Laboratory	**Garg Associates Private Limited, QA Lab, D-3, Meerut Road Industrial Area-3, Ghaziabad, Uttar Pradesh**		
Accreditation Standard	**ISO/IEC 17025: 2005**		
Certificate Number	**TC-6953**	**Page 1 of 8**	
Validity	**05.03.2018 to 04.03.2020**	**Last Amended on 13.05.2019**	

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection

ELECTRICAL TESTING

I.	**CABLES AND ACCESSORIES**			
1.	**Wires and Cables**	Tensile Strength of Tape (Unsupported Tape)	AS22759C (Cl. 5.1.4.1)	10 N to 400 N
			QDAS/35.12/TR/362/96 (Cl. 6.2.1)	
		Elongation of Tape (Unsupported Tape)	AS22759C (Cl. 5.1.4.1)	0.1 mm to 600 mm
			QDAS/35.12/TR/362/96 (Cl. 6.2.1)	
		Specific gravity of Tape (Unsupported Tape)	AS22759C (Cl. 5.1.4.3)	1.2 to 3.00
			QDAS/35.12/TR/362/96 (Cl. 6.2.3)	
		Visual Examination	JSS 51034 (Cl. 13.1.1)	Qualitative
			JSS 51038 CL. No. 13.1 & Cl No.13.9.1	
			QDAS/35.12/TR/362/96 (Cl. 6.3)	
		Conductor Diameter	JSS 51034 (Cl. 13.1.2.1)	0.05 mm to 16 mm
			JSS 51038 (Cl. 13.9.2)	
			AS22759C (Cl. 5.2.4)	
			NEMA HP3 (Cl. 6.1.4.1)	
		Wire Diameter	JSS 51034 (Cl. 13.1.2.2)	0.20 mm to 18 mm
			AS22759C (Cl. 5.5.1)	
			NEMA HP3 (Cl. 6.1.4.2)	
		Cable Diameter	JSS 51038 (Cl. 13.2)	1.50 mm to 35 mm
			NEMA WC 27500 (Cl. 4.4)	
			QDAS/35.12/TR/363/96 (Cl. 4.12)	
		Wire Weight	AS22759C (Cl. 5.5.2)	0.001 kg/m to 5.00 kg/m
			MIL-DTL-81381C (Cl. 4.6.4.5)	

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
			JSS 51038 (Cl. 13.9.3)	
		Cable Weight	JSS 51038 (Cl. 13.3)	0.001 kg/m to 5.00 kg/m
			NEMA WC 27500 (Cl. 4.5)	
		Concentricity	JSS 51034 (Cl. 13.2)	50 % to 100 %
			JSS 51038 (Cl. 13.13)	
			AS22759C (Cl. 5.5.5)	
			NEMA HP3 (Cl. 6.1.4.3)	
			NEMA WC 27500 (Cl. 4.3.16)	
			QDAS/35.12/TR/362/96 (Cl. 6.7)	
		Spark Test / Jacket Flaws	JSS 51034 (Cl. 13.3)	1.0 kV to 8.0 kV
			JSS 51038 (Cl. 13.8)	
			AS22759C (Cl. 5.3.3.1)	
			NEMA WC 27500 (Cl. 4.3.4)	
			QDAS/35.12/TR/362/96 (Cl. 6.4)	
			QDAS/35.12/TR/363/96 (Cl. 4.3)	
		Conductor Continuity	JSS 51034 (Cl. 13.5)	Qualitative
			JSS 51038 (Cl. 13.4)	
			NEMA WC 27500 (Cl. 4.3.8)	
			QDAS/35.12/TR/363/96 (Cl. 4.7)	
		Conductor Resistance	JSS 51034 (Cl. 13.6)	1.0 Ω/km to 620 Ω/km
			JSS 51038 (Cl. 13.9.4)	
			AS22759C (Cl. 5.4.1)	
			NEMA HP3 (Cl. 6.2.1)	
			MIL-DTL-81381C (Cl 4.6.4.6)	

