

Laboratory **Aadco Testing & Research Laboratory Private Limited,**
F-28, Bulandshahar Road Industrial Area, Ghaziabad, Uttar Pradesh

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

Certificate Number **TC-8006** (in lieu of T-3157, T-3158) **Page 1 of 29**

Validity **24.10.2018 to 23.10.2020** **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
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CHEMICAL TESTING

I.	BUILDING MATERIAL			
1.	Ordinary Portland Cement (OPC)	Loss on Ignition Silicon dioxide Aluminium oxide Iron oxide Calcium oxide Magnesium oxide Sulphuric anhydride Insoluble Residue Total Chloride	IS 4032:1985 (RA 2014) IS 4032:1985 (RA 2014)	1% to 5% 15 % to 35 % 2 % to 5 % 2 % to 10 % 35 % to 70 % 1 % to 10 % 1 % to 5 % 1 % to 5 % 0.01 % to 0.1%
2.	Portland Pozzolana Cement (PPC)	Loss on Ignition Magnesium oxide Sulphuric anhydride Insoluble Residue	IS 4032:1985 (RA 2014) IS 4032:1985 (RA 2014) IS 4032:1985 (RA 2014) IS 4032:1985 (RA 2014)	1 % to 5% 1 % to 10% 1 % to 5 % 5 % to 35 %
3.	Portland Slag Cement (PSC)	Loss on Ignition Magnesium oxide Sulphuric anhydride Insoluble Residue Sulphide Sulphur	IS 4032:1985 (RA 2014) IS 4032:1985 (RA 2014) IS 4032:1985 (RA 2014) IS 4032:1985 (RA 2014) IS 4032:1985 (RA 2014)	1 % to 5 % 1 % to 10 % 1 % to 5 % 2 % to 8 % 0.2 % to 2 %
4.	Concrete	Sulphate Chloride	BS 1881 (Part 124): 1988 BS 1881 (Part 124): 1988	0.05 % to 5 % 0.05 % to 5 %
5	Micro Silica	Silicon Dioxide (SiO ₂) Moisture Loss On Ignition	IS 1727:1967 (RA 2013) IS 1727:1967 (RA 2013) IS 1727:1967 (RA 2013)	50 % to 99 % 0.1 % to 5 % 0.1 % to 5 %

Laboratory **Aadco Testing & Research Laboratory Private Limited,**
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Accreditation Standard **ISO/IEC 17025: 2005**

Certificate Number **TC-8006** (in lieu of T-3157, T-3158) **Page 2 of 29**

Validity **24.10.2018 to 23.10.2020** **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
6	Lime Stone, Building Lime, Calcite, Dolomite	Loss On Ignition	IS 1760 (Part 1): 1991 (RA 2017)	1 % to 45 %
		Silicon Dioxide (SiO ₂)	IS 1760 (Part 2): 1991 (RA 2017)	0.1 % to 24 %
		Calcium Oxide (CaO)	IS 1760 (Part 3): 1992 (RA 2017)	0.1 % to 60 %
		Magnesium Oxide (MgO)	IS 1760 (Part 3): 1992 (RA 2017)	0.1 % to 40 %
		Iron Oxide (Fe ₂ O ₃)	IS 1760 (Part 3): 1992 (RA 2017)	0.1 % to 5 %
		Aluminium Oxide (Al ₂ O ₃)	IS 1760 (Part 3): 1992 (RA 2017)	0.1 % to 5 %
		Total Chloride (Cl)	IS 1760 (Part 5): 1991 (RA 2017)	0.01 % to 0.5 %
7.	Plaster of Paris (POP) or Gypsum Building Plaster	Sulphur Trioxide (SO ₃)	IS 1288: 1982 (RA 2012)	20 % to 50 %
		Calcium Oxide (CaO)	IS 1288: 1982 (RA 2012)	20 % to 40 %
		Magnesium Oxide (MgO)	IS 4032: 1985 (RA 2012)	0.05 % to 1.0 %
		Loss On Ignition	IS 2547 (Part 1):1976 (RA 2012)	2 % to 15 %
8	Admixture	Dry Material Content	IS 9103:1999 (RA 2008)	10 % to 70%
		Ash Content	IS 9103:1999 (RA 2008)	5 % to 20 %
		Relative Density	IS 9103:1999 (RA 2008)	1.00 to 2.00
		Chloride Content	IS 6925:1973 (RA 2008)	0.01 % to 0.1%
		pH value	IS 9103:1999 (RA 2008)	2 to 13
9.	Fly Ash	Silicon Dioxide (SiO ₂)	IS 1727:1967 (RA 2013)	20 % to 70 %
		Aluminium Oxide (Al ₂ O ₃)	IS 1727:1967 (RA 2013)	5 % to 40 %
		Iron Oxide (Fe ₂ O ₃)	IS 1727:1967 (RA 2013)	5 % to 30 %
		Magnesium Oxide (MgO)	IS 1727:1967 (RA 2013)	0.1 % to 10 %
		Sulphur Trioxide (SO ₃)	IS 1727:1967 (RA 2013)	0.01 % to 5 %

Laboratory

Aadco Testing & Research Laboratory Private Limited,
F-28, Bulandshahar Road Industrial Area, Ghaziabad, Uttar Pradesh

Accreditation Standard ISO/IEC 17025: 2005

Certificate Number TC-8006 (in lieu of T-3157, T-3158)

Page 3 of 29

Validity 24.10.2018 to 23.10.2020

Last Amended on --

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		Total Chloride (Cl) Loss On Ignition Moisture	IS 4032:1985 (RA 2014) IS 1727:1967 (RA 2013) IS 1727:1967 (RA 2013)	0.01 % to 0.5 % 0.1 % to 15 % 0.1% to 5%
II.	SOIL & ROCK			
1.	Soil	Water Content pH value Electrical Conductivity Organic Matter Organic Carbon Carbonates Total soluble sulphate as SO ₄	IS 2720 (Part 2): 1973 (RA 2010/Sec I) IS 2720 (Part 26): 1987 (RA 2011) Clause. 2 IS 14767: 2000 (RA 2010) IS 2720 (Part 22/ Sec I): 1972 (RA 2010) IS 2720 (Part 22/ Sec I): 1972 (RA 2010) IS 2720 (Part 23): 1976 (RA 2010) IS 2720 (Part 27): 1977 (RA 2010) Clause. 2	0.5 % to 40 % 2 to 13 1 mS/m to 2000 mS/m 0.05 % to 30 % 0.03 % to 15 % 0.01 % to 15 % 0.05 % to 10 %
III.	METALS & ALLOYS			
1.	Mild Steel	Carbon Sulphur Silicon Manganese Phosphorous	IS 228 (Part 1): 1987 (RA 2012) Amd. 1 IS 228 (Part 9): 1989 (RA 2009) IS 228 (Part 8): 1989 (RA 2009) IS 228 (Part 2): 1987 (RA 2012) IS 228 (Part 3): 1987 (RA 2012)	0.05 % to 0.5 % 0.01 % to 0.5 % 0.05 % to 5.0 % 0.1 % to 2.0 % 0.01 % to 0.5 %

