

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

Laboratory Name: M/s RTRC LIMITED, Plot No. 296, Sector-7, Phase-II, Industrial Estate,
IMT Manesar, Gurugram (Haryana)-122050

Validity 17.06.2024 to 16.06.2026 Amended on 04.01.2025

Chemical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method	Equipment Used
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Group- Metal and Alloys					
1	Copper	Copper	IS 191:2007, IS 440:1964	Copper Purity Test Apparatus	
		Phosphorus		-----	
		Arsenic		-----	
		Antimony		-----	
		Bismuth		UV Visible spectrometer	
		Iron			
		Lead			-----
		Nickel			-----
		Oxygen		-----	
		Selenium			
		Tellurium			
		Tin			
		Dimension, Masses and Tolerances			
		Chemical composition			-----
		Hydrogen embrittlement Test			
Resistivity Test					
2	Copper & Copper Alloys	Aluminium	BS EN 15079:2015	Optical Emission Spectrometer	
		Antimony			
		Arsenic			
		Cobalt			
		Iron			

Dealing Officer
Page 1 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

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Chemical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method	Equipment Used
		Lead		
		Manganese		
		Nickel		
		Phosphorus		
		Silicon		
		Sulphur		
		Tin		
		Chromium		
		Silver		
		Zinc		
		Bismuth		
		Tellurium		
		Selenium		
		Cadmium		
3	Aluminium & Aluminium alloys	Antimony	ASTM: E1251-17a	Optical Emission Spectrometer
		Arsenic		
		Beryllium		
		Bismuth		
		Boron		
		Calcium		
		Chromium		
		Cobalt		
		Copper		
		Gallium		
		Iron		
		Lead		
		Lithium		
		Magnesium		
		Manganese		

Dealing Officer
Page 2 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

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Amended on

04.01.2025

Chemical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method	Equipment Used
		Nickel		
		Phosphorus		
		Silicon		
		Sodium		
		Strontium		
		Tin		
		Titanium		
		Vanadium		
		Zinc		
		Zirconium		
4	Wrought Aluminium Alloys	Copper	IS 11035:1984	
		Magnesium		
		Silicon		
		Iron		
		Manganese		
		Zinc		
		Chromium		
		Titanium		
5	Aluminium Alloy Redraw Rods	Silicon	IS 4026:2023	Optical emission spectrometer, Atomic absorption spectrophotometer, UV-Visible spectrometer
		Magnesium	IS 504 (Part 1 to 12):2002	
		Iron		
		Copper		
		Manganese		
		Chromium		
		Zinc		
		Lead		
		Tin		
		Titanium		
		Vanadium		

Dealing Officer
Page 3 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

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Chemical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method	Equipment Used
		Boron		
		Gallium		
		Zirconium		
		Shape and Sizes		
		Chemical Composition		
6	Plane Carbon & Low Alloy Steel	Aluminium	IS 8811:1998	Optical Emission Spectrometer
		Arsenic		
		Boron		
		Carbon		
		Chromium		
		Cobalt		
		Copper		
		Manganese		
		Molybdenum		
		Nickel		
		Niobium		
		Phosphorus		
		Silicon		
		Sulphur		
		Tin		
		Titanium		
		Vanadium		
		Zirconium		
		Nitrogen		
		Magnesium		
Lead				
Tungsten				
Calcium				
7	Austenitic & Ferric Stainless Steel	Aluminium	IS 9879:1998	Optical Emission Spectrometer
		Arsenic		

Dealing Officer
Page 4 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method	Equipment Used
		Boron		
		Carbon		
		Chromium		
		Cobalt		
		Copper		
		Manganese		
		Molybdenum		
		Nickel		
		Niobium		
		Phosphorus		
		Silicon		
		Sulphur		
		Tin		
		Titanium		
		Vanadium		
		Zirconium		
		Nitrogen		
Magnesium				
Lead				
Tungsten				
Calcium				
8	Austenitic Stainless Steel	Chromium	ASTM: E-1086-2022	Optical Emission Spectrometer
Nickel				
Molybdenum				
Manganese				
Silicon				
Copper				
Carbon				
Phosphorous				

Dealing Officer
Page 5 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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Chemical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method	Equipment Used		
		Sulphur	ASTM E-415-2021			
		Aluminum				
		Arsenic				
		Boron				
		Calcium				
		Carbon				
		Chromium				
		Cobalt				
		Copper				
		Manganese				
		Molybdenum				
		Nickel				
		Niobium				
		Nitrogen				
		Phosphorous				
		Silicon	ASTM E-415-2021			
		Sulphur				
		Tin				
		Titanium				
		Vanadium				
		Zirconium				
		9	Cast Iron		Carbon	ASTM E 1999-23
		Chromium				
		Copper				
		Manganese				
Molybdenum						
Nickel						
Phosphorous						
Silicon						
Sulphur						

Dealing Officer
Page 6 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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Chemical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method	Equipment Used
		Tin		
		Titanium		
		Vanadium		
		Carbon	IS 15338:2003	
		Manganese		
		Phosphorous		
		Sulphur		
		Silicon		
		Copper		
		Chromium		
		Nickel		
		Aluminium		
		Molybdenum		
		Vanadium		
10	Primary Aluminium ingots for remelting	Copper	IS 2590:1987	Optical emission spectrometer, Atomic absorption spectrophotometer, UV-Visible spectrometer
		Silicon		
		Iron		
		Manganese		
		Zinc		
		Titanium		
		Vanadium		
		Shape and Sizes		
		Chemical Composition		
11	High Purity Aluminium ingots for remelting	Copper	IS 11890:1987	Optical emission spectrometer, Atomic absorption spectrophotometer, UV-Visible spectrometer
		Silicon		
		Iron		
		Manganese		
		Magnesium		
		Zinc		

Dealing Officer
Page 7 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

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Chemical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method	Equipment Used
		Titanium		
		Vanadium		
		Gallium		
		Shape and Sizes		
		Chemical Composition		
12	Copper Wire Rods for electrical applications	Tellurium	IS 12444:2020	Optical emission spectrometer, Atomic absorption spectrophotometer, UV-Visible spectrometer
		Selenium		
		Bismuth		
		Antimony		
		Arsenic		
		Tin		
		Lead		
		Iron		
		Nickel		
		Sulphur		
		Silver		
		Oxygen		
		Chemical Composition		
13	Aluminum 1350 drawing stock for electrical purposes	Silicon	ASTM B233-98(2021)	Optical emission spectrometer, Atomic absorption spectrophotometer, UV-Visible spectrometer
		Iron		
		Copper		
		Manganese		
		Chromium		
		Zinc		
		Boron		
		Gallium		
		Vanadium		
		Titanium		
		Aluminum		

Dealing Officer
Page 8 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

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Chemical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method	Equipment Used
14	Painted & Coated metals	Salt Spray Corrosion Test	ASTM B 117: 2019 JIS Z 2371: 2015 ISO 9227:2017	Salt Spray corrosion Test Assembly

Group: Plastic and Resins

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method	Equipment Used
15	Toys and Children's Products	Antimony (Sb)	IS 9873-3(2020)	Atomic Absorption Spectrometer
		Arsenic (As)		
		Barium (Ba)		
		Bis (2-ethylhexyl) phthalate(DEHP)	IS 9873-6(2021)	Gas Chromatography Mass Spectrometer
		Bis (2-ethylhexyl) phthalate(DEHP)	IS 9873-9(2017)	
		Butyl benzyl phthalate (BBP)	IS 9873-6(2021)	
		Butyl benzyl phthalate (BBP)	IS 9873-9(2017)	
		Cadmium (Cd)	IS 9873-3(2020)	Atomic Absorption Spectrometer
		Chromium (Cr)		
		Di-butyl phthalate (DBP)	IS 9873-6(2021)	Gas Chromatography Mass Spectrometer
		Di-butyl phthalate (DBP)	IS 9873-9(2017)	
		Di-iso-decyl phthalate (DIDP)	IS 9873-6(2021)	
		Di-iso-decyl phthalate (DIDP)	IS 9873-9(2017)	
		Di-iso-nonyl phthalate (DINP)	IS 9873-6(2021)	

Dealing Officer
Page 9 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

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S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method	Equipment Used
		Di-iso-nonyl phthalate (DINP)	IS 9873-9(2017)	Atomic Absorption Spectrometer
		Di-n-octyl phthalate (DNOP)	IS 9873-6(2021)	
		Di-n-octyl phthalate (DNOP)	IS 9873-9(2017)	
		Lead (Pb)	IS 9873-3(2020)	
		Mercury (Hg)		
		Selenium (Se)		
16	Polymers	Bis (2-ethylhexyl) phthalate (DEHP)	IEC 62321-8:2017	-----
		Butyl benzyl phthalate (BBP)		
		Diisobutyl phthalate (DIBP)		
		PBB's and PBDE's - Decabromobiphenyl (B-209)	IEC 62321-6:2015	
		PBB's and PBDE's- 2,2',3,3',4,4',5,5'- Octabromobiphenyl (BB-194)		
		PBB's and PBDE's- 2,2',3,3',4,4',5,5',6- Nonabromobiphenyl (BB-206)		
		PBB's and PBDE's- 2,2',3,3',4,4',5,5',6- Nonabromodiphenyl ether(BDE-206)		

Dealing Officer
Page 10 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

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S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method	Equipment Used
		PBB's and PBDE's- 2,2',3,4,4',5,6- Heptabromodiphenyl ether (BDE-181)		
		PBB's and PBDE's- 2,2',3,4,4',5,5'- Heptabromobiphenyl (BB-180)		
		PBB's and PBDE's - 2,2',3,4,4',5,5',6- Octabromodiphenyl ether (BDE-203)		
		PBB's and PBDE's - 2,2',4,5'- Tetrabromobiphenyl (B- 049)		
		PBB's and PBDE's - 2,2',4,5',6- Pentabromobiphenyl (B-103)		
		PBB's and PBDE's - 2,2',3,3',4,4'- Hexabromodiphenyl ether (BDE-128)		
		PBB's and PBDE's - 2,2',4,4',5,5'- Hexabromobiphenyl(BB -153)		-----

Dealing Officer
Page 11 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



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S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method	Equipment Used
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		PBB's and PBDE's - 2,4,6-Tribromobiphenyl (BB-30)		
		PBB's and PBDE's - 3,3',4,4'- Tetrabromodiphenyl ether (BDE-77)		
		PBB's and PBDE's - 3,3',4,4',5- Pentabromodiphenyl ether (BDE-126)		
		PBB's and PBDE's -3- Bromobiphenyl (B-002)		
		PBB's and PBDE's -4,4'- Dibromobiphenyl (BB- 15)		
		PBB's and PBDE's -4,4'- Dibromodiphenyl ether(PBDE-15)		
		PBB's and PBDE's -4- Bromodiphenyl ether (PBDE-3)		
		PBB's and PBDE's - Decabromodiphenyl ether (BDE-209S)		
		PBB's and PBDE's-3,3',4- Tribromodipheny lether(BDE-035S)		

Dealing Officer
Page 12 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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Chemical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method	Equipment Used
17	Polymers, Electronic Metals	Di-butyl phthalate (DBP)	IEC 62321-8(2017)	Atomic Absorption Spectrometer
		Cadmium (Cd)	IEC 62321-3-1(2013)	
			IEC 62321-5(2013)	
		Chromium (Cr)	IEC 62321-3-1(2013)	
			IEC 62321-5(2013)	
			IEC 62321-7-1(2015)	
			IEC 62321-7-2(2017)	
		Di-butyl phthalate (DBP)	IEC 62321-8(2017)	
		Lead (Pb)	IEC 62321-3-1(2013)	
			IEC 62321-5(2013)	
Mercury (Hg)	IEC 62321-3-1(2013)			
	IEC 62321-4:2013			

Group: AYUSH Products

18	Herbs	Adenosine	TM-AP/01:2021	HPLC (High Performance Liquid Chromatography)
		Cordycepin		

Dealing Officer
Page 13 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

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Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
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Group: Material Testing (Insulation oil Testing)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
19	New Insulating Oils as per IS:335: 2018	Viscosity	IS:1448(Part 25/sec 1):2018 ISO 3104:2023 IS 16084:2013	Digital Kinematic Viscosity Bath (RTRC-214), Low Temp Kinematic Viscosity Bath(RTRC-306)
		Pour point	IS:1448(Part 10/sec 2):2021 ISO 3016:2019	Automatic Cloud point & Pour point Apparatus (RTRC-213), Cloud and Pour Point apparatus (RTRC-305)
		Water Content	IEC:60814: 1997 IS 13567:2018	Karl Fischer Titrator
		Breakdown Voltage	IS 6792:2023 IEC 60156:2018	Automatic Oil Test Set
		Density	IS:1448(Part 16):2014 ISO 3675:1998	Liquid Glass bath (Density Bath) Refrigerated
		Dielectric dissipation factor (DDF)	IS: 6262:1971 IS 16086:2013 IEC: 61620:1998	Capacitance & Tan Delta Test set
		Particle Content	IS 13236:2013 IEC:60970: 2007	Particle counter
		Appearance	Clause 6.6 of IS:335:2018	Qualitative Test

Dealing Officer
Page 14 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



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S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		Stray gassing of oil	IS 335:2018, IS 10593:2006 CIGRE Brochure 296 and ASTM D7150-13(2020)	Gas Chromatography
		Acidity	IEC:62021-1:2003	Potentiometric Titrator
		Interfacial Tension (IFT)	ASTM D971:2020	Digital Surface Interfacial Tensiometer
		Total Sulphur content	ISO: 14596:2007 ASTM 4294:2021 ASTM D129:2018	EDXRF
		Corrosive Sulphur	DIN: 51353:1985	Hot Air Oven
		Potentially corrosive Sulphur	IS: 16310:2017 IEC: 62535:2008	Copper Strip Corrosion Test Apparatus
		DBDS	IS:16497(Part 1)2017 IEC:62697-1:2012	Gas Chromatography Mass Spectrometer
		Inhibitors	IS: 13631:2017 IEC: 60666:2010	HPLC (High Performance Liquid Chromatography)
		Metal Passivator additives	IS 13631:2017 IEC: 60666:2010	HPLC (High Performance)
		2-Furfuryl Alcohol (2-Furfural and related compound content)	IS: 15668:2006 IEC: 61198:1993	Liquid Chromatography)
		5-Hydroxymethyl-2-	IS: 15668:2006	HPLC (High

Dealing Officer
Page 15 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

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S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		Furfural(2-Furfural and related compound content)	IEC: 61198:1993	Performance Liquid Chromatography)
		2-Furfural (2-Furfural and related compound content)	IS: 15668:2006 IEC: 61198:1993	HPLC (High Performance Liquid Chromatography)
		2-Furyl Methyl Ketone (2 Acetyl Furan)(2-Furfural and related compound content)	IS: 15668:2006 IEC: 61198:1993	HPLC (High Performance Liquid Chromatography)
		5-Methyl-2-Furfural (2- Furfural and related compound content)	IS: 15668:2006 IEC: 61198:1993	HPLC (High Performance Liquid Chromatography)
		Oxidation Stability	Method C of IS 12422:2017 IEC 61125:1992	Oxidation Stability Test Apparatus
		a. Total acidity	As per 1.9.4 of IS 12422:2023 IEC 61125:2018	Glass Burette A CLASS Capacity-1 ml Q 3 283Q
		b. Sludge	As per 1.9.1 of IS:12422:2023 IEC: 61125:2018	Weighing Balance
		c. DDF at 90°C	As per 1.9.6 of IS:12422:2023 IEC: 61125:2018	Capacitance & Tan Delta Test set
		Gassing Tendency	Method A of IEC: 60628:1985	Gassing Tendency Apparatus

Dealing Officer
Page 16 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

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S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		Flash Point	IS:1448(Part 21):2019 ISO: 2719:2016	Pensky Marten flash Point Tester
		PCA Content	IP: 346:2015	Weighing Balance
		PCB Content	IS: 16082:2013 IEC: 61619:1997	Gas Chromatography Mass Spectrometer
20	Mineral Insulating Oils in electrical supervision and maintenance guidance's per IS:1866:2017 or IEC:60422:2013	Color & Appearance	ISO: 2049:1996	Color Comparator
		Breakdown Voltage	IEC: 60156:2018	Automatic Oil Test Set
		Water Content	IEC:60814: 1997	Karl Fischer Titrator
		Acidity (Neutralization value)	IEC:62021-1:2003 IEC:62021-2:2007	Potentiometric Titrator
		Dielectric dissipation factor (DDF) and resistivity	IEC: 60247: 2004	Capacitance & Tan Delta Test set Resistivity (Million Mega Ohm Meter)
		Inhibitor content	IEC: 60666:2010	HPLC (High Performance Liquid Chromatography)
		Sediment/Sludge	Annex-C of IS:1866:2017 IEC: 60422:2013	Weighing Balance
		Interfacial Tension (IFT)	ASTM D971:2020 BSEN 14210:2003	Digital Surface Interfacial Tensiometer
		Particle (counting and Sizing)	IEC: 60970:2007	Particle counter
		Oxidation Stability	IEC: 61125:2018	Oxidation Stability Test Apparatus

Dealing Officer
Page 17 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

Laboratory Name: M/s RTRC LIMITED, Plot No. 296, Sector-7, Phase-II, Industrial Estate,
IMT Manesar, Gurugram (Haryana)-122050

Validity 17.06.2024 to 16.06.2026 Amended on 04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
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		a. Total acidity		Glass Burette A CLASS Capacity-1 ml
		b. Sludge		Weighing Balance
		c. DDF at 90°C		Capacitance & Tan Delta Test set
		Flash point	ISO 2719 :2016	Pensky Marten flash Point Tester
		Compatibility	IEC: 61125:2018	Qualitative Test (Not Applicable)
		Pour point	ISO: 3016:2019	Automatic Cloud point & Pour point Apparatus, Cloud and Pour Point Apparatus
		Density	ISO 3675:1998	Liquid Glass bath (Density Bath) Refrigerated
		Viscosity	ISO 3104:2023	Digital Kinematic Viscosity Bath, Low Temp kinematic Viscosity Bath
		Polychlorinated Biphenyls (PCBs)	IEC 61619:1997	Gas Chromatography Mass Spectrometer (RTRC-243)
		Corrosive Sulphur	IEC 62535:2008 ASTMD1275:2024, Method B of DIN 51353:2021	Hot Air Oven

Dealing Officer
Page 18 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

Laboratory Name: M/s RTRC LIMITED, Plot No. 296, Sector-7, Phase-II, Industrial Estate,
IMT Manesar, Gurugram (Haryana)-122050

Validity 17.06.2024 to 16.06.2026 Amended on 04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
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		Dibenzyl disulfide (DBDS) content	IEC 62697-1:2012	Gas Chromatography Mass Spectrometer
		Passivator content	Annex B of IEC: 60666:2010	HPLC (High Performance Liquid Chromatography)
		Dissolved gas analysis	IS 10593:2023 IEC 60599:2022	Gas Chromatography
21	Natural Ester Fluid and Synthetic Ester Fluid	Viscosity	IS:1448(Part 25/sec 1):2018, ISO: 3104:2023	Digital Kinematic Viscosity Bath, Low Temp Kinematic Viscosity Bath
		Pour point	IS:1448(Part 10/sec 2):2021 ISO: 3016:2019 ASTM D97-17b-2022	Automatic Cloud point & Pour point Apparatus, Cloud and Pour Point Apparatus
		Water Content	IEC:60814: 1997, IS 13567:2018 ASTM D1533-2020	Karl Fischer Titrator
		Breakdown Voltage	IS 6792:2023 IEC 60156:2018, ASTM D1816-12(2019)	Automatic Oil Test Set
		Density	IS:1448(Part 16): 2014, ISO 3675:1998	Liquid Glass bath (Density Bath) Refrigerated
		Dielectric dissipation factor (DDF)	IS: 6262:1971 IS 16086:2013 IEC: 61620:1998	Capacitance & Tan Delta Test set

Dealing Officer
Page 19 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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Validity 17.06.2024 to 16.06.2026 Amended on 04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
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		Particle Content	IS 13236:2013, IEC:60970: 2007	Particle counter
		Acidity (Neutralization Value)	IEC:62021-1:2003, IEC:62021-2:2007, ASTM D664-24	-----
		Interfacial Tension (IFT)	ASTM D971:2020, BSEN14210-2003	Digital Surface Interfacial Tensiometer
		Total Sulphur content	ISO: 14596:2007 ASTM D4294:2021 ASTM D129:2018	EDXRF
		Corrosive Sulphur	DIN: 51353:2021 ASTM D1275-24	--
		Potentially corrosive Sulphur	IS: 16310:2017, IEC: 62535:2008	--
		DBDS	IS:16497(Part 1) : 2017, IEC:62697-1:2012	Gas Chromatography Mass Spectrometer
		Inhibitors	IS: 13631:2017, IEC: 60666:2010	
		Metal Passivator additives		
		2-Furfuryl Alcohol (2-Furfural and related compound content)	IS: 15668:2006 IEC: 61198:1993	HPLC
		5-Hydroxymethyl-2-Furfural (2-Furfural and related compound content)	IS: 15668:2006 IEC: 61198:1993	HPLC (High Performance Liquid chromatography)

Dealing Officer
Page 20 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

Laboratory Name: M/s RTRC LIMITED, Plot No. 296, Sector-7, Phase-II, Industrial Estate,
IMT Manesar, Gurugram (Haryana)-122050

Validity

17.06.2024 to 16.06.2026

Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		2-Furfural (2-Furfural and related compound content)		
		2-Furyl Methyl Ketone (2-Acetyl Furan) (2-Furfural and related compound content)		
		5-Methyl-2-Furfural (2-Furfural and related compound content)		
		a. Total acidity Afteroxidation stability	IS: 12422:2023, IEC: 61125:2018	Oxidation Stability Test Apparatus,
		b. Sludge After oxidation stability		Oxidation Stability Test Apparatus,
		c. DDF at 90°C Afteroxidation stability		Capacitance & Tan Delta Test set
		Gassing Tendency	IEC: 60628:1985	Gassing Tendency Apparatus
		Flash Point	IS:1448(Part21)-2019, ISO: 2719:2016	Pensky Marten flash Point Tester
		PCA Content	IP: 346:2015	Weighing Balance
		PCB Content	IS: 16082:2013 IEC: 61619:1997, ASTM D4059-00	Gas Chromatography Mass Spectrometer

Dealing Officer
Page 21 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

Laboratory Name: M/s RTRC LIMITED, Plot No. 296, Sector-7, Phase-II, Industrial Estate,
IMT Manesar, Gurugram (Haryana)-122050

Validity 17.06.2024 to 16.06.2026 Amended on 04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
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		Color	ISO: 2049:1996, ASTM D1500-24	Color Comparator
		Appearance	IS 16081:2013 IS 16659:2017	-----
		Crystallization	IS 16081:2013	
		Performance	IS 16659:2017	
		Dielectric breakdown voltage, impulse conditions	ASTM D3300-20	Automatic Oil Test Set
		AC loss characteristics—dissipation factor and relative permittivity	ASTM D924 -23	Capacitance & Tan Delta Test set
		Kinematic viscosity	ASTM D445-24	Digital Kinematic Viscosity Bath, Low Temp
		Flash point and fire Point —Cleveland Open Cup Method	ASTM D92-18	Pensky Marten flash Point Tester
		Relative density (specific gravity)	ASTMD1298-12b(2017)e1	Liquid Glass bath (Density Bath) Refrigerated
		Volume resistivity (specific resistance)	ASTM D1169-19a	Resistivity (Million Mega Ohm Meter)
		Visual examination field test and color)	ASTM D1500:2024 ASTM D1524-15(2022)	Color Comparator
		Gassing of insulating oils under electrical stress and ionization	ASTM D2300-08 (2017)	Gassing Tendency Apparatus

Dealing Officer
Page 22 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

Laboratory Name: M/s RTRC LIMITED, Plot No. 296, Sector-7, Phase-II, Industrial Estate,
IMT Manesar, Gurugram (Haryana)-122050

Validity 17.06.2024 to 16.06.2026 Amended on 04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
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		Acid and Base Number by Color indicator Titration	ASTM D974-2022	-----
		Dissolved Gas Analysis (Hydrogen)	IS: 93:2023 ASTM D3612-02 (2017) IS 9434 :2019	Gas Chromatography
		Dissolved Gas Analysis (Oxygen)		
		Dissolved Gas Analysis (Nitrogen)		
		Dissolved Gas Analysis (Carbon Monoxide)		
		Dissolved Gas Analysis (Carbon Dioxide)		
		Dissolved Gas Analysis (Methane)		
		Dissolved Gas Analysis (Ethane)		
		Dissolved Gas Analysis (Ethylene)		
		Dissolved Gas Analysis (Acetylene)		

Dealing Officer
Page 23 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

Laboratory Name: M/s RTRC LIMITED, Plot No. 296, Sector-7, Phase-II, Industrial Estate,
IMT Manesar, Gurugram (Haryana)-122050

Validity 17.06.2024 to 16.06.2026 Amended on 04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
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Group- Distribution System