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
		Dielectric withstanding Voltage (Wet)	JSS 51034 (Cl. 13.7)	0.5 kV to 5.0 kV
			JSS 51038 (Cl. 13.6)	
			AS22759C (Cl. 5.4.4)	
			NEMA HP3 (Cl. 6.2.3)	
			NEMA WC 27500 (Cl. 4.3.3.2)	
			QDAS/35.12/TR/362/96 (Cl. 6.5)	
		Dielectric Withstand Voltage in Component Wire	NEMA WC 27500 (Cl. 4.3.3.1)	0.5 kV to 5.0 kV
			QDAS/35.12/TR/363/96 (Cl. 4.2)	
		Impulse Dielectric Test	JSS 51038 (Cl. 13.7)	1.0 to 12.0 kV, 50 Hz
			AS22759C (Cl. 5.3.3.2)	
			NEMA HP 3 (Cl. 6.2.2)	
			NEMA WC 27500 (Cl. 4.3.3.3)	
			MIL-DTL-81381C (Cl. 4.6.4.1)	
		High Frequency Spark Test	AS22759C (Cl. 5.3.3.3)	0.5 kV to 10 kV
			NEMA HP3 (Cl. 6.2.2)	
		Voltage Withstand (Jacket)	JSS 51038 (Cl. 13.17)	1.0 kV to 3.0 kV
			NEMA WC 27500 (Cl. 4.3.7)	
			QDAS/35.12/TR/363/96 (Cl. 4.6)	
		Insulation Resistance	JSS 51034 (Cl. 13.8)	500 MΩ to 1000x10³ MΩ at 100 V to 500 V
			AS22759C (Cl. 5.4.2)	
			QDAS/35.12/TR/362/96 (Cl. 6.6)	
			MIL-DTL-81381C (Cl. 4.6.4.2)	
		Coating Thickness over Conductor, Shield	JSS 51034 (Cl. 13.9)	0.01 micron to 12 micron
			JSS 51038 (Cl. 13.11)	

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
		Strands & Continuity of Coating	NEMA WC 27500 (Cl. 4.3.2.2.1)	
			QDAS/35.12/TR/362/96 (Cl. 6.1)	
			QDAS/35.12/TR/363/96 (Cl. 4.1.2)	
		Conductor Tensile Strength, Shield Strands Tensile Strength	JSS 51034 (Cl. 13.10)	10 N/mm² to 400 N/mm²
			JSS 51038 (Cl. 13.10)	
			AS22759C (Cl. 5.2.6)	
			MIL-DTL-81381C (Cl. 4.6.4.7)	
		Conductor Elongation, Shield Strands Elongation	JSS 51034 (Cl. 13.10)	0.1 mm to 300 mm
			JSS 51038 (Cl. 13.10)	
			AS22759C (Cl. 5.2.6)	
			NEMA WC 27500 (Cl. 4.3.2.1)	
			QDAS/35.12/TR/363/96 (Cl. 4.1.1)	
			MIL-DTL-81381C (Cl. 4.6.4.7)	
		Conductor Solderability	AS22759C (Cl. 5.2.3)	200 °C to 300 °C
			NEMA WC 27500 (Cl. 4.3.18)	
			QDAS/35.12/TR/362/96 (Cl. 6.11)	
		Insulated Conductor Strand Blocking-Adhesion	AS22759C (Cl. 5.2.5)	Qualitative
			MIL-DTL-81381C (Cl. 4.6.2.1)	
		Insulation/Jacket Tensile Strength	JSS 51034 (Cl. 13.12)	10 N/mm² to 400 N/mm²
			JSS 51038 (Cl. 13.16)	
			AS22759C (Cl. 5.3.1.2)	
			NEMA HP3 (Cl. 6.1.3)	
			NEMA WC 27500 (Cl. 4.3.13)	