Laboratory

Aadco Testing & Research Laboratory Private Limited,
F-28, Bulandshahar Road Industrial Area, Ghaziabad, Uttar Pradesh

Accreditation Standard ISO/IEC 17025: 2005

Certificate Number

TC-8006 (in lieu of T-3157, T-3158)

Page 4 of 29

Validity

24.10.2018 to 23.10.2020

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
2.	Stainless Steel	Nickel	IS 228 (Part 5): 1987 (RA 2009)	1 % to 10 %
		Phosphorous	IS 228 (Part 3): 1987 (RA 2008)	0.02 % to 0.05 %
		Carbon	IS 228 (Part 1): 1987 (RA 2012)	0.05 % to 0.2 %
		Chromium	Amd. 1	5 % to 20 %
		Silicon	IS 228 (Part 6): 1987 (RA 2009)	0.2 % to 1.0 %
		Manganese	IS 228 (Part 8): 1989 (RA 2009)	0.1 % to 1.5 %
		Sulphur	IS 228 (Part 2): 1987 (RA 2012) IS 228 (Part 8): 1989 (RA 2009)	0.01 % to 0.5 %
IV.	PAINTS & SURFACE COATING			
1.	Steel Products	Mass Zinc Coating (Mass/unit area)	IS 6745:1972 (RA 2011) Amd. 5, Clause. 5	50 g/m ² to 2000 g/m ²
		Uniformity of coating	IS 2633:198 (RA 2010)	Qualitative Test
2.	Aluminium Products	Thickness of Anodizing coating	IS 5523:1983 (RA 2010) Amd 1, Clause. 2.3	5 Micron to 30 Micron
V.	WATER			
1.	Construction Water	Volume of 0.02 N H ₂ SO ₄ required to neutralize 100ml of sample (Alkalinity)	IS 3025 (Part 23): 1986 (RA 2003)	0.1 ml to 40 ml
		Volume of 0.02 N NaOH required to neutralize 100ml of sample (Acidity)	IS 3025 (Part 22): 1986 (RA 2009) IS 3025 (Part 11): 1964	0.1 ml to 40 ml

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Laboratory **Aadco Testing & Research Laboratory Private Limited,**
F-28, Bulandshahar Road Industrial Area, Ghaziabad, Uttar Pradesh

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

Certificate Number **TC-8006** *(in lieu of T-3157, T-3158)* **Page 6 of 29**

Validity **24.10.2018 to 23.10.2020** **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
		Carbonate (As CaCO ₃)	IS:3025(Part-51):2009 (RA 2009)	By Calculation
		Conductivity	IS:3025 (Part-14) :2013	1µs to 2000µs /cm
		Bicarbonate (as CaHCO ₃)	IS:3025 (Part-51) :2001 RA 2006	By Calculation
		Sulphite	IS:3025 (Part-28) :1986 (RA 2003)	2 mg/l to 500mg/l

Laboratory **Aadco Testing & Research Laboratory Private Limited,**
F-28, Bulandshahar Road Industrial Area, Ghaziabad, Uttar Pradesh
Accreditation Standard **ISO/IEC 17025: 2005**
Certificate Number **TC-8006** (in lieu of T-3157, T-3158) **Page 7 of 29**
Validity **24.10.2018 to 23.10.2020** **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
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MECHANICAL TESTING

I. BUILDING MATERIAL				
1	Cement (OPC/PPC)	Setting Time Initial Final	IS 4031(Part -5): 1988,(RA 14)	20min to 600min 30-600 Minutes
		Soundness By Le-chatellier	IS 4031(Part -3): 1988,(RA 14)	0.5 mm to 10 mm
		Soundness By Autoclave		0.01% to 2 %
		Compressive strength	IS 4031(Part -6): 1988,(RA 14)	5 N/mm ² to 70 N/mm ²
		Fineness By Blain's air permeability,	IS 4031(Part -2): 1999,(RA 13)	150 m ² /kg to 400 m ² /kg
		Fineness By Dry sieving	IS 4031(Part-1):1996, (RA 2011)	0.05% to 100 %
		Density	IS 4031(Part-11):1988, (RA 2014)	2 gm/cc to 3.5 gm/cc
		Consistency	IS 4031(Part-4):1988, (RA 2014)	20% to 40 %
		Drying shrinkage	IS 4031(Part-10):1988, (RA 2014)	0.01% to 5%
		2.	Concrete hollow/ solid block	Density
Water Absorption	IS 2185 (Part I): 2005 (RA 2010)			0.5% to 50 %
Compressive Strength	IS 2185 (Part I): 2005			1 N/mm ² to 30 N/mm ²

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F-28, Bulandshahar Road Industrial Area, Ghaziabad, Uttar Pradesh

Accreditation Standard ISO/IEC 17025: 2005

Certificate Number TC-8006 (in lieu of T-3157, T-3158)