22	Outdoor/Indoor Type Oil Immersed Distribution Transformers up to and including 2500 kVA, 33 kV	Measurement of Winding Resistance	IS 1180(Part 1):2014 IS 2026(Part 1):2011 IEC 60076 (Part 1):2011	Digital Micro-ohm Meter
		Measurement of Voltage ratio and check of phase displacement	IS 1180(Part 1):2014 IS 2026(Part 1):2011 IEC 60076 (Part 1):2011	Automatic Turn-Ratio Meter
		Measurement of Short Circuit Impedance (principal tapping, when applicable) and Load Loss at 50% and 100 % load	IS 1180(Part 1):2014 IS 2026(Part 1):2011 IEC 60076 (Part 1):2011	Digital Power Meter
		Measurement of no-load loss and current	IS 1180(Part 1):2014 IS 2026(Part 1):2011 IEC 60076 (Part 1):2011	Digital Power Meter
		Measurement of insulation resistance	IS 1180(Part 1):2014 IS 2026(Part 1):2011 IEC 60076 (Part 1):2011	Digital Insulation Tester
		Induced over-voltage withstand test	IS 1180(Part 1):2014 IS 2026(Part 3):2018 IEC 60076 (Part 3):2013	Motor Generator Set
		Separate source voltage withstand test (Primary & secondary)	IS 1180(Part 1): 2014 IS 2026(Part 3):2018 IEC 60076 (Part 3): 2013	High-Voltage Test Set

Dealing Officer
Page 24 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

Laboratory Name: M/s RTRC LIMITED, Plot No. 296, Sector-7, Phase-II, Industrial Estate,
IMT Manesar, Gurugram (Haryana)-122050

Validity

17.06.2024 to 16.06.2026

Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
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		Pressure Test (Routine Test)	IS 1180(Part 1):2014	Pressure Gauge
		Oil leakage Test	IS 1180(Part 1):2014	Pressure Gauge
		Lightning Impulse Test	IS 1180(Part 1):2014 IS 2026(Part 3):2018 IEC 60076 (Part 3):2013	Impulse Generator, Analyzer, Impulse Current Shunt
		Temperature rise test	IS 1180(Part 1):2014 IS 2026(Part 2):2010 IEC 60076 (Part 2):2011	Temp Data logger/16 Channel & Digital Power Meter
		Pressure test (Type Test)	IS 1180(Part 1):2014	Pressure Gauge
		Determination of soundlevel	IS 1180(Part 1):2014 IS 2026(Part 10):2009 IEC 60076 (Part-10)2016	Sound LevelMeter
		No load current at 112.5 % voltage	IS 1180(Part 1):2014	Digital Power Meter
		Paint adhesion test	IS 1180 (Part 1):2014 ASTM D3359:2023	Cutting Tool, Tape, Brush, Eyeglass Lenses.
		Oil BDV and moisture content of transformer oil	IS 1180(Part 1):2014 IS 335:2018	Motorized Oil Test Set and Karl Fischer titrator
		Measurement of dimension and physical verification	IS 1180(Part 1):2014	-----

Dealing Officer
Page 25 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

Laboratory Name: M/s RTRC LIMITED, Plot No. 296, Sector-7, Phase-II, Industrial Estate,
IMT Manesar, Gurugram (Haryana)-122050

Validity 17.06.2024 to 16.06.2026 Amended on 04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
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		Permissible flux density and over fluxing	IS 1180(Part 1):2014	-----
		Measurement of zero-sequence impedance(s) on three phase transformers	IS:2026(Part 1):2011 IEC 60076-1:2011	Digital Power Meter
		Measurement of Harmonic on no-load current	IS:2026 (Part 1):2011 IEC 60076-1:2011	Digital Power Meter
		Measurement of dissipation factor tan delta of the insulation system capacitances	IS: 2026 (Part 1):2011 IEC 60076-1:2011	Capacitance & Ten-Delta Test Set
		Determination of capacitance winding to earth and between windings	IS 2026 (Part 1):2011 IEC 60076-1:2011	Capacitance & Ten-Delta Test Set
		Unbalance Current Test	CBIP Publication No.: 317:2013	Digital PowerMeter, Clamp Meter
		Magnetic Balance Test	CBIP Publication No.: 317:2013	Digital Power Meter
23	Dry Type Transformer up to2500 kVA,33 kV	Measurement of Winding Resistance	IS 2026(Part1):2011 IEC 60076(Part 1): 2011 IS 2026(Part 11): 2021	Digital Micro-ohm Meter
		Measurement of Voltage ratio and checkof phase displacement	IS 2026(Part1):2011 IEC 60076(Part 1): 2011, IS 2026(Part 11): 2021	Automatic Turn-Ratio

Dealing Officer
Page 26 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

Laboratory Name: M/s RTRC LIMITED, Plot No. 296, Sector-7, Phase-II, Industrial Estate,
IMT Manesar, Gurugram (Haryana)-122050

Validity 17.06.2024 to 16.06.2026 Amended on 04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
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		Measurement of short circuit impedance (principal tapping, when applicable) and Load Loss at 50 % and 100 %load	IS 2026(Part1):2011 IEC 60076(Part 1): 2011 IS 2026(Part 11): 2021	Digital Power Meter
		Measurement of no-load loss and current	IS 2026 (Part1): 2011 IEC 60076 (Part 1): 2011, IS 2026 (Part 11): 2021	Digital Power Meter
		Measurement of insulation resistance	IS 2026 (Part1):2011 IEC 60076(Part 1):2011	Insulation Tester
		Induced over-voltage withstand test	IS 2026: (Part 3): 2018, IEC 60076 (Part 3): 2013, IS 2026(Part 11):2021	Motor Generator Set
		Separate source voltage withstands test (Primary & secondary)	IS 2026 (Part 3): 2018, IEC 60076 (Part 3): 2013, IS 2026 (Part 11):2021	High-Voltage Test Set
		Lightning Impulse test	IS 2026 (Part 3): 2018, IEC 60076 (Part 3): 2013, IS 2026(Part 11):2021	Impulse Measuring &, Analyzing System, Imp Impulse Current Shunt

Dealing Officer
Page 27 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

Laboratory Name: M/s RTRC LIMITED, Plot No. 296, Sector-7, Phase-II, Industrial Estate,
IMT Manesar, Gurugram (Haryana)-122050

Validity

17.06.2024 to 16.06.2026

Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		Temperature rise test	IS 2026(Part 2):2010 IEC 60076 (Part 2):2011 IS 2026(Part 11):2021	Temp Data logger/16 Channel & Digital Power Meter
		Partial discharge measurement	IS: 2026 (Part 3):2018, IS 2026(Part 11):2021	PD Test Analyzer, PD Calibrator
		Determination of sound level	IS: 2026(Part 10):2009 IEC:60076(Part-10):2016, IS 2026(Part 11):2021	Sound Level Meter
		Measurement of zero-sequence impedance(s) on three phase transformer	IS: 2026(Part 1):2011 IEC:60076-1:2011	Digital Power Meter
		Measurement of Harmonic on no-load current	IS 2026 (Part 1): 2011, IEC: 60076-1: 2011	Digital Power Meter
		Measurement of dissipation factor tan delta of the insulation system capacitance	IS 2026 (Part 1): 2011, IEC: 60076-1: 2011	Capacitance & Ten-Delta Test Set
		Determination of capacitance winding to earth and between windings	IS 2026 (Part 1): 2011, IEC 60076-1: 2011	Capacitance & Ten-Delta Test Set
		Unbalance Current Test	CBIP Publication No.: 317:2013	Digital Power Meter, Clamp Meter
		Magnetic Balance Test	CBIP Publication No.: 317:2013	Digital Power Meter/Multimeter

Dealing Officer
Page 28 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

Laboratory Name: M/s RTRC LIMITED, Plot No. 296, Sector-7, Phase-II, Industrial Estate,
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Validity

17.06.2024 to 16.06.2026

Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
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24	Outdoor/Indoor Type Oil Immersed Distribution Transformers up to and including 2500 kVA, 33 kV as per IS 1180 Part-3:2021	Measurement of Winding Resistance	Cl.21.2 a of IS 1180 (Part 3):2021, Amd-01: 2018	Digital Micro-ohm Meter
		Measurement of Voltage ratio and check of phase displacement	Cl.21.2 b of IS 1180 (Part3):2021, Amd-01: 2018	Automatic Turn-Ratio Meter
		Measurement of Short Circuit Impedance (principal tapping, when applicable) and Load Loss at 50% and 100 % load	Cl.21.2 c of IS 1180 (Part3):2021, Amd-01: 2018	Digital Power Meter
		Measurement of no-load loss and current	Cl.21.2 d of IS 1180 (Part 3):2021, Amd-01: 2018	Digital Power Meter
		Measurement of insulation resistance	Cl.21.2 e of IS 1180 (Part 3):2021, Amd-01:2018	Digital Insulation Tester
		Induced over-voltage withstand test	Cl.21.2 f of IS 1180 (Part 3):2021, Amd-01:2018	Digital Volt meter, Digital Frequency meter
		Separate source voltage withstand test	Cl.21.2 g of IS 1180 (Part 3):2021, Amd-01:2018	AC High voltage Test Set
		Pressure Test (Routine Test)	Cl.21.2 h of IS 1180 (Part 3):2021, Amd-01:2018	Pressure Gauge
		Ester Liquid leakage Test	Cl.21.2 j of IS 1180 (Part 3):2021, Amd-01:2018	
		Lightning Impulse Test	Cl.21.3 a of IS 1180 (Part 3):2021, Amd-01:2018	Impulse Generator, Analyzer, Impulse Current Shunt

Dealing Officer
Page 29 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

Laboratory Name: M/s RTRC LIMITED, Plot No. 296, Sector-7, Phase-II, Industrial Estate,
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Validity

17.06.2024 to 16.06.2026

Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
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		Temperature rise test	Cl.21.3 b of IS 1180 (Part 3):2021, Amd-01:2018	Temp Data logger/ 16 Channel & Glass Thermometer
		Pressure test (Type Test)	Cl.21.3 d of IS 1180 (Part 3):2021,Amd-01:2018	Pressure Gauge
		Determination of sound level	Cl.21.4 a of IS 1180 (Part 3):2021,Amd-01:2018	Sound Level Meter
		No load current at 112.5 % voltage	Cl.21.4 c of IS 1180 (Part 3):2021,Amd-01:2018	Digital Power Meter
		Paint adhesion test	Cl.21.4 d of IS 1180 (Part 3):2021,Amd-01:2018	Cutting Tool, Tape, Brush, Eyeglass Lenses.
		Break down Voltage of transformer oil	Cl.21.4 e of IS 1180 (Part 3):2021,Amd-01:2018	Motorized Oil Test Set
		Moisture content in transformer oil	Cl.21.4 e of IS 1180 (Part 3):2021,Amd-01:2018	Karl Fischer titrator
		Measurement of dimension and physical verification	Cl. 11,15.1,15.5,16 of IS 1180 (Part 3):2021, Amd-01:2018	Measuring Tape
		Permissible flux density and over fluxing	Cl.6.9.1,6.9.2,7.9.1,7.9.2,8.9.1,8.9.2 of IS 1180 (Part 3):2021, Amd-01:2018	Micrometer
		Vacuum test	Cl.21.5 of IS 1180 (Part 3):2021,Amd-01:2018	Vacuum Gauge

Dealing Officer
Page 30 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

Laboratory Name: M/s RTRC LIMITED, Plot No. 296, Sector-7, Phase-II, Industrial Estate,
IMT Manesar, Gurugram (Haryana)-122050

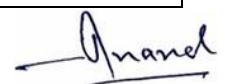
Validity 17.06.2024 to 16.06.2026 Amended on 04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
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Group:- Insulation (Cable Testing)

2 5	5 kV to 46 kV Extruded Electric Power Cables	Dicumyl Peroxide	TM-XLPE/02 By Gas Chromatography	Gas Chromatography Mass Spectrometer
		Alpha Methyl Styrene (2-Phenyl Propane)		
		Acetophenone		
		Alpha Cumyl Alcohol (2 phenyl Propane-2 ol)		
		Oxidation induction time (OIT)	ASTM D3895:2019 (Optical Induction Time Tester)	
26	Electrical Cables for photovoltaic system	Sheath resistance against acid and alkaline solution	BS EN 50618:2014, IEC 62930:2017	Tensile testing machine
27	300/500 V fire resistant screened cables having low emission of smoke and corrosive gases when affected by fire: Multicore and multipair cables	Conductor Resistance	BS 7629-1:2015	Senior Industrial Kelvin ridge
		Halogen Acid Gas Evolution / Corrosive & halogen acid gas		----
		Resistance to fire alone (Protocol C)		----
		Resistance to fire to with water (Protocol W)		----



Dealing Officer
Page 31 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

Laboratory Name: M/s RTRC LIMITED, Plot No. 296, Sector-7, Phase-II, Industrial Estate,
IMT Manesar, Gurugram (Haryana)-122050

Validity

17.06.2024 to 16.06.2026

Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		Resistance to fire with mechanical shock (Protocol Z)		----
		Resistance to fire with mechanical shock and water spray (Classification PH15, PH30, PH60, PH90, PH120)		----
		Smoke Density under Fire Conditions		-----
		Test under Fire Conditions / Flammability Test		-----
28	Aerial Bunched Cables for working voltages upto and including 1100V	Ageing in Air Oven	IS 14255:1995	-----
		Bending Test		-----
		Breaking load on Messenger Conductor		Digital tensile testing machine
		Carbon Content Test		-----
		Conductor Resistance		Industrial kelvin doubleBridge
		Elongation on Messenger Conductor		Digital tensile testing machine
		Environmental stress cracking		-----
		High Voltage test at room temperature		HV tester
		Hot Set Test		-----

Dealing Officer
Page 32 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

Laboratory Name: M/s RTRC LIMITED, Plot No. 296, Sector-7, Phase-II, Industrial Estate,
IMT Manesar, Gurugram (Haryana)-122050

Validity

17.06.2024 to 16.06.2026

Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		Insulation Resistance		Million megaohm meter
		Shrinkage Test		-----
		Tensile strength and elongation at break on Insulation and Sheath		Digital tensile testing machine
		Tensile Strength for Aluminium Wires		Digital tensile testing machine
		Test for eccentricity and Thickness of insulation and sheath / Overall Dimensions		Digital vernier calliper
		Vicat Softening Point		-----
		Water Absorption Test (Gravimetric)		-----
		Wrapping Test for Aluminium Wires		-----
29	Aerial Bundled Conductors - Performance of Supporting Cores under Mechanical and Thermal Stresses	Performance of Supporting Cores	SANS 6100:2007	Thermal stress-Strain test apparatus
30	Aluminium Conductors – Galvanized Steel – Reinforced for extra high voltage (400 kV & above)	Breaking load of Individual wires	IS 398(Part 5):1992	Digital tensile testing machine
		Diameter of Aluminium , Steel wires & Stranded Conductor		Digital micrometer

Dealing Officer
Page 33 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		Ductility test (Torsion test and Elongation test)		Torsion tester
		Galvanizing Test on steel wire (Uniformity of Zinc Coating & Weight of Zinc Coating)		---
		Lay Ratio		----
		Resistance test of Aluminium wires		Industrial kelvin doubleBridge
		Surface Condition Test		----
		Wrapping test for Aluminum & Aluminized Wires		----
		Measurement of Dimensions		
		Visual Examination / Freedom of defects		
		Breaking Load of individual Aluminium wires		
		Breaking Load of individual Galvanized Steel wires		
		Wrapping Test of Aluminium Wires		
		Wrapping Test of Galvanized Steel Wires		

Dealing Officer
Page 34 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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IMT Manesar, Gurugram (Haryana)-122050

Validity

17.06.2024 to 16.06.2026

Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		Resistance Test of Aluminium Wires		
		Measurement of Lay Ratio		
		Uniformity of Zinc Coating		
		Mass of Zinc Coating		
		Torsion Test of Galvanized Steel wire		
		Elongation Test		
31	Aluminium Conductors for overhead transmission purpose (Aluminium Alloy Stranded Conductors) [Al. – Magnesium – Silicon Type]	Diameter of Aluminium, Steel wires & Stranded Conductor	IS 398(Part 4):1994	Digital micrometer, Digital tensile testing machine, Industrial kelvin double bridge
		Elongation Test		Digital Tensile testing machine
		Resistance test of Aluminium wires		
		Breaking load of Individual wires		
		Measurement of Dimensions of Aluminium Alloy Wires)		
		Breaking Load of Aluminium Alloy wires		
		Elongation Test of Aluminium Alloy Wires		
		Resistance Test of Aluminium Alloy Wires		

Dealing Officer
Page 35 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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IMT Manesar, Gurugram (Haryana)-122050

Validity

17.06.2024 to 16.06.2026

Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
32	Aluminum conductors for overhead transmission purposes: Part 3 Aluminium conductors, aluminized steel reinforced	Measurement of Lay Ratio	IS 398(Part 3):1976	Digital micrometer, Digital tensile testing machine, Industrial kelvin doublebridge
		Direction of Lay		
		Breaking load of Individual wires		
		Diameter of Aluminium , Steel wires & Stranded Conductor		
		Ductility test (Torsion test and Elongation test		
		Lay Ratio		
		Resistance test of Aluminium wires		
		Wrapping test for Aluminized Wires		
		Wrapping test for Aluminum Wires		
		Measurement of Dimensions		
		Visual Examination / Freedom of defects		
		Breaking Load of Aluminium wires		
		Breaking Load of Aluminized Steel wires		
		Wrapping Test of Aluminium Wires		
		Wrapping Test of Aluminized Steel Wires		
Resistance Test of Aluminium wires				

Dealing Officer
Page 36 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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Validity

17.06.2024 to 16.06.2026

Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
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		Measurement of Lay Ratio		
		Coating of Aluminzes Steel Wires		
		Torsion Test of Aluminized Steel wire		
		Elongation Test		
33	Aluminium Conductors for Overhead Transmission Purposes	Breaking load of Individual wires	IS 398 (Part 1):1996	Digital micrometer, Digital tensile testing machine, Industrial kelvin doublebridge
		Diameter of Aluminium wires		
		Lay Ratio		
		Resistance test of Aluminium wires		
		Wrapping test for Aluminum wires		
34	Aluminium Conductors for Overhead Transmission Purposes - Aluminium Conductors, galvanized steel-reinforce	Resistance test of Aluminium wires	IS 398(Part 2):1996	Digital micrometer, Digital tensile testing machine, Industrial kelvin doublebridge
		Breaking load of Individual wires		
		Diameter of Aluminium & Steel wires		
		Ductility test (Torsion test and Elongation test)		
		Galvanizing Test on steel wire (Uniformity of Zinc Coating & Weight of Zinc Coating)		
		Lay ratio		

Dealing Officer
Page 37 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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Validity

17.06.2024 to 16.06.2026

Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		Wrapping test for Aluminum wires		
35	Armoured Cables with Thermosetting Insulation for rated voltages from 3.8/6.6 kV to 19/33 kV	Ageing in Air Oven	BS 6622:2007	-----
		Bending Test		-----
		Cold Impact Test		-----
		Compatibility Test		-----
		Conductor Resistance		-----
		Dielectric Power Factor Test as a function of voltage		Ten delta testset
		Elongation Test at Low Temperature		-----
		Heat Cycle Test		Heating cycle test apparatus
		Heat Shock Test		Hot air oven
		High Voltage Test (4 Hour Test)		HV Tester
		High Voltage test at room temperature		-----
		Hot deformation test / Pressure Test at High Temperature		-----
Hot Set Test	-----			

Dealing Officer
Page 38 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

Laboratory Name: M/s RTRC LIMITED, Plot No. 296, Sector-7, Phase-II, Industrial Estate,
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Validity

17.06.2024 to 16.06.2026

Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		Impulse Withstand Test		-----
		Loss of Mass		-----
		Partial Discharge Test		PD test setup
		Power Factor Test as a function of temperature		Ten delta testset
		Tensile strength and elongation at break on Insulation and Sheath		-----
		Test for eccentricity and Thickness of insulation and sheath / Overall Dimensions		-----
		Test on extruded semi conducting screens- Volume Resistivity		Digital Ohmmeter
		Water Absorption Test (Gravimetric)		-----
36	Armoured Cables with Thermosetting Insulation having low emission of smoke and corrosive gases when affected by fire	Ageing in Air Oven	BS 7835:2007	
		Bending Test		
		Bending Test at low Temperature		
		Cold Impact Test		
		Conductor Resistance		

Dealing Officer
Page 39 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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Validity

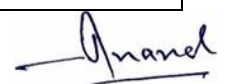
17.06.2024 to 16.06.2026

Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		Dielectric Power Factor Test as a function of voltage		-----
		Dimension for Armoring Material		
		Elongation Test at Low Temperature		
		Flame Retardance Test on Bunched cable		
		Halogen Acid Gas Evolution / Corrosive & halogen acid gas		
		Heat Cycle Test		
		High Voltage Test (4 Hour Test)		
		High Voltage test at room temperature		
		Hot deformation test / Pressure Test at High Temperature		
		Hot Set Test		
		Impulse Withstand Test		
		Insulation Resistance		
		Mass of Zinc Coating		



Dealing Officer
Page 40 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

Laboratory Name: M/s RTRC LIMITED, Plot No. 296, Sector-7, Phase-II, Industrial Estate,
IMT Manesar, Gurugram (Haryana)-122050

Validity

17.06.2024 to 16.06.2026

Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		Partial Discharge Test		
		Power Factor Test as a function of temperature		
		Shrinkage Test		
		Smoke Density under Fire Conditions		
		Tensile strength & Elongation at break for armouring material		
		Tensile strength and elongation at break on Insulation and Sheath		
		Tensile Strength for Aluminium Wires		
		Test for eccentricity and Thickness of insulation and sheath / Overall Dimensions		
		Test under Fire Conditions / Flammability Test		
		Water Absorption Test (Gravimetric)		
		Winding/ Wrapping Test on Galvanized steel strip for Armouring		

Dealing Officer
Page 41 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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IMT Manesar, Gurugram (Haryana)-122050

Validity 17.06.2024 to 16.06.2026 Amended on 04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
37	Armouring material of electric cables	Dimension for Armouring Material	IS 10810 (Part 36): 1984	-----
38	Bundled assembled cores for overhead system of rated voltages 0.6/1.0 kV	Absence of capillary water rising	NFC 33-209:1982	-----
		Dielectric strength		-----
		Adhesion of Neutral Core Sheath		-----
		Behavior of neutral core under thermal and mechanical stresses		Thermal Stress-strain test apparatus
		Breaking Force of Conductors		-----
		Dimensions of Conductors		-----
		Dimensions of Insulating sheath		-----
		Hot Set Test		-----
		Impulse Voltage Test		-----
		Insulation Resistance		Million mega ohm meter
Minimum Tensile Strength and Minimum Elongation of Insulating Sheath	-----			

Dealing Officer
Page 42 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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IMT Manesar, Gurugram (Haryana)-122050

Validity

17.06.2024 to 16.06.2026

Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		Perforation susceptibility of insulating sheath		-----
		Shrinkage Test		
		Stranding Pitch of Conductors		
		Weather Resistance		UV test apparatus
39	Cables	Assessing the ability of unenclosed sheathed cables and non-metallic wiring enclosures to withstand cutting action	AS/NZS 3013:2005 (R2020)	
		Circuit integrity against mechanical damage		-----
		Circuit integrity under fire condition		
		Circuit integrity when subject to both fire conditions and spraying with water		
		Water Treeing Test	IEEE 1407:2021	HV tester and Treeing test apparatus
40	Cables for control and instrumentation circuits 150/250 V (300 V)	Additional aging test on pieces of complete cable	IEC 60092-376:2017	
		Bunched cable flame spread test		-----
		Cable dimension		

Dealing Officer
Page 43 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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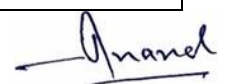
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Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		Conductor resistance		
		Coverage density of braid		
		Fire resistance test (test for circuit integrity cables)		FS test setup
		High voltage test		-----
		Hot set test		
		Inductance to resistance ratio		LCR meter
		Insulation resistance test		Million megaohm meter
		Mutual capacitance		LCR meter
		Smoke emission test		-----
		Thickness of insulation and sheath		
41	Cables for general applications. Flexible cables with crosslinked elastomeric insulation	Bending Test at Low Temperature	BS EN 50525-2-21:2011	- ----
		Insulation Resistance		Million megaohm meter
42	Cables for general applications. Flexible cables with thermoplastic PVC insulation	Insulation Resistance	BS EN 50525-2-11:2011	Million megaohm meter
43	Cables for Motor Vehicle	Ageing in Air Oven	IS 2465:1984	-----
		Annealing Test for Copper Wire		



Dealing Officer
Page 44 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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Validity

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Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
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		Capacitance Test		LCR meter
		Conductor Resistance		Industrial kelvin doubleBridge
		Effect of lubricating oil, break fluid, diesel, petrol (for general wiring cables)		-----
		Heat Shock Test		
		High Voltage test (Water immersion)		
		High Voltage test at room temperature		
		Hot deformation test / Pressure Test at High Temperature		
		Loss of Mass		
		Oil Resistance Test		
		Ozone Resistance Test		
		Persulphate Test/ Tinning Test		
		Shrinkage Test		
		Tensile strength and elongation at break on Insulation and Sheath		-----
		Test for eccentricity and Thickness of insulation and sheath / Overall Dimensions		

Dealing Officer
Page 45 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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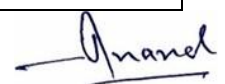
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Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
44	Cables for rated voltages from 6 kV (Urn= 7,2 kV) up to 30 kV (Urn =36 kV)	Water Penetration Test	IEC 60502-2:2014	-----
		Determination of cable conductor temperature (Ampacity test)		heat cycle test apparatus
45	Cadmium Copper Conductor	Electrical Resistance	ETI/OHE/50(6/97)	Industrial kelvin doublebridge
		Lay ratio		-----
		Tensile strength		Tensile testing machine
		Wrapping test		-----
		Diameter of individual wire		
		Lay length		
46	Carbon Black Content in Olefin Plastics	Carbon Content Test	ASTM D1603:20	Carbon blacktest apparatus
47	Charging cables for electric vehicles	Bending at low temperature	IEC 62893-1:2017	-----
		Elongation at break		
		Elongation at low temperature		
		Hot set test		
		Pressure test at high temperature		
		Tensile strength		-----
48	Choice of test criteria	Thermal Endurance Test	IEC 60216-2:2005	-----
49	Communication	Capacitance Test	BS EN 50289-1-5:2001	LCR Meter



Dealing Officer
Page 46 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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Validity

17.06.2024 to 16.06.2026

Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
	cable	Inductance Test	BS EN 50289-1-12:2005, BS EN 50289-1-2:2023	
		Conductor Elongation at Break	BS EN 50289-3-2:2001	-----
		Conductor Resistance	BS EN 50289-1-2:2023	Kelvin Double Bridge
		DC resistance test	BS EN 50289-1-2:2023	-----
		Dielectric test	BS EN 50289-1-3:2001	
		Insulation resistance	BS EN 50289-1-4:2001	Million megaohm meter
50	Compounds for cables and pipes / ducts	Anti rodent test	NPCIL specification I28.KK34.0.0.ET.PM.P R072	-----
			RDSO/SPN/TC/45:2013	
		Anti termite test	NPCIL specification I28.KK34.0.0.ET.PM.P R072	
			RDSO/SPN/204:2011	
51	Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard, or Soft	Density	ASTM B8-23	-----
		Diameter		
		Lay length		
		Resistance		
52	Conductors - Covered overhead - For working voltages	Adhesion test	AS/NZS 3675:2002(R2017)	
		Carbon black dispersion		

Dealing Officer
Page 47 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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Validity

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Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used	
	6.35/11(12) kV up to and including 19/33(36) kV	Dripping test		---	
		Dynamic water blocking test			
		High voltage test			
		Inter stand conductivity test			
		Resistivity test			
		Spark test			Spark tester
		Static water blocking test			----
		Thickness of covering			
		Ultimate tensile stress test			
		UV test			UV apparatus
		Wire diameter			----
Wrapping test					
53	Conductors for overhead lines - Round wire concentric lay stranded conductors	Adhesion of zinc coating	BS EN 50182:2001		
		Elongation test			
		Inertness			
		Lay ratio and direction of lay			
		Mass of zinc coating			
		Resistivity			

Dealing Officer
Page 48 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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Validity

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04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		Tensile strength		-----
		Torsion test		
		Wrapping test		
		Zinc dip test		
		Diameter		
		Nominal d.c. resistance		
54	Conductors in insulated electric cables and flexible cords	Conductor diameter	AS/NZS 1125:2001(R2017)	-----
		Conductor resistance		
55	Conductors of Insulated Cables	Conductor Resistance	BS EN 60228:2005, IEC 60228:2023	----- Tensile testing machine
		Persulphate Test/ Tinning Test		
		Tensile Strength for Aluminium Wires		
56	Control and Instrumentation Cables for Polyethylene Insulated Cables	Ageing in Air Oven	PAS 5308-1:2009	-----
		Capacitance Test		LCR Meter
		Conductor Resistance		
		Dimension for Armouring Material		
		Heat Shock Test		
		High Voltage test at room temperature		

Dealing Officer
Page 49 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		Hot deformation test / Pressure Test at High Temperature		-----
		Inductance Test		
		Insulation Resistance		
		L/R Ratio Test		
		Loss of Mass		
		Mass of Zinc Coating		
		Resistivity & Conductance test of Armour (Wires/strips)		Digital ohmmeter
		Shrinkage Test		-----
		Tensile strength & Elongation at break for armouring material		
		Tensile strength and elongation at break on Insulation and Sheath		
		Test for eccentricity and Thickness of insulation and sheath / Overall Dimensions		
		Torsion Test on Galvanized steel wire for Armouring		
		Uniformity of Zinc coating (Dip Test)		

Dealing Officer
Page 50 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.




SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

Laboratory Name: M/s RTRC LIMITED, Plot No. 296, Sector-7, Phase-II, Industrial Estate,
IMT Manesar, Gurugram (Haryana)-122050

Validity 17.06.2024 to 16.06.2026 Amended on 04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		Winding/ Wrapping Test on Galvanized steel strip for Armouring		
57	Control and Instrumentation Cables for PVC Insulated cables	Ageing in Air Oven	PAS 5308-2:2009	
		Capacitance Test		
		Conductor Resistance		
		Dimension for Armouring Material		
		Heat Shock Test		
		High Voltage test at room temperature		
		Inductance Test		
		Insulation Resistance		
		L/R Ratio Test		
		Loss of Mass		
		Mass of Zinc Coating		
		Pressure Test at High Temperature		
		Resistivity & Conductance test of Armour (Wires/strips)		-----
		Shrinkage Test		


Dealing Officer
Page 51 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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Validity

17.06.2024 to 16.06.2026

Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		Tensile strength & Elongation at break for armouring material		
		Tensile strength and elongation at break on Insulation and Sheath		
		Test for eccentricity and Thickness of insulation and sheath / Overall Dimensions		
		Torsion Test on Galvanized steel wire for Armouring		
		Uniformity of Zinc coating (Dip Test)		
		Winding/ Wrapping Test on Galvanized steel strip for Armouring		
58	Copper	Copper Purity Test	IS 191:2007 IS 440:1964	-----
59	Copper and aluminum conductors	Conductor Resistance	IS 10810(Part 5):1984	-----
60	Copper and Copper cadmium conductor	Conductivity	BS 7884:1997	
		Dimension		
		Electrical resistance		
		Lay length		
		Lay ratio		

Dealing Officer
Page 52 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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Validity

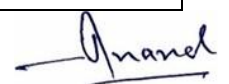
17.06.2024 to 16.06.2026

Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		Tensile strength		-----
		Wire diameter		
		Wrapping test		
61	Covered conductors for overhead lines and the related accessories for rated voltages above 1 kV AC and not exceeding 36 kV AC Covered conductors	Carbon Black Content	BS EN 50397-1:2020	-----
		Ageing in Air Oven		
		Compliance with Constructional requirements		
		Conductor Resistance		
		Construction and dimensions of the conductor		
		Content, Legibility of Marking		
		Durability of Marking		
		High Voltage Test		
		Hot deformation test / Pressure Test at High Temperature		
		Hot Set Test		
		Leakage Current		
		Rated Tensile Strength of the conductor		



Dealing Officer
Page 53 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

Laboratory Name: M/s RTRC LIMITED, Plot No. 296, Sector-7, Phase-II, Industrial Estate,
IMT Manesar, Gurugram (Haryana)-122050

Validity

17.06.2024 to 16.06.2026

Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		Resistance to UV Rays		
		Shore D Hardness		
		Shrinkage Test		
		Slippage Test		
		Tensile Strength & Elongation at Break		
		Tensile strength and elongation at break on Insulation and Sheath		
		Test of Compatibility (Ageing of complete product sample)		
		Test of longitudinal Water Tightness		
		Thickness of the covering		
		Tracking Resistance		
		UV Test		
		Water Absorption Test		
62	Cross Linked Polyethylene Insulated Thermoplastic Sheathed cables	Impulse Withstand Test	IS 7098 (Part 2):2011	
		Bending Test		
		Carbon Content Test		

Dealing Officer
Page 54 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

Laboratory Name: M/s RTRC LIMITED, Plot No. 296, Sector-7, Phase-II, Industrial Estate,
IMT Manesar, Gurugram (Haryana)-122050

Validity

17.06.2024 to 16.06.2026

Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
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	for working voltages from 3.3 kV to 33 kV	Dielectric Power Factor Test as a function of temperature		-----
		Dielectric Power Factor Test as a function of voltage		
		Heat Cycle Test		
		High Voltage Test (4 Hour Test)		
		Partial Discharge Test		
		Test on extruded semi conducting screens-Test for Strip ability of semiconducting strippable insulation screen		
		Test on extruded semi conducting screens- Volume Resistivity		
		Thermal ageing test for complete cable/ Additional Ageing Test on pieces of Completed Cables		
		Annealing Test for Copper Wire		
		Tensile Strength for Aluminium Wires		

Dealing Officer
Page 55 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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IMT Manesar, Gurugram (Haryana)-122050

Validity

17.06.2024 to 16.06.2026

Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
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		High Voltage test at room temperature		
		Hot deformation test / Pressure Test at High Temperature		
		Tensile strength & Elongation at break for armouring material		
		Torsion Test on Galvanized steel wire for Armouring		
		Uniformity of Zinc coating (Dip Test)		
		Ageing in Air Oven		
		Armour Coverage Percentage Test		
		Cold Impact Test		
		Conductor Resistance		
		Dimension for Armouring Material		
		Flame Retardance Test on Bunched cable		
		Flame Retardant Test on Single cable (Swedish Chimney)		

Dealing Officer
Page 56 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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IMT Manesar, Gurugram (Haryana)-122050

Validity 17.06.2024 to 16.06.2026 Amended on 04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
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		Halogen Acid Gas Evolution / Corrosive & halogen acid gas		
		Heat Shock Test		
		Hot Set Test		
		Insulation Resistance		
		Loss of Mass		
		Mass of Zinc Coating		
		Oxygen Index Test		
		Resistance Test for Armour (for Mining Cables)		
		Resistivity & Conductance test of Armour (Wires/strips)		
		Shrinkage Test		
		Temperature Index Test		
		Tensile strength and elongation at break on Insulation and Sheath		
		Test for eccentricity and Thickness of insulation and sheath / Overall Dimensions		
		Test under Fire Conditions / Flammability Test		
		Thermal Stability		

Dealing Officer
Page 57 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

Laboratory Name: M/s RTRC LIMITED, Plot No. 296, Sector-7, Phase-II, Industrial Estate,
IMT Manesar, Gurugram (Haryana)-122050

Validity

17.06.2024 to 16.06.2026

Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		Water Absorption Test (Gravimetric)		
		Winding/ Wrapping Test on Galvanized steel strip for Armouring		
		Wrapping Test for Aluminium Wires		
63	Cross Linked Polyethylene Insulated Thermoplastic Sheathed cables for working voltages from 66 kV upto and including 220 kV	Annealing test for copper wire	IS 7098 (Part 3):1993	-----
		Bending Test followed by PD Test		
		Carbon Black Content		
		Diameter of Armour Wire		
		Dielectric Power Factor and Capacitance Measurement at ambient temperature		
		Dielectric Power Factor measurement at elevated temperature		
		Elongation at break for armouring material		
		Flammability Test (For PVC Outer Sheath only)		
		Heat Shock Test		

Dealing Officer
Page 58 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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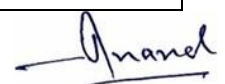
17.06.2024 to 16.06.2026

Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		Hot Deformation Test		
		Hot Set Test		
		Impulse Withstand Test followed by HV Test		
		Load Cycle test followed by PD Measurement		
		Longitudinal Water Tightness Test		
		Loss of Mass test		
		Partial Discharge Test		
		Resistance Test / Conductor Resistance		
		Resistivity Test for semi conducting layers		
		Resistivity Test on Armour		
		Shrinkage Test		
		Tensile strength and elongation at break on Insulation and Sheath		
		Tensile strength for Aluminum Wires		
		Tensile strength for armouring material		



Dealing Officer
Page 59 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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Validity

17.06.2024 to 16.06.2026

Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		Test for eccentricity and Thickness of insulation and sheath / Overall Dimensions		
		Thermal ageing in air oven		
		Thermal ageing test for complete cable		
		Thermal Stability		
		Thickness of Metallic Sheath		
		Void and Contamination Test		
		Wrapping Test		
		Wrapping test for Aluminum wires		
		Test for concentric metallic screen		
		Radial water tightness		
64	Cross Linked Polyethylene Insulated Thermoplastic	Annealing Test for Copper Wire	IS 7098 (Part 1):1988	-----
		Ageing in Air Oven		

Dealing Officer
Page 60 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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Validity

17.06.2024 to 16.06.2026

Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
	Sheathed cables for working voltages upto and including 1100 V	Armour Coverage Percentage Test		
		Cold Bend Test		
		Cold Impact Test		
		Conductor Resistance		
		Dimension for Armouring Material		
		Flame Retardance Test on Bunched cable		
		Flame Retardant Test on Single cable (Swedish Chimney)		
		Flammability Test		
		Halogen Acid Gas Evolution / Corrosive & halogen acid gas		
		Heat Shock Test		
		High Voltage test at room temperature		
		Hot deformation test / Pressure Test at High Temperature		
		Hot Set Test		
	Insulation Resistance			

Dealing Officer
Page 61 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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IMT Manesar, Gurugram (Haryana)-122050

Validity

17.06.2024 to 16.06.2026

Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
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		Loss of Mass		
		Mass of Zinc Coating		
		Oxygen Index Test		
		Resistance Test for Armour (for Mining Cables)		
		Resistivity & Conductance test of Armour (Wires/strips)		
		Shrinkage Test		
		Temperature Index Test		
		Tensile strength & Elongation at break for armouring material		
		Tensile strength and elongation at break on Insulation and Sheath		
		Tensile Strength for Aluminium Wires		
		Test for eccentricity and Thickness of insulation and sheath / Overall Dimensions		
		Thermal Stability		

Dealing Officer
Page 62 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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Validity

17.06.2024 to 16.06.2026

Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		Torsion Test on Galvanized steel wire for Armouring		
		Uniformity of Zinc coating (Dip Test)		
		Water Absorption Test (Gravimetric)		
		Winding/ Wrapping Test on Galvanized steel strip for Armouring		
		Wrapping Test for Aluminium Wires		
65	Crosslinked Ethylene Plastics	Determination of Gel Content and Swell Ratio of Crosslinked Ethylene Plastics	ASTM D 2765:16 (2024)	-----
66	Dielectric material of electric cables	Dielectric Power Factor Test as a function of voltage	IS 10810 (Part 48): 1984	-----
67	Distribution Cables (Single Core) with extruded insulation of rated voltages of 11 kV to 33 kV	Abrasion Test	BS 7870-4.10:2011	
		Bending Test		
		Cold bend Test / Voltage Test after bending		
		Compatibility Test		
		Conductor Resistance		
		Dielectric Power Factor Test as a function of voltage		

Dealing Officer
Page 63 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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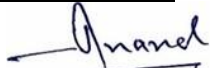
17.06.2024 to 16.06.2026

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Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		Flame Propagation (Retardance) Test on Multiple (Bunched) cables		-----
		Halogen Acid Gas Evolution / Corrosive & halogen acid gas		
		Heat Cycle Test		
		High Voltage Test (4 Hour Test)		
		Hot Set Test		
		Impulse Withstand Test		
		Long Duration Test		
		Long Duration Test	BS 7870-4.20:2011	-----
		Measurement of Thickness of Insulation & Sheath	BS 7870-4.10:2011	
		Partial Discharge		
		Power Factor Test as a function of temperature		
		Resistivity of Conductor Screen		---
		Shrinkage Test		
		Smoke Density under Fire Conditions		



Dealing Officer
Page 64 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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IMT Manesar, Gurugram (Haryana)-122050

Validity

17.06.2024 to 16.06.2026

Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		Test on extruded semi conducting screens-Test for Strippability of semiconducting strippable insulation screen		
		Test on extruded semi conducting screens-Volume Resistivity		
		Tests on Water Blocking Tape		
		Water Penetration Test		
68	Distribution Cables (Three Core) with extruded insulation of rated voltage of 11 kV to 33 kV	Impulse Withstand Test	BS 7870-4.20:2011	
		Abrasion Test		
		Bending Test		
		Compatibility Test		
		Conductor Resistance		
		Dielectric Power Factor Test as a function of voltage		
		Flame Propagation (Retardance) Test on Multiple (Bunched) cables		-----
		Halogen Acid Gas Evolution / Corrosive & halogen acid gas		
		Heat Cycle Test		
		High Voltage Test (4 hour Test)		

Dealing Officer
Page 65 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		Hot Set Test		
		Measurement of Thickness of Insulation & Sheath		
		Partial Discharge Test		
		Power Factor Test as a function of temperature		
		Resistivity of Conductor Screen		
		Shrinkage Test		
		Smoke Density under Fire Conditions		
		Test on extruded semi conducting screens-Test for Strippability of semiconducting strippable insulation screen		
		Test on extruded semi conducting screens- Volume Resistivity		
		Water Penetration Test		
69	Elastomer Insulated Cables (with Limited Circuit Integrity when affected by Fire) for working voltages upto and including 1100 Volts	Ageing in air bomb	IS 16246:2015	
		Ageing in air oven on insulation and sheath		
		Annealing test (for copper)		-----
		Circuit integrity test under fire condition		
		Conductor resistance test		

Dealing Officer
Page 66 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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Validity

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Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		Oil resistance test		
		Dimension of armoring material		
		Elongation at break for armoring material		
		Elongation at break of insulation and sheath before and after ageing		
		Flame retardant on bunched cable		
		Flame retardant test on single cable		
		High voltage test on insulation		
		Hot set test on insulation and sheath		
		Insulation resistance test		
		Mass of zinc coating		
		Oxygen index test on sheath		
		Persulphate test for tinned copper		
		Resistivity of armour (wires/strips)		
		Temperature index test on sheath		

Dealing Officer
Page 67 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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Validity

17.06.2024 to 16.06.2026

Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		Tensile strength for armoring material		
		Tensile strength of insulation and sheath, before ageing and after ageing		
		Test of acid gas generation on sheath		
		Test of overall dimensions and thickness of insulation and sheath		
		Torsion test on galvanized steel wire for armoring		
		Uniformity of zinc coating (Dip test)		
		Water absorption test (for insulation)		
		Winding / Wrapping test on galvanized steel grip for armoring		
		Smoke Density Rating	IS 16246: 2015 (IS 13360 Part 6 Sec 9: 2001)	Smoke Density Test Apparatus
70	Elastomer Insulated Cables for working voltages from 3.3 kV to 33 kV	Bending Test	IS 9968 (Part 2):2002	-----
		Cold Impact Test		
		Dielectric Power Factor Test as a function of temperature		

Dealing Officer
Page 68 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
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		Dielectric Power Factor Test as a function of voltage		
		Dimension for Armouring Material		
		Heat Cycle Test		
		Heat Shock Test		
		High Voltage Test (4 Hour Test)		
		Hot deformation test / Pressure Test at High Temperature		
		Electrical Test on semi-conducting screen for non-metallic screened cable		
		Impulse Withstand Test		
		Loss of Mass		
		Mass of Zinc Coating		
		Ozone Resistance Test		Ozone chamber
		Partial Discharge Test		
		Resistivity & Conductance test of Armour (Wires/strips)		

Dealing Officer
Page 69 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		Shrinkage Test		
		Tensile strength & Elongation at break for armouring material		
		Thermal Stability		
		Torsion Test on Galvanized steel wire for Armouring		-----
		Uniformity of Zinc coating (Dip Test)		
		Winding/ Wrapping Test on Galvanized steel strip for Armouring		-----
		Insulation Resistance		Million megaohm meter
		Accelerated Water Absorption Test (Electrical)		
		Ageing in Air Bomb		
		Ageing in Air Oven		
		Annealing Test for Copper Wire		-----
		Conductor Resistance		Senior Industrial Kelvin Bridge
		Hot Set Test		
		Oil Resistance Test		-----

Dealing Officer
Page 70 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

Laboratory Name: M/s RTRC LIMITED, Plot No. 296, Sector-7, Phase-II, Industrial Estate,
IMT Manesar, Gurugram (Haryana)-122050

Validity

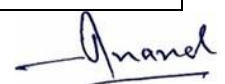
17.06.2024 to 16.06.2026

Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		Persulphate Test/ Tinning Test		Tensile testing machine
		Tear Resistance		
		Tensile strength and elongation at break on Insulation and Sheath		
		Tensile Strength for Aluminium Wires		
		Test for eccentricity and Thickness of insulation and sheath / Overall Dimensions		
		Test under Fire Conditions / Flammability Test		
		Wrapping Test for Aluminium Wires		
71	Elastomer Insulated Cables for working voltages up to and including 1100 Volts	Assessment of halogen on insulation and sheath - pH test	IEC/BS EN 60684-2:2011	pH & Conductivity meter
		Ageing in air bomb	IS 10810 (Part 56):1987	---
			IS 6380:1984	
		Ageing in air oven on insulation and sheath	IS 10810 (Part 11):1984	---
		Annealing test (for copper)	IS 10810 (Part 1):1984	Tensile testing machine
Tensile Test for Aluminium				



Dealing Officer
Page 71 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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Validity

17.06.2024 to 16.06.2026

Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		Annealing Test for Copper		
		Assessment of halogen on insulation and sheath - pH test	BS EN 50525-1:2011 IEC 60754-2:2011	-----
		Assessment of halogen on insulation and sheath - Chlorine and bromine content expressed as content of HCL	BS EN 50525-1:2011 IEC/BS EN 60684-2:2011	
		Assessment of halogen on insulation and sheath - Conductivity test	BS EN 50525-1:2011 IEC/BS EN 60684-2:2011	
		Assessment of halogen on insulation and sheath - Fluorine content	BS EN 50525-1:2011 IEC/BS EN 60684-2:2011	
		Assessment of halogen on insulation and sheath - Presence of fluorine	BS EN 50525-1:2011 IEC/BS EN 60684-2:2011	
		Circuit integrity test under fire condition	IEC 60331-21:1999	
		test for electric cable under fire conditions: part 23 : Electric data cables	IEC 60331-23:1999	
		Cold bend test on finished cable	IS 10810 (Part 20): 1984	
		Cold impact test on insulation and finished cable	IS 10810 (Part 21): 1984	

Dealing Officer
Page 72 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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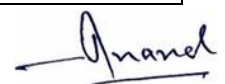
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04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
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		Conductivity Test	IEC 60754-2:2011	
		Conductor resistance test	IS 10810 (Part 5):1984	Senior Industrial Kelvin Bridge
		Resistance Test		
		Dimension for armouring material	IS 10810 (Part 36): 1984	
		Elongation at break for armouring material	IS 10810 (Part 37): 1984	
		Tensile Strength & Elongation at Break		
		Elongation at break of insulation and sheath before aging	IS 6380:1984	
		Wrapping Test	IS 1755 : 2018	-----
		Elongation at break of insulation and sheath, before and after ageing	IS 10810 (Part 11): 1984	
		Elongation at break of insulation and sheath, before and after ageing	IS 10810 (Part 7):1984	
		Flame retardant test on bunched cable	IS 10810 (Part 62): 1993	
		Flame retardant test on single cable	IS 10810 (Part 61): 1988	Flammability test apparatus
		Flammability test on finished cable	IS 10810 (Part 53): 1984	
		High voltage test on insulation and finished cable	IS 10810 (Part 45): 1984	



Dealing Officer
Page 73 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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IMT Manesar, Gurugram (Haryana)-122050

Validity

17.06.2024 to 16.06.2026

Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
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		Hot deformation on insulation and sheath	IS 10810 (Part 15): 1984	-----
		Hot set test on insulation and sheath	IS 10810 (Part 30): 1984 IS 6380:1984	
		Insulation Resistance test	IS 10810 (Part 43): 1984 IS 6380:1984	Million megaohm meter -----
		Tear Resistance Test	IS : 6380 : 1984 Reaffirmed 2021 Annexure-B ,	Tensile Testing Machine with Tear Resistance Die
		Tear Resistance Test	IS 10810 (Part 17): 1986	Tensile Testing Machine with Tear Resistance Die
		Mass of zinc coating	IS 10810 (Part 41): 1984	
		Oxygen index test on insulation and sheath	IS 10810 (Part 58): 1998	
		Ozone resistance test on insulation and sheath	IS 10810 (Part 13): 1984	
		Persulphate test for tinned copper	IS 10810 (Part 4):1984	
		Resistivity test of armour (Wires/strips)	IS 10810 (Part 42): 1984	

Dealing Officer
Page 74 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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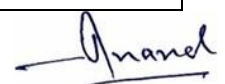
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Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		Smoke density test on finished cable	IS 10810 (Part 63): 1993	3 m cube chamber - smoke density test apparatus
		Temperature index test on insulation and sheath	IS 10810 (Part 64): 2003	-----
		Tensile strength for armouring material	IS 10810 (Part 37): 1984	
		Tensile strength of insulation and sheath, before ageing	IS 6380:1984	
		Tensile test (for aluminium)	IS 10810 (Part 2):1984	
		Wrapping Test for Aluminium		
		Test of acid gas generation on sheath	IS 10810 (Part 59): 1988	
		Test of overall dimensions and thickness of insulation and sheath	IS 10810 (Part 6):1984	
		Torsion Test on Galvanized steel wire for Armouring	IS 10810 (Part 38): 1984	
		Uniformity of Zinc coating (Dip Test)	IS 10810 (Part 40): 1984	
		Water absorption test (for insulation)	IS 10810 (Part 28): 1984	



Dealing Officer
Page 75 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

Laboratory Name: M/s RTRC LIMITED, Plot No. 296, Sector-7, Phase-II, Industrial Estate,
IMT Manesar, Gurugram (Haryana)-122050

Validity

17.06.2024 to 16.06.2026

Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
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		Resistivity of Armour Wire	IS:10810 Part-42:1984	
		Winding Test on Strips	IS:10810 Part-39:1984	
		Dimensions	IS:10810 Part-36:1984	
		Mass of Zinc Coating	IS:10810 Part-41:1984	
		Uniformity of Zinc Coating	IS:10810 Part-40:1984	
		Torsion Test	IS:10810 Part-38:1984	
		Winding/ Wrapping Test on Galvanized steel strip for Armouring	IS 10810 (Part 40): 1984	
		Wrapping test (for aluminium)	IS 10810 (Part 3):1984	
		Accelerated Water Absorption Test (Electrical)	IS 9968 (Part 1):1988	Ten delta & capacitance bridge
		Ageing in Air Bomb	IS 9968 (Part 1):1988	
		Ageing in Air Oven		
		Ageing in Oxygen Bomb		
		Annealing Test for Copper Wire		
		Conductor Resistance		
		Flexing Test		---

