

Laboratory	Jindal Saw Limited (IPU) Laboratory, Village: Samaghogha, Taluka: Mundra, District: Kutch, Gujarat		
Accreditation Standard	ISO/IEC 17025: 2005		
Discipline	Mechanical Testing	Issue Date	15.06.2015
Certificate Number	T-3476	Valid Until	14.06.2017
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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.	Ferrous Metal Ductile Iron pipes	Tensile strength	ISO 6892 -1: 2009 IS 1608: 2005 UTM Sr. No.3086	300 Mpa to 700 Mpa (1 kN to 200 kN)
		Elongation		2 % to 30 %
		Brinell Hardness Test	ISO 6506-1: 2014 IS 1500: 2005 Hardness M/C Sr.No.441	140 HBW to 300 HBW
		Tensile Strength	ISO 6892 -1: 2009 IS 1608: 2005 UTM Sr. No.52864	300 Mpa to 700 Mpa (1 kN to 30 kN)
		Yield / Proof Strength (0.2 % offset)		200 Mpa to 500 Mpa (1 kN to 30 kN)
		%Elongation		2 % to 30 %
		Brinell Hardness Test	ISO 6506-1: 2014 IS 1500: 2005 Hardness tester Sr. No. 3001 XLM02146103	140 HBW to 300 HBW
2.	Low Alloy Steel	Yield strength (0.5 % extension under load)	ASTM A 370:2014	175 MPa to 800 MPa. (10 kN to 1000 kN)
		Ultimate tensile strength		300 Mpa to 920 Mpa (10 kN to 1000 kN)
		Elongation		10 % to 60 %
		Vickers Hardness Test	ASTM E 384:2011	5 kgf (125 HV5 to 300 HV5) 10 kgf (125 HV10 to 300 HV10)

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	Low Alloy Steel	Guided Bend Test	ASTM A 370: 2014	(Qualitative) Mandrel Dia 16 mm to 230 mm
		Charpy "V" notch Impact Test (Room Temperature to (-) 60 °C)	ASTM A370:2014	2 J to 400 J Shear fracture Estimation Qualitative
		Drop weight Tear test on Line Pipe	API RP 5L3: 2014	Shear fracture Estimation. Qualitative
		Hydrogen Induced Cracking (HIC) Test	NACE TM 0284: 2003	Qualitative
		Sulphide Stress Corrosion Test (SSC) Method A- NACE standard Tensile Test	NACE TM 0177: 2005	Qualitative (Crack/ No Crack)
		Sulphide Stress Corrosion Test (SSC) Method B- NACE standard Bent-Beam Test (Four Point)	NACE TM 0177: 2005 ASTM G39: 2011	Qualitative (Crack/ No Crack)
II. PLASTICS AND RUBBER				
1.	Fusion Bonded Epoxy Coated Samples	Cross-Section & Interface Porosity	CSA Z 245 20-2010 Clause 12.10	Qualitative (Rating 1 to 5)
		Adhesion (Hot Water Soak)	Clause 12.14	Qualitative (Rating 1 to 5)
		Flexibility	Clause 12.11	Qualitative (Visual)

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2.	HDPE, PP, LDPE, MDPE, LLDPE, Molded Material Samples / Sheet	Melt Flow Rate of Thermoplastics	ASTM D 1238: 2013	(0.15 gm to 50 gm) / 10 min
		Vicat Softening Temperature of Thermoplastics	ASTM D 1525: 2009	50 °C to 160 °C
		Specific Gravity/Density of Thermoplastics	ASTM D 792: 2008 Method A	0.1 to 3.0
		Indentation Hardness of Thermoplastics	DIN 30670: 2012 Clause. 5.3.5 Annexure 1 DIN 30678: 1992	0.01 mm to 1.0 mm at Temp. Upto 120 °C
		% of Elongation of Thermoplastics	ASTM D 638: 2010 ISO 527: 2012	0.1 % to 800 %
		Tensile Strength of Thermoplastics	ASTM D 638: 2010 ISO 527: 2012	0.1 MPa to 100 MPa
		3.	Liquid Epoxy Coated Sample	Buchholz Hardness
Bend (Using Conical Mandrel & Diameter check at 3.17 to 31.75 mm)	ISO 6860: 2006 Clause. 4.3.8 ISO 15741: 2001			Qualitative (Visual inspection)
Adhesion	ISO 15741: 2001 Clause. 4.3.4 ISO 2409: 13, Clause. 3.2.3 API RP 5L2: 2002 Appendix D			Qualitative (Classification 0 to 5)

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	Liquid Epoxy Coated Sample	Adhesion (Pull of Method)	ASTM D 4541: 2009 Test Method E	0.1 Psi to 3000 Psi
III. METALLOGRAPHY TEST				
1.	Low Alloy Steel	Macro Examination of Pipe Weld	ASTM E 340: 2013	Qualitative
		Microscopic Examination-Grain Size Measurement	ASTM E112: 2013 (comparison Method)	ASTM Grain Size Number 3 to 10. Qualitative

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