Page 8 of 29

Validity 24.10.2018 to 23.10.2020

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
3.	Paver Block	Compressive Strength	(RA 2010) IS 15658: 2006 (RA 2016)	5 N/mm ² to 60 N/mm ²
		Water Absorption	IS 15658: 2006 (RA 2016)	0.5% to 20 %
			IS 15658: 2006 (RA 2016)	
		Dimension:		
		Length		100mm to 500 mm
		Width		100mm to 500 mm
		Thickness		50mm to 120 mm
4.	Cement concrete	Permeability	DIN 1048 (P-5) 1991	1mm to 25mm
5.	Ceramic Tiles/ Vitrified Tiles	Water Absorption	IS 13630 (Part 2): 2006 (RA 2016)	0.1% to 25 %
		Hardness by Moh's scale	IS 13630 (Part 13): 2006 (RA 2016)	1 to 9
		Bulk density	IS 13630 (Part 2): 2006 (RA 2016)	1.5 g/cc to 2.5 g/cc
6.	Flush Door Shutter	Glue adhesion	IS 4020 (Part 15): 1998 (RA 2013)	Qualitative
		Knife test	IS 4020 (Part 14): 1998 (RA 2013)	Qualitative
		End immersion test	IS 4020 (Part 13): 1998 (RA 2013)	Qualitative
		Dimension :-		
		Length	IS 4020 (Part 13): 1998 (RA 2013)	50 mm to 3000 mm
		Width	IS 4020 (Part 13): 1998 (RA 2013)	50 mm to 3000 mm
		Thickness	IS 4020 (Part 13): 1998 (RA 2013)	0.1 mm to 150 mm
7.	Building Bricks	Dimension	IS 1077:1992,(RA 11)	20 mm to 5000 mm

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F-28, Bulandshahr Road Industrial Area, Ghaziabad, Uttar Pradesh

Accreditation Standard ISO/IEC 17025: 2005

Certificate Number TC-8006 (in lieu of T-3157, T-3158)

Page 9 of 29

Validity 24.10.2018 to 23.10.2020

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
			IS 13757:1993,(RA 11) IS 12894:2002,(RA 12)	
		Water absorption	IS 3495(Part-2):1992,(RA 11)	1% to 40 %
		Efflorescence	IS 3495(Part-3):1992,(RA 11)	Qualitative test
		Compressive strength	IS 3495(Part-1):1992,(RA 11)	5 Mpa to 39 Mpa
8.	Coarse Aggregate	Flakiness index	IS 2386(Part-1):1963,(RA 11)	5% to 50 %
		Elongation Index	IS 2386(Part-1):1963,(RA 11)	5% to 50 %
		Bulk density	IS 2386(Part-3):1963,(RA 11)	1 kg/l to 4 kg/l
		Specific gravity	IS 2386(Part-3):1963,(RA 11)	1.5 to 5
		Water absorption	IS2386(Part- 3):1963,(RA11)	0.1% to 5 %
		Crushing value	IS 2386(Part-4):1963,(RA 11)	5% to 50 %
		Impact value	IS 2386(Part-4):1963,(RA 11)	5% to 50 %
		Los Angeles abrasion value	IS 2386(Part-4):1963,(RA 11)	5% to 50 %
		10% Fines value	IS 2386(Part-4):1963,(RA 11)	5T to 70 T
		Soundness test	IS 2386(Part-5):1963,(RA 11)	0.1% to 25 %
		Sieve analysis	IS 383:2016 IS 2386 (Part-1):1963,(RA 11)	0.1% to 100 % (6mm to 125mm)
		Organic impurities	IS 2386(Part-2):1963,(RA 11)	Qualitative test
		Deleterious materials		
		Material finer than 75micron	IS 2386(Part-1):1963,(RA 11)	0.1% to 10 %
		Clay lumps	IS 2386(Part-2):1963,(RA 11)	Upto 5 %
		Coal and Lignite	IS 2386(Part-2):1963,(RA 11)	0.1% to 2 %
9.	Fine Aggregate	Bulk density	IS 2386(Part-3):1963,(RA 11)	1 kg/l to 4 kg/l
		Specific gravity	IS 2386(Part-3):1963,(RA 11)	1.5-4
		Water absorption	IS2386(Part-3):1963,(RA11)	0.1% to 5 %
		Soundness test	IS 2386(Part-5):1963,(RA 11)	0.1 % to 20 %
		Sieve analysis	IS 383:2016	0.1% to 100 %

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F-28, Bulandshahar Road Industrial Area, Ghaziabad, Uttar Pradesh

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

Certificate Number **TC-8006** (in lieu of T-3157, T-3158) **Page 10 of 29**

Validity **24.10.2018 to 23.10.2020** **Last Amended on --**

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			IS 2386 (Part-1):1963, (RA 11)	(0.150 mm to 10 mm)
		Bulking of sand	IS 2386(Part-3): 1963, (RA 11)	1% to 25 %
		Organic impurities	IS 2386(Part-2):1963, (RA 11)	Qualitative
		Deleterious materials		
		Material finer than 75micron	IS 2386(Part-1):1963,(RA 11)	0.1% to 20 %
		Clay lumps	IS 2386(Part-2):1963,(RA 11)	Upto 5 %
		Coal and Lignite	IS 2386(Part-2):1963,(RA 11)	0.1% to 2 %
10.	Bituminious Mix	Bitumen Content	IRC SP-11	2 % to 10 %
11.	Bentonite	Moisture Content	IS 6186: 1986 (RA 2015) Appendix A-2	1% to 15 %
		Gel Formation Index	IS 6186: 1986 (RA 2015) Appendix A-4	Qualitative
		Swelling power	IS 6186: 1986 (RA 2015) Appendix A-5	Upto 100 ml
		Fineness by Dry & wet	IS 6186: 1986 (RA 2015) Appendix A-6	60% to 100%
		Sand content	IS 6186: 1986 (RA 2015) Appendix A-9	Upto 5 %
12.	Paving Bitumen/ Industrial Bitumen/ Modified Bitumen	Specific Gravity	IS 1202: 1978 (RA 2014)	1 to 5
		Penetration	IS 1203: 1978 (RA 2014)	(5 to 400) mm (1/10mm)
		Softening Point	IS 1205: 1978 (RA 2014)	30°C to 200 °C
		Ductility,	IS 1208: 1978 (RA 2014)	5cm to 100cm
		Flash Point	IS 1448 (Part 69): 2013	50°C to 350 ° C
		Fire point	IS 1448 (Part 69): 2013	100°C to 350°C
		Solubility in Trichloroethylene	IS 1216: 1978 (RA 2014)	10% to 100 %
13.	Hardened Concrete	Compressive strength	IS 516:1959, (RA 13)	5 N/mm ² to 80 N/mm ²

Laboratory

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F-28, Bulandshahar Road Industrial Area, Ghaziabad, Uttar Pradesh

Accreditation Standard ISO/IEC 17025: 2005

Certificate Number TC-8006 (in lieu of T-3157, T-3158)

