduction of Area		2.0% to 80%
		Bend	ASTM A370-2017 IS 1599-2012(RA 2015) ASTM E190-2014 ASTM E 290-2014 ASME-Sec-IX-2017	Qualitative (Mandrel Dia : 8 mm, 10 mm, 12 mm, 16 mm, 20 mm, 24 mm, 32 mm & 50 mm)
2.	**Ferrous & Non-Ferrous Metals Steel, Cast Iron & Alloy, Cu & Cu Alloy, Al & Al Alloy, Ni & Ni Alloy**	**Hardness Test**		
		Rockwell B	ASTM A370-2017 ASTM E18–2017	20 HRBW to 100 HRBW
		Rockwell C		20 HRC to 70 HRC
		Hardenability of Steel (Jominy End Quenched)	ASTM A 255-2014 IS 3848-1981(RA 2009)	20 HRC to 70 HRC
		Impact Test		
		Charpy Impact @ Room Temperature to (-)90°C and (-)196°C	ASTM A370-2017 ASTM E 23–2016b IS 1757 (Part 1)-2014 ISO 148-1-2016	2J to 240J
II.	**METALLOGRAPHY TEST**			
1.	**Ferrous Materials**	Grain size (Comparison Method)	ASTM E112-2013	Qualitative (100X, ASTM no. 1 to 14)
		Case depth (microscopic Method)	IS 6416 (Part 88) (RA 2012)	10 µm to 900 µm (100X)

Prachi Kukreti
Convenor

N. Venkateswaran
Program Director

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
		Decarburization Depth (Microscopic Method)	ASTM E1077-2014 IS 6396-2000 (RA 2012)	10 µm to 900 µm (100X)
		Inclusion rating (By Comparison Method)	ASTM E45-2013 IS 4163:2004 (RA 2010)	Qualitative (100X, Type A, B, C, D, No: 1 to 3)
2.	**Steel, Cast Iron & Alloy, Cu & Cu Alloy, Al & Al Alloy, Ni & Ni Alloy**	Microstructure Examination	ASM Vol. 9-2004 (Metallography and Microstructures)	Qualitative (100X, 200X, 400X, 500X, 1000X)
3.	**Cast Iron & SG Iron**	Size & Distribution of graphite Flake & Nodular (By Comparison Method)	IS 7754-1975 (RA 2012) ASTM A247-2016	Qualitative 100X
4.	**Fe & Fe Alloy Cu & Cu Alloy, Al & Al Alloy, Ni & Ni Alloy**	Volume Fraction	ASTM E562-2011	2.0% to 90% (100X)
5.	**Bearing Steel**	Carbide Structure	SEP 1520-1998 (DIN)	Qualitative 100X to 1000X
6.	**Steel**	Macroetch	ASTM E340-2015 ASTM E381-2017 IS 11371:1985 (RA 2012) IS 13015:1991 (RA 2012)	Qualitative (7X to 45X)
7.	**Steel, Cast Iron & Alloy, Cu & Cu Alloy, Al & Al Alloy**	Coating Thickness	ASTM B 487-1985 (RA 2013) IS 3203: 1982 (RA 2014)	0.01 mm to 1.0 mm
8.	**Austenitic Stainless Steel**	IGC Test 'A'	ASTM A262-2015	Qualitative (250X to 500X)
		IGC Test 'B'		1 mpy to 200 mpy
		IGC Test 'C'		1 mpy to 200 mpy
		IGC Test 'E'		Qualitative (5 X to 20 X Upto 180° Bend)
		IGC Test 'F'		1 mpy to 200 mpy
		IGC Method 'A' IGC Method 'B' IGC Method 'C'	ISO 3651-2:1998	Qualitative (20X to 40X Upto 180° Bend)

Laboratory	**Rajkot Metlab Services, National Highway No. 27, Rajkot, Gujarat**		
Accreditation Standard	**ISO/IEC 17025: 2005**		
Certificate Number	**TC-5212**	**Page 5 of 5**	
Validity	**09.11.2017 to 08.11.2019**	**Last Amended on 15.11.2017**	

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
9.	**Nickel-Rich, Chromium-Bearing Alloys**	IGC Test Method "A" IGC Test Method "B"	ASTM G28-2002 (RA 2015)	1 mpy to 200 mpy 1 mpy to 200 mpy
10.	**Stainless steel, Nickel base**	Method A Method B Method E	ASTM G48-2011 (RA 2015)	0.1 g/m² to 20 g/m² 5°C to 80°C
11.	**Duplex steel**	Method A Method B Method C	ASTM A923-2014	Qualitative (0.1 g/m² to 20 g/m² 5°C to 80°C)
12.	**Ferrous & Non-Ferrous Materials (Coated & Painted Materials)**	Neutral Salt Spray	ASTM B117-2016 ISO 9227-2017 IS 6910-1985 (RA 2015)	Qualitative

Prachi Kukreti
Convenor

N. Venkateswaran
Program Director