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
		Insulation Jacket Elongation	JSS 51034 (Cl. 13.12)	0.1 mm to 600 mm
			JSS 51038 (Cl. 13.16)	
			AS22759C (Cl. 5.3.1.2)	
			NEMA HP3 (Cl. 6.1.3)	
			NEMA WC 27500 (Cl. 4.3.13)	
		Insulation Shrinkage	AS22759C (Cl. 5.3.12)	200°C to 300°C, 0.001 mm to 4.00 mm
			NEMA HP3 (Cl. 6.1.5)	
			QDAS/35.12/TR/362/96 (Cl. 6.8)	
			MIL-DTL-81381C (Cl. 4.6.4.9)	
		Cable Jacket Removability	JSS 51038 (Cl. 13.14)	Qualitative
		Insulation Strip Force	AS22759C (Cl. 5.5.4)	10 N to 400 N
		Wire Insulation Stripping	AS22759C (Cl. 5.5.3)	0.001 mm to 25 mm
		Insulation/Jacket Wall Thickness	JSS 51038 (Cl. 13.15)	0.001 mm to 2.00 mm
			AS22759C (Cl. 5.5.5)	
			NEMA WC 27500 (Cl. 4.3.12)	
			QDAS/35.12/TR/363/96 (Cl. 4.11)	
			MIL-DTL-81381C (Cl. 4.6.4.8)	
		Braid Angle & Shield Coverage	JSS 51038 (Cl. 13.12)	18° to 50° 80 % to 100 % coverage
			NEMA WC 27500 CL. No. 4.3.5	
			QDAS/35.12/TR/363/96 (Cl. 4.4)	
		Surface Resistance	JSS 51034 (Cl. 13.13)	0.1 M Ω-mm to 1000 x 10^2 M Ω-mm
			MIL-DTL-81381C (Cl. 4.6.4.20)	
		Stripe Durability	JSS 51034 (Cl. 13.14)	Qualitative

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
		Cold Bend	JSS 51034 (Cl. 13.15)	(-)70°C to (-)45°C (0.5 kV to 3.0 kV)
			JSS 51038 (Cl. 13.22)	
			AS22759C (Cl. 5.7.3)	
			NEMA WC 27500 (Cl. 4.3.6)	
			QDAS/35.12/TR/362/96 (Cl. 6.9)	
			QDAS/35.12/TR/363/96 (Cl. 4.5)	
			MIL-DTL-81381C (Cl. 4.6.4.12)	
		Heat Resistance	JSS 51034 (Cl. 13.16)	200 °C for PTFE 230°C for FEP
		Wrap Back	JSS 51034 (Cl. 13.17)	250 °C to 350 °C 0.5 to 5 kV
			NEMA HP3 (Cl. 6.1.2)	
		Resistance to Soldering Heat	JSS 51034 (Cl. 13.18)	250° C to 350 °C 0.001 mm to 4.00 mm
		Flammability	JSS 51034 (Cl. 13.19)	800° C to 1000 °C 0.01 mm to 100 mm
			JSS 51038 (Cl. 13.27)	
			AS22759C (Cl. 5.7.10)	
			NEMA WC 27500 (Cl. 4.3.19)	
			MIL-DTL-81381C (Cl. 4.6.4.16)	
		Thermal Shock	JSS 51038 (Cl. 13.23)	200 °C to 300 °C 0.001 to 2 mm
			NEMA WC 27500 (Cl. 4.3.9)	
			QDAS/35.12/TR/363/96 (Cl. 4.8)	
		Thermal Shock Resistance	AS22759C (Cl. 5.7.4)	200 °C to 300 °C (-)70 °C to (-)45 °C
			QDAS/35.12/TR/362/96 (Cl. 6.12)	
			MIL-DTL-81381C (Cl. 4.6.4.13)	