Page 11 of 29

Validity 24.10.2018 to 23.10.2020

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
14.	AAC BLOCK	Bulk density	IS 6441 (Part 1): 1972 (RA 2017)	100 to 1000 kg/m ³
		Compressive Strength	IS 6441 (Part 5): 1972 (RA 2017)	0.5 to 20 N/mm ²
		Drying Shrinkage	IS 6441(Part 2): 1972 (RA 2017)	0.001 to 0.50 %
		Dimensions	IS 2185 (Part 3): 1984 (RA 2010)	
		Length		100mm to 1000 mm
	Width		100mm to 1000 mm	
	Height		50mm to 1000 mm	
II.	SOIL AND ROCK			
1.	SOIL	Specific Gravity	IS 2720 (Part 3/ Sec I): 1980,(RA 2011)	1 to 4
		Water Content	IS 2720 (Part 2): 1973 (RA 2010)	Upto 50 %
		Grain Size Analysis	IS 2720 (Part 4): 1985 (RA 2010)	5 to 100 (Sieve size 4.75 mm to 0.075 mm) %
		Liquid Limit	IS 2720 (Part 5): 1985, (RA 2010)	10 to 50 %
		Plastic Limit	IS 2720 (Part 5): 1985 (RA 2010)	0 to 50 %
		(1)Light Compaction	IS 2720 (Part 7): 1980 (RA 2010)	MDD: 1 g/cc to 3 g/cc OMC: 1 g/cc to 20 g/cc
		(2)Heavy Compaction	IS 2720 (Part 8): 1983 (RA 2010)	MDD: 1 g/cc to 3 g/cc OMC: 1 to 20 g/cc
	California Bearing Ratio	IS 2720 (Part 16): 1987 (RA 2011)	1% to 80 %	
	Free Swell Index	IS 2720 (Part 40): 1977	Upto 90 %	

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Laboratory

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F-28, Bulandshahar Road Industrial Area, Ghaziabad, Uttar Pradesh

Accreditation Standard ISO/IEC 17025: 2005

Certificate Number TC-8006 (in lieu of T-3157, T-3158)

Page 12 of 29

Validity 24.10.2018 to 23.10.2020

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
III.	MECHANICAL PROPERTIES OF METAL			(RA 2011)
1.	High Strength deformed steel bar, structure steel, M. S. Pipe, G. I. Pipe, H.D. Wire, Hollow Section	Tensile Test		
i.		Tensile strength	IS 1608:2005,(RA 10)	300 N/mm ² to 900 N/mm ²
ii.		Yield stress/0.2% proof stress	IS 1608:2005,(RA 10)	120 N/mm ² to 700 N/mm ²
iii.		Elongation	IS 1608:2005,(RA 10)	5% to 50 %
iv.		Total Elongation at maximum force	IS 1608:2005,(RA 10)	5% to 30 %
		Bend test	IS 1599:2012 IS 1786:2008,(RA 13)	Qualitative Test Angle at 180° Mandrel size (20, 24, 28, 30, 32, 36, 40, 42, 48, 50, 56, 60, 64, 70, 72, 80, 84, 96, 100, 112, 120, 125, 140, 150, 160, 175, 180, 192, 196, 200)mm
	Rebend test	IS 1786:2008,(RA 13)	Qualitative Test Angle at 135° & 157.5° Mandrel size (20, 24, 28, 30, 32, 36, 40, 42, 48, 50, 56, 60, 64, 70, 72, 80, 84, 96, 100, 112, 120, 125, 140, 150, 160, 175, 180, 192, 196, 200) mm)	

Laboratory

Aadco Testing & Research Laboratory Private Limited,
F-28, Bulandshahar Road Industrial Area, Ghaziabad, Uttar Pradesh

Accreditation Standard ISO/IEC 17025: 2005

Certificate Number TC-8006 (in lieu of T-3157, T-3158)

Page 13 of 29

Validity 24.10.2018 to 23.10.2020

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
2.	High Strength deformed steel bar, structure steel, M. S. Pipe, G. I. Pipe, H.D. Wire, Hollow Section	Mass per meter	IS 1786:2008,(RA 13) IS 1730:1989,(RA 09) IS 1732:1989,(RA 09) IS 808:1989,(RA 09) IS1852:1985,(RA 09) IS 4923:1997,(RA 09)	0.001 kg to 100 kg
		Dimension Length Width Thickness	IS 1730:1989,(RA 09) IS 1732:1989,(RA 09) IS 808:1989,(RA 09) IS 1852:1985,(RA 13) IS 1239(P-1):2004,(RA 10) IS 1161:2014 IS 4923:1997,(RA 09)	1mm to 5000mm 1mm to 3500mm 0.01mm to 25 mm
		Rockwell Hardness test HRA	IS 1586(P-1):2012	30HRA to 88HRA
		HRBW		30 HRBW to 100HRBW
		HRC		20HRC to 70HRC
3.	Aluminium and alloys, bars and rods etc. (20mm & Above diameter)	Tensile Test		
		i. Tensile strength	IS 1608:2005, (RA 10)	200N/mm ² to 560N/mm ²
		ii. 0.2% proof stress	IS 1608:2005, (RA 10)	150N/mm ² to 450N/mm ²
		iii. Elongation	IS 1608:2005, (RA 10)	1% to 50 %
		Dimensions Length Width Thickness	IS 2673:2002, (RA 07) IS 2676:1981, (RA 07) IS 2677:1979, (RA 07) IS 2678:1987, (RA 06) IS 2826:1986, (RA 06) IS 3965:1981, (RA 06) IS 6477:1983, (RA 10)	500 mm to 5000 mm 0.02 mm to 300 mm 0.01 mm to 25 mm
	Freedom from defects	IS 733:1983, (RA 06)	Qualitative	

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F-28, Bulandshahar Road Industrial Area, Ghaziabad, Uttar Pradesh

Accreditation Standard ISO/IEC 17025: 2005

Certificate Number

TC-8006 (in lieu of T-3157, T-3158)