Dealing Officer
Page 76 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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IMT Manesar, Gurugram (Haryana)-122050

Validity

17.06.2024 to 16.06.2026

Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		High Voltage test (Water immersion)		
		Hot Set Test		
		Insulation Resistance		
		Oil Resistance Test		
		Persulphate Test/ Tinning Test		
		Tear Resistance		
		Tensile strength and elongation at break on Insulation and Sheath		
		Tensile Strength for Aluminium Wires		
		Test for eccentricity and Thickness of insulation and sheath / Overall Dimensions		
		Test under Fire Conditions / Flammability Test		
		Wrapping Test for Aluminium Wires		
72	Elastomer Insulated Flexible Cables used in Mines	Accelerated Water Absorption Test (Electrical)	IS 14494:2019	Ten delta & capacitance bridge
		Ageing in Air Bomb		
		Ageing in Air Oven		

Dealing Officer
Page 77 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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Validity

17.06.2024 to 16.06.2026

Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
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		Annealing Test for Copper Wire		---
		Bending Test		
		Conductor Resistance		Senior Industrial Kelvin bridge
		Electrical Test on semi-conducting screen for non-metallic screened cable		Voltage Source with leakage current
		Dielectric Power Factor Test as a function of temperature		-----
		Dielectric Power Factor Test as a function of voltage		
		Dimension for Armouring Material		
		Heat Cycle Test		
		High Voltage test (Water immersion)		
		High Voltage Test (4 Hour Test)		
		Insulation Resistance		
		Mass of Zinc Coating		
		Oil Resistance Test		
		Ozone Resistance Test		

Dealing Officer
Page 78 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION

(Annexure to Certificate of TL - 101)

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Validity

17.06.2024 to 16.06.2026

Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		Partial Discharge Test		
		Resistivity & Conductance test of Armour (Wires/strips)		
		Tear Resistance		
		Tensile strength & Elongation at break for armouring material		
		Tensile strength and elongation at break on Insulation and Sheath		
		Test for eccentricity and Thickness of insulation and sheath / Overall Dimensions		
		Test on extruded semi conducting screens-Test for Strippability of semiconducting strippable insulation screen		
		Torsion Test on Galvanized steel wire for Armouring		
		Uniformity of Zinc coating (Dip Test)		
73	Elastomeric heavy duty sheathed cables	Tear Resistance	IS 10810 (Part 17): 1986	-----

Dealing Officer
Page 79 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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IMT Manesar, Gurugram (Haryana)-122050

Validity 17.06.2024 to 16.06.2026 Amended on 04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used	
74	Elastomeric Insulation and Sheath of Electric Cables	Ageing in Air Bomb	IS 6380:1984	----	
75	Electric and Communication cable	Damp Heat Test	BS EN 60068-2-78:2013 IEC 60068-2-78:2012	----	
76	Electric and optical fibere cables	Flame Retardance Test on Bunched cable	IEC 60332-3-21:2018	----	
			IEC 60332-3-22:2018		
			IEC 60332-3-23:2018		
			IEC 60332-3-24:2018		
			IEC 60332-3-25:2018		
		Test under Fire Conditions / Flammability Test	BS EN 60332-1-2:2004 IEC 60332-1-2:2004		----
		Cold Impact Test	IEC/BS EN 60811-506:2012		----
		Compatibility Test	IEC/BS EN 60811-401:2012		
		Heat Shock Test	IEC/BS EN 60811-509:2012		
Loss of Mass	IEC/BS EN 60811-409:2012				
Pressure Test at High Temperature	IEC/BS EN 60811-508:2012				

Dealing Officer
Page 80 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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17.06.2024 to 16.06.2026

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04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
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		Ageing in Air Bomb	IEC/BS EN 60811 (Part412): 2012	
		Test for eccentricity and Thickness of insulation and sheath / Overall Dimensions	IEC/BS EN 60811-201:2012	
		Ageing in Air Oven	IEC/BS EN 60811-401:2012	
		Bending Test at low Temperature	IEC/BS EN 60811 (Part 504):2012	
		Cold Elongation Test / Elongation at low temperature	IEC/BS EN 60811-505:2012	
		Cold Impact Test	IEC/BS EN 60811-506:2012	
		Conductivity Test	AS/NZS 3808:2000(R:2017)	
			IEC 60754-2:2011	
		Flame Retardance Test on Bunched cable	IS 10810 (Part 62):1993(RA:2019)	
		Flame Retardant Test on Single cable (Swedish Chimney)	IS 10810 (Part 61):1988(RA:2020)	
		Hot Set Test	IEC/BS EN 60811-507:2012	
		Insulation Resistance	IEC/BS EN 60811-301:2012	
			IEC/BS EN 60811-302:2012	

Dealing Officer
Page 81 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
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		Oil Resistance Test	IEC/BS EN 60811-404:2012	
		Sheath resistance against acid and alkaline solution		
		Ozone Resistance Test	IEC/BS EN 60811-403:2012	
		pH Test	IEC 60754-2:2011	
		Shrinkage Test	IEC/BS EN 60811-502:2012	
			IEC/BS EN 60811-503:2012	
		Tensile strength and elongation at break on Insulation and Sheath	IEC/BS EN 60811-501:2012	
		Test for eccentricity and Thickness of insulation and sheath / Overall Dimensions	IEC/BS EN 60811-202:2012	
		Test for eccentricity and Thickness of insulation and sheath / Overall Dimensions	IEC/BS EN 60811-203:2012	
		Test under Fire Conditions / Flammability Test	IS 10810 (Part 53):1984 (RA:2021)	
		Thermal Stability	IEC/BS EN 60811-405:2012	
		Water Absorption Test (Gravimetric)	IEC/BS EN 60811-402:2012	

Dealing Officer
Page 82 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
77	Electric and optical fibre cables and compound	Toxicity Index	NES 713:2000	Toxicity test apparatus
78	Electric cable	Test for electric cables under fire conditions- Circuit Integrity	IEC 60331-21:1999	FS Test apparatus
		Ageing in Air Oven	IS 10810 (Part 11): 1984	-----
		High Voltage test (Water immersion)	IS 10810 (Part 45): 1984	
		High Voltage test at room temperature		
		Impulse Withstand Test	IS 10810 (Part 47): 1984	Impulse testset
		Insulation Resistance	IS 10810 (Part 43): 1984	-----
		Maximum value of smoke production	BS EN 50399:2022	CPR test apparatus
		Oxygen		
		Shrinkage Test	IS 10810 (Part 12): 1984	
		Tensile strength and elongation at break on Insulation and Sheath	IS 10810 (Part 7):1984	-----
		Test for eccentricity and Thickness of insulation and sheath / Overall Dimensions	IS 10810 (Part 6):1984	
		Thermal Stability	IS 10810 (Part 60): 1988	
		Total heat release	BS EN 50399:2022	CPR test apparatus
Total smoke production				

Dealing Officer
Page 83 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		Carbon dioxide		-----
		Droplets and/or Particles		-----
79	Electric cable- Polymeric insulated for working voltages 0.6/1 (1.2)kV	Compatibility test	AS/NZS5000.1:2005 (R:2017)	-----
		Conductor resistance		-----
		High voltage a.c. test for 4 hour		125kV / 80 kVAC HV test set
		Legibility of marking on outer surface		-----
		Measurement of armour dimension		-----
		Measurement of insulation thickness		-----
		Measurement of thickness of over sheath		-----
		Vertical flame propagation		-----
80	Electric cable- Polymeric insulated for working voltages 1.9/3.3 (3.6) kV up to and including 19/33 (36)kV	Adhesion of hand strippable extruded screen	AS/NZS 1429.1:2006 (R:2017)	-----
		Bending test		-----
		Compatibility test		-----
		Concentricity		-----
		Heating cycle test		-----
		High voltage test		-----
		Hot set test		-----
		Partial discharge test		-----

Dealing Officer
Page 84 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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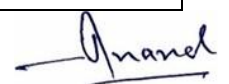
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Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		Projection or irregularities at conductor screen/ insulation interface		
		Shrinkage test		
		Stripability of strippable extruded screen		
		Tan delta measurement as a function of at elevated temperature		Capacitance & Ten delta bridge
		Tan delta measurement as a function of voltage		-----
		Thickness of extruded layer		
		Thickness of insulation		
		Volume resistivity of extruded screen		Digital ohmmeter
		Water penetration test		-----
81	Electric cables	Accelerated Water Absorption Test (Electrical)	IS 10810 (Part 28): 1984	Capacitance & Ten delta bridge
		Ageing in Air Bomb	IS 10810 (Part 56): 1987	
		Ageing in Oxygen Bomb	IS 10810 (Part 16): 1986	
		Anti Rodent & Anti Termite test	AAI Specification	
		Bending Test	IS 10810 (Part 50): 1984	-----



Dealing Officer
Page 85 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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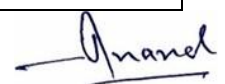
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Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		Breaking load on Messenger Conductor	IS 10810 (Part 2):1984	Tensile testing machine
		Conductor Resistance	BS EN 50395:2005	
		Dielectric Power Factor Test as a function of temperature	IS 10810 (Part 48): 1984	
		Fire Growth Rate Index	BS EN 50399:2022	CPR test apparatus
		Flame Retardant Test on Single cable (Swedish Chimney)	SS-424-1475:1978	Swedish chimney
		Flammability test (Vertical tray flame test)	IEEE 383:2023	-----
		Flexing Test	IS 10810 (Part 57): 1987	
		Gross heat of combustion	BS EN ISO 1716:2018	
		Heat Cycle Test	IS 10810 (Part 49): 1984	
		High Voltage Test (4 Hour Test)	IS 10810 (Part 45): 1984	
		High Voltage test at room temperature	IS 2071 (Part 2):1974	
		Hot Set Test	IS 10810 (Part 30): 1984	
		Insulation Resistance	BS EN 50395:2005	
		Long Term Resistance of insulation to d.c.	BS EN 50395:2005	
		Mass of Zinc Coating	IS 10810 (Part 41): 1984	



Dealing Officer
Page 86 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

Laboratory Name: M/s RTRC LIMITED, Plot No. 296, Sector-7, Phase-II, Industrial Estate,
IMT Manesar, Gurugram (Haryana)-122050

Validity

17.06.2024 to 16.06.2026

Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		Ozone Resistance Test	IS 10810 (Part 13): 1984	Ozone chamber
		Partial Discharge Test	IS 10810 (Part 46): 1984	PD test apparatus
		Peak Heat Release Rate	BS EN 50399:2022	CPR test apparatus
		Resistance to fire alone (Protocol C)	BS 6387:2013	FS Test apparatus
		Resistance to fire to with water (Protocol W)		
		Resistance to fire with mechanical shock (Protocol Z)		
		Resistance to fire with mechanical shock	IEC 60331-1:2018	
			IEC 60331-2:2018	
			IEC 60331-3:2018	
		Resistance to fire with mechanical shock and water spray (Classification PH15, PH30, PH60, PH90, PH120)	BSEN 50200:2015	
			BS 8434-2:2003	
		Resistivity & Conductance test of Armour (Wires/strips)	IS 10810 (Part 42): 1984	-----
		Smoke Density Rating	IS 13360 (Part 6, Sec9): 2001	
		Smoke Density under Fire Conditions	IS 10810 (Part 63): 1993	
		Spark Test	IS 10810 (Part 44): 1984	spark tester

Dealing Officer
Page 87 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		Static Flexibility	IS 10810 (Part 54): 1984	static flexibility test apparatus
		Surface Resistance of Sheath	BS EN 50395:2005	-----
		Temperature Index Test	IS 10810 (Part 64): 2003	
		Tensile strength & Elongation at break for armouring material	IS 10810 (Part 37): 1984	
		Torsion Test on Galvanized steel wire for Armouring	IS 10810 (Part 38): 1984	
		Uniformity of Zinc coating (Dip Test)	IS 10810 (Part 40): 1984	
		UV test	IEC 60068-2-5:2018	UV test apparatus
		Vertical Flame Spread	BS EN 50399:2022	-----
		Voltage Test on completed cable with a.c. or d.c.	BS EN 50395:2005	
		Water Absorption Test (Gravimetric)	IS 10810 (Part 33): 1984	Weighing balance & Vacuum chamber
		Winding/ Wrapping Test on Galvanized steel strip for Armouring	IS 10810 (Part 39): 1984	-----
82	Electric cables - Charging cables for electric vehicles	Absence of faults on insulation	BS EN 50620:2017	
		Assessment of halogens	BS EN 50620:2017	
			IEC 62893-1:2017	

Dealing Officer
Page 88 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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IMT Manesar, Gurugram (Haryana)-122050

Validity 17.06.2024 to 16.06.2026 Amended on 04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
			IEC 62893-3:2017	
			IEC 62893-4-1:2020	
		Bending test	IEC 62893-1:2017	
			IEC 62893-3:2017	
			IEC 62893-4-1:2020	
		Bending test at low temperature	IEC 62893-3:2017	
			IEC 62893-4-1:2020	
		Check on absence of faults on insulation	BS EN 50620:2017	
		Cold bend test		-----
		Cold elongation test		
		Cyclic Bending Test		
		Shore Hardness (IRHD)		
		Cold Impact test	BS EN 50620:2017	
			IEC 62893-1:2017	
			IEC 62893-2:2017	
			IEC 62893-3:2017	
			IEC 62893-4-1:2020	
		Compatibility test	BS EN 50620:2017	
			IEC 62893-1:2017	

Dealing Officer
Page 89 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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IMT Manesar, Gurugram (Haryana)-122050

Validity 17.06.2024 to 16.06.2026 Amended on 04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
			IEC 62893-3:2017	
			IEC 62893-4-1:2020	
		Conductor Resistance	BS EN 50620:2017	
		Crush resistance test	IEC 62893-1:2017	
			IEC 62893-2:2017	
			IEC 62893-3:2017	
			IEC 62893-4-1:2020	
		Determination of saponification value	IEC 62893-1:2017	
			IEC 62893-2:2017	
			IEC 62893-3:2017	
			IEC 62893-4-1:2020	
		Elongation at low temperature	IEC 62893-3:2017	
			IEC 62893-4-1:2020	
		Flexing test	BS EN 50620:2017	
			IEC 62893-1:2017	
			IEC 62893-3:2017	
			IEC 62893-4-1:2020	
		Heat shock test	IEC 62893-1:2017	
			IEC 62893-3:2017	

Dealing Officer
Page 90 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



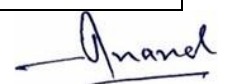
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Validity 17.06.2024 to 16.06.2026 Amended on 04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
			IEC 62893-4-1:2020	
		High voltage water immersion test	BS EN 50620:2017	
		Hot set test	BS EN 50620:2017	-----
			IEC 62893-3:2017	
			IEC 62893-4-1:2020	
		Impact test	IEC 62893-3:2017	
			IEC 62893-4-1:2020	
		Insulation resistance test	IEC 62893-3:2017	
			IEC 62893-4-1:2020	
		Long term resistance of insulation of DC	IEC 62893-2:2017	3 kV/ 80 KV DC test set
			IEC 62893-3:2017	
			IEC 62893-4-1:2020	-----
			IEC 62893-1:2017	
		Long term resistance of power cores of d.c.	BS EN 50620:2017	-----
		Measurement of conductor resistance	IEC 62893-1:2017	-----
			IEC 62893-3:2017	Kelvin Double Bridge
			IEC 62893-4-1:2020	
		Measurement of insulation resistance	BS EN 50620:2017	
			IEC 62893-1:2017	
		Measurement of overall dimension	IEC 62893-4-1:2020	
			IEC 62893-3:2017	



Dealing Officer
Page 91 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

Laboratory Name: M/s RTRC LIMITED, Plot No. 296, Sector-7, Phase-II, Industrial Estate,
IMT Manesar, Gurugram (Haryana)-122050

Validity

17.06.2024 to 16.06.2026

Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		Measurement of thickness of insulation and sheath	BS EN 50620:2017 IEC 62893-3:2017 IEC 62893-4-1:2020	-----
		Overall diameter	IEC 62893-1:2017	Vernier caliper
		Overall dimension	BS EN 50620:2017	
		Ozone resistance test	IEC 62893-1:2017 BS EN 50620:2017 IEC 62893-3:2017 IEC 62893-4-1:2020	-----
		Pressure test at high temperature	BS EN 50620:2017 IEC 62893-3:2017 IEC 62893-4-1:2020	
		Resistance against acid and alkaline solution of outer sheath	IEC 62893-1:2017 IEC 62893-3:2017 IEC 62893-4-1:2020	
		Resistance against chemicals	IEC 62893-2:2017	-----
		Shore Hardness	HD 605 S2:2008 IEC 62893-1:2017 ISO 48-2:2018 ISO 48-4:2018	Shore hardness tester -----
		Determination of hardness Part 2: Hardness between 10 IRHD and 100 IRHD	ISO 48-2:2018	-----
		Shrinkage test	BS EN 50620:2017	

Dealing Officer
Page 92 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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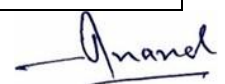
Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
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			IEC 62893-1:2017	
			IEC 62893-3:2017	
			IEC 62893-4-1:2020	
		Surface resistance of sheath	BS EN 50620:2017	-----
		Tear resistance test	IEC 62893-1:2017	
			IEC 62893-2:2017	
			IEC 62893-3:2017	-----
			IEC 62893-4-1:2020	
		Tensile strength and elongation at break	IEC 62893-3:2017	
			IEC 62893-4-1:2020	-----
		Test under fire condition	BS EN 50620:2017	
			IEC 62893-1:2017	
			IEC 62893-3:2017	
			IEC 62893-4-1:2020	-----
		UV test	BS EN 50620:2017	-----
		Voltage test on complete cable	BS EN 50620:2017	
			IEC 62893-1:2017	
			IEC 62893-3:2017	-----
			IEC 62893-4-1:2020	
		Voltage test on cores	BS EN 50620:2017	
			IEC 62893-1:2017	



Dealing Officer
Page 93 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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IMT Manesar, Gurugram (Haryana)-122050

Validity 17.06.2024 to 16.06.2026 Amended on 04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		Water resistance test	IEC 62893-3:2017	-----
			IEC 62893-4-1:2020	
			IEC 62893-1:2017	
			IEC 62893-2:2017	
		Weathering/UV resistance of outer sheath	IEC 62893-3:2017	-----
			IEC 62893-4-1:2020	
			IEC 62893-1:2017	
			IEC 62893-2:2017	
83	Electric cables – Halogen-free, low smoke, thermoplastic insulated and sheathed cables of rated voltages up to and including 450/750 V	Absence of fault in insulation	IEC 62821-2:2015 IEC 63294:2021	-----
		Ageing test	IEC 62821-1:2015	
		Assessment of halogens		
		Bending test		
		Bending test at low temperature		
		Conductor resistance test		
		Elongation test at low temperature		
Flexing test for flexible cables				

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FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

Laboratory Name: M/s RTRC LIMITED, Plot No. 296, Sector-7, Phase-II, Industrial Estate,
IMT Manesar, Gurugram (Haryana)-122050

Validity

17.06.2024 to 16.06.2026

Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		Insulation resistance		
		Long term resistance of insulation to d.c. voltage	IEC 62821-2:2015, IEC 63294:2021	
		Mechanical strength of flexible cables	IEC 62821-1:2015	
		Overall dimension		
		Pressure test at high temperature		
		Shrinkage test		
		Snatch Test		
		Spark test	IEC 62821-2:2015, IEC 63294:2021	
		Surface resistance of sheath	IEC 62821-2:2015, IEC 63294:2021	
		Tensile strength and elongation at break	IEC 62821-1:2015	
		Test for separation of cores		
		Test under fire conditions		
		Voltage test	IEC 62821-2:2015, IEC 63294:2021	
		Voltage test on complete cable	IEC 62821-1:2015	125/80 kV AC HV test set
		Voltage test on cores		
		Voltage test on cores in water	IEC 62821-2:2015, IEC 63294:2021	-----

Dealing Officer
Page 95 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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IMT Manesar, Gurugram (Haryana)-122050

Validity

17.06.2024 to 16.06.2026

Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		Water immersion on sheath	IEC 62821-1:2015	
		Water immersion test		
84	Electric cables — Low voltage energy cables of rated voltages up to and including 450/750 V	Absence of faults in insulation	BS EN 50525-3-11: 2011	-----
		Compatibility test		
		Conductor resistance test		
		Insulation resistance test		
		Long term resistance of insulation to d.c.		
		Measurement of overall dimension		
		Measurement of thickness of insulation and sheath		
		Surface resistance to sheath		
		Voltage test on complete cable		
		Voltage test on cores		
		Assessment of halogen		
		Flexing test		
		High voltage Water immersion test		
		Impact test		
Test under fire condition				
				HCL test apparatus

Dealing Officer
Page 96 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
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85	Electric Cables for Photovoltaic Systems for Rated Voltage 1500 V d.c.	Thermal endurance test	IS 17293:2020	-----
		Insulation resistance		
		Sheath resistance against acid and alkaline solution		
		Voltage test on complete cable with a.c. or d.c.		
		Ageing in air oven		
		Assessment of halogens		
		Cold bend test		
		Cold impact test		
		Compatibility test		
		Conductor Resistance		
		Continuity of Tin		
		Damp Heat test		
		Diameter of conductor		
		Dynamic Penetration test		
		Elongation at low temperature		
Hot set test				
Insulation and sheath thickness				

Dealing Officer
Page 97 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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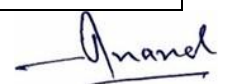
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Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		Ovality		
		Ozone resistance test on complete cable		
		Persulphate test		
		Shrinkage test		
		Smoke density under fire condition		
		Surface resistance of sheath		
		Tensile strength and elongation at break on insulation and sheath		
		UV test		
		Vertical flame propagation on complete cable		
		Long term resistance of insulation to d.c.		3/80 kV HV test
		Durability & Legibility of Marking		----
86	Electric cables-Cross-linked polyethylene insulated- Aerial bundled- For working voltages up to and including 0.6/1(1.2) kV	Conductor diameter	AS/NZS 3560.1:2000(R 2021)	-----
		Conductor resistance		
		Core diameter		
		High voltage test		
		Insulation thickness		
		Rib dimensions		



Dealing Officer
Page 98 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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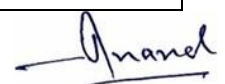
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04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		Shrinkage test		
		Spark test		
		Water absorption of insulation (Electrical)		
87	Electric flexible cords	Bending test	AS/NZS 3191:2008 (R2019)	-----
		Combustion proportion test		
		Compatibility test		
		Flexing test		
		High voltage test		
		Measurement of thickness of insulation and sheath		
		Voltage test		
88	Electric power cables	Resistance to Fire (Category F30, Category F60, Category F120)	BS 8491:2008	FS test apparatus
89	Electric strength of insulating materials	Break down voltage	IEC 60243-1:2013	-----
90	Electrical and optical fibre cables	Halogen Acid Gas Evolution / Corrosive & halogen acid gas	IEC 60754-1:2011	-----
		UV Test	BS EN 50289-4-17:2015	
91	Electrical Cables	Durability of Marking	DS/HD 605 S1/A2:2001	
		High Voltage Test	DS/HD 605 S1/A2:2001	
		Resistance to UV Rays	BS EN 50397-1:2020	-----



Dealing Officer
Page 99 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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IMT Manesar, Gurugram (Haryana)-122050

Validity 17.06.2024 to 16.06.2026 Amended on 04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
92	Electrical Cables for photovoltaic systems	Thermal Endurance Test	BS EN 50618:2014	-----
		Ageing in Air Oven	IEC 62930:2017	
		Assessment of halogens for all non-metallic materials		
		Cold Impact Test		
		Compatibility Test		
		Conductor Resistance		
		Continuity of Tin		
		Damp Heat Test		
		Diameter of Conductor		
		Dynamic Penetration Test		
		Hot Set Test		
		Insulation Resistance		
		Long Term Resistance of insulation to d.c.		
		Measurement of Thickness of Insulation & Sheath		
Ovality				
Ozone Resistance Test				

Dealing Officer
Page 100 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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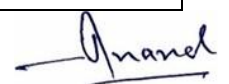
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Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		Shrinkage Test		
		Smoke Density under Fire Conditions		
		Surface Resistance of Sheath		
		Tensile strength and elongation at break on Insulation and Sheath		
		Test for vertical flame propagation		
		UV Test		
		Voltage Test on completed cable with a.c. or d.c		
		Cold Bending Test	BS EN 50618:2014	
		Cold Elongation Test		
		Bending Test at Low Temperature	IEC 62930:2017	
		Elongation at Low Temperature		
93	Electrical insulating materials	Thermal endurance	IEC 60216-3:2021 IEC 60216-4-1:2006	
		Thermal endurance test	IS 8504 (Part- 1):2012 IS 8504 (Part- 2):2013	-----
94	Electrical Test Low voltage energy cables	Long Term Resistance of Insulation to d.c.	BS EN 50395:2005	-----



Dealing Officer
Page 101 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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Validity

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Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
95	Ethylene Plastics	Environmental Stress Cracking Test	ASTM D1693-21	-----
96	extruded dielectric power, control, instrumentation portable cables	Accelerated Water Absorption Test (Electrical)	ANSI NEMA WC 53: 2020	Capacitance and ten deltabridge
97	Extruded outer sheath armoured cables	Abrasion Test	IS 10810 (Part 55): 1986	Scrape abrasion testapparatus
98	Flat Polyvinyl Chloride Sheathed Flexible Cables	Ageing in Air Oven	BS EN 50214:2006	-----
		Bending Test at low Temperature		
		Cold Impact Test		
		Conductor Resistance		
		Elongation Test at Low Temperature		
		Flexing Test		
		Heat Shock Test		
		High Voltage test (Water immersion)		
		High Voltage test at room temperature		

