Laboratory	**Veeyes Foundry Laboratory, SF No. 302/1&4, Kadathur Pirivu (Sathy Road), Kunnathur Village & Post, Coimbatore, Tamil Nadu**
Accreditation Standard	**ISO/IEC 17025: 2005**
Certificate Number	**TC-5145** **Page 1 of 4**
Validity	**03.03.2017 to 02.03.2019** **Last Amended on 08.05.2018**

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.	**Ferrous Alloys / Low Alloy Steels**	Aluminum	IS 8811:1998 (RA 2012) / ASTM E415-2017 VSF/VAL/FE-LAS/2017	0.005 % to 0.175 %
		Antimony		0.002 % to 0.030 %
		Arsenic		0.002 % to 0.280 %
		Boron		0.000 4 % to 0.002 %
		Calcium		0.002% to 0.003 %
		Carbon		0.050 % to 1.50 %
		Chromium		0.010 % to 6.00 %
		Cobalt		0.005 % to 0.50 %
		Copper		0.005 % to 0.350 %
		Manganese		0.050 % to 1.50 %
		Molybdenum		0.002 % to 1.60 %
		Nickel		0.020 % to 5.00 %
		Niobium		0.003 % to 0.60 %
		Nitrogen		0.005 % to 0.020 %
		Phosphorus		0.003 % to 0.100 %
		Silicon		0.100 % to 1.50 %
		Sulphur		0.003 % to 0.065 %
		Tin		0.005 % to 0.060 %
		Titanium		0.001 % to 0.400 %
		Tungsten		0.005 % to 1.00 %
		Vanadium		0.002 % to 1.00 %
		Zirconium		0.001 % to 0.050 %
2.	**Ferrous/Duplex/ Super Duplex Stainless Steel**	Aluminum	ASTM E1086-2014/ IS 9879:1998 (RA 2015) VSFL/VAL/FE-SS/2017	0.003 % to 0.200 %
		Carbon		0.010 % to 0.200 %
		Cobalt		0.020 % to 0.320 %
		Chromium		7.50 % to 2 6.00 %
		Copper		0.010 % to 3.70 %
		Manganese		0.100 % to 2.00 %
		Molybdenum		0.050 % to 6.50 %

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
		Nickel		0.200 % to 33.00 %
		Niobium		0.005 % to 2.00 %
		Nitrogen		0.005 % to 0.300 %
		Phosphorous		0.003 % to 0.050 %
		Silicon		0.100 % to 1.00 %
		Sulphur		0.003 % to 0.050 %
		Titanium		0.005 % to 1.80 %
		Tungsten		0.020 % to 4.00 %
		Vanadium		0.030 % to 0.250 %
3.	**Nickel Alloys**	Aluminum	ASTM E3047-2016 / VSFL/VAL/Ni/2017	0.004 % to 0.70 %
		Carbon		0.005 % to 0.20 %
		Chromium		0.30 % to 22.00 %
		Cobalt		0.050 % to 0.80 %
		Copper		0.015 % to 2.00 %
		Iron		1.50 % to 32.00 %
		Magnesium		0.002 % to 0.020 %
		Manganese		0.025 % to 1.25 %
		Molybdenum		0.040 % to 14.00 %
		Niobium		0.030 % to 6.00 %
		Phosphorous		0.003 % to 0.025 %
		Silicon		0.025 % to 0.30 %
		Sulphur		0.001 % to 0.010 %
		Titanium		0.005 % to 1.10 %
		Tungsten		0.015 % to 2.90 %
		Vanadium		0.020 % to 0.200 %

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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.	**Metal & Metal Products (Ferrous & Non-Ferrous Castings & Welded Plates)**	Tensile Test Tensile Strength Yield Strength / 0.2%, 0.5% & 1% Proof Strength	ASTM A370-2017a ASTM E8/8M-2016a IS 1608:2005 (RA 2011) ISO 6892 (Part 1): 2016 ASME SEC IX-2017 EN ISO 15614-1:2017	100 MPa to 1500 MPa 100 MPa to 1500 MPa
		% Elongation		1% to 80 %
		% Reduction Area		1 % to 80 %
		Bend Test	ASTM A370-2017a IS 1599-2012	(Qualitative) Mandrel Diameter in mm (6, 8, 10,12, 13, 24, 32, 40, 48, 50, 70, 80)
		Face/Root/Side Bend	ASME SEC IX-2017 EN ISO 15614-1:2017 ISO 5173-2017	(Qualitative) Mandrel Diameter in mm (6, 8, 10,12, 13, 24, 32, 40, 48, 50, 70, 80)
		Brinell Hardness Test (HBW 10/3000)	ASTM E10-2017 IS 1500 (Part 1): 2013 ISO 6506 (Part 1): 2014	100 HBW to 400 HBW
		Charpy Impact Test	ASTM A370-2017a ASTM E23-2016b ASME SEC IX-2017 EN ISO 15614-1:2017 ISO 148-1:2016	4 J to 300 J (RT to (-) 196 °C)
2.	**Ferrous & Non Ferrous Products, Weldments, Castings**	Macro Examination	ASTM E340-2015 ASME SEC IX-2017 ISO 17639-2013	(Qualitative) 10X to 45X

Birendra Prasad Murmu
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N. Venkateswaran
Program Director

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3.	**Metals & Alloys**	Micro Examination	ASTM E3-2011 (RA 2017) ASTM E407-07(RA 2015) e1 ASM Metals Hand Book Vol. 9-2004	Qualitative 50X to 1000X
4.	**Steels & Low Alloys Steels**	Inclusion Rating	IS 4163:2004 ASTM E 45-2013	(Qualitative) 100X
5.	**Stainless & Duplex Stainless Steels**	Determination of Volume Fraction of Phase	ASTM E 562-2011	(Qualitative) 5 % to 95 %
II.	**METALLOGRAPHY TEST**			
1.	**Stainless Steel Cast Products**	Intergranular Corrosion Test	ASTM A262-2015	
		Practice-A Practice-B Practice-C Practice-E		(Qualitative) 1 mils/year to 60 mils/year 0.0001 mils/month to 4.0 mils/month Qualitative
2.	**Nickel Rich Chromium Bearing Alloys**	Intergranular Corrosion Test	ASTM G 28-2002 (RA 2015)	
		Method-A		0.0001 mm/month to 8.0 mm/month
3.	**Duplex Stainless Steels**	Intergranular Corrosion Test	ASTM A 923-2014	
		Method-A Method-C		Qualitative 0.1 g/m^2 to 4.0 g/m^2
4.	**Stainless/Duplex Stainless Steels**	Pitting Corrosion Test Method to A	ASTM G 48-2011 (RA 2015)	0.1 g/m^2 to 4.0 g/m^2

Birendra Prasad Murmu
Convenor

N. Venkateswaran
Program Director