Page 14 of 29

Validity

24.10.2018 to 23.10.2020

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
			IS 737:2008, (RA 13) IS 738:1994, (RA 10) IS 1285:2002, (RA 13) IS 277:2003, (RA 13)	
4.	Galvanized steel sheet (Plain & Corrugated)	Size Thick Length Width Depth Mass Bend Test Freedom from defects	IS 277:2003, (RA 13) IS 277:2003, (RA 13) IS 277:2003, (RA 13)	0.05mm to 5 mm 500mm 5000 mm 250mm to 3000 mm 8mm to 25 mm 1gm to 30000gm Qualitative Test, Angle at 180°, Mandrel size (20, 24, 28, 30, 32, 36, 40, 42, 48, 50) mm Qualitative
IV. WOOD AND WOOD PRODUCTS				
1.	Timber & Wood	Moisture Content	IS 1708: 1986 (P-1) (RA 2010)	1% to 40 %
2.	Ply Wood	Specific gravity Dimension	IS 1708 (Part-2) 1986 IS 303:1989 (RA 2003)	400 to 2000 1mm to 3000 mm
		Moisture content	IS 1734 (Part 1): 1983 (RA 2008)	1% to 50 %
		Adhesion of plies	IS 1734 (Part 5): 1983 (RA 2013)	Qualitative
3.	Prelaminated Particle boards from wood	Water resistance Moisture Water absorption Density	IS 1734 (Part-6) : 1983 IS: 2380 (Part- 3), Amd. 4 1977 IS: 2380(Part-16), Amd. 4 1977 IS: 2380 (Part-3), Amd. 4	Qualitative 0.1% to 50 % 0.2% to 25 % 400kg/m ³ to 1200kg/m ³

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

Certificate Number **TC-8006** *(in lieu of T-3157, T-3158)* **Page 15 of 29**

Validity **24.10.2018 to 23.10.2020** **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
		Resistance to steam	IS:12823:1990	Qualitative
		Crack resistance	IS:12823:1990	Qualitative
		Resistance to cigarette burn	IS:12823:1990	Qualitative
		Resistance to stain	IS:12823: 1990	Qualitative
4.	Block Board	Defect	IS: 1659: 2004 Amd -2	Qualitative
		Length	IS: 1659: 2004 Amd 2	50mm to 3000mm
		Width	IS: 1659: 2004 Amd 2	50mm to 3000mm
		Thickness	IS: 1659: 2004 Amd 2	0.1mm to 150mm
		Straightness edge	IS: 1659: 2004 Amd 2	0.01% to 4%
		Squareness	IS: 1659: 2004 Amd 2	0.01% to 4%
		Resistance to water	IS: 1659: 2004 Amd 2	Qualitative
		Adhesion of plies	IS: 1659: 2004 Amd 2	Qualitative
		Spot Test	IS: 1659: 2004 Amd 2	Qualitative

Laboratory **Aadco Testing & Research Laboratory Private Limited,**
F-28, Bulandshahar Road Industrial Area, Ghaziabad, Uttar Pradesh
Accreditation Standard **ISO/IEC 17025: 2005**
Certificate Number **TC-8006** (in lieu of T-3157, T-3158) **Page 16 of 29**
Validity **24.10.2018 to 23.10.2020** **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
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<u>ELECTRICAL TESTING</u>				
I.	CABLES AND ACCESSORIES			
1.	PVC Insulated unsheathed and sheathed Cables/cords with rigid and flexible conductor for rated voltage upto and including 450/750Volts IS 694:2010	A. Tests on conductor		
		Annealing test (for Copper)	IS 8130-2013 IS 10810 (Part-1):1984, RA -2016	0.2% to 200%
		Tensile test (for Aluminum)	IS 8130-2013 IS 10810(Part-2):1984, RA -2016	1N to 2500N
		Wrapping test (for Aluminum)	IS 8130-2013 IS 10810(Part-3):1984, RA -2016	Qualitative
		Conductor Resistance tests	IS 8130-2013 IS 10810(Part-5):1984, RA -2016	0.2μΩ to 11Ω
		Persulphate test (Tinned copper conductor cable only)	IS 8130-2013 IS 10810(Part-4):1984, RA -2016	Qualitative
		B. Test for overall dimension, thickness of insulation & sheath	IS 10810(Part-6):1984, RA -2016	0.01 to 150mm 0.001 to 25mm
		C. Physical test on insulation & sheath		
		Tensile strength	IS 5831-1984, RA .2016 IS 10810(Part-7):1984, RA .2016	1N to 2500N
		Elongation at break		2.5% to 650%
	Loss of mass in air oven	IS 5831:1984, RA -2016	Upto 200°C,	

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**Aadco Testing & Research Laboratory Private Limited,
F-28, Bulandshahar Road Industrial Area, Ghaziabad, Uttar Pradesh**

Accreditation Standard

ISO/IEC 17025: 2005

Certificate Number

TC-8006 (in lieu of T-3157, T-3158)

Page 17 of 29

Validity

24.10.2018 to 23.10.2020

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
			IS 10810(Part-10):1984, RA -2016	Upto 200g
		Tensile strength & Elongation at break After ageing	IS 5831-1984, RA .2016 IS 10810 (Part-11):1984, RA .2016	1N to 2500N 2.5 to 650% Upto 200°C
		Shrinkage tests	IS 5831-1984, RA .2016 IS 10810(Part-12):1984, RA -2016	Up to 200°C 0.01mm to 150mm,
		Heat shock tests	IS 5831:1984, RA .2016 IS 10810(Part-14):1984, RA -2016	Qualitative Upto200°C
		Hot deformation tests	IS 5831:1984, RA .2016 IS 10810(Part-15):1984, RA -2016	Up to 200°C
		Thermal stability test	IS 5831:1984, RA .2016 IS 10810(Part-60):1988, RA .2016	Upto 200 °C
		Cold bend test	IS 5831-1984, RA .2016 IS 10810(Part-20):1984, RA -2016	Qualitative (-)50°C to 50°C
		Cold impact test	IS 5831:1984, RA .2016 IS 10810(Part-21) :1984, RA .2016	Qualitative (-)50°C to 50°C
		Flammability test	IS 10810(Part-53):1984, RA -2016	0.01mm to 1000mm Upto 60sec
		Insulation Resistance Test	IS 5831-1984, RA .2016 IS 10810(Part-43):1984, RA -2016	100 X 10 ⁵ Ω (At 500V DC)
		High voltage test (water immersion AC & DC test)	IS 694:2010 Riff-2016 IS 10810(Part-45):1984, RA :2016	Upto 10 kV, Qualitative

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Aadco Testing & Research Laboratory Private Limited,
F-28, Bulandshahar Road Industrial Area, Ghaziabad, Uttar Pradesh

Accreditation Standard ISO/IEC 17025: 2005

Certificate Number TC-8006 (in lieu of T-3157, T-3158)