Dealing Officer
Page 102 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

Laboratory Name: M/s RTRC LIMITED, Plot No. 296, Sector-7, Phase-II, Industrial Estate,
IMT Manesar, Gurugram (Haryana)-122050

Validity

17.06.2024 to 16.06.2026

Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		Hot deformation test / Pressure Test at High Temperature		
		Insulation Resistance		
		Loss of Mass		
		Static Flexibility Test		
		Tensile strength and elongation at break on Insulation and Sheath		
		Test for eccentricity and Thickness of insulation and sheath / Overall Dimensions		
		Test under Fire Conditions / Flammability Test		
		Two pulley Flexing Test		
99	Flexible Cables for Lifts and other flexible Connection (Elastomer Insulated Cable)	Ageing in Air Bomb	IS 4289 (Part 1):1984	-----
		Ageing in Air Oven		
		Ageing in Oxygen Bomb		
		Conductor Resistance		
		High Voltage test (Water immersion)		
		Insulation Resistance		
		Oil Resistance Test		

Dealing Officer
Page 103 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		Persulphate Test/ Tinning Test		
		Static Flexibility Test		
		Tear Resistance		
		Tensile strength and elongation at break on Insulation and Sheath		
		Test for eccentricity and Thickness of insulation and sheath / Overall Dimensions		
		Test under Fire Conditions / Flammability Test		
100	Flexible Cables for Lifts and other flexible Connection (PVC Insulated Circular Cable)	Ageing in Air Oven	IS 4289 (Part 2):2000	-----
		Conductor Resistance		
		Heat Shock Test		
		High Voltage test (Water immersion)		
		Insulation Resistance		
		Loss of Mass		
		Shrinkage Test		
		Static Flexibility Test		
		Tensile strength and elongation at break on Insulation and Sheath		

Dealing Officer
Page 104 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		Test for eccentricity and Thickness of insulation and sheath / Overall Dimensions		
		Test under Fire Conditions / Flammability Test		
		Thermal Stability		
		Cold Bend Test		
		Cold Impact Test		
101	Flexible Cables for Lifts and Other Flexible Connections - Elastomer Insulated Cables	Annealing Test for Copper Wire	IS 4289 (Part 1):1984	-----
102	Flexible Cables for Lifts and Other Flexible Connections: PVC Insulated Circular Cables	Annealing Test for Copper Wire	IS 4289 (Part 2):2000	-----
103	Flexible Cables with Thermoplastic PVC Insulation	Ageing in Air Oven	BS EN 50525-2-11: 2011	-----
		Bending Test at Low Temperature		
		Conductor Resistance		
		Elongation Test at Low Temperature		

Dealing Officer
Page 105 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		Flexing Test		
		Heat Shock Test		
		Hot deformation test / Pressure Test at High Temperature		
		Long Term Resistance of Insulation to d.c.		
		Loss of Mass		
		Mechanical Strength of Strain Bearing Member		
		Tensile strength and elongation at break on Insulation and Sheath		
		Test for eccentricity and Thickness of insulation and sheath / Overall Dimensions		
		Test under Fire Conditions / Flammability Test		
		Thermal Stability		
		Voltage Test		
104	Halogen Free Cross-linked Insulating Compounds	Halogen Acid Gas Evolution / Corrosive & halogen acid gas	BS EN 50363-5:2005	-----
105	Halogen Free Flame Retardant (HFFR) cables for working voltages upto and	Ageing in air oven on insulation and sheath Annealing test for copper	IS 17048:2018	-----

Dealing Officer
Page 106 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
	including 1100 Volts	Assessment of halogen - Chlorine and bromine content expressed as content of HCL		
		Assessment of halogen - Conductivity test		
		Assessment of halogen - Fluorine content		
		Assessment of halogen - pH test		
		Assessment of halogen - Presence of fluorine		
		Cold bend test on finished cable		
		Cold impact test on insulation and finished cable		
		Conductor Resistance		
		Elongation at break of insulation and sheath, before and after ageing		
		Flame retardant test on insulation and finished cable		
		Flammability test on finished cable		
		Hot deformation on insulation and sheath		

Dealing Officer
Page 107 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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IMT Manesar, Gurugram (Haryana)-122050

Validity

17.06.2024 to 16.06.2026

Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
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		Hot set test on insulation and sheath		
		Insulation Resistance		
		Oxygen Index Test on insulation and sheath		
		Ozone resistance test on insulation and sheath		
		Persulphate test for tinned copper		
		Smoke density test on finished cable		
		Temperature Index test on insulation and sheath		
		Tensile Strength for Aluminium Wires		
		Tensile strength of insulation and sheath, before ageing and after ageing		
		Test of overall dimensions and thickness of insulation and sheath		
		Water immersion test (effect of water on sheath of cable) on finished cable- Elongation at break		

Dealing Officer
Page 108 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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Validity

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04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		Water immersion test (effect of water on sheath of cable) on finished cable Tensile Strength		
		Wrapping test for aluminium		
		High voltage test on insulation and finished cable		
106	Halogen-free, cross-linked insulating compounds	Conductivity Test	BS EN 50363-5:2005	-----
		pH Test		
107	Halogen-free, low smoke, thermoplastic insulated and sheathed cables of rated voltages up to and including 450/750 V	Assessment of halogens for all non-metallic materials	IEC 62821-1:2015	-----
		Long Term Resistance of insulation to d.c.	IEC 62821-2:2015	
		Surface Resistance of Sheath		
108	High Voltage electric cable	Partial Discharge Test	IS/IEC 60270:2000	-----
109	Insulated Cables	Measurement of thickness of metallic sheath	IS 10810 (Part 34): 1984	-----
110	Insulating and sheathing materials for electric cables	Ageing in air oven	AS/NZS 3808:2000 (R2017)	-----
		Capacitance increase, after immersion in water		
		Carbon black content		

Dealing Officer
Page 109 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.




SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		Carbon black dispersion		
		Environmental stress cracking		
		Heat Shock		
		Hot set test		
		Insulation resistance constant		
		Loss of mass test		
		Oil immersion test		
		pH test		
		Pressure test at high temperature		
		Tensile strength and elongation of insulation and sheath		
		Volume resistivity test		
		Water absorption test		
111	Insulating material	Volume resistivity	ASTM D257-14(2021)	-----


Dealing Officer
Page 110 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
112	Insulating, sheathing and covering materials for low voltage energy cables. PVC sheathing compounds	Heat Shock Test	BS EN 50363-4-1:2005	-----
113	Insulation and sheath of Electric Cables	Halogen Acid Gas Evolution / Corrosive & halogen acid gas	IS 10810 (Part 59): 1988	-----
114	Insulation/ non metallic sheathing materials	Oil Resistance Test	IS 10810 (Part 31): 1984	-----
115	Low Carbon Galvanized Steel Wires, Formed Wires and Tapes for Armouring of Cables	Adhesion Test	IS 3975:1999	-----
		Dimension for Armouring Material		
		Mass of Zinc Coating		
		Resistivity & Conductance test of Armour (Wires/strips)		
		Tensile strength & Elongation at break for armouring material		
		Torsion Test on Galvanized steel wire for Armouring		
		Uniformity of Zinc coating (Dip Test)		

Dealing Officer
Page 111 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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Validity 17.06.2024 to 16.06.2026 Amended on 04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
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		Winding/ Wrapping Test on Galvanized steel strip for Armouring		
		Test for Chemical Composition		
		Dimension & Sizes		
		Tensile Test		
		Elongation Test		
		Wrapping Test		
		Adhesion Test		
		Torsion Test	IS 3975: 1999 , IS 10810 Part 38:1984 IS 1717:2018	
		Coating Test (Mass of Zinc Test)	IS 3975: 1999, IS 4826:2023	
		Coating Test (Uniformity of Zinc)	IS 3975: 1999 , IS 2633:1986	
		Coating Test (Adhesion of Zinc)	IS 3975: 1999 , IS 2633:1986	
		Resistance Test	IS 3975: 1999, IS 10810 Part- 42:1984	
		Freedom from defects		
		Phosphorous		
		Sulphur	IS 3975: 1999	
		Nitrogen		
				Optical emission spectrometer, Atomic absorption spectrophotometer, UV-Visible spectrometer

Dealing Officer
Page 112 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



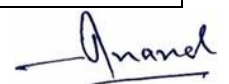
SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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IMT Manesar, Gurugram (Haryana)-122050

Validity 17.06.2024 to 16.06.2026 Amended on 04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
116	Low voltage energy cables	Test for eccentricity and Thickness of insulation and sheath / Overall Dimensions	BS EN 50396:2005	-----
		Measurement of Thickness of Insulation & Sheath		
		Ovality		
		Two pulley Flexing Test		
		Assessment of halogens for all non-metallic materials	BS EN 50525-1:2011	
		Fluorine Test		
		Insulation Resistance		
		Long Term Resistance of Insulation to D.C.		
		Voltage Test		
		Voltage Test on cores		
		Voltage Test on Cores according to Specified Insulation Thickness	BS EN 50395:2005	
		Surface Resistance of Sheath		
		High Voltage test (Water immersion)		
		High Voltage test at room temperature		



Dealing Officer
Page 113 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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Validity

17.06.2024 to 16.06.2026

Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
117	Low Voltage Energy Cables – Flexible Cables with cross- linked elastomeric insulation	Ageing in Air Oven	BS EN 50525-2-21: 2011	-----
		Conductor Resistance		
		Elongation Test at Low temperature		
		High Voltage test (Water immersion)		
		High Voltage test at room temperature		
		Hot Set Test		
		Ozone Resistance Test		
		Tensile strength and elongation at break on Insulation and Sheath		
		Test for eccentricity and Thickness of insulation and sheath / Overall Dimensions		
Test under Fire Conditions / Flammability Test				
118	Low Voltage Energy Cables – Multicore Cables with cross- linked Silicon Rubber insulation	Ozone Resistance Test	BS EN 50525-2-83: 2011	-----
		Ageing in Air Oven		
		Cold Impact Test		
		Conductor Resistance		

Dealing Officer
Page 114 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



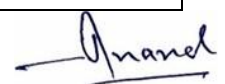
SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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Validity 17.06.2024 to 16.06.2026 Amended on 04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		Elongation Test at Low Temperature		
		High Voltage test (Water immersion)		
		High Voltage test at room temperature		
		Hot Set Test		
		Tensile strength and elongation at break on Insulation and Sheath		
		Test for eccentricity and Thickness of insulation and sheath / Overall Dimensions		
119	Low Voltage Energy Cables – Single Core non-sheathed cables with halogen-free cross-linked insulation and low emission of smoke	Ageing in Air Oven	BS EN 50525-3-41: 2011	-----
		Cold Impact Test		
		Conductivity		
		Conductor Resistance		
		Elongation Test at Low Temperature		
		Halogen Acid Gas Evolution / Corrosive & halogen acid gas		
		High Voltage test (Water immersion)		



Dealing Officer
Page 115 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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Validity

17.06.2024 to 16.06.2026

Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		High Voltage test at room temperature		
		Hot deformation test / Pressure Test at High Temperature		
		Hot Set Test		
		Insulation Resistance		
		Ozone Resistance Test		
		pH		
		Smoke Density under Fire Conditions		
		Tensile strength and elongation at break on Insulation and Sheath		
		Test for eccentricity and Thickness of insulation and sheath / Overall Dimensions		
		Test under Fire Conditions / Flammability Test		
120	Low voltage energy cables of rated voltage up to and including 450/750V	Absence of faults in insulation	BS EN 50525-2-51: 2011	-----
		Compatibility test		

Dealing Officer
Page 116 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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IMT Manesar, Gurugram (Haryana)-122050

Validity 17.06.2024 to 16.06.2026 Amended on 04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		Conductor resistance		
		Flexing test		
		Impact test at -5°C		
		Insulation resistance		
		Long term resistance of insulation to d.c.		
		Measurement of overall dimensions		
		Measurement of thickness of insulation and sheath		
		Ovality		
		Test under fire conditions (Flammability test)		
		Voltage test on complete cable		
121	LV & MV Polymeric Insulated Cables for use by distribution & generation utilities	Abrasion Test	BS 7870-2:2022	
		Bending Test		
		Long Duration Test		
		Water Penetration Test		
		Cold Bend Test		
		Conductor Diameter		

Dealing Officer
Page 117 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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Validity

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04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
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		Conductor Resistance		-----
		Dielectric Power Factor Test as a function of voltage		
		Heat Cycle Test		
		High Voltage Test (4 Hour Test)		
		Impulse Withstand Test		
		Mass of Zinc Coating		
		Partial Discharge Test		
		Power Factor Test as a function of temperature		
		Spark Test		
		Tear Resistance		
		Test on extruded semi conducting screens-Test for Strippability of semiconducting strippable insulation screen		
		UV Test		
		Winding/ Wrapping Test on Galvanized steel strip for Armouring		

Dealing Officer
Page 118 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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Validity 17.06.2024 to 16.06.2026 Amended on 04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
122	LV and MV Polymeric insulated cable	Hardness (Shore A and Shore D)	BS 7870-8.5:2003	-----
123	LV and MV polymeric insulated cables for use by distribution and generation utilities	Ageing in Air Oven	BS 7870-2:2022	-----
		High Voltage test (Water immersion)	BS 7870-1:2011	
		High Voltage test at room temperature		
		Insulation Resistance		
		Tensile strength and elongation at break on Insulation and Sheath		
	Test for eccentricity and Thickness of insulation and sheath / Overall Dimensions			
124	Measurement of carbon black and/or mineral filler in polyethylene compounds	Carbon Content Test	IEC/BS EN 60811-605: 2012	-----
125	Measurement of smoke density of cables burning under defined conditions	Smoke Density under Fire Conditions	IEC/BS 61034-2:2005	-----
126	Melt Flow Rates of Thermoplastics by Extrusion Plastometer	Melt Flow Index	ASTM D1238-23	-----

Dealing Officer
Page 119 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
127	Multi Element Metallic Cables Used in Analogue And Digital Communication and Control	Ageing in Air Oven	BS EN 50288-7:2005	-----
Capacitance Tests				
Conductor Elongation at Break				
Conductor Resistance				
Dimension for Armouring Material				
Environmental Stress Cracking Test				
Heat Shock Test				
Hot deformation test / Pressure Test at High Temperature				
Inductance Test				
Insulation Resistance				
L/R Ratio Test				
Loss of Mass				
Mass of Zinc Coating				
Melt Flow Index				
Resistivity & Conductance test of Armour (Wires/strips)				

Dealing Officer
Page 120 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.




SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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Validity 17.06.2024 to 16.06.2026 Amended on 04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		Shrinkage Test		
		Tensile strength & Elongation at break for armouring material		
		Tensile strength and elongation at break on Insulation and Sheath		
		Test for eccentricity and Thickness of insulation and sheath / Overall Dimensions		
		Torsion Test on Galvanized steel wire for Armouring		
		Uniformity of Zinc coating (Dip Test)		
		Winding/ Wrapping Test on Galvanized steel strip for Armouring		
128	Optical fibre cable	Abrasion test	IEC 60794-1-2:2021 IS 13882 (Part 1 / Sec 1):2001	----
		Bend test		
		Flexing test		
		Impact test		
		Torsion test		
		Water penetration test		
		Tensile strength		


Dealing Officer
Page 121 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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Validity

17.06.2024 to 16.06.2026

Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		Test under fire condition		
		Physical Dimension		
		Physical Dimension		
			IEC 60794-1-1:2023	
			IEC 60811-203:2012	
129	Paper Covered Aluminium Conductors	Conductor diameter	IS 6162 (P- 1):1971	-----
		Diameter		
		Increase in diameter		
		Oil absorption		
		Overall diameter of wire		
		Resistance		
		Tensile strength and elongation		
		Thickness of paper		
		Wrapping test		
		Increase in dimension due to covering	IS 6162 (P- 2):1971	-----
		Oil absorption		
		Over all dimension		
		Resistance		
		Tensile strength		
		Thickness of paper		

Dealing Officer
Page 122 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

Laboratory Name: M/s RTRC LIMITED, Plot No. 296, Sector-7, Phase-II, Industrial Estate,
IMT Manesar, Gurugram (Haryana)-122050

Validity 17.06.2024 to 16.06.2026 Amended on 04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
130	Persulphate Test of Conductor	Persulphate Test/ Tinning Test	IS 10810 (Part 4):1984	-----
131	Petroleum and natural gas industries External coatings for buried or submerged pipelines used in pipeline transportation systems (Polyolefin coatings (3- layer PE and 3-layer PP))	UV Test	ISO 21809-1:2018	-----
132	Plastics and Insulation sheath compound of cable	Density and Specific Gravity (Relative Density) of Plastics by displacement	ASTM D792-20	-----
		Smoke Density Rating	ASTM D2843-22	
		Tensile Strength at yield	ASTM D638-22	
		Oxygen Index Test	ASTM D2863:23	
			IS 10810 (Part 58): 1998	
		Tensile strength & elongation	ASTM D638-22	
		UV Test	ISO 4892-2:2013	
	ISO 4892-3:2016			

Dealing Officer
Page 123 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

Laboratory Name: M/s RTRC LIMITED, Plot No. 296, Sector-7, Phase-II, Industrial Estate,
IMT Manesar, Gurugram (Haryana)-122050

Validity 17.06.2024 to 16.06.2026 Amended on 04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
133	Plastics -- Determination of burning behavior by oxygen index --Part 2: Ambient-temperature test	Oxygen Index Test	ISO 4589-2:2017	-----
134	Plastics -- Determination of burning behavior by oxygen index --Part 3: Elevated-temperature test	Temperature Index Test	ISO 4589-3:2017	-----
135	Plastics and other cable compound	Density and Specific Gravity (Relative Density) of Plastics by displacement	IEC/BS EN 60811-606:2012	-----
136	Polyethylene insulation and sheath	Carbon Content Test	IS 10810 (Part 32): 1984	-----
137	Polyethylene & its derivatives	Oxygen Induction time	ASTM D3895-19	-----
138	Polyethylene compounds	Melt Flow Index	IEC/BS EN 60811-511: 2012	-----
139	Polyethylene insulation and sheath	Annealing Test for Copper Wire	IS 10810 (Part- 1): 1984	-----
		Melt Flow Index	IS 10810 (Part 23): 1984	-----
		Environmental Stress Cracking Test	IS 10810 (Part 29): 1984	-----
140	Polyethylene Moulding Materials and Polyethylene Compounds	Bleeding and Blooming Test	IS 2530:1963	-----
		Carbon Content Test		

Dealing Officer
Page 124 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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IMT Manesar, Gurugram (Haryana)-122050

Validity

17.06.2024 to 16.06.2026

Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		Colour Fastness to Day Light		
		Colour Fastness to Water		
		Melt Flow Index		
		Vicat Softening Point		-----
141	Polymeric insulated aerial bundled conductors (ABC) of rated voltage 0.6/1 kV for overhead distribution	Ageing in Air Oven	BS 7870-5:2011	
		Breaking load on Messenger Conductor		-----
		Conductor Resistance		
		High Voltage test at room temperature		
		Insulation Resistance		
		Shrinkage Test		
		Spark Test		
		Tensile strength and elongation at break on Insulation and Sheath		
		Test for eccentricity and Thickness of insulation and sheath / Overall Dimensions		
		Water Absorption Test (Gravimetric)		
142	Polyolefin pipes, fittings and compounds	Carbon black dispersion test	ISO 18553:2002	-----

Dealing Officer
Page 125 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

Laboratory Name: M/s RTRC LIMITED, Plot No. 296, Sector-7, Phase-II, Industrial Estate,
IMT Manesar, Gurugram (Haryana)-122050

Validity

17.06.2024 to 16.06.2026

Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
143	Polyvinyl Chloride Insulated Cables	Ageing in Air Oven	IEC 60227-1:2024	-----
		Bending Test at low Temperature	IEC 60227-2:1997	
		Conductor Resistance		
		Durability & Legibility of Marking		
		Elongation Test at Low Temperature		
		Heat Shock Test		
		High Voltage test (Water immersion)		
		High Voltage test at room temperature		
		Hot deformation test / Pressure Test at High Temperature		
		Insulation Resistance		
		Loss of Mass		
		Tensile strength and elongation at break on Insulation and Sheath		
Test for eccentricity and Thickness of insulation and sheath / Overall Dimensions				

Dealing Officer
Page 126 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

Laboratory Name: M/s RTRC LIMITED, Plot No. 296, Sector-7, Phase-II, Industrial Estate,
IMT Manesar, Gurugram (Haryana)-122050

Validity

17.06.2024 to 16.06.2026

Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		Test under Fire Conditions / Flammability Test		
		Thermal Stability		
		Bending Test		
144	Polyvinyl Chloride Insulated cables - Part 6 Lift Cables and Cables for Flexible Connections	Conductor Resistance	IEC 60227-6:2001	-----
145	Polyvinyl chloride insulated cables of rated voltages up to and including 450/750 V	Flexing test	IEC 60227-2:1997	-----
146	Polyvinyl Chloride Insulated Cables: Flexible Cables (Cords)	Bending Test at low Temperature	IEC 60227-5:2011	-----
		Elongation Test at Low Temperature		
		Heat Shock Test		
		High Voltage test (Water immersion)		
		High Voltage test at room temperature		
		Hot deformation test / Pressure Test at High Temperature		
		Loss of Mass		

Dealing Officer
Page 127 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

Laboratory Name: M/s RTRC LIMITED, Plot No. 296, Sector-7, Phase-II, Industrial Estate,
IMT Manesar, Gurugram (Haryana)-122050

Validity

17.06.2024 to 16.06.2026

Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		Thermal Stability		
		Ageing in Air Oven		
		Conductor Resistance		
		Durability & Legibility of Marking		
		Insulation Resistance		
		Tensile strength and elongation at break on Insulation and Sheath		
		Test for eccentricity and Thickness of insulation and sheath / Overall Dimensions		
		Test under Fire Conditions / Flammability Test		
147	Polyvinyl Chloride Insulated Cables: Lift Cables and Cables for Flexible Connections	Ageing in Air Oven	IEC 60227-6:2001	-----
		Bending Test at low Temperature		
		Durability & Legibility of Marking		
		Elongation Test at Low Temperature		
		Heat Shock Test		
		High Voltage test (Water immersion)		

Dealing Officer
Page 128 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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IMT Manesar, Gurugram (Haryana)-122050

Validity

17.06.2024 to 16.06.2026

Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		High Voltage test at room temperature		
		Hot deformation test / Pressure Test at High Temperature		
		Insulation Resistance		
		Loss of Mass		
		Tensile strength and elongation at break on Insulation and Sheath		
		Test for eccentricity and Thickness of insulation and sheath / Overall Dimensions		
		Test under Fire Conditions / Flammability Test		
		Thermal Stability		
148	Polyvinyl Chloride Insulated Cables: Non-Sheathed Cables for Fixed Wiring	Conductor Resistance	IEC 60227-3:2024	
		Ageing in Air Oven		
		Bending Test at low Temperature		
		Durability & Legibility of Marking		

Dealing Officer
Page 129 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

Laboratory Name: M/s RTRC LIMITED, Plot No. 296, Sector-7, Phase-II, Industrial Estate,
IMT Manesar, Gurugram (Haryana)-122050

Validity 17.06.2024 to 16.06.2026 Amended on 04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
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		Elongation Test at Low Temperature		-----
		Heat Shock Test		
		High Voltage test (Water immersion)		
		High Voltage test at room temperature		
		Hot deformation test / Pressure Test at High Temperature		
		Insulation Resistance		
		Loss of Mass		
		Tensile strength and elongation at break on Insulation and Sheath		
		Test for eccentricity and Thickness of insulation and sheath / Overall Dimensions		
		Test under Fire Conditions / Flammability Test		
		Thermal Stability		

Dealing Officer
Page 130 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

Laboratory Name: M/s RTRC LIMITED, Plot No. 296, Sector-7, Phase-II, Industrial Estate,
IMT Manesar, Gurugram (Haryana)-122050

Validity

17.06.2024 to 16.06.2026

Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
149	Polyvinyl Chloride Insulated Cables: Sheathed Cables for fixed wiring	Ageing in Air Oven	IEC 60227-4:2024	-----
		Bending Test at low Temperature		
		Conductor Resistance		
		Durability & Legibility of Marking		
		Elongation Test at Low Temperature		
		Heat Shock Test		
		High Voltage test (Water immersion)		
		High Voltage test at room temperature		
		Hot deformation test / Pressure Test at High Temperature		
		Insulation Resistance		
		Loss of Mass		
		Tensile strength and elongation at break on Insulation and Sheath		
Test for eccentricity and Thickness of insulation and sheath / Overall Dimensions				

Dealing Officer
Page 131 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

Laboratory Name: M/s RTRC LIMITED, Plot No. 296, Sector-7, Phase-II, Industrial Estate,
IMT Manesar, Gurugram (Haryana)-122050

Validity

17.06.2024 to 16.06.2026

Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
150	Polyvinyl Chloride Insulated unsheathed and sheathed cables/cords with rigid and flexible conductor for rated voltages upto and including 1100V	Test under Fire Conditions / Flammability Test	IS 694:2010	-----
		Thermal Stability		
		Additional Ageing Test		
		Ageing in Air Oven		
		Annealing Test for Copper Wire		
		Cold Bend Test		
		Cold Impact test		
		Conductor Resistance		
		Durability & Legibility of Marking		
		Flexing Test		
		Halogen Acid Gas Evolution / Corrosive & halogen acid gas		
		Heat Shock Test		
		High Voltage test (Water immersion)		
High Voltage test at room temperature				