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
		Ageing Stability	JSS 51038 (Cl. 13.24)	200 °C to 300 °C 0.5 kV to 3.0 kV
			QDAS/35.12/TR/363/96 (Cl. 4.9)	
		Blocking	JSS 51038 (Cl. 13.25)	200° C to 300° C
			AS22759C (Cl. 5.3.11)	
			NEMA WC 27500 CL. No. 4.3.15	
			QDAS/35.12/TR/362/96 (Cl. 6.10)	
			QDAS/35.12/TR/363/96 (Cl. 4.10)	
			MIL-DTL-81381C (Cl. 4.6.4.4)	
		Lamination Sealing	AS22759C (Cl. 5.3.8)	200 °C to 300 °C
			NEMA WC 27500 (Cl. 4.3.14)	
			MIL-DTL-81381C (Cl. 4.6.4.10)	
		Wire Identification Mark, Stripe, or Band Durability	AS22759C (Cl. 5.6.3)	100 Cycles to 200 Cycles
			NEMA HP3 (Cl. 6.1.6)	
			MIL-DTL-81381C (Cl. 4.6.4.3)	
		Mandrel Bend Mechanical Resistance	AS22759C (Cl. 5.7.1)	0.5 kV to 5.0 kV
		Life Cycle	AS22759C (Cl. 5.7.5)	200 °C to 300 °C 0.5 kV to 5.0 kV
			QDAS/35.12/TR/362/96 (Cl. 6.13)	
			MIL-DTL-81381C (Cl. 4.6.4.17)	
		Mandrel Bend Test/Wrap test	AS22759C (Cl. 5.7.6)	Qualitative
			MIL-DTL-81381C (Cl. 4.6.4.15)	
		Fluid Immersion Test	AS22759C (Cl. 5.7.7)	18 °C to 150 °C 0.5 kV to 5 kV
			MIL-DTL-81381C	

Laboratory	**Garg Associates Private Limited, QA Lab, D-3, Meerut Road Industrial Area-3, Ghaziabad, Uttar Pradesh**
Accreditation Standard	**ISO/IEC 17025: 2005**
Certificate Number	**TC-6953** **Page 8 of 8**
Validity	**05.03.2018 to 04.03.2020** **Last Amended on 13.05.2019**

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
			(Cl. 4.6.4.18)	
		Humidity Resistance	AS22759C (Cl. 5.7.8) MIL-DTL-81381C (Cl. 4.6.4.19)	RH - 90% to 95%; 50 °C to 70°C; (10 MΩ to 1000 x 10^2 MΩ)
		Smoke Resistance	AS22759C (Cl. 5.7.9)	200 °C to 300 °C
		Wet Arc Propagation Resistance	AS22759C (Cl. 5.7.11)	0.5 A to 1.5 A 0.5 kV to 5.0 kV
		Dry Arc Propagation Resistance	AS22759C (Cl. 5.7.12)	0.5 A to 1.5 A 0.5 kV to 5.0 kV
		Dynamic Cut through Resistance	AS22759C (Cl. 5.7.13)	10 N to 400 N
		Forced Hydrolysis Insulation Resistance	AS22759C (Cl. 5.7.14)	50 °C to 100 °C 0.5 kV to 5.0 kV 500 MΩ to 1000 x 10^3 MΩ 100 V to 500 V
		Thermal Index	AS22759C (Cl. 5.7.15)	200 °C to 300 °C
		Tape Overlap	AS22759C (Cl. 5.3.5)	5 % to 60 %
		Insulation State of Sinter or Differential Scanning Calorimeter Analysis	AS22759C (Cl. 5.3.4)	0 to 500 °C
		Characteristic Impedance	Mll-DTL-17H (Cl. 4.8.7) ASTM 4566 IS/IEC61196-1-112 MIL-DTL-1553	50 Ω to 100 Ω
		RF Transmission Loss (Attenuation)	Mll-DTL-17H (Cl. 4.8.8) ASTM 4566 IS/IEC61196-1-112 MIL-DTL-1553	1 dB to130 dB

Amit Kumar Sinha
Convenor

Birendra Prasad Murmu
Program Manager