Page 18 of 29

Validity 24.10.2018 to 23.10.2020

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
		A.C. High voltage test at Room temp.	IS 694:2010 Riff-2016 IS 10810(Part-45):1984, RA :2016	0 to 5/10 kV, Qualitative
2.	PVC Insulated cables for Working voltage Upto and including 1100Volts IS 1554 (P-1) 1988	A. Tests on conductor Annealing test (for copper)	IS 8130-2013, IS 10810(Part-1):1984, RA -2016	0.2 to 200%
		Tensile test (for Aluminum)	IS 8130-2013 IS 10810(Part-2):1984, RA -2016	1N to 5000N
		Wrapping test (for Aluminum)	IS 8130:2013, IS10810(Part-3):1984, RA .2016	Qualitative
		Conductor Resistance tests	IS 8130-2013, IS 10810(Part-5)1984, RA .2016	0.02 ohms to 11 ohms
		B. Test on Armouring wire and strip		
		Dimensions Diameter, mm	IS 1554(Part-1):1988, RA .2010 IS 10810(Part-36):1984, RA -2016 IS 3975:1999	0.01mm to 150mm
		Tensile strength test	IS 1554(Part-1):1988, RA .2010 IS 10810(Part-37):1984, RA -2016 IS 3975:1999	1N to 2500N
		Elongation at break	IS 1554(Part-1):1988,	0.2% to 200%

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Aadco Testing & Research Laboratory Private Limited,
F-28, Bulandshahar Road Industrial Area, Ghaziabad, Uttar Pradesh

Accreditation Standard ISO/IEC 17025: 2005

Certificate Number

TC-8006 (in lieu of T-3157, T-3158)

Page 19 of 29

Validity

24.10.2018 to 23.10.2020

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
			RA .2010 IS 10810(Part-37):1984, RA -2016	
		Winding Test For Formed Wire	IS 1554(Part-1):1988, RA .2010 IS 10810(Part-39):1984, RA -2016 IS 3975:1999	Qualitative
		Uniformity Of Zinc coating	IS 1554(Part-1):1988, RA .2010 IS 10810(Part-40):1984, RA -2016 IS 3975:1999	Qualitative
		Mass of Zinc coating	IS 1554(Part-1):1988, RA .2010 IS 10810(Part-41):1984, RA -2011 IS 3975:1999	20 g/m ² to 750g/m ²
		Resistivity Test	IS 1554(Part-1):1988, RA .2010 IS 10810(Part-42):1984, RA -2016 IS 3975:1999	0.02 Ωcm to 100 Ωcm
		Physical test on insulation & sheath		
		Test for overall dimension, Thickness of insulation & sheath	IS 1554:1988, RA .2010 IS 10810(Part-6):1984, RA -2016	0.01mm to 150mm 0.001mm to 25mm
		Tensile strength	IS 5831:1984, RA .2016 IS 10810(Part-7)1984,	1 to 2500N, LC-1N
		Elongation at break	RA .2016	2.5-650%

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**Aadco Testing & Research Laboratory Private Limited,
F-28, Bulandshahar Road Industrial Area, Ghaziabad, Uttar Pradesh**

Accreditation Standard

ISO/IEC 17025: 2005

Certificate Number

TC-8006 (in lieu of T-3157, T-3158)

Page 20 of 29

Validity

24.10.2018 to 23.10.2020

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
		Tensile strength	IS 5831:1984, RA .2016	1N to 5000N,
		Elongation at break After ageing	IS 10810 (Part-11):1984, RA .2016	2.5%-650% Up to 200°C
		Shrinkage tests	IS 5831:1984, RA .2016 IS 10810 (Part-12):1984, RA -2016	Up to 200°C, 1mm to 300mm
		Hot deformation tests	IS 5831:1984, RA -2016 IS 10810 (Part-15):1984, RA .2016	Upto 100%
		Loss of mass in air oven	IS 5831:1984, RA .2016 IS 10810 (Part-10):1984, RA -2016	Up to 200°C, Upto 200g
		Heat shock tests	IS 5831:1984, RA .2016 IS 10810 (Part-14):1984, RA -2016	Qualitative Up to 200°C
		Insulation resistance test	IS 5831:1984, RA .2016 IS 10810(Part-43):1984, RA -2016	100 X 10 ⁵ MΩ (At 500V DC)
		High voltage (water immersion AC test)	IS 1554:1988, RA .2010 IS 10810:(Part-45):1984, RA -2016	Upto 10 kV, Qualitative
		High voltage (water immersion DC test)	IS 1554:1988, RA .2010 IS 10810 (Part-45)-1984, RA -2016	1 kV to 3 kV Qualitative
		A.C. High voltage at room temp.	IS 1554:1988, RA .2010 IS 10810(Part-45):1984, RA -2016	0 to 5/10 kV, Qualitative
		Flammability test	IS 1554:1988, RA .2010 IS 10810(Part-53):1984,	Upto 600mm

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Laboratory

Aadco Testing & Research Laboratory Private Limited,
F-28, Bulandshahar Road Industrial Area, Ghaziabad, Uttar Pradesh

Accreditation Standard ISO/IEC 17025: 2005

Certificate Number

TC-8006 (in lieu of T-3157, T-3158)

Page 21 of 29

Validity

24.10.2018 to 23.10.2020

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
		Cold bend test	RA -2016 IS 5831-1984, RA .2016 IS 10810(Part-20):1984, RA -2016	Qualitative (-)50°C to+50°C
		Cold impact test	IS 5831-1984, RA -2016 IS 10810(Part-21):1984, RA -2016	Qualitative (-)50°C to+50°C
		Thermal stability test	IS 5831:1984, RA -2016 IS 10810(Part-60):1984, RA -2015	30°C to 200°C
3.	Cross Linked Polyethylene Insulated PVC Sheathed Cables for Working voltage including 1100 Volts IS 7098(P-1) 1988	A. Tests on conductor		
		Annealing test (for copper)	IS 8130:2013 IS 10810(Part-1):1984, RA -2016	0.2% to 200%
		Tensile test (for Aluminium)	IS 8130:2013 IS 10810(Part-2)1984, RA -2016	1N to 2500N
		Wrapping test (for Aluminium)	IS 8130-1984:2013 IS 10810(Part-3)1984, RA -2016	Qualitative
		Conductor Resistance tests	IS 8130:2013 IS 10810(Part-5)1984, RA -2016	0.2 micro ohms to 11 ohms
		B. Test on Armouring wire and strip		
	Dimensions Diameter	IS 7098(Part-1):1988, RA -2015 IS 10810(Part-36):1984, RA -2016	0.01mm to 150mm	