Dealing Officer
Page 132 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



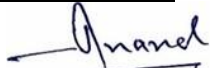
SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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IMT Manesar, Gurugram (Haryana)-122050

Validity 17.06.2024 to 16.06.2026 Amended on 04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		Hot deformation test / Pressure Test at High Temperature		
		Insulation Resistance		
		Loss of Mass		
		Oxygen Index Test		
		Persulphate Test/ Tinning Test		
		Shrinkage Test		
		Temperature Index Test		
		Tensile strength and elongation at break on Insulation and Sheath		
		Tensile Strength for Aluminium Wires		
		Test for eccentricity and Thickness of insulation and sheath / Overall Dimensions		
		Test under Fire Conditions / Flammability Test		
		Thermal Stability		
		Wrapping Test for Aluminium Wires		



Dealing Officer
Page 133 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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IMT Manesar, Gurugram (Haryana)-122050

Validity 17.06.2024 to 16.06.2026 Amended on 04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
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		Smoke Density Rating	IS 694: 2010 (IS13360 Part 6 Sec 9: 2001)	Smoke Density Test Apparatus
151	Power cables for rated voltage 1kV and 3kV	Measurement of Conductor resistance	IEC 60092-353:2016	-----
		Increase in AC capacitance after immersion in water		
		Acid gas emission		
		Additional ageing compatibility test		
		Behavior at high temperature (Hot pressure test)		
		Behavior at low temperatures on sheaths		
		Conductivity test		
		Conductor examination		
		Coverage density of braid		
		Durability of marking		
		Enhanced hot oil immersion		
		External diameter		

Dealing Officer
Page 134 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

Laboratory Name: M/s RTRC LIMITED, Plot No. 296, Sector-7, Phase-II, Industrial Estate,
IMT Manesar, Gurugram (Haryana)-122050

Validity

17.06.2024 to 16.06.2026

Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		Fire retardant test (Circuit integrity)		
		Fluorine content test		
		High voltage test for 4 hour		
		Hot oil immersion test		
		Hot set test		
		Insulation resistance measurement at maximum rated temperature		
		Insulation resistance test		
		Loss of mass test		
		Mechanical properties of insulation before and after ageing		
		Ozone resistance test		
		pH test		
		Resistance to cracking heat shock		
		Smoke emission test		
		Test for coating of copper wires		

Dealing Officer
Page 135 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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Validity

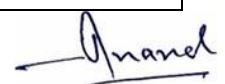
17.06.2024 to 16.06.2026

Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		test for fire resistance (limited circuit integrity)		
		Thickness of insulation		
		Thickness of non metallic sheath		
		Voltage test		
		Voltage test on sheath		
152	Power Cables for the distribution of electrical energy	Accelerated Water Absorption Test (Electrical)	NEMA WC 5:1992	-----
		Dielectric Strength Retention Test		
153	Power Cables rated 2000V or less for the distribution of Electrical Energy	Accelerated Water Absorption Test (Electrical)	NEMA WC70:2021	-----
154	Power cables with extruded insulation and their accessories for rated voltages above 30 kV (Um =36 kV) up to 150 kV (Um= 170 kV)	Impulse Withstand Test	IEC 60840:2020	
		Abrasion Test		
		Adhesion Strength of metal foil		
		Ageing in Air Bomb		
		Ageing in Air Oven		
		Bending Test		
		Carbon Black Content		



Dealing Officer
Page 136 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

Laboratory Name: M/s RTRC LIMITED, Plot No. 296, Sector-7, Phase-II, Industrial Estate,
IMT Manesar, Gurugram (Haryana)-122050

Validity

17.06.2024 to 16.06.2026

Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		Cold Elongation Test		
		Cold Impact Test		
		Compatibility Test		
		Conductor Resistance		
		Density of HDPE Insulation		
		Determination of Elastic Modulus		
		Determination of Hardness		
		Heat Cycle Test		-----
		Heat Shock Test		
		High Voltage Test for 15 minutes		
		Hot Set Test		
		Loss of Mass Test		
		Measurement of Capacitance		
		Ozone Resistance Test		
		Partial Discharge Test		
		Peel Strength of overlapped metal foil		

Dealing Officer
Page 137 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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IMT Manesar, Gurugram (Haryana)-122050

Validity

17.06.2024 to 16.06.2026

Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		Pressure Test at high Temperature		
		Shrinkage Test		
		Tan delta Measurement		
		Tensile strength and elongation at break on Insulation and Sheath		
		Test for eccentricity and Thickness of insulation and sheath / Overall Dimensions		
		Test on extruded semi conducting screens- Volume Resistivity		
		Test under Fire Conditions		
		Thermal ageing test for complete cable		
		Thickness of Metal Sheath		
		Water Penetration Test		
155	Power Cables with extruded insulation and their accessories for rated voltages from 1kV to 3 kV	Accelerated Water Absorption Test (Electrical)	IEC 60502-1:2021	
		Ageing in Air Oven		
		Carbon Content Test		

Dealing Officer
Page 138 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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IMT Manesar, Gurugram (Haryana)-122050

Validity

17.06.2024 to 16.06.2026

Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
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		Cold Bend Test		
		Cold Impact Test		
		Conductor Resistance		
		Elongation Test at Low Temperature		
		Flame Retardance Test on Bunched cable		
		Halogen Acid Gas Evolution / Corrosive & halogen acid gas		
		Heat Shock Test		-----
		High Voltage Test (4 Hour Test)		
		High Voltage test at room temperature		
		Hot deformation test / Pressure Test at High Temperature		
		Hot Set Test		
		Impulse Withstand Test		
		Insulation Resistance		
		Loss of Mass		
		Ozone Resistance Test		
		Shrinkage Test		

Dealing Officer
Page 139 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

Laboratory Name: M/s RTRC LIMITED, Plot No. 296, Sector-7, Phase-II, Industrial Estate,
IMT Manesar, Gurugram (Haryana)-122050

Validity

17.06.2024 to 16.06.2026

Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		Tensile strength and elongation at break on Insulation and Sheath		
		Test for eccentricity and Thickness of insulation and sheath / Overall Dimensions		
		Test under Fire Conditions / Flammability Test		
		Thermal ageing test for complete cable/ Additional Ageing Test on pieces of Completed Cables		
		Thermal Stability		
		Water Absorption Test (Gravimetric)		
156	Power Cables with extruded insulation and their accessories for rated voltages from 6 kV to 30 kV	Conductor Resistance	IEC 60502-2:2014	
		Accelerated Water Absorption Test (Electrical)		
		Ageing in Air Oven		
		Carbon Content Test		
		Cold Bend Test		
		Cold Impact Test		
		Elongation Test at Low Temperature		

Dealing Officer
Page 140 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

Laboratory Name: M/s RTRC LIMITED, Plot No. 296, Sector-7, Phase-II, Industrial Estate,
IMT Manesar, Gurugram (Haryana)-122050

Validity

17.06.2024 to 16.06.2026

Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		Heat Shock Test		-----
		High Voltage Test (4 Hour Test)		
		High Voltage test at room temperature		
		Hot deformation test / Pressure Test at High Temperature		
		Hot Set Test		
		Impulse Withstand Test		
		Insulation Resistance		
		Loss of Mass		
		Ozone Resistance Test		
		Shrinkage Test		
		Tensile strength and elongation at break on Insulation and Sheath		
		Test for eccentricity and Thickness of insulation and sheath / Overall Dimensions		
		Test under Fire Conditions / Flammability Test		

Dealing Officer
Page 141 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

Laboratory Name: M/s RTRC LIMITED, Plot No. 296, Sector-7, Phase-II, Industrial Estate,
IMT Manesar, Gurugram (Haryana)-122050

Validity

17.06.2024 to 16.06.2026

Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		Thermal ageing test for complete cable/ Additional Ageing Test on pieces of Completed Cables		
		Thermal Stability		
		Water Absorption Test (Gravimetric)		
		Bending Test		
		Dielectric Power Factor Test as a function of temperature		
		Heat Cycle Test		
		Partial Discharge Test		
157	Power, control and instrumentation cables	Acid gas emission test	IEC 60092-350:2020	
		Additional aging test on pieces of completed cable (Compatibility test)		
		Ageing test of insulation and sheath		
		Cold bend test		
		Cold impact test		
		Conductivity test		
		Conductor resistance		

Dealing Officer
Page 142 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

Laboratory Name: M/s RTRC LIMITED, Plot No. 296, Sector-7, Phase-II, Industrial Estate,
IMT Manesar, Gurugram (Haryana)-122050

Validity

17.06.2024 to 16.06.2026

Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
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		Coverage density of braid		
		Durability of print		
		Enhanced hot oil immersion test		
		Fire resistance test (test for circuit integrity cables)		
		Flame spread test on bunched cables		
		Flame spread test on single cables		
		Fluorine content test		-----
		Heat shock test		
		High voltage test for 4 hours		
		Hot oil immersion test		
		Hot pressure test		
		Increase in a.c. capacitance after immersion in water		
		Inductance to resistance ratio		
		Insulation resistance test		

Dealing Officer
Page 143 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

Laboratory Name: M/s RTRC LIMITED, Plot No. 296, Sector-7, Phase-II, Industrial Estate,
IMT Manesar, Gurugram (Haryana)-122050

Validity

17.06.2024 to 16.06.2026

Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		Loss of mass test		
		Measurement of standard diameter		
		Mud drilling fluid test		
		Mutual capacitance		
		Ozone resistance test		
		pH test		
		Smoke emission test		
		Test for behavior of insulation and sheath at low temperatures		
		Test for determining the mechanical properties of insulation and sheath		
		Test for metal coating of copper wires		
		Thickness of insulation and sheath		
158	Procedure and requirements – Optical Fibre Cables	Test for electric cables under fire conditions- Circuit Integrity	IEC 60331-25:1999	-----
	PVC Insulated	Bending Test	IS 1554 (Part 2):1988	

Dealing Officer
Page 144 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

Laboratory Name: M/s RTRC LIMITED, Plot No. 296, Sector-7, Phase-II, Industrial Estate,
IMT Manesar, Gurugram (Haryana)-122050

Validity

17.06.2024 to 16.06.2026

Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
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159	(Heavy Duty) Electric cables for working voltages from 3.3 kV to 11 kV	Dielectric Power Factor Test as a function of temperature		
		Dielectric Power Factor Test as a function of voltage		
		Heat Cycle Test		
		High Voltage Test (4 Hour Test)		
		Impulse Withstand Test		
		Partial Discharge Test		
		Water Absorption Test (Gravimetric)		
		Annealing Test for Copper Wire		
		Tensile Strength for Aluminium Wires		
		Tensile strength and elongation at break on Insulation and Sheath		
		Insulation Resistance		
		Resistivity & Conductance test of Armour (Wires/strips)		

Dealing Officer
Page 145 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

Laboratory Name: M/s RTRC LIMITED, Plot No. 296, Sector-7, Phase-II, Industrial Estate,
IMT Manesar, Gurugram (Haryana)-122050

Validity

17.06.2024 to 16.06.2026

Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		Flame Retardance Test on Bunched cable		
		Halogen Acid Gas Evolution / Corrosive & halogen acid gas		
		Oxygen Index Test		
		Dimension for Armouring Material		
		Ageing in Air Oven		
		Armour Coverage Percentage Test		
		Cold impact Test		
		Conductor Resistance		
		Flame Retardant Test on Single cable (Swedish Chimney)		
		Heat Shock Test		
		High Voltage test (Water immersion)		
		High Voltage test at room temperature		
		Hot deformation test / Pressure Test at High Temperature		

Dealing Officer
Page 146 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

Laboratory Name: M/s RTRC LIMITED, Plot No. 296, Sector-7, Phase-II, Industrial Estate,
IMT Manesar, Gurugram (Haryana)-122050

Validity

17.06.2024 to 16.06.2026

Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
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		Loss of Mass		
		Mass of Zinc Coating		
		Resistance Test for Armour (for Mining Cables)		
		Shrinkage Test		
		Temperature Index Test		
		Tensile strength & Elongation at break for armouring material		
		Test for eccentricity and Thickness of insulation and sheath / Overall Dimensions		
		Test under Fire Conditions / Flammability Test		
		Thermal Stability		
		Torsion Test on Galvanized steel wire for Armouring		
		Winding/ Wrapping Test on Galvanized steel strip for Armouring		

Dealing Officer
Page 147 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

Laboratory Name: M/s RTRC LIMITED, Plot No. 296, Sector-7, Phase-II, Industrial Estate,
IMT Manesar, Gurugram (Haryana)-122050

Validity

17.06.2024 to 16.06.2026

Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
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		Wrapping Test for Aluminium Wires		
		Uniformity of Zinc coating (Dip Test)		
160	PVC Insulated (Heavy Duty) Electric cables for working voltages up to 1100	Cold Bend Test	IS 1554 (Part 1):1988	-----
		Cold Impact Test		
		Dimension for Armouring Material		
		Flame Retardance Test on Bunched cable		
		Flame Retardant Test on Single cable (Swedish Chimney)		
		Halogen Acid Gas Evolution / Corrosive & halogen acid gas		
		High Voltage test (Water immersion)		
		High Voltage test at room temperature		
		Oxygen Index Test		
		Resistance Test for Armour (for Mining Cables)		

Dealing Officer
Page 148 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

Laboratory Name: M/s RTRC LIMITED, Plot No. 296, Sector-7, Phase-II, Industrial Estate,
IMT Manesar, Gurugram (Haryana)-122050

Validity

17.06.2024 to 16.06.2026

Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		Resistivity & Conductance test of Armour (Wires/strips)		
		Temperature Index Test		
		Tensile strength & Elongation at break for armouring material		
		Test under Fire Conditions / Flammability Test		
		Torsion Test on Galvanized steel wire for Armouring		
		Uniformity of Zinc coating (Dip Test)		
		Winding/ Wrapping Test on Galvanized steel strip for Armouring		
		Armour Coverage Percentage Test		
		Mass of Zinc Coating		
		Ageing in Air Oven		
		Annealing Test for Copper Wire		
		Conductor Resistance		

Dealing Officer
Page 149 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

Laboratory Name: M/s RTRC LIMITED, Plot No. 296, Sector-7, Phase-II, Industrial Estate,
IMT Manesar, Gurugram (Haryana)-122050

Validity

17.06.2024 to 16.06.2026

Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		Heat Shock Test		
		Hot deformation test / Pressure Test at High Temperature		
		Insulation Resistance		
		Loss of Mass		
		Shrinkage Test		
		Tensile strength and elongation at break on Insulation and Sheath		
		Tensile Strength for Aluminium Wires		
		Test for eccentricity and Thickness of insulation and sheath / Overall Dimensions		
		Thermal Stability		
		Wrapping Test for Aluminium Wires		
161	PVC Insulated and PVC Sheathed cables for electric power and lighting	Ageing in Air Oven	BS 6004:2012	
		Conductor Resistance		
		Heat Shock Test		

Dealing Officer
Page 150 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

Laboratory Name: M/s RTRC LIMITED, Plot No. 296, Sector-7, Phase-II, Industrial Estate,
IMT Manesar, Gurugram (Haryana)-122050

Validity

17.06.2024 to 16.06.2026

Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		Hot deformation test / Pressure Test at High Temperature		----
		Insulation Resistance		
		Loss of Mass		
		Thermal Stability		
162	PVC insulated cables	Ageing in air oven	IR S 63:2014	-----
		Annealing test		
		Conductor Diameter		
		Conductor resistance test		
		Elongation for armour		
		Elongation of sheath and insulation		
		Flammability test		
		High voltage test		
		Insulation resistance test		
		Loss of mass test		
		Mass of zinc coating		
		Resistivity test		
		Shrinkage test		

Dealing Officer
Page 151 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

Laboratory Name: M/s RTRC LIMITED, Plot No. 296, Sector-7, Phase-II, Industrial Estate,
IMT Manesar, Gurugram (Haryana)-122050

Validity

17.06.2024 to 16.06.2026

Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		Specific gravity test		-----
		Tensile strength for armour		
		Tensile strength of insulation and sheath		
		Thermal stability test		
		Thickness of insulation		
		Thickness of insulation and sheath		
		Torsion test		
		Uniformity of zinc coating		
		Water immersion test		
		Winding test and Wrapping		
163	PVC Insulated combined neutral and earth copper wire concentric cables with copper or aluminium conductor	Ageing in Air Oven	BS 7870-3.10:2001	
		Bending Test at Low Temperature		
		Compatibility Test		
		Conductor Resistance		
		Elongation Test at Low Temperature		

Dealing Officer
Page 152 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

Laboratory Name: M/s RTRC LIMITED, Plot No. 296, Sector-7, Phase-II, Industrial Estate,
IMT Manesar, Gurugram (Haryana)-122050

Validity 17.06.2024 to 16.06.2026 Amended on 04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
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		Heat Shock Test		-----
		Hot deformation test / Pressure Test at High Temperature		
		Insulation Resistance		
		Loss of Mass		
		Measurement of Overall Dimensions		
		Measurement of Thickness of Insulation & Sheath		
		Tensile strength and elongation at break on Insulation and Sheath		
		Test under Fire Conditions / Flammability Test		
		Voltage Test on Complete Cable		
164	PVC insulated compounds	Volume resistivity	BS EN 50290-2-21: 2002	
		Heat Shock Test	BS EN 50363-3:2005	
		Thermal Stability		
		Ageing in Air Oven		

Dealing Officer
Page 153 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

Laboratory Name: M/s RTRC LIMITED, Plot No. 296, Sector-7, Phase-II, Industrial Estate,
IMT Manesar, Gurugram (Haryana)-122050

Validity

17.06.2024 to 16.06.2026

Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		Bending Test at Low Temperature		-----
		Elongation Test at Low Temperature		
		Hot deformation test / Pressure Test at High Temperature		
		Insulation Resistance		
		Loss of Mass		
		Tensile strength and elongation at break on Insulation and Sheath		
165	PVC Insulation and Sheath of Electrical Cables	Bleeding & Blooming Test	IS 5831:1984	-----
166	PVC Sheathing Compound	Tensile strength and elongation at break on Insulation and Sheath	BS EN 50363-4-1: 2005	-----
		Ageing in Air Oven		
		Bending Test at Low Temperature		
		Elongation Test at Low Temperature		
		Heat Shock Test		

Dealing Officer
Page 154 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

Laboratory Name: M/s RTRC LIMITED, Plot No. 296, Sector-7, Phase-II, Industrial Estate,
IMT Manesar, Gurugram (Haryana)-122050

Validity

17.06.2024 to 16.06.2026

Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		Hot deformation test / Pressure Test at High Temperature		
		Loss of Mass		
		Thermal Stability		
167	Railway rollingstock cables	Abrasion resistance	BS EN 50305:2020	
		Acid and alkali resistance		
		Blocking of cores		
		D.C. stability		
		Dielectric strength		
		Durability of marking		
		Electrical resistance of conductors		
		Flame propagation		
		Impact test at low temperature		
		Insulation resistance		
		Long term ageing for insulation		-----
		Long term ageing for sheath		

Dealing Officer
Page 155 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

Laboratory Name: M/s RTRC LIMITED, Plot No. 296, Sector-7, Phase-II, Industrial Estate,
IMT Manesar, Gurugram (Haryana)-122050

Validity

17.06.2024 to 16.06.2026

Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		Mineral and fuel oil resistance		
		Notch propagation		
		Ozone resistance test		
		flammability		
		Pressure test at high temperature		
		Shrinkage test for insulation		
		Spark test		
		Stress cracking test		-----
		Stripability and adhesion of insulation		
		Surface resistance test		
		Toxicity		
		Voltage test on complete cable		
		Voltage test on sheath		
		Water absorption of sheath		
168	Railway rolling stock power and control cables having special fire performance	Measurement of Overall Dimensions	BS EN 50264-3-1: 2008	
		Acid and alkali resistance test		

Dealing Officer
Page 156 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

Laboratory Name: M/s RTRC LIMITED, Plot No. 296, Sector-7, Phase-II, Industrial Estate,
IMT Manesar, Gurugram (Haryana)-122050

Validity

17.06.2024 to 16.06.2026

Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
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		Ageing test		----
		Bending test at low temperature		
		Cold elongation		
		Compatibility test		
		Conductor resistance		
		D.C. stability		
		Dielectric strength		
		Fuel resistance test		
		Hot set test		
		Impact test at low temperature		
		Insulation resistance		
		Mineral oil resistance		
		Ozone resistance test		
		Spark test		
		Surface resistance		
		Voltage test		
		Water absorption test		

Dealing Officer
Page 157 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

Laboratory Name: M/s RTRC LIMITED, Plot No. 296, Sector-7, Phase-II, Industrial Estate,
IMT Manesar, Gurugram (Haryana)-122050

Validity 17.06.2024 to 16.06.2026 Amended on 04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
169	Reference Standard for Electrical Wires, Cables, and Flexible Cords	UV Test	UL 1581(Section 1200):2023	-----
170	Resistance to stress cracking of polyethylene and polypropylene compounds	Environmental Stress Cracking Test	IEC/BS EN 60811-406:2012	-----
171	Road vehicles- 60V and 600V single core cable	Abrasion test	ISO 6722-1:2011	-----
		Cold impact		
		Conductor diameter		
		Conductor resistance		
		Durability of cable marking		
		Fluid compatibility		
		Insulation faults		
		Insulation thickness		
		Insulation volume resistivity		
		Long term heat aging		
		Low temperature winding		

Dealing Officer
Page 158 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

Laboratory Name: M/s RTRC LIMITED, Plot No. 296, Sector-7, Phase-II, Industrial Estate,
IMT Manesar, Gurugram (Haryana)-122050

Validity

17.06.2024 to 16.06.2026

Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		Outside cable diameter		
		Pressure test at high temperature		
		Resistance to flame propagation		
		Resistance to hot water		
		Resistance to ozone		
		Short term heat aging		
		Shrinkage by heat		
		Strip force		
		Temperature and humidity cycling		
		Thermal overload		
		Withstand voltage		
172	Rubber compound for cables	Hydrolytic Stability Test	ASTM D3137-81 (2018)	-----
173	Rubber Deterioration in an Ozone Controlled Environment	Ozone resistance	ASTM D 1149-18	-----
174	Rubber insulated cables	Ageing in Air Oven	IEC 60245-1:2003	
		Conductor Resistance	IEC 60245-2:1994	

Dealing Officer
Page 159 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

Laboratory Name: M/s RTRC LIMITED, Plot No. 296, Sector-7, Phase-II, Industrial Estate,
IMT Manesar, Gurugram (Haryana)-122050

Validity

17.06.2024 to 16.06.2026

Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
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		Flexing Test		-----
		Hot Set Test		
		Measurement of Overall Dimensions		
		Measurement of Thickness of Insulation & Sheath		
		Tensile strength and elongation at break on Insulation and Sheath		
		Voltage test on complete cables		
		Voltage Test on cores	IEC 60245-2:1994	
		Distance between centers of conductors		
		High Voltage Test		
		Ovality		
		Overall Dimensions		
		Kink Test		
		Flexing Test		

Dealing Officer
Page 160 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

Laboratory Name: M/s RTRC LIMITED, Plot No. 296, Sector-7, Phase-II, Industrial Estate,
IMT Manesar, Gurugram (Haryana)-122050

Validity

17.06.2024 to 16.06.2026

Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		Static Flexibility Test		
		Electrical Resistance of Conductors		
		Voltage Test on Complete Cable		
		Voltage Test on Cores		
175	Rubber insulated cables – Rated voltages up to and including 450/750 V	Ageing test	IEC 60245-2:1994	-----
		Electrical resistance of conductors		
		Flame retardant test		
		Flexing test		
		Insulation resistance at temperatures above 90°C		
		Kink Test		
		Measurement of overall dimension		
		Measurement of thickness of insulation and sheath		
		Oxygen bomb test		
		Static Flexibility test		

Dealing Officer
Page 161 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

Laboratory Name: M/s RTRC LIMITED, Plot No. 296, Sector-7, Phase-II, Industrial Estate,
IMT Manesar, Gurugram (Haryana)-122050

Validity 17.06.2024 to 16.06.2026 Amended on 04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		Voltage test carried out on complete cables	IEC 60245-4:2011	-----
		Voltage test on cores		
		Wear Resistance		
		Ageing test		
		Bending test at low temperature		
		Flexing test		
		Hot set test		
		Measurement of thickness of insulation and sheath		
		Ovality		
		Overall diameter		
		Ozone resistance test		
		Resistance of conductor		
		Tensile strength and elongation		
		Voltages test on complete cable		
		Voltages test on cores		
176	Rubber insulated cables: Cords and Flexible Cables	Ageing in Air Oven	IEC 60245-4:2011	
		Conductor Resistance		

Dealing Officer
Page 162 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

Laboratory Name: M/s RTRC LIMITED, Plot No. 296, Sector-7, Phase-II, Industrial Estate,
IMT Manesar, Gurugram (Haryana)-122050

Validity

17.06.2024 to 16.06.2026

Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		Distance between centres of conductors		
		Flexing Test		
		Hot Set Test		
		Measurement of Overall Dimensions		
		Measurement of Thickness of Insulation & Sheath		
		Ozone Resistance Test		
		Tensile strength and elongation at break on Insulation and Sheath		-----
		Voltage Test		
		Voltage Test on Cores according to Specified Insulation Thickness		
177	Rubber insulated cables: Heat resistant silicone insulated cables	Ageing in Air Oven	IEC 60245-3:1994	
		Conductor Resistance		-----
		Hot Set Test		
		Measurement of Overall Dimensions		
		Measurement of Thickness of Insulation & Sheath		
		Tensile strength and elongation at break on Insulation and Sheath		-----
		Voltage Test		

Dealing Officer
Page 163 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

Laboratory Name: M/s RTRC LIMITED, Plot No. 296, Sector-7, Phase-II, Industrial Estate,
IMT Manesar, Gurugram (Haryana)-122050

