

Laboratory	Sunbeam Auto Pvt. Ltd., Testing Research & Development Centre, 38/6 Km Stone, Delhi-Jaipur Highway, Narsingpur, Gurgaon, Haryana		
Accreditation Standard	ISO/IEC 17025: 2005		
Discipline	Mechanical Testing	Issue Date	01.11.2015
Certificate Number	T-0327	Valid Until	31.10.2017
Last Amended on	29.01.2016	Page	1 of 5

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.	Metal & Alloy (Ferrous)	Tensile Strength Proof Stress/Yield Stress Elongation % Reduction Area %	IS 1608: 2005 ASTM E-8/E-8m-15a	50 MPa to 3000 MPa 20 MPa to 2800 MPa 0.5 % to 65.0 % 0.5 % to 65.0 %
2.	Metal & Alloy (Non-Ferrous)	Tensile Strength Proof stress/ Yield Stress % Elongation % Reduction Area Bend	IS 1608: 2005 ASTM E-8/E-8m-15a ASTM E-290: 14 IS 1599: 2012	40 MPa to 800 MPa 20 MPa to 750 MPa 0.5 % to 65.0 % 0.5 % to 65.0 % Qualitative (Mandrel Dia.: 18,20,24, 25,32,36,40,42,44,48,54, 56,60,64,80,88,100,112, 128,140,144,160,180, 200 mm) 100 MPa to 1500 MPa 20 MPa to 1400 MPa
		Tensile Strength 0.2% Proof/Yield Strength % Elongation Mass Per Meter Deformation & Surface Characteristics	IS 1786: 2008 With Amd. 1	0.5 % to 65.0 % Upto 9.2 kgs 0.15 mm ² /mm to 10.0 mm ² /mm
3.	Metal Tube	Bend	IS 2329: 2005	Qualitative (15 mm to 50 mm)
		Impact Testing Charpy V Notch (Upto -40°C)	IS 1757: 1988	2 J to 300 J
		Charpy U Notch (Upto -40°C)	IS 1499: 1982	2 J to 300 J

Laboratory Sunbeam Auto Pvt. Ltd., Testing Research & Development Centre,
38/6 Km Stone, Delhi-Jaipur Highway, Narsingpur, Gurgaon, Haryana

Accreditation Standard ISO/IEC 17025: 2005

Discipline Mechanical Testing **Issue Date** 01.11.2015

Certificate Number T-0327 **Valid Until** 31.10.2017

Last Amended on 29.01.2016 **Page** 2 of 5

S. No.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
	Metal Tube	Izod Impact	IS 1598: 1977	2 J to 168 J
		Flattening	IS 2328: 2005	Qualitative (Upto 300 mm Dia)
		Drift Expansion	IS 2335: 2005	Qualitative (Upto 65 mm Dia)
		Cupping	IS 10175: 2012	0.2 mm to 2 mm
		Brinell Hardness Load 187.5 kgf/Φ2.5 mm Load 62.5 kgf/Φ2.5 mm	IS 1500: 2005 ASTM E-10: 12	100 HBW to 350 HBW
		Rockwell Hardness 'B' at 100 kgf Load 'C' at 150 kgf Load	ASTM E 18: 13 IS 1586: 2000	20 HRC to 100 HRC 20 HRC to 70 HRC
		Vicker Hardness	IS 1501: 2013 ASTM E-384-11e1	50 to 1500

II. METALLOGRAPHY TEST

1.	Metal & Alloy (Ferrous)	Microstructure	Asm Handbook Vol. 7 Asm Handbook Vol. 9 ASTM E 407: 07(2015) ASTM E3: 11	50 x to 1000 x
		Grain Size	ASTM E-112: 13 IS 4748: 2009 (Intercept & Comparison Method)	ASTM 1 to 10 1 to 14

Laboratory	Sunbeam Auto Pvt. Ltd., Testing Research & Development Centre, 38/6 Km Stone, Delhi-Jaipur Highway, Narsingpur, Gurgaon, Haryana		
Accreditation Standard	ISO/IEC 17025: 2005		
Discipline	Mechanical Testing	Issue Date	01.11.2015
Certificate Number	T-0327	Valid Until	31.10.2017
Last Amended on	29.01.2016	Page	3 of 5

S. No.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
	Metal & Alloy (Ferrous)	Inclusion Rating	ASTM E-45: 13 Method-A IS 4163: 2004 Method-A	Qualitative
		Case Depth	IS 6416: 1988 (Microscopic & Hardness Survey)	Upto 10 mm
		Intergranular Corrosion	ASTM A 262 Practice-B, C & E	Qualitative
III. BUILDING MATERIALS				
1.	Cement (OPC, PPC, Srcs, Slag, White)	Consistency	IS 4031 (Part 4): 2009	10 % to 45 %
		Initial Setting Time	IS 4031 (Part 5): 2009	5 min to 120 min
		Final Setting Time	IS 4031 (Part 5): 2009	30 min to 600 min
		Soundness (L.C)	IS 4031 (Part 3): 2009	0.5 mm to 10 mm
		Soundness (Autoc -Lave)	IS 4031 (Part 3): 2009	8 %
		Fineness (Blaines)	IS 4031 (Part 2): 2008	150 m ² /kg to 600 m ² /kg
		Compressive Strength	IS 4031 (Part 6): 2009	Upto 70 MPa
2.		Coarse Aggregate	Sieve Analysis	IS 2386 (Part 1): 2007
	Materials Finer Than 75 Micron		IS 2386 (Part 1): 1963	0 to 15 %
	Flakiness Index		IS 2386 (Part 1): 1963	5 % to 45 %
	Elongation Index		IS 2386 (Part 1): 1963	5 % to 45 %
	Water Absorption		IS 2386 (Part 3): 2007	0.5 % to 5 %
	Specify Gravity		IS 2386 (Part 3): 1963	1.0 to 5.0
	Bulk Density		IS 2386 (Part 5): 2007	1.2 to 1.5
	Soundness		IS 2386 (Part 4): 2007	0.01 % to 20 %
	Crushing Value		IS 2386 (Part 4): 2007	5 % to 45 %
	Ten Percent Fine Value		IS 2386 (Part 4): 2007	50 kN to 250 kN
	Impact Value		IS 2386 (Part 4): 2007	55 % to 45 %
	Abrasion Value	IS 2386 (Part 4): 2007	0 to 50 %	