Laboratory

Aadco Testing & Research Laboratory Private Limited,
F-28, Bulandshahar Road Industrial Area, Ghaziabad, Uttar Pradesh

Accreditation Standard ISO/IEC 17025: 2005

Certificate Number TC-8006 (in lieu of T-3157, T-3158)

Page 22 of 29

Validity 24.10.2018 to 23.10.2020

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
		Tensile strength test	IS 7098(Part-1): 1988, RA -2015 IS 10810(Part-37):1984, RA -2016	1N to 2500N
		Elongation at break	IS 7098(Part-1):1988, RA -2015 IS 10810(Part-37):1984, RA -2016	0.2% to 200%
		Winding Test For Formed Wire	IS 7098(Part-1):1988 RA -2015 IS 10810(Part-39):1984, RA -2016	Qualitative
		Uniformity Of Zinc coating	IS 7098(Part-1):1988 RA -2015 IS 10810(Part-40):1984, RA -2016	Qualitative
		Mass of Zinc coating	IS 7098(Part-1):1988 RA -2015 IS 10810(Part-41):1984, RA -2016	20 gm/m ² to 750gm/m ²
		Resistivity	IS 7098(Part-1):1988 RA -2015 IS 10810(Part-42):1984, RA -2016	0.02 Ωcm to 100 Ωcm
		C. Physical test on insulation		
		Test for Thickness of Insulation & sheath	IS 7098(Part-1):1988 RA -2015 S:10810(Part-6)1984, RA -2016	0.01 to 150mm/0.01 0.001 to 25mm/0.001

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Aadco Testing & Research Laboratory Private Limited,
F-28, Bulandshahar Road Industrial Area, Ghaziabad, Uttar Pradesh

Accreditation Standard ISO/IEC 17025: 2005

Certificate Number TC-8006 (in lieu of T-3157, T-3158)

Page 23 of 29

Validity 24.10.2018 to 23.10.2020

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
		Tensile strength Elongation at break	IS 7098(Part-1):1988 RA -2015 IS 10810(Part-7)1984, RA -2016	1N to 2500N 2.5% to 650%
		Shrinkage test	IS 7098(Part-1):1988 RA -2015 IS 10810(Part-12):1984, RA -2016	Upto 200°C, 0.1mm to 150mm
		D. Physical test on Outer Sheath		
		Tensile strength Elongation at break	IS 5831-1984, RA -2016 IS 10810(Part-7)1984, RA -2016	1N to 2500N, 2.5% to 650%
		After ageing Tensile strength Elongation at break	IS 5831-1984, RA -2016 IS 10810 (Part-11):1984, RA -2016	Up to 200°C, 1kN to 5kN 2.5% to 650%
		Loss of mass in air oven	IS 5831-1984, RA -2016 IS 10810 (Part-10):1984, RA -2016	Up to 200°C Upto 200g,
		Shrinkage test	IS 5831-1984,RA -2016 IS 10810(Part-12)1984, RA -2016	Up to 200°C Upto 150mm,
		Hot deformation tests	IS 5831:1984, RA -2016 IS 10810(Part-15):1984, RA :2016	Up to 200°C
		Heat shock tests	IS 5831-1984, RA -2016 IS 10810(Part-14):1984, RA -2016	Qualitative Up to200°C
		Thermal stability test	IS 5831:1984, RA -2016 IS 10810(Part-60)1984,	Upto 200°C

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Aadco Testing & Research Laboratory Private Limited,
F-28, Bulandshahar Road Industrial Area, Ghaziabad, Uttar Pradesh

Accreditation Standard ISO/IEC 17025: 2005

Certificate Number TC-8006 (in lieu of T-3157, T-3158)

Page 24 of 29

Validity 24.10.2018 to 23.10.2020

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
		Insulation resistance test	RA -2016 IS 5831:1984, RA -2016 IS 10810(Part-43):1984, RA -2016	100 X 10 ⁵ MΩ (500V DC)
		High voltage test (AC) (Room Temp.)	IS 7098(Part-1):1988, RA -2015 IS 10810(Part-45):1984, RA -2016	0.2kV to 10 kV, Qualitative
		Flammability test	IS 7098(Part-1):1988, RA -2015 IS 10810(Part-53):1984, RA -2016	Upto 600mm
		Cold bend test (outer Sheath)	IS 5831:1984, RA -2016 IS 10810(Part-20):1984, RA -2016	Qualitative (-50°C to+50°C
		Cold impact test (outer sheath)	IS 5831:1984, RA -2016 IS 10810(Part--21):1984, RA -2016	Qualitative (-50°C to+50°C
II. WIRING ACCESSORIES				
1.	Plug and socket outlet of rated voltage Upto and including 250 volts and rated current Upto and including 16 Amperes	Marking	IS 1293-2005, RA -2010	Qualitative
		Dimensions	IS 1293-2005, RA -2010	Upto 300mm
		Protection against electric shock	IS 1293-2005, RA -2010	Up to 100V
		Provision for Earthing	IS 1293-2005, RA -2010	Upto 20V Upto 30 A Qualitative
		Terminals	IS 1293-2005, RA -2010	Upto 150mm Upto 80 N Qualitative

Laboratory **Aadco Testing & Research Laboratory Private Limited,**
F-28, Bulandshahar Road Industrial Area, Ghaziabad, Uttar Pradesh

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

Certificate Number **TC-8006** (in lieu of T-3157, T-3158) **Page 25 of 29**

Validity **24.10.2018 to 23.10.2020** **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
		construction requirements of Fixed socket outlet	IS 1293-2005, RA -2010	Upto 250°C (20 to 50°C) Qualitative
		construction of plug and portable socket outlets	IS 1293-2005, RA -2010	Qualitative
		Resistance to ageing	IS 1293-2005, RA -2010	Ambient Temp.250°C Qualitative
		Resistance to Humidity	IS 1293-2005, RA -2010	Upto 95%RH Qualitative
		Insulation resistance (After humidity)	IS 3854:1997, RA -2017	Up to 500 V DC 2- ∞(mΩ)
		Electric Strength (After Humidity)	IS 1293-2005, RA -2010	Qualitative Up to 5Kv/0.1V
		Operation of Earthing contact	IS 1293-2005, RA -2010	Qualitative Upto to 100°C/0.1°C
		Temperature rise test	IS 1293-2005, RA -2010	Up to 400°C/0.1°C
		Making and Breaking Capacity	IS 1293-2005, RA -2010	Pf Upto 0.9 Upto 50A Upto 500V Qualitative
		Normal operation	IS 1293-2005, RA -2010	Qualitative Pf Upto 0.9 Upto 50A Upto 500V Qualitative
		Force Necessary withdraw the plug	IS 1293-2005, RA -2010	Up to 600N Qualitative
		Flexible cables and their connection	IS 1293-2005, RA -2010	Up to 60N Qualitative
		Mechanical Strength	IS 1293-2005, RA -2010	Impact-150gm, (Low-Temp.