Validity

17.06.2024 to 16.06.2026

Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
178	Rubber insulated cables: Lift Cables	Tensile strength and elongation at break on Insulation and Sheath	IEC 60245-5:1994	-----
		Ageing in Air Oven		
		Conductor Resistance		
		Hot Set Test		
		Measurement of Overall Dimensions		
		Measurement of Thickness of Insulation & Sheath		
179	Rubber or Silicon Rubber insulated flexible cables & cords for coils & leads	Ageing in Air Oven	BS 6195:2006	
		Conductor Resistance		
		Heat Shock Test		
		High Voltage test (Water immersion)		
		High Voltage test at room temperature		
		Hot deformation test / Pressure Test at High Temperature		
		Hot Set Test		
		Tensile strength and elongation at break on Insulation and Sheath		

Dealing Officer
Page 164 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

Laboratory Name: M/s RTRC LIMITED, Plot No. 296, Sector-7, Phase-II, Industrial Estate,
IMT Manesar, Gurugram (Haryana)-122050

Validity

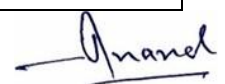
17.06.2024 to 16.06.2026

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04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		Test for eccentricity and Thickness of insulation and sheath / Overall Dimensions		
		Test under Fire Conditions / Flammability Test		-----
180	Rubber Property-Durometer Hardness	Shore A Hardness	ASTM D2240-15 (2021)	-----
		Shore D Hardness		
181	Rubber, vulcanized or thermoplastic	Elongation at break	ISO 37:2024	-----
		Tensile at 100% extension		
182	Single core cables with crosslinked silicone rubber insulation	Ageing in Air Oven	BS EN 50525-2-41: 2011	-----
		Conductor Resistance		
		Insulation Resistance		
		Test for eccentricity and Thickness of insulation and sheath / Overall Dimensions		
183	Single core non-sheathed cables with crosslinked EVA insulation	Ageing in Air Oven	BS EN 50525-2-42: 2011	-----
		Insulation Resistance		
		Test for eccentricity and Thickness of insulation and sheath / Overall Dimensions		
184	Single Core non-sheathed cables with thermoplastic PVC Insulation	Ageing in Air Oven	BS EN 50525-2-31: 2011	
		Bending Test at Low Temperature		



Dealing Officer
Page 165 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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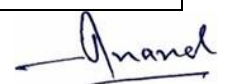
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04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		Conductor Resistance		
		Elongation Test at Low Temperature		
		Heat Shock Test		
		High Voltage test at 2000 V or 2500 V		
		Long Term Resistance of Insulation to d.c.		
		Loss of Mass		-----
		Measurement of Overall Dimensions		
		Measurement of Thickness of Insulation & Sheath		
		Pressure Test at High Temperature		
		Tensile strength and elongation at break on Insulation and Sheath		
		Test under Fire Conditions / Flammability Test		
		Thermal Stability		
185	Single core PVC insulated flexible cable for	Ageing in Air Oven	BS 6231:2006	
		Conductor Resistance		----



Dealing Officer
Page 166 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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Validity

17.06.2024 to 16.06.2026

Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
	switchgear and control gear wiring	Heat Shock Test		
		High Voltage test (Water immersion)		
		High Voltage test at room temperature		
		Insulation Resistance		
		Loss of Mass		
		Pressure Test at High Temperature		
		Tensile strength and elongation at break on Insulation and Sheath		
		Test for eccentricity and Thickness of insulation and sheath / Overall Dimensions		
186	Single insulated wire or cable	Test under Fire Conditions / Flammability Test	IEC 60332-1-1:2004	-----
187	Single wire armoured and PVC sheathed multicore cable with copper conductors	Ageing in Air Oven	BS 7870-8.1:2003	-----
		Conductor Resistance		
		High Voltage test (Water immersion)		

Dealing Officer
Page 167 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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Validity

17.06.2024 to 16.06.2026

Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		High Voltage test at room temperature		
		Hot deformation test / Pressure Test at High Temperature		
		Tensile strength and elongation at break on Insulation and Sheath		
		Test for eccentricity and Thickness of insulation and sheath / Overall Dimensions		
188	Single wire armoured and PVC sheathed multicore cable with copper conductors, having reduced fire propagation performance	Ageing in Air Oven	BS 7870-8.3:2003	
		Conductor Resistance		
		High Voltage test (Water immersion)		
		High Voltage test at room temperature		
		Insulation Resistance		-----
		Shrinkage Test		
		Tensile strength and elongation at break on Insulation and Sheath		

Dealing Officer
Page 168 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

Laboratory Name: M/s RTRC LIMITED, Plot No. 296, Sector-7, Phase-II, Industrial Estate,
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Validity

17.06.2024 to 16.06.2026

Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		Test for eccentricity and Thickness of insulation and sheath / Overall Dimensions		
		Water Absorption Test (Gravimetric)		
189	Single Wire Armoured and PVC Sheathed Multipair Cable with Copper Conductors	Ageing in Air Oven	BS 7870-8.2:2003	
		Bending Test at Low Temperature		
		Carbon Content Test		
		Conductor Resistance		
		Density and Specific Gravity (Relative Density) of Plastics by displacement		
		Dimension for Armouring Material		
		Elongation Test at Low Temperature		
		Environmental Stress Crack Resistance		
		Heat Shock Test		
		Hot deformation test / Pressure Test at High Temperature		

Dealing Officer
Page 169 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

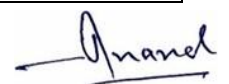
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Validity 17.06.2024 to 16.06.2026 Amended on 04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
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		Inductance Test		
		Insulation Resistance		
		Loss of Mass		
		Mass of Zinc Coating		
		Measurement of Thickness of Insulation & Sheath		
		Melt Flow Index		
		Tensile strength & Elongation at break for armouring material		
		Tensile strength and elongation at break on Insulation and Sheath		
		Tensile Strength at yield		
		Water Penetration Test		
		Winding/ Wrapping Test on Galvanized steel strip for Armouring		
190	Single wire armoured and unarmoured multicore cables with copper conductor and non-halogenated sheath	Abrasion Test	BS 7870-8.5:2003	
		Ageing in Air Bomb		
		Ageing in Air Oven		
		Compatibility Test		



Dealing Officer
Page 170 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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IMT Manesar, Gurugram (Haryana)-122050

Validity

17.06.2024 to 16.06.2026

Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		Conductivity		-----
		Conductor Resistance		
		Dimension for Armouring Material		
		Elongation Test at Low Temperature		
		Flame Propagation (Retardance) Test on Multiple (Bunched) cables		
		Halogen Acid Gas Evolution / Corrosive & halogen acid gas		
		High Voltage test (Water immersion)		
		Hot deformation test / Pressure Test at High Temperature		
		Hot Set Test		
		Impact Test at Low Temperature		
		Insulation Resistance		
		Mass of Zinc Coating		
		Measurement of Thickness of Insulation & Sheath		

Dealing Officer
Page 171 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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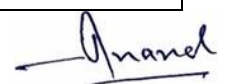
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Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		Mineral Oil Resistance		
		Oxygen Index Test		
		Ozone Resistance Test		
		pH		
		Shrinkage Test		
		Smoke Density under Fire Conditions		
		Tear Resistance		
		Tensile strength and elongation at break on Insulation and Sheath		
		Test under Fire Conditions / Flammability Test		
		Water Absorption Test		
		Winding/ Wrapping Test on Galvanized steel strip for Armouring		
191	Single wire or double steel tape armoured and non-halogenated sheathed multipair cable with copper conductors	Ageing in Air Oven	BS 7870-8.6:2003	-----
		Conductor Resistance		
		Hot deformation test / Pressure Test at High Temperature		
		Insulation Resistance		
		Tensile strength and elongation at break on Insulation and Sheath		



Dealing Officer
Page 172 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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IMT Manesar, Gurugram (Haryana)-122050

Validity

17.06.2024 to 16.06.2026

Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		Test for eccentricity and Thickness of insulation and sheath / Overall Dimensions		
192	Single Wire or double steel tape armoured and PVC Sheathed multipair cable with copper conductors, having reduced fire propagation performance	Ageing in Air Oven	BS 7870-8.4:2003	-----
Bending Test at Low Temperature				
Cold bend Test / Voltage Test after bending				
Conductor Resistance				
Dimension for Armouring Material				
Elongation Test at Low Temperature				
Flame Propagation (Retardance) Test on Multiple (Bunched) cables				
Heat Shock Test				
Hot deformation test / Pressure Test at High Temperature				
Inductance Test				
Insulation Resistance				
Loss of Mass				
Mass of Zinc Coating				

Dealing Officer
Page 173 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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IMT Manesar, Gurugram (Haryana)-122050

Validity 17.06.2024 to 16.06.2026 Amended on 04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		Measurement of Thickness of Insulation & Sheath		
		Oxygen Index Test		
		Tensile strength and elongation at break on Insulation and Sheath		
		Test under Fire Conditions / Flammability Test		
		Winding/ Wrapping Test on Galvanized steel strip for Armouring		
193	Soft or annealed copper wire	Density	ASTM B3-13(2024)	
		Dimension		
		Elongation		
		Surface finish		-----
194	Solid Electrical Insulating Materials	Dielectric strength	ASTM D149-20	
195	Specification for insulating and sheathing materials for cables. PVC sheathing compounds	Heat Shock Tests	BS 7655-4.2:2000	-----
196	Specification for PVC Insulation and Sheath of Electric Cables	Colour Fastness to Day Light	IS 5831:1984 (RA:2021)	
		Colour Fastness to Water		-----

Dealing Officer
Page 174 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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IMT Manesar, Gurugram (Haryana)-122050

Validity

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Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
197	Standard for Control, Thermo Couple Extension and Instrumentation Cables	Dielectric Strength Retention Test	NEMA WC 57:2014	Capacitance & tan delta bridge
		Accelerated Water Absorption Test (Electrical)		-----
198	Standard Practice for Operating Xenon Arc Light Apparatus for Exposure of Non-Metallic Materials ¹	UV test	ASTM G155-21	Xenon arc lamp UV test apparatus
199	Steel wire and wire products- Non ferrous metallic coatings on steel wire. Zinc or Zinc alloy coating	Adherence test	BS EN 10244-1:2009	-----
		Dipping test	BS EN 10244-2:2023	
			ISO 7989-2:2021	
		Mass of coating	BS EN 10244-1:2009	
Mass of zinc coating	ISO 7989-2:2021			
200	Tensile Properties of Plastics	Tensile strength and elongation at break on Insulation and Sheath	ASTM D638-22	-----
201	Thermoplastic insulation and sheath	Bleeding and Blooming Test	IS 10810 (Part 19): 1984	-----
202	Thermal endurance properties. Ageing procedures and evaluation of test results	Thermal Endurance Test	IEC 60216-1:2013	-----
203	Thermo-couple Compensating cables	Conductor Resistance	IS 8784:1987	-----
		Heat Shock Test		
		Drain Wire Continuity Test		

Dealing Officer
Page 175 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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Validity

17.06.2024 to 16.06.2026

Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
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		High Voltage test at room temperature		----
		Hot deformation test / Pressure Test at High Temperature		
		Insulation Resistance		
		Test for eccentricity and Thickness of insulation and sheath / Overall Dimensions		
204	Thermocouple compensating cables	Thermal emf Test	ANSI MC-96.1:1982 IS 8784:1987	-----
205	Thermoplastic elastomeric insulation and sheath of electric cable	Hot deformation test / Pressure Test at High Temperature	IS 10810 (Part 15): 1984	-----
		Loss of Mass	IS 10810 (Part 10): 1984	
		Cold Impact Test	IS 10810 (Part 21): 1984	
		Cold Bend Test	IS 10810 (Part 20): 1984	
		Heat Shock Test	IS 10810 (Part 14): 1984	
		Colour Fastness to Day Light	IS 10810 (Part 18): 1984	
		Vicat softening Point	IS 10810 (Part 22): 1984	

Dealing Officer
Page 176 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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Validity

17.06.2024 to 16.06.2026

Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
206	Thermosetting insulated and Thermoplastic Sheathed cables for electric power, lighting and having low emission of smoke and corrosive gases when effected by fire	Ageing in Air Oven	BS 7211:2012	-----
		Cold Bend Test		
		Cold Impact Test		
		Compatibility Test		
		Conductor Resistance		
		Elongation Test at Low Temperature		
		Flame Retardance Test on Bunched cable		
		Halogen Acid Gas Evolution / Corrosive & halogen acid gas		
		High Voltage test at room temperature		
		Hot deformation test / Pressure Test at High Temperature		
		Hot Set Test		
		Insulation Resistance		
		Shrinkage Test		
Smoke Density under Fire Conditions				

Dealing Officer
Page 177 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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Validity

17.06.2024 to 16.06.2026

Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		Tear Resistance		
		Tensile strength and elongation at break on Insulation and Sheath		
		Test for eccentricity and Thickness of insulation and sheath / Overall Dimensions		
		Test under Fire Conditions / Flammability Test		
		Water Absorption Test (Gravimetric)		
207	Thermosetting Insulated Fire Survival cables for fixed Installation having low Emission of smoke and Corrosive Gases when affected by Fire for Working Voltages upto and including 1100 V A.C and 1500 V D.C	Abrasion resistance test	IS 17505(Part-1):2021	
		Ageing in air oven of Insulation and Sheath		
		Annealing Test (For Copper)		
		Assessment of halogen on insulation and sheath - Chlorine and bromine content expressed as content of HCL		
		Assessment of halogen on insulation and sheath - Conductivity test		-----

Dealing Officer
Page 178 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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Validity 17.06.2024 to 16.06.2026 Amended on 04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		Assessment of halogen on insulation and sheath - Fluorine content		
		Assessment of halogen on insulation and sheath - Presence of fluorine		
		Assessment of halogen on insulation and sheath- pH test		
		Cold Bend Test		
		Cold Impact Test		
		Conductor Resistance Test		
		Dimension of armouring material		
		Elongation at break for armouring material		
		Elongation of Insulation and Sheath		
		Flame test on bunched cable		
		Flame test on single cable		
		Heat Shock		
		High voltage test		

Dealing Officer
Page 179 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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Validity

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04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
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		Hot Deformation Test		
		Hot Set Test		
		Insulation resistance test		
		Mass of zinc coating		
		Oxygen Index Test		
		Ozone resistance test		
		Persulphate Test for Tinned Conductor		
		Resistance to Fire , Water and shock (Category F30, Category F60, Category F120)		
		Resistance to fire alone (Category F3) (Symbol F)		
		Resistance to fire and mechanical shock (Category F3), (Symbol S)		
		Resistance to fire and water (Category F3) (Symbol W)		
		Resistivity test of armour (wire/strips)		
		Shrinkage Test		

Dealing Officer
Page 180 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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Validity

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Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
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		Smoke density		
		Temperature index test		
		Tensile strength of armouring material		
		Tensile Strength of Insulation and Sheath		
		Test for Thickness of Insulation and Sheath		
		Torsion test on galvanized steel wire for armouring		
		Uniformity of zinc coating (dip test)		
		Water Absorption (Gravimetric)		
		Water immersion test (effect of water on sheath of cable) on finished cable Elongation at break		
		Water immersion test (effect of water on sheath of cable) on finished cable Tensile Strength		
		Winding / Wrapping test on galvanized steel grip for armouring		

Dealing Officer
Page 181 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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Validity 17.06.2024 to 16.06.2026 Amended on 04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
208	Thermosetting insulated, armoured cables for voltages of 600/1000V and 1900/3300V	Abrasion Test	BS 5467:2016	-----
		Ageing in Air Oven		
		Conductor Resistance		
		Dimension for Armouring Material		
		Insulation Resistance		
		Loss of Mass		
		Mass of Zinc Coating		
		Resistivity & Conductance test of Armour (Wires/strips)		
		Shrinkage Test		
		Tensile strength & Elongation at break for armouring material		
		Tensile strength and elongation at break on Insulation and Sheath		
Test for eccentricity and Thickness of insulation and sheath / Overall Dimensions				

Dealing Officer
Page 182 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		Torsion Test on Galvanized steel wire for Armouring		
		Uniformity of Zinc coating (Dip Test)		
		Winding/ Wrapping Test on Galvanized steel strip for Armouring		
209	Thermosetting insulated, armoured cables having low emission of smoke and corrosive gases when affected by fire	Abrasion Test	BS 6724:2016	-----
		Ageing in Air Oven		
		Cold Bend Test		
		Cold Impact Test		
		Compatibility Test		
		Conductor Resistance		
		Dimension for Armouring Material		
		Elongation Test at Low Temperature		
		Flame Retardance Test on Bunched cable		
		Halogen Acid Gas Evolution / Corrosive & halogen acid gas		

Dealing Officer
Page 183 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

Laboratory Name: M/s RTRC LIMITED, Plot No. 296, Sector-7, Phase-II, Industrial Estate,
IMT Manesar, Gurugram (Haryana)-122050

Validity

17.06.2024 to 16.06.2026

Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
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		High Voltage test at room temperature		
		Hot deformation test / Pressure Test at High Temperature		
		Hot Set Test		
		Insulation Resistance		
		Mass of Zinc Coating		
		Shrinkage Test		
		Smoke Density under Fire Conditions		
		Tear Resistance		
		Tensile strength and elongation at break on Insulation and Sheath		
		Test for eccentricity and Thickness of insulation and sheath / Overall Dimensions		
		Test under Fire Conditions / Flammability Test		
		Water Absorption Test (Gravimetric)		
		Winding/ Wrapping Test on Galvanized steel strip for Armouring		

Dealing Officer
Page 184 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.




SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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IMT Manesar, Gurugram (Haryana)-122050

Validity 17.06.2024 to 16.06.2026 Amended on 04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
210	Thermosetting insulated, armoured Fire-Resistant cables having low emission of smoke and corrosive gases when affected by fire	Abrasion Test	BS 7846:2015	-----
		Ageing in Air Oven		
		Cold Bend Test		
		Cold Impact Test		
		Compatibility Test		
		Conductor Resistance		
		Dimension for Armouring Material		
		Elongation Test at Low Temperature		
		Flame Retardance Test on Bunched cable		
		Halogen Acid Gas Evolution / Corrosive & halogen acid gas		
		High Voltage test at room temperature		
		Hot deformation test / Pressure Test at High Temperature		
		Hot Set Test		
Insulation Resistance				


Dealing Officer
Page 185 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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Validity

17.06.2024 to 16.06.2026

Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		Mass of Zinc Coating		
		Resistance to Fire (Category F30, Category F60, Category F120)		
		Resistance to fire alone (Protocol C)		
		Resistance to fire to with water (Protocol W)		
		Resistance to fire with mechanical shock (Protocol Z)		
		Shrinkage Test		
		Tear Resistance		
		Tensile strength and elongation at break on Insulation and Sheath		
		Test for eccentricity and Thickness of insulation and sheath / Overall Dimensions		
		Test under Fire Conditions / Flammability Test		
		Water Absorption Test (Gravimetric)		
		Winding/ Wrapping Test on Galvanized steel strip for Armouring		

Dealing Officer
Page 186 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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IMT Manesar, Gurugram (Haryana)-122050

Validity 17.06.2024 to 16.06.2026 Amended on 04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
211	Thermosetting Insulated, non-armoured cables for fixed installations	Ageing in Air Oven	BS 7889:2012	-----
		Bending Test at low Temperature		
		Cold Impact Test		
		Conductivity Test		
		Conductor Resistance		
		Elongation Test at Low Temperature		
		Heat Shock Test		
		High Voltage test at room temperature		
		Hot deformation test / Pressure Test at High Temperature		
		Hot Set Test		
		Loss of Mass		
		Ozone Resistance Test		
		pH Test		
Tensile strength and elongation at break on Insulation and Sheath				

Dealing Officer
Page 187 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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IMT Manesar, Gurugram (Haryana)-122050

Validity

17.06.2024 to 16.06.2026

Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		Test for eccentricity and Thickness of insulation and sheath / Overall Dimensions		
		Test under Fire Conditions / Flammability Test		
		Water Absorption Test (Gravimetric)		
212	UV Exposure of non-metallic materials	UV Test	ASTM G151-19 ASTM G154-23	-----
213	Water Absorption of Plastics	Water Absorption Test	ASTM D570-22	-----
214	Welding Cables	Ageing in Air Bomb	IS 9857:1990	-----
		Ageing in Air Oven		
		Annealing Test for Copper Wire		
		Conductor Resistance		
		High Voltage test (Water immersion)		
		Hot Set Test		
		Oil Resistance Test		
		Static Flexibility Test		

Dealing Officer
Page 188 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

Laboratory Name: M/s RTRC LIMITED, Plot No. 296, Sector-7, Phase-II, Industrial Estate,
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Validity

17.06.2024 to 16.06.2026

Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		Tensile strength and elongation at break on Insulation and Sheath		
		Test for eccentricity and Thickness of insulation and sheath / Overall Dimensions		
215	Winding Wires for Submersible Motors: Cross linked Polyethylene Insulated and Polyamide Jacket Wires	Annealing Test for Copper Wire	IS 8783 (Part 4 Sec2): 1995	
		Accelerated Water Absorption Test (Electrical)		
		Ageing in Air Oven		
		Conductor Diameter		
		Conductor Resistance		-----
		Heat Shock Test		
		High Voltage test (Water immersion)		
		Hot deformation test / Pressure Test at High Temperature		
		Hot Set Test		
		Insulation Resistance		
		Overall Dimensions		
		Shrinkage Test		
		Spark Test		

Dealing Officer
Page 189 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



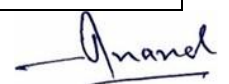
SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

Laboratory Name: M/s RTRC LIMITED, Plot No. 296, Sector-7, Phase-II, Industrial Estate,
IMT Manesar, Gurugram (Haryana)-122050

Validity 17.06.2024 to 16.06.2026 Amended on 04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		Tensile strength and elongation at break on Insulation and Sheath		
		Test for eccentricity and Thickness of insulation and sheath / Overall Dimensions		
216	Winding Wires for submersible motors: HR PVC Insulated Wires	Water Absorption Test (Gravimetric)	IS 8783 (Part 4,Sec1): 1995	-----
		Accelerated Water Absorption Test (Electrical)		
		Ageing in Air Oven		
		Annealing Test for Copper Wire		
		Conductor Diameter		
		Conductor Resistance		
		Heat Shock Test		
		High Voltage test (Water immersion)		
		Hot deformation test / Pressure Test at High Temperature		
		Hot Set Test		
		Insulation Resistance		
		Overall Dimensions		



Dealing Officer
Page 190 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

Laboratory Name: M/s RTRC LIMITED, Plot No. 296, Sector-7, Phase-II, Industrial Estate,
IMT Manesar, Gurugram (Haryana)-122050

Validity

17.06.2024 to 16.06.2026

Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		Shrinkage Test		
		Spark Test		
		Tensile strength and elongation at break on Insulation and Sheath		
		Test for eccentricity and Thickness of insulation and sheath / Overall Dimensions		
		Water Absorption Test (Gravimetric)		
217	Winding Wires for submersible motors: Polyester and Polypropylene Insulated Winding Wires	Accelerated Water Absorption Test (Electrical)	IS 8783 (Part 4, Sec3): 1995	capacitance and ten deltabridge
		Ageing in Air Oven		
		Annealing Test for Copper Wire		
		Conductor Diameter		
		Conductor Resistance		-----
		Heat Shock Test		
		High Voltage test (Water immersion)		
		Hot deformation test / Pressure Test at High Temperature		
		Hot Set Test		

Dealing Officer
Page 191 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

Laboratory Name: M/s RTRC LIMITED, Plot No. 296, Sector-7, Phase-II, Industrial Estate,
IMT Manesar, Gurugram (Haryana)-122050

Validity

17.06.2024 to 16.06.2026

Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		Insulation Resistance		
		Overall Dimensions		
		Shrinkage Test		
		Spark Test		
		Tensile strength and elongation at break on Insulation and Sheath		
		Test for eccentricity and Thickness of insulation and sheath / Overall Dimensions		
		Water Absorption Test (Gravimetric)		
218	Wires & Cables	Accelerated Water Absorption Test (Electrical)	ASTM D2633:2021	Capacitance and tendelta bridge
		Dielectric Strength Retention Test		
219	zinc or zinc alloy coated non-alloy steel wire for armouring either power or telecommunication cables land cables	Electrical resistance	BS EN 10257-1:2011	Kelvin double bridge
		Nominal diameter		-----
		Tensile strength and elongation		
		Torsion test		Torsion tester

Dealing Officer
Page 192 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

Laboratory Name: M/s RTRC LIMITED, Plot No. 296, Sector-7, Phase-II, Industrial Estate,
IMT Manesar, Gurugram (Haryana)-122050

Validity

17.06.2024 to 16.06.2026

Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
220	Communication Cables	Attenuation	BS EN 50289-1-8: 2017	Cross talk & Attenuation meter
		Characteristic Impedance	BS EN 50289-1-11: 2016	Impedance meter
		Cross Talk	BS EN 50289-1-10: 2002	Cross talk & Attenuation meter
221	Electric Cable	Insulation Resistance Test(Post Thermal Ageing Test)	NPCIL Specification No.I28.KK34.0.0.ET. PM. 2021	Thermal ageing oven
		Absence of faults in insulation	IEC 63294: 2021	HV tester
		Bending Test	IEC 63294: 2021	
		Checking of the durability of clours and markings	IEC 63294: 2021	
		Dielectric Constant	ASTM D150: 2022	
		Dielectric Strength	ASTM D149: 2020	
		Electrical resistance of conductors	IEC 63294: 2021	
		Elogation at Break(Post Thermal Ageing Test)	NPCIL Specification No. I28.KK34.0.0.ET.PM. 2021	-----
		Flexing Test	IEC 63294: 2021	