Laboratory	Sunbeam Auto Pvt. Ltd., Testing Research & Development Centre, 38/6 Km Stone, Delhi-Jaipur Highway, Narsingpur, Gurgaon, Haryana		
Accreditation Standard	ISO/IEC 17025: 2005		
Discipline	Mechanical Testing	Issue Date	01.11.2015
Certificate Number	T-0327	Valid Until	31.10.2017
Last Amended on	29.01.2016	Page	4 of 5

S. No.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
3.	Fine Aggregate	Sieve Analysis Water Absorption Specify Gravity Bulk Density Soundness Mortar Making Properties Silt Content	IS 2386 (Part 1): 2007 IS 2386 (Part 3): 1963 IS 2386 (Part 3): 1963 IS 2386 (Part 3): 1963 IS 2386 (Part 5): 2007 IS 2386 (Part 6): 1963 IS 2720 (Part 4)	0.1 % to 100 % 0.5 % to 5.0 % 1.0 to 5.0 1.4 to 1.8 0.01 % to 20 % Upto 70 MPa 0 to 20 %
4.	Concrete	Compressive Strength (By Accelerating Curing) Setting Time	IS 9013: 2008 IS 8142: 2010	5 MPa to 100 MPa 0 to 600 min
5.	Bricks	Compressive Strength Water Absorption Efflorescence Dimension	IS 3495 (Part 1): 2007 IS 3495 (Part 2): 2007 IS 3495 (Part 3): 2007	2 MPa to 40 MPa 0 to 20 % Qualitative Qualitative
6.	Tile	Resistance To Wear Flexural Strength Water Absorption	IS 1237: 2006 IS 13801: 2006 IS 1237: 2006 IS 13801: 2006 IS 1237: 2006 IS 13801: 2006	0.3 mm to 2.5mm 2 N/mm ² to 40 N/mm ² 0 to 20 %
7.	Admixture	Setting Time Comp. Strength Flexural Strength Length Change Air Content Workability	IS 9103: 2008 IS 9103: 2008 IS 9103: 2008 IS 9103: 2008 IS 9103: 2008 IS 9103: 2008	0 to 600 min Upto 70 MPa Upto 70 MPa 0 to 12.7 mm 0 to 10% 0 to 160 mm
8.	Water Proofing Compound	Consistency Setting Time Compressive Strength	IS 2645: 2007 IS 2645: 2007 IS 2645: 2007	10 % to 45% 10 min to 600 min 5 MPa to 100 MPa

Laboratory	Sunbeam Auto Pvt. Ltd., Testing Research & Development Centre, 38/6 Km Stone, Delhi-Jaipur Highway, Narsingpur, Gurgaon, Haryana		
Accreditation Standard	ISO/IEC 17025: 2005		
Discipline	Mechanical Testing	Issue Date	01.11.2015
Certificate Number	T-0327	Valid Until	31.10.2017
Last Amended on	29.01.2016	Page	5 of 5

S. No.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
9.	Bitumen	Specific Gravity at 27 °C	IS 1202: 2009	0.70 to 1.2
		% of Binder Content	IRC Sp: 11	3 % to 10 %
		Water Percent by Weight	IS 1211: 2009	0.1 % to 10 %
		Flash Point (Closed Type °C)	IS 1209: 2009	25 °C to 350 °C
		Penetration at 25 °C 5 Second In 1/10mm	IS 1203: 2009	0 to 400 mm
		Ductility at 27 °C	IS 1208: 2009	0 to 100 cm
		Loss on Heating % by Weight	IS 1216: 2009	0.1 % to 100 %
		Matter Soluble In Carbon Disulphide, % by Wt	IS 1216: 2009	0.1 % to 100 %
	Softening Point °C	IS 1205: 2009	25 °C to 150 °C	
IV. SOIL AND ROCK				
1.	Soil	Liquid Limit & Plastic Limit	IS 2720 (Part 5): 2010	Upto 40 %
		Moisture Content	IS 2720 (Part 2): 2010	0.5 % to 30 %
		Sieve Analysis	IS 2720 (Part 4): 2010	0.1 % to 100 %
		Proctor Compaction (Light Compaction)	IS 2720 (Part 7): 2010	1.5 g/cm ³ to 1.9 g/cm ³
		Proctor Compaction (Heavy Compaction)	IS 2720 (Part 8): 2010	1.8 g/cm ³ to 2.4 g/cm ³
		Laboratory CBR	IS 2720 (Part 14): 2010	0.0 % to 100 %
		Sp. Gravity	IS 2720 (Part 5): 2010	1.0 to 5.0
		Linear Shrinkage	IS 2720 (Part 20): 2010	0.0 % to 10.0 %

-X-X-X-X-X-X-X-X-X-X-X-X-