

Laboratory PSL Central Laboratory, Varsana Complex, Survey No.37, Village- Varsana, Taluka, Anjar, Kutch, Gujarat

Accreditation Standard ISO/IEC 17025: 2005

Certificate Number TC-7804

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Validity 30.08.2018 to 29.08.2020

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
<u>CHEMICAL TESTING</u>				
I.	METAL & ALLOYS			
1.	Carbon Steel & Alloys Steel	Carbon (C)	ASTM E 415 - 2017	0.006% to 1.03%
		Manganese (Mn)		0.022% to 2.0%
		Phosphorus (P)		0.002% to 0.04%
		Sulfur (S)		0.0024% to 0.035%
		Silicon (Si)		0.01% to 0.63%
		Copper (Cu)		0.0013% to 0.51%
		Nickel (Ni)		0.002% to 1.99%
		Chromium (Cr)		0.0015% to 1.480%
		Vanadium (V)		0.004% to 0.307%
		Molybdenum (Mo)		0.0035% to 0.50%
		Titanium (Ti)		0.0005% to 0.308%
		Aluminum (Al)		0.004% to 0.0706%
		Niobium (Nb)		0.0004% to 0.353%
		Boron (B)		0.00012% to 0.0054%
	Nitrogen (N)		0.0008% to 0.0044%	
	Tin (Sn)		0.001% to 0.046%	
	Lead (Pb)		0.0003% to 0.003%	
II.	PLASTIC & PLASTIC PRODUCTS			
1.	Epoxy Powder	Gel Time	CAN CSA Z 245 20 - 2014	Upto 60 Seconds
		Cure Time		30 Seconds to 180 Seconds
		% of Cure		Upto 99.99 %
		Delta Tg		(-)20°C to 20 °C
		Moisture Content		Upto 5%
		Thermal Characteristics		25 °C to 300 °C
		Glass Transition -Tg1		
		Glass Transition -Tg2		
		Heat of Reaction -Delta H		

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2.	Polyethylene or Polypropylene Based Co-Polymer Adhesive, Polyethylene, Polypropylene Sheet or Molded Material Sample	Specific Gravity	ASTM D792 - 2013	0.920 to 0.970
		Vicat Softening Temperature	ASTM D 1525 - 2017	40 °C to 160 °C
3.	Polyethylene, Polypropylene Sheet or Molded Material Sample	24 Hrs Water Absorption	ASTM D 570 - 2010	0 to 5 %
4.	Cured Liquid Epoxy Coating	Curing	ISO 15741 - 2016 ISO 2812-1 -2007	No Softening, Wrinkling or Blistering
		Pin Hole	ISO 15741 - 2016	10 Pin Holes Max.
5.	Fusion Bonded Epoxy Coating	Adhesion (Hot Water Soak)	CAN CSA Z 245 20 - 2014	Rating 1 to 5
		Cross-Section Interface Porosity	CAN CSA Z 245 20 - 2014	Rating 1 to 5
6.	3 Layer Polyethylene or Polypropylene Coating / Fusion Bonded Epoxy Coating	Cathodic Disbandment Test	ASTM G 95 - 2013 CAN CSA Z 245 21 - 2014	0.01 mm to 40 mm @Temperature Upto 80 °C

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<u>MECHANICAL TESTING</u>				
I	METAL & ALLOYS			
1.	Carbon Steel & Alloys Steel	Tensile:- a) Yield Strength by i) Autographic Diagram ii) Offset (50 mm GL from 0.2% & 0.5%) iii) Extension Under Load (50 mm GL from 0.2% & 0.5%) b) Ultimate Tensile Strength c) % Elongation d) % Reduction Area	ASTM A 370 - 2017 ISO 6892 - 2016 IS 1608 - 2005 IS 3600-3 - 2009	20 kN to 1000 kN 20 kN to 1000 kN 10% to 60% 10% to 60%
		"V" Notch Charpy Impact (at +100 °C to - 60 °C) Temp	ASTM A 370 - 2017 ISO 148-1 - 2016 IS 1757-1 - 2014 (Temp @ - 60 °C to 100 °C)	Upto 450 Jouls
		Vickers Hardness	ASTM E 92 - 2017 ASTM E 384 - 2017 ISO 6507-1 - 2018 IS 1501 - 2013	5 kgf & 10 kgf 100 HV ₅ to 750 HV ₅ 100 HV ₁₀ to 750 HV ₁₀
		Bend / Guided Bend	ASTM A 370 - 2017 ASTM E 190 - 2014 ISO 7438 - 2016 IS 3600-7 - 1985	Qualitative Mandrel Jig Dia (10 mm, 12 mm, 14 mm,

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			IS 1599 - 2012	16 mm,18 mm, 20 mm, 22 mm,24 mm, 26 mm, 28 mm,30 mm, 32 mm, 34 mm,36 mm, 38 mm, 40 mm,42 mm, 44 mm, 46 mm,48 mm, 50 mm, 60 mm, 94 mm,120 mm)
		Macro Examination	ASTM E340 - 2015 IS 3600-9 - 1985	Visual
		Nick Break	API 5L 45th Edition – 2012, API 5L 1104 - 2013, IS 5504:1997, 9606-1 - 2012, IS 3600-8 - 1985	Upto 38 mm
		Drop Weight Tear Test	API 5L-45th Edition 2012, API RP 5L 3 - 2014	Qualitative
		Hydrogen Induced Crack (HIC) at 100X Magnification	NACE - TM0284 - 2016	Qualitative
		Sulphite Stress Crack (SSC) by Four Point Bent-Beam Test Method	ASTM G 39 - 2016	Qualitative
II.	PLASTIC & PLASTIC PRODUCTS			
1.	Polyethylene, Polypropylene Sheet Sample	Indentation	DIN 30670 - 2012 DIN 30678 - 2013	0.10 mm to1.0 mm at Temp Upto 75 °C
2.	Liquid Epoxy Coating	Buchholz Hardness	ISO 2815 - 2003	20 to 2000 BUCHHOLZ

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		Bend	ISO 6860 - 2006	Qualitative
		Adhesion	API RP 5L2 - 2002 ISO 2409 - 2013	Qualitative
3.	Fusion Bonded Epoxy Coating	Flexibility	CAN CSA Z 245 20 - 2014	1.5°, 2°, 2.5° & 3°
4.	Polyethylene, Polypropylene Sheet Sample	% Elongation	DIN 30670 - 2012 DIN 30678 - 2013	200 mm to 1000 mm