

Laboratory **Cochin Shipyard Central Laboratory, Cochin Shipyard Limited,
Perumanoor P.O., Kochi, Kerala**

Accreditation Standard **ISO/IEC 17025: 2005**

Discipline **Mechanical Testing** **Issue Date** **06.01.2016**

Certificate Number **T-2111** **Valid Until** **05.01.2018**

Last Amended on **-** **Page** **1 of 4**

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.	Metallic Materials (Ferrous, Aluminium plate, GI Wire)	Tensile test (UTS, YS, 0.2% Proof Stress, Breaking load)	IS 1608: 2005 (RA 2010)	20 kN to 950 kN	
			ISO 6892: 2009	2.5 kN to 250 kN	
			ASTM E8M: 2015a		
			% Elongation		1% to 80%
			% Area Reduction		5% to 80%
			Bend	IS 1599: 2012	Qualitative (Diameter/Thickness: 2 mm to 25 mm) Bend Angle 180 ⁰ (Mandrel Dia. 10 mm to 320 mm)
			Rockwell Hardness	IS 1586-1: 2012	40 HRA to 88 HRA
				ISO 6508-1: 2005	60 HRB to 100 HRB
				ASTM E 18: 2015	20 HRC to 30 HRC 60 HRC to 70 HRC
			Vickers Hardness	IS 1501-1: 2013 ISO 6507-1: 2005	Upto 225 HV1 700 HV1 to 750 HV1
	Upto 725 HV5				
	Upto 600 HV10				
	Upto 225 HV20 700 HV20 to 750 HV20				
			400 HV50 to 700 HV50		

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Program Manager

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Last Amended on **-** **Page** **2 of 4**

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	Metallic Materials (Ferrous, Aluminium plate, GI Wire)	Charpy Impact (V-Notch)	IS 1757: 2014 ISO 148-1: 2009	20 J to 400 J Room temp to (-) 60 °C
2.	High Strength Deformed Bars	Mass per meter	CSCL/SOP/Mech-03	200 g to 10 kg
		Tensile (UTS, YS, 0.2% Proof Stress) % Elongation	IS 1608: 2005 (RA 2010)	20 kN to 950 kN 1 % to 80 % 2.5 kN to 250 kN
		Bend	IS 1599: 2012	Qualitative (5 mm to 40 mm Dia.) Bend Angle 180° (Mandrel Dia. 10 mm to 320 mm)
		Re-bend	IS 1786: 2008 (RA 2013)	Qualitative (5 mm to 40 mm dia.) (Mandrel Dia. 10 mm to 320 mm)
3.	Metallic Tubes (Ferrous)	Flattening	IS 2328: 2005 (RA 2011) ASTM A370: 2014	Qualitative (OD: 10 mm to 300 mm)
		Flaring/Drift Expansion	IS 2325: 2005 (RA 2011) ASTM A370: 2014	Qualitative (OD: 10 mm to 80 mm)
4.	Fusion Welded Butt Joints & Weld Metal in Steel	Tensile Transverse	ASME (Sec IX): 2015 IS 3600 (Part 3): 2009 AWS D1.1: 2015 AWS D1.2: 2014	20 kN to 950 kN 2.5 kN to 250 kN

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Last Amended on - **Page** **3 of 4**

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	Fusion Welded Butt Joints & Weld Metal in Steel	Tensile	ASME (Sec IX): 2015	20 kN to 950 kN
		Longitudinal (YS, UTS)	IS 3600 (Part 4): 1984 (RA 2011)	MU (\pm)1.56 %
		% Elongation	ASTM A370: 2014	2.5 kN to 250 kN
		% Area Reduction		1 % to 80 %
		Transverse Bend	ASME (Sec IX): 2015	5 % to 80 %
		Root & Face Side	QW 160 IS 3600 (Part 5): 1983 (RA 2011) IS 3600 (Part 6): 1983 (RA 2013) AWS D1.1: 2015 AWS D1.2: 2014	Qualitative 2 mm to 40 mm (Thick) 90 ° & 180 ° Bend
	Charpy Impact (V-notch)	IS 1757: 2014 IS 3600 (Part 2): 1985 (RA 2013) ISO 148-1: 2009	20 J to 400 J Room temp to (-) 60 °C	
	Fillet Weld Fracture	ASME (Sec IX): 2015 QW 180 ISO 5817: 2014 IS 3600 (Part 8): 1985 (RA 2013)	10 mm to 50 mm (Thick)	
	Nick Break	IS 3600 (Part 8): 1985 (RA 2013) API 1104: 2013	10 mm to 20 mm (Thick)	

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Last Amended on	-	Page	4 of 4

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II. METALLOGRAPHY TEST				
1.	Fusion Welded Butt Joints & Weld Metal in Steel	Macro Examination	ASME (Sec IX): 2015 QW 183 IS 3600 (Part 9): 1985 (RA 2013) ASTM E 340: 2015	Qualitative (Visual)

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