Dealing Officer
Page 193 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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Validity

17.06.2024 to 16.06.2026

Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		High Voltage Test(Post LOCA Test)	NPCIL Specification No. I28.KK34.0.0.ET. PM. 2021	LOCA Test apparatus & AC HV test setwith Current transformer
		High Voltage Test(Post Thermal ageing Test)	NPCIL Specification No. I28.KK34.0.0.ET.PM. 2021	-----
		Insulation resistance	IEC 63294: 2021	
		Insulation resistance at temperature above 90°C	IEC 63294: 2021	
		Insulation Resistance Test (Post LOCA Test)	NPCIL Specification No. I28.KK34.0.0.ET. PM. 2021	Million mega ohm meter
		LOCA Test	NPCIL Specification No. I28.KK34.0.0.ET. PM. 2021	LOCA Test apparatus & AC HV test setwith Current transformer
		Long-term resistance of insulation to direct current	IEC 63294: 2021	DC HV test set
		Longitudinal water Penetration Test	IS 7098-2:2011	water penetration test apparatus
		Resistivity	IEC 60468: 1974	Digital ohmmeter
		Measurement of overall dimensions and ovality	IEC 63294: 2021	-----
		Measurement of thickness of insulation		

Dealing Officer
Page 194 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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Validity

17.06.2024 to 16.06.2026

Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		Spark Test		
		Static flexing Test		Flexing tester
		Surface resistance of sheath		-----
		Test for Mechanical properties after air oven ageing of insulation consisting of rubber compound		Tensile testing machine
		Test of resistance of sheath to water		-----
		Voltage Test		-----
		Voltage test carried out on completed cables		
		Voltage test on cores in water		
		Thermal Ageing Test	NPCIL Specification No. I28.KK34.0.0.ET. PM. 2021	-----
222	Electric Cables, Cords and conductors	Heat shock test	AS/NZS 1660.2.3:1998 (2017)	-----
		Pressure test at high temperature		
		Thermal stability test		
		Capacitance increase after immersion in water	AS/NZS1660.3:1998 (R:2017)	-----
		Insulation resistance constant		
		Partial discharge test		

Dealing Officer
Page 195 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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Validity 17.06.2024 to 16.06.2026 Amended on 04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		Spark Test		
		Tan d Measurement as function of temperature		
		Ten d Measurement as function of voltage		
		Voltage Test		
		Volume resistivity of semiconductive screen		
		Continuity test for nickel plating		
		Continuity test for tin or silver plating		
		Mass of coating of armour wires		
		Measurement of diameter of wire		
		Measurement of thickness of metallic sheath		
		Ageing in air oven		
		Loss of mass Test		
223	Insulating and sheathing materials with drilling fluids resistance properties	Ageing in calcium bromide brine	IEC 60092-360: 2021	
		Ageing in IRM 903		
		Aging in oil-based test fluid		
		Elongation at break		
		Tensile strength		
		Volume swelling		
		Weight change		

Dealing Officer
Page 196 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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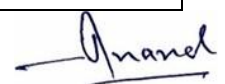
17.06.2024 to 16.06.2026

Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
224	Insulation, Extruded semi-conductive screens and Non-Metallic Sheaths	Measurement of thickness and diameter	AS/NZS 1660.2.1: 1998 (R:2017)	-----
		Bending test at low temperature for insulation and sheath		
		Elongation at low temperature for sheath		
		Gravimetric water absorption		
		Impact test at low temperature for insulation and sheath		
225	Insulation, Extruded Semi-Conductive screens and Non-Metallic Sheaths	Shrinkage Test	AS/NZS 1660.2.4: 1998 (R:2017)	-----
		Test for mechanical properties of Insulation and sheath	AS/NZS 1660.2.1: 1998 (R:2017)	
226	Metallic materials - Tensile testing	Elongation after break	ISO 6892-1: 2019	-----
		Elongation at break		
227	Metallic materials - Wire - Simple torsion test	Torsion Test	ISO 7800: 2012	Torsion tester
228	Metallic materials - Wire - Wrapping test	Wrapping Test	ISO 7802: 2013	
229	Overhead distribution cables of rated voltage U ₀ /U(U _m): 0,6/1 (1,2)kV	Bending Test	HD 626 S1 Part-2 : 1996	Mendrells
		Conductor resistance tests		
		High voltage tests		
		Insulation resistance test		



Dealing Officer
Page 197 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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Validity

17.06.2024 to 16.06.2026

Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		Resistance of the insulation to weather conditions		----- Thermo mechanical stress tests apparatus
		Test for capillary water rising		
		Testing of adherence of insulation		
		Testing of mechanical strength of conductors		
		Thermomechanical behavior of messenger		
230	Polyethylene and polypropylene Materials	Carbon Black Content	AS/NZS 1660.2.4 (R:2017):1998	Carbon black test apparatus, melt flow test apparatus
		Carbon Black Dispersion		
		Melt flow Index		
231	Power, control and communication cables	Measurement of low level of halogen content	IEC 60754-3: 2018	Chromatograph test apparatus
		Tensile strength	ASTM D638: 2022	-----
		Ultimate elongation at break		
		Carbon dioxide	BS EN 50575:2014 BS EN50399: 2022	CPR Test apparatus
		Carbon Mono Oxide (CO) Droplets and/or Particles		
		Fire Growth Rate Index (FIGRA)		
		Oxygen		

Dealing Officer
Page 198 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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IMT Manesar, Gurugram (Haryana)-122050

Validity 17.06.2024 to 16.06.2026 Amended on 04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		Peak Heat release Rate(Peak HRR)		----
		Peak smoke production rate (Peak SPR)		
		Total heat release(THR)		
		Total smoke production (TSP)		
		Vertical Flame Spread (FS)		
232	Steel wire and wire products	Uniformity of zinc and zinc aluminum coating (Or dipping test)	ISO 7989-2: 2021	Copper sulphate solution
233	Electric Cables	Anti Rodent Test	TEC/GR/FA/DWC-034/02:2019	-----
234	Road Vehicles- Automotive Cables	1. Dimensional tests: - Cable outside diameter - Insulation thickness - Conductor diameter - Cross sectional area - In-process cable outside diameter 2. Electrical tests: - Conductor resistance - Determination of temperature coefficients	ISO 19642-1:2023, ISO 19642-2:2023, ISO 19642-4:2019, ISO 19642-5:2019	-----

Dealing Officer
Page 199 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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Validity

17.06.2024 to 16.06.2026

Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		<ul style="list-style-type: none">- Withstand voltage- Withstand voltage after environmental testing- Insulation Faults- Insulation Volume resistivity 3. Mechanical Tests <ul style="list-style-type: none">- Strip force- Abrasion- Sandpaper abrasion test- Scrape abrasion test- Breaking force of the finished cable- Cyclic bending- Flexibility 4.Environmental Tests <ul style="list-style-type: none">- Specimen preparation and winding testsLong term heat ageing, 3000h at temperature class rating.		
		Cyclic Bending Test	ISO 19642-2 : 2023	Cyclic Bending Test Apparatus
235	Wire and Cables	UV Test	UL-2556:2021	-----

Dealing Officer
Page 200 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.




SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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Validity 17.06.2024 to 16.06.2026 Amended on 04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		Physical properties of conductors (tensile strength, elongation at break, and ultimate strength)		
236	Concentric Neutral Cables, Rated 5 Through 46 KV	Dry Electrical Test	ICEA S-94-649-2021	-----


Dealing Officer
Page 201 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
237	Insulating and Sheathing Materials for Cables	1. Properties in the state as manufactured -Minimum tensile strength -Minimum elongation at break 2. Test for tear resistance 3. Properties after ageing in air oven -Tensile Strength -Elongation at break 4. Properties after ageing in air bomb - Tensile Strength - Elongation at Break 5. Hot Set Test -Elongation under load -Elongation after unloading 6. Mineral oil immersion test - Tensile strength - Elongation at break 7. Linear swell test	BS 7655-2.6:2000 BS 6469-99.1:1992	-----

Dealing Officer
Page 202 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

Laboratory Name: M/s RTRC LIMITED, Plot No. 296, Sector-7, Phase-II, Industrial Estate,
IMT Manesar, Gurugram (Haryana)-122050

Validity 17.06.2024 to 16.06.2026 Amended on 04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		8.Halogen gas emission Test	BS EN 60754-1:2014	-----
238	Aluminum alloy wire for Stranded conductors for overhead lines-Al 59 conductors.	Tensile Strength	SS 424 08 13:2005	-----
		Elongation		
		Wrapping Test		
		Resistivity of Wire		
		Diameter Measurement		
		Resistance of conductor and wire		
		Wire Diameter Test	SS 424 08 14:1989	-----
		Breaking load Test		
		Conductor Resistance Test		
239	Fiber Optic cable for Cable TV Application	Crush Test	IS 17046:2018	Tensile - Compression Machine , Crush Test Plates
		Abrasion test		Abrasion Test Apparatus
		Impact Test		Impact Test Apparatus
		Repeated Bending		Repeat Bending Tester
		Torsion Test		Torsion Test Apparatus
		Cable Bend Test (Flexing)		Two Pully Flexing

Dealing Officer
Page 203 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
240	Optical Fiber Cable	Temperature Cycling Test	IEC 60794-1-21 : 2015	Damp Heat Test Apparatus
		Attenuation		OTDR Test Apparatus
		Crush Test		Tensile - Compression Machine , Crush Test Plates
		Abrasion test		Abrasion Test Apparatus
		Impact Test		Impact Test Apparatus
		Repeated Bending		Repeat Bending Tester
		Torsion Test		Torsion Test Apparatus
		Cable Bend Test (Flexing)		Two Pully Flexing
		Temperature Cycling Test		Damp Heat Test Apparatus
		Attenuation		OTDR Test Apparatus
241	Continuously Cast and Rolled Electrolytic Copper wire Rods for Electrical Conductors	Dimension	IS 12444: 2020	-----
		Freedom from efects		
		Mechanical Properties (Tensile and Elongation)		
		Surface Test (Compression Test)		
242	SPECIFICATION FOR CONDUCTORS FOR	Tensile Test for Aluminium	IS 8130: 2013	-----

Dealing Officer
Page 204 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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Validity

17.06.2024 to 16.06.2026

Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
	INSULATED ELECTRIC CABLES ANJD FLEXIBLE CORDS	Wrapping Test for Aluminium		
		Annealing Test for Copper		
		Persulphate Test for Tinned Copper		
		Form of Conductor		
		Joints in Conductor		
		No. of Wires in Stranded Conductor		
		Direction of Lay		
		Dimension of wires in the conductor		
		Resistance Test		
243	Mild Steel Wire For General Engineering Purposes	Dimension & Sizes		
		Bend Test	IS 280: 2006	
		Coating Test	IS 280:2006, IS 4826:2023	-----
		Coating Test (Mass of Zinc Test)		
		Coating Test (Uniformity of Zinc)	IS 280:2006, IS 12753:1989	
		Coating Test (Adhesion of Zinc)		
		Carbon Manganese	IS 280 :2006	Optical emission spectrometer,

Dealing Officer
Page 205 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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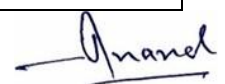
17.06.2024 to 16.06.2026

Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		Sulphur		Atomic absorption spectrophotometer, UV-Visible spectrometer
		Phosphorous		
		Silicon		
		Aluminium		
		Copper		
244	Mild Steel Wire rods For General Engineering Purposes	Sizes & Tolerance	IS 7887:1992	Optical emission spectrometer, Atomic absorption spectrophotometer, UV-Visible spectrometer
		Carbon		
		Manganese		
		Sulphur		
		Phosphorous		
		Silicon		
		Aluminum		
		Copper		
245	Aluminium Conductor for Overhead Transmission (Aluminium Conductor , Galvanized Steel-Reinforced for extra High Voltage)	Measurement of Dimensions	IS 398 Part-6:2021	-----
		Visual Examination / Freedom of defects		
		Breaking Load of individual Aluminum wires		
		Breaking Load of individual Galvanized Steel wires		
		Wrapping Test of Aluminum Wires		
		Wrapping Test of Galvanized Steel Wires		
		Resistance Test of Aluminium Wires		



Dealing Officer
Page 206 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

Laboratory Name: M/s RTRC LIMITED, Plot No. 296, Sector-7, Phase-II, Industrial Estate,
IMT Manesar, Gurugram (Haryana)-122050

Validity 17.06.2024 to 16.06.2026 Amended on 04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		Measurement of Lay Ratio		
		Uniformity of Zinc Coating		
		Mass of Zinc Coating		
		Torsion Test of Galvanized Steel wire		
		Elongation Test		
246	Wires and Cables Insulation / Sheath	Resistance to the Vertical Flame Propagation of Flame and dropping of Flaming particles of a wire , cable ,or cord	UL 2556:2021	
		Continuity of Conductors		
		Dielectric voltage-withstand		
		Dielectric Breakdown		
		Cold Bend		
		Cold Impact		
		Abrasion test		
		Crush Test		
		Flexing of Shielded cables		
		Halogen Acid Gas Emission		
247	Wires and Cables	Cyclic Bending Test	ISO 14572: 2011 Cl. 5.9	Cyclic Bending Test Apparatus
248	Flame test VW1	Flame Test VW-1	UL 1581:2023/ UL 2556:2021	Flammability Test Apparatus as per UL-1581/ UL-2556

Dealing Officer
Page 207 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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IMT Manesar, Gurugram (Haryana)-122050

Validity 17.06.2024 to 16.06.2026 Amended on 04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
249	Round Wire Concentric Lay Overhead Conductor	Joints in aluminium wires	IEC 61089:1991	-----
		Surface Condition		
		Lay ratio		
		Direction of Lay		
		Cross-sectional area of Aluminium portion		
		Breaking strength wires		
		Linear Density (Mass per unit length)		
		Conductor Strength		
		Diameter of wires		
		Overall Diameter		
		Resistance Test of Aluminium Wires		
250	Conductors for overhead lines - Coated or cladded metallic wire for concentric lay stranded conductors	Freedom from defects	IEC 63248:2022	-----
		Joints in the wires		
		Surface Condition		
		Lay ratio		
		Direction of Lay		
		Diameter of wires from direct measurement		
		Diameter of wires from weight measurement		
		Stress at 1% extension , tensile strength & elongation		

Dealing Officer
Page 208 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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IMT Manesar, Gurugram (Haryana)-122050

Validity

17.06.2024 to 16.06.2026

Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		Stress at 1% extension & tensile strength		
		Elongation at break		
		Ductility Test (Torsion Test)		
		Ductility (Wrapping Test)		
		Reverse bend test		
		Coating mass or cladding thickness test		
		Adherence of coating or cladding test (Zinc or Zinc-aluminium Alloy coating)		
		Adherence of coating or cladding test (Aluminum cladding test)		
		Coating Adherence heat resistance test		
		Dipping Test		
		Resistivity		
251	FOR FIRE SURVIVAL, HIGH TEMPERATURE ZONE AND FIRE RETARDANT HALOGEN FREE SHEATHED ELECTRON BEAM CROSSLINKED ELECTRIC CABLES	Critical Oxygen Index	EDD50-13:2012 Rev-1	Oxygen Index Test Apparatus
		Temperature Index		Halogen Content Test Apparatus
		Halogen Content		Toxicity Index Test Apparatus
		Toxicity Index		Tensile Testing Machine
		Tensile Strength		Hot Set Test Apparatus
		Elongation at break		
		Hot Set Test		

Dealing Officer
Page 209 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

Laboratory Name: M/s RTRC LIMITED, Plot No. 296, Sector-7, Phase-II, Industrial Estate,
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Validity

17.06.2024 to 16.06.2026

Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
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		Resistance to fluids		Heating Oven , various fluids
		Tear Resistance		Tensile Testing Machine, tear resistance die
		Thermal Endurance		Thermal Endurance Heating ovens , Tensile testing machine
		Accelerated Ageing		Tensile testing machine
		Smoke Index		Smoke Density Test Apparatus
		Smoke density		3 Meter cube (Smoke Density - Smoke Emission Test apparatus)
		Ozone Resistance		Ozone Resistance Test Apparatus
		Cold Elongation at - 2°C +/-3°C for 4 hours		Cold Elongation Test Apparatus
		Heat Shock		Heating Oven, thermostatically controlled, steel mandrels
		Insulation Resistance Constant		Water Bath Thermostatically controlled , million megohm meter

Dealing Officer
Page 210 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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IMT Manesar, Gurugram (Haryana)-122050

Validity 17.06.2024 to 16.06.2026 Amended on 04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		Ageing in Air Oven at 150°C +/-3°C for 10 days		Thermal Ageing oven , Tensile testing Machine
		Acid Gas generation / corrosivity of combustion gases		Halogen Content Test apparatus
252	Test on extruded over sheath with a special protective function	D.C. voltage test	IEC 60229:2007	DC HV test set (upto 80 KV)
		Spark test		Spark tester
		Abrasion test		Abrasion test apparatus
253	Test methods used in the United Kingdom but not specified in BS EN 60811-Electrical tests.	Method of test for insulation resistance constant (K value)	BS 6469-99.2:1992	-----
		Method of test for power factor and permittivity		
		Water absorption determined by the capacitance method		
254	METHODS OF TEST FOR RESISTANCE OF METALLIC ELECTRICAL RESISTANCE MATERIAL	ELECTRICAL RESISTANCE	IS 3635: 1966	-----
255	LV Cables	TEST PROCEDURE FOR ANTI-RODENT & ANTI-TERMITE TEST OF LV CABLE	I28.KK34.0.0.ET.PM.PRO88 LT/KK34/EDRC-O18155-E-PG-0-VD-072 I26.KK34.0.0.ET.QFS.PR017	-----

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FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

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Validity 17.06.2024 to 16.06.2026 Amended on 04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
256	Winding wires for submersible motors - METHODS OF TESTS	1. Tests on Conductor	IS 8783-3: 1995	-----
		Conductor diameter	Annex A of IS 8783-3: 1995	
		Conductor resistance	IS 10810 Part-5:1984	
		Annealing test	IS 10810 Part-1:1984	
		2. Tests on Insulation and Jacket		
		Test for thickness	IS 10810 Part-6:1984	
		Tensile strength and elongation	IS 10810 Part-7:1984	
		Thermal ageing in air	IS 10810 Part-11:1984	
		Heat shock	IS 10810 Part-14:1984	
		Hot set	IS 10810 Part-30:1984	
		Melting point	Annex B of IS 8783-3: 1995	
		Spark test	IS 10810 Part-44:1984	
		3. Tests on Finished Wire		
		Overall dimensions	Annex A of IS 8783-3: 1995	
		High voltage test	IS 10810 Part-45:1984	
		Spark test	IS 10810 Part-44:1984	
		Insulation resistance	IS 10810 Part-43:1984	
		Shrinkage	IS 10810 Part-12:1984	
Hot deformation	IS 10810 Part-15:1984			


Dealing Officer
Page 212 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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Validity 17.06.2024 to 16.06.2026 Amended on 04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		Water absorption	IS 10810 Part-28/33: 1984	
257	Electric cables	Electric cables- Extended application of test results for reaction to fire	EN 50576:2023	-----
258	Conductors and metallic components	TENSILE STRENGTH AND ELONGATION TESTS	AS/NZS 1660.1:1998 (2017)	-----
		CONDUCTOR OR ARMOUR		
		TINSEL CONDUCTORS		
		WRAPPING TEST		
		METAL PLATING TESTS		
		CONTINUITY TEST FOR TIN OR SILVER PLATING		
		CONTINUITY TEST FOR NICKEL PLATING		
		MASS OF COATING OF ARMOUR WIRES		
		MEASUREMENT OF METALLIC SHEATH AND WIRES		
		MEASUREMENT OF THICKNESS OF METALLIC SHEATH		
MEASUREMENT OF DIAMETER OF WIRES				
259	Insulation, extruded semi-conductive	HOT SET TEST	AS/NZS 1660.2.2:1998 (2017)	-----
		THERMAL AGEING		

Dealing Officer
Page 213 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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Validity

17.06.2024 to 16.06.2026

Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
	screens and non-metallic sheaths— Methods specific to elastomeric, XLPE and XLPVC materials	MINERAL OIL IMMERSION TEST		
260	Insulation, extruded semi-conductive screens and non-metallic sheaths— Methods specific to PVC and halogen free thermoplastic materials	THERMAL AGEING Loss of mass Test for extrusion of plasticizer (Loop test)	AS/NZS 1660.2.3:1998 (2017)	-----
	Insulation, extruded semi-conductive screens and Non-metallic sheaths— Methods specific to polyethylene and polypropylene materials	RESISTANCE TO ENVIRONMENTAL STRESS CRACKING	AS/NZS 1660.2.4:1998 (2017)	-----
261	Electrical Cable	IMPULSE TEST	AS/NZS 1660.3:1998 (2017)	
262	Test on electric and optical cables under fire conditions.	Test for vertical flame propagation for a single insulated wire or cable	AS/NZS IEC 60332.1.1: 2017 AS/NZS IEC 60332.1.2: 2017 AS/NZS IEC 60332.1.3: 2017	-----

Dealing Officer
Page 214 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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Validity

17.06.2024 to 16.06.2026

Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
263	Electrical Cable	Complete cable and flexible cord	AS/NZS 1660.4.1:1998 (2017)	-----
		Fire tests—Tests on bunched cables	AS/NZS 1660.5.1:2005	-----
		Fire tests—Smoke density	AS/NZS 1660.5.2:2006	-----
		Fire tests— Determination of the amount of halogen acid gas evolved during the combustion of polymeric materials taken from cables	AS/NZS 1660.5.3:1998	-----
		Fire tests—Determination of degree of acidity of gases evolved during the combustion of materials taken from electric cables by measuring pH and conductivity	AS/NZS 1660.5.4:1998	-----
		Fire tests— Circuit integrity under fire conditions	AS/NZS 1660.5.5:2005	-----
		Fire tests— Test for combustion propagation	AS/NZS 1660.5.6:2005	-----
264	Electrical Cable	Conductor diameter	AS/NZS 4961:2003 (2017)	-----
		Conductor Resistance		
		Persulphate Test/ Tinning Test		
		Annealing test for copper		
		Tensile Strength for Aluminium Wires		

Dealing Officer
Page 215 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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Validity

17.06.2024 to 16.06.2026

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04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
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		Screen Resistance		
		Measurement of insulation and sheath thickness		
		High voltage a.c test for 4 h		
		High voltage a.c test for 4 h on sheath		
		Insulation resistance constant of sheath		
		High voltage a.c test for 5 Min on insulation		
		Spark test a) On Cores b) On Sheath		
		Wrapping test for aluminum wire		
		Ageing in air oven		
		Capacitance increase, after immersion in water		
		Carbon black content		
		Carbon black dispersion		
		Environmental stress cracking		
		Heat Shock		
		Hot set test		
		Insulation resistance constant		
		Loss of mass test		
		Oil immersion test		

Dealing Officer
Page 216 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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Validity

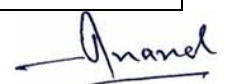
17.06.2024 to 16.06.2026

Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		pH test		
		Pressure test at high temperature		
		Tensile strength and elongation of insulation and sheath		
		Volume resistivity test		
		Conductivity Test		
		Water absorption test		
265	Electrical Cable	Resistance of conductors	IEC 60245-3:1994	
		Voltage test at 2 000 V		
		Measurement of insulation thickness		
		Measurement of overall diameter		
		Ovality		-----
		Tensile test before ageing		
		Tensile test after ageing in the air oven		
		Hot set test		
266	Electrical Cables	Resistance of conductors	IEC 60245-4:2011	
		Voltage test on cores according to specified insulation thickness: - at 1 500 V up to and including 0,6 mm - at 2 000 V exceeding 0,6 mm		



Dealing Officer
Page 217 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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Validity

17.06.2024 to 16.06.2026

Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
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		Voltage test on completed cable at 2000 V		
		Measurement of thickness of insulation		
		Measurement of thickness of sheath		
		Measurement of overall diameter: - mean value - ovality		
		Tensile test before ageing of insulation		
		Tensile test after ageing in the air oven of insulation		
		Tensile test after ageing in the air bomb of insulation		
		Hot set test of insulation		
		Ozone resistance test of insulation		
		Tensile test before ageing of sheath		
		Tensile test after ageing in the air oven of sheath		
		Hot set test of sheath		

Dealing Officer
Page 218 of 219

FEDERATION FOR DEVELOPMENT OF ACCREDITATION SERVICES

118-119, First Floor, Sushant Tower, Sector – 56, Gurugram – 122011, Haryana, India.



SCOPE OF ACCREDITATION (Annexure to Certificate of TL - 101)

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Validity

17.06.2024 to 16.06.2026

Amended on

04.01.2025

Electrical Testing (Laboratory based)

S. No.	Material/Products	Component/Parameter / Characteristic tested	Test Method Specification against which tests are performed	Equipment Used
		Flexing test followed, after immersion in water, by a voltage test: at 2 000 V on completed cable having two cores For cables having more than two cores: - at 1 500 V on cores with specified insulation thickness up to and including 0,6 mm - at 2 000 V on cores with specified insulation thickness exceeding 0,6 mm		
		Test at low temperature		
		Bending test for sheath		
267	Standard Specification for Aluminum 1350 Drawing Stock for Electrical Purposes	Diameter	ASTM B233-97(2021)	-----
		Tensile Strength		
		Joints		
		Resistivity		
268	Aluminum 1350 Round Wire, Annealed and Intermediate Tempers, for Electrical Purposes	Diameter	ASTM B609/B609M-12(2021)	-----
		Tensile Strength		
		Joints		
		Resistivity		
		Surface Finish		

*Amended to include year of test standard.

Dealing Officer
Page 219 of 219