

<b>Laboratory</b>	<b>Quality Control Laboratory (Coating) of Jindal Saw Limited, Village: Nanakapaya, Taluka: Mundra, Distt: Kutch, Gujarat</b>		
<b>Accreditation Standard</b>	<b>ISO/IEC 17025: 2005</b>		
<b>Discipline</b>	<b>Chemical Testing</b>	<b>Issue Date</b>	<b>09.02.2015</b>
<b>Certificate Number</b>	<b>T-3301</b>	<b>Valid Until</b>	<b>08.02.2017</b>
<b>Last Amended on</b>	<b>-</b>	<b>Page</b>	<b>1 of 3</b>

<b>S.No.</b>	<b>Product / Material of Test</b>	<b>Specific Test Performed</b>	<b>Test Method Specification against which tests are performed</b>	<b>Range of Testing / Limits of Detection</b>
<b>I.</b>	<b>PAINTS AND SURFACE COATING</b>			
<b>1.</b>	<b>Epoxy Powder</b>	Gel Time	CSA Z245.20-2010, (Clause 12.2)	(1 to 50) s
		Thermal Characteristics	CSA Z245.20-2010, (Clause 12.7)	Tg: (20 to 250) °C
		(a) Glass Transition Temperature (Tg)		ΔH: (10 to 250) J/g
		(b) Thermal Analysis Enthalpy (ΔH)		
		Moisture Content of Epoxy Powder	CSA Z245.20-2010, (Clause 12.4)	(0.01 to 10) %
		Density of Epoxy Powder	CSA Z245.20-2010, (Clause 12.6)	(500 to 1800) g/L
		Sieve Analysis of Epoxy Powder (150μm)	CSA Z245.20-2010, (Clause 12.5)	(0.01 to 10) %
		Sieve Analysis of Epoxy Powder (250μm)	CSA Z245.20-2010, (Clause 12.5)	(0.01 to 10) %
<b>2.</b>	<b>Fusion Bond Epoxy (FBE) / Dual Fusion Bond Epoxy (DFBE) Coated Steel Pipe</b>	Cathodic Disbondment of Applied Coating – (Epoxy, 3LPE & 3LPP Coating)	CSA Z 245.20-2010, (Clause 12.8), NF A49-711-1992, (Clause 9.13)	(0.01 to 25) mm
		Cure Test of Applied Coating	CSA: Z245.20-2010, (Clause 12.7)	(10 to 100) %
		Flexibility of Applied Coating	CSA: Z245.20-2010, (Clause 12.11)	Qualitative
		Interface / Cross Section Porosity	CSA Z245.20-2010, (Clause 12.10)	Qualitative
		Adhesion Test (Hot Water Soak)	CSA: Z245.20-2010, (Clause 12.14)	Qualitative
		Dry Adhesion	ISO: 21809-2-2007, (Clause A.4)	Qualitative
		Impact Resistance	CSA: Z245.20-2010, (Clause 12.12)	Qualitative

<b>Laboratory</b>	<b>Quality Control Laboratory (Coating) of Jindal Saw Limited, Village: Nanakapaya, Taluka: Mundra, Distt: Kutch, Gujarat</b>		
<b>Accreditation Standard</b>	<b>ISO/IEC 17025: 2005</b>		
<b>Discipline</b>	<b>Chemical Testing</b>	<b>Issue Date</b>	<b>09.02.2015</b>
<b>Certificate Number</b>	<b>T-3301</b>	<b>Valid Until</b>	<b>08.02.2017</b>
<b>Last Amended on</b>	<b>-</b>	<b>Page</b>	<b>2 of 3</b>

<b>S.No.</b>	<b>Product / Material of Test</b>	<b>Specific Test Performed</b>	<b>Test Method Specification against which tests are performed</b>	<b>Range of Testing / Limits of Detection</b>
<b>3.</b>	<b>Oil Based Liquid Paint</b>	Non-Volatile Matter	ISO 3251-2003	(1.0 to 100) %
		Density of Paint (by Pyknometer)	ISO 2811-1-1997	(0.5 to 2.0) g/mL
		Fineness of Grind of Liquid Paint	ISO 1524: 2013	Qualitative
		Curing Test	ISO 15741-2001	Qualitative
		Water Immersion	API RP 5L2-2002	Qualitative
		Flow Time	ISO 2431-1993	(10 to 300) s
<b>4.</b>	<b>Liquid epoxy coated steel / glass panels</b>	Porosity of Film on coated Glass Panel	ISO 15741-2001, (Annexure-E)	1 Nos. to 5 Nos. (Visual)
		Adhesion of Applied Paint coating	ISO 2409-2007	Classification: 0 to 5 (Visual)
		Stripping	API RP 5L2-2002	Qualitative
		Bend Test of Applied Paint Coating	ISO 6860-2006	Upto 180°
		Buchholz Hardness	ISO 2815-2003 ISO 15741-2001	(42 to 1250) Buchholz
		Pull – Off strength of Coating	ASTM: D4541-2009	(0.01 to 20) MPa
		Solvent Rub for Applied Coating	ASTM: D4752-2010	Rating: 0 to 5 (Visual)

<b>Laboratory</b>	<b>Quality Control Laboratory (Coating) of Jindal Saw Limited, Village: Nanakapaya, Taluka: Mundra, Distt: Kutch, Gujarat</b>		
<b>Accreditation Standard</b>	<b>ISO/IEC 17025: 2005</b>		
<b>Discipline</b>	<b>Chemical Testing</b>	<b>Issue Date</b>	<b>09.02.2015</b>
<b>Certificate Number</b>	<b>T-3301</b>	<b>Valid Until</b>	<b>08.02.2017</b>
<b>Last Amended on</b>	-	<b>Page</b>	<b>3 of 3</b>

S.No.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
<b>II. METALLIC COATINGS AND TREATMENT SOLUTIONS</b>				
1.	<b>Steel Shot &amp; Grit</b>	Conductivity of Abrasive Extract	ASTM: D4940-2010	(1 to 1000) $\mu\text{S}/\text{cm}$
		Contamination in Abrasive Material	ASTM: D7393-2012	Qualitative
2.	<b>Externally Blasted steel pipe</b>	Soluble Contaminants Level (Using Bresle Kit)	ISO 8502-6-2006	(0.1 to 20) $\mu\text{g}/\text{cm}^2$
		Soluble Contaminants Level (Using SCM 400 Meter)	SSPC Guide 15- 2005	(0 to 20) $\mu\text{g}/\text{cm}^2$
		Soluble Contaminants Level (Using Potassium Ferricyanide Solution)	SSPC Guide 15- 2005	Qualitative
<b>III. WATER</b>				
1.	<b>Deionized / Demineralized water</b>	Conductivity of DI/DM Water	ASTM D1125-1999	(0.1 to 1000) $\mu\text{S}/\text{cm}$

~~-X-X-X-X-X-X-X-X-X-X-X-X-~~