Laboratory

**Aadco Testing & Research Laboratory Private Limited,
F-28, Bulandshahar Road Industrial Area, Ghaziabad, Uttar Pradesh**

Accreditation Standard

ISO/IEC 17025: 2005

Certificate Number

TC-8006 (in lieu of T-3157, T-3158)

Page 26 of 29

Validity

24.10.2018 to 23.10.2020

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
				15°C)1000gm Compression- 150N Qualitative
		Resistance to Heat	IS 1293-2005, RA -2010	0 to 250°C,20N, 300mm
		Compression Test	IS 1293-2005, RA -2010	Qualitative
		Screw current carrying parts and connection	IS 1293-2005, RA -2010	1 to 6Nm 20 cNm to 120 cNm Qualitative
		Creepage Distance & Clearance Distance	IS 1293-2005, RA -2010	0.01 mm to 150 mm
		Resistance to Abnormal heat & to fire	IS :1293-2005, RA -2010	Upto 1000°C 0 to 30sec. Qualitative
		Resistance to rusting	IS 1293-2005, RA -2010	Qualitative Upto 250°C Qualitative
		Additional Test on pins provided with insulating sleeves. Impact Test at low temp.	IS :1293-2005, RA -2010	Qualitative
2.	Switches For Domestic & Similar Purposes	Marking	IS 3854:1997,RA -2017	Up to 16A 250V Qualitative
		Protection against Electric Shock	IS 3854:1997, RA -2017	Up to 100 V/1V Qualitative
		Terminal and screws	IS 3854:1997 , RA -2017	Up to 150mm/0.01 Mm Qualitative
		Insulation resistance Test	IS 3854:1997, RA -2017	Up to 500 V DC 2- ∞(mΩ)

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**Aadco Testing & Research Laboratory Private Limited,
F-28, Bulandshahar Road Industrial Area, Ghaziabad, Uttar Pradesh**

Accreditation Standard

ISO/IEC 17025: 2005

Certificate Number

TC-8006 (in lieu of T-3157, T-3158)

Page 27 of 29

Validity

24.10.2018 to 23.10.2020

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
		Electric Strength test	IS 3854:1997, RA -2017	Qualitative 0.1 kV to 0.1 kV
		Resistance to ageing & moisture	IS 3854:1997, RA -2017	Qualitative
		Temperature rise	IS 3854:1997, RA -2017	Up to 400°C/1°C
		Making and breaking capacity	IS 3854:1997, RA -2017	Pf Upto 0.9 Upto 50A Upto 500V Qualitative
		Normal operation	IS 3854:1997, RA -2017	Qualitative Pf Upto 0.9 Upto 50A Upto 500V
		Mechanical Strength Test	IS 3854-1997, RA -2017	10kg Qualitative
		Resistance to Heat	IS 3854:1997, RA -2017	20 N 0-200°C, 0 to 300mm
		Creepage distance and clearance	IS 3854:1997, RA -2017	Upto 150mm LC-0.01mm
		Resistance to Abnormal Heat & fire	IS 3854:1997, RA -2017	Up to 1000°C/0.1°C 0 to 30sec/1sec Qualitative
		Resistance to rusting	IS 3854, RA -2017	Qualitative
3.	Rigid plain Conduits of insulating material. IS 9537(P-3) 1983	Dimensions	IS 9537(Part-3)-1983, RA -2017 IS 9537(Part-1)-1980, RA -2015	0.01 to 150mm

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**Aadco Testing & Research Laboratory Private Limited,
F-28, Bulandshahar Road Industrial Area, Ghaziabad, Uttar Pradesh**

Accreditation Standard ISO/IEC 17025: 2005

Certificate Number TC-8006 (in lieu of T-3157, T-3158)

Page 28 of 29

Validity 24.10.2018 to 23.10.2020

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
		Uniformity of wall thickness	IS 9537(Part-1)-1980, RA -2015	0.01 to 150mm
		Bending Test	IS 9537(Part-3)-1983, RA -2017	Qualitative
		Compression Test	IS 9537(Part-1)-1980, RA -2015	125N,320N, 750N,1250N, 4000N
		Impact Test	IS 9537(Part-1)-1980, RA -2015	Qualitative
		Collapse Test	IS 9537(Part-1)-1980, RA -2015	Qualitative
		Resistance to Heat Test	IS 9537(Part-3)-1983, RA -2017	0.1°C to 300°C
		Resistance to Burning	IS 9537(Part-1)-1980, RA -2015	0.01mm to 1000mm
		Electrical Strength	IS 9537(Part-1)-1980, RA -2015	0.1 to 5kV Qualitative
		Insulation resistance	IS 9537(Part-1)-1980, RA -2015	Qualitative

Laboratory **Aadco Testing & Research Laboratory Private Limited,**
F-28, Bulandshahar Road Industrial Area, Ghaziabad, Uttar Pradesh

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

Certificate Number **TC-8006** *(in lieu of T-3157, T-3158)* **Page 29 of 29**

Validity **24.10.2018 to 23.10.2020** **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>NON-DESTRUCTIVE TESTING</u>				
I.	BUILDING MATERIAL			
1.	Reinforced concrete structures	Rebound hammer	IS 13311 (Part 2) 1992 (RA 2013)	10 to 60 N/mm ²
		Depth of Carbonation	BS: 1881 (Part 201) 1986	Upto 100 mm
		Low Strain Pile Integrity	ASTM D 5882 – 07 IS 14893 – 2001 (RA 2005)	2m to 80 m