AMIT TEST AND CALIBRATION CENTRE

(NABL ACCREDITED LABORATORY)

T-1945 T-3288

19/168, Sarai Rohilla, Old Rohtak Road, Near Usha Mata Mandir, New Delhi-110035, M.: +91-9560959122

Phone : 011-23643995, 011-23643992, +91-9811196977 amittestcc@gmail.com Website : www.atncc.in

TEST REPORT

(ELECTRICAL LABORATORY)

ADDRESS OF THE LABORATORY :	19/168, Basti Sarai Rohilla, Old Rohtak Road, Near Usha Mata Mandir, Gurudwara Wali Gali, Delhi -110035
TELEGRAM :	
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TEST REPORT AS PER IS 9968(Part-1)1988 [WITH AMENDMENT NO {s} 3]

REPORT No. : ATCC 19110702 Dated: 30.11.2019

ULR - TC558419000000817F

Issue To : Heatflex Cables Pvt. Ltd.
H-1464, D.S.I.D.C. Narela ,
Industrial Area, Delhi – 110040

PART A. PARTICULARS OF SAMPLE SUBMITTED

a) Nature of Sample :	Elastomer insulated cables for working Voltages up to and Including 1100 Volts.
b) Grade/Variety/Type/Class/Size etc:	4C x 95 sq. mm, (484/0.50 mm) Annealed Tinned flexible Copper Conductor Class 5, wrapped with polyster taped, heat resisting elastomer insulated (Type IE2) and heavy duty elastomer sheathed.(Type SE4) flexible cable, Voltage Grade 1100V cable code RR 5 Meters annealed tinned Copper wire Dia. 0.50mm for Annealing test before stranding. 6 Meters insulated core of each colour for water absorption test (Electrical) 50 grams Annealed Tinned Copper wire Dia. 0.50 mm for Persulphate Test before stranding
c) Declared Values, if any :	.....
d) Code No./Drum No./Coil No.	.....
e) Batch No. & Date of Manufacture :	.....
f) Quantity :	25 Meters + 5 Meters+6 Meters each colour+50 Grams (Approx.)
g) Date of Receipt :	07.11.2019
h) Job Order Number:	19110702
i) BIS seal :	INTACT/ NOT INTACT/ NOT SEALED NIL
j) IO's Signature :	Signed/ Unsigned NIL
k) Any other Information/Expiry date,if any :	.....
l) Date of Commencement of Testing :	11.11.2019
m) Date of Completion of Testing :	29.11.2019
n) Embossing/Printing:	UNIQUE 1100V 4CX95 SQ.MM 'RR' HR-90 Dated : 07.11.2019
o) Party Ref. No. :	.....

PART B : SUPPLEMENTARY INFORMATIONS

a) Reference to sampling procedure, wherever applicable :	N.A.
b) Supporting documents for the measurements taken and results derived like graphs, tables, sketches and/or photographs, as appropriate to test report, if any[To be attached]:	NIL
c) Deviation from the test methods as prescribed in relevant ISS/ work instructions, if any :	NIL

This Test Report is not for BIS (Bureau of Indian Standard) Purpose.

Issued By

MANOHAR SINGH JADON
(C.E.O.)

Authorized Signatory

SADHANA JADON
(Quality Manager)

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PART C. TEST RESULTS

REPORT No. : ATCC 19110702 **IS : 9968(Part-1)1988**

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SL.NO.	TESTS/ CL. REF.	SPECIFIED REQUIREMENTS	RESULTS
1	**Type of Cable** Cl. 1.2	**1.2.1 Cables for Fixed Wiring**	
		a) Braided and compounded/ varnished	N.A.
		b) Elastomer sheathed (Normal duty)	N.A.
		c)Elastomer sheathed (Normal duty) with earth continuity conductor	N.A.
		1.2.2 Flexible cables	
		a) Braided and varnished	N.A.
		b) Elastomer sheathed (Heavy duty)	**Elastomer sheathed (Heavy Duty)**
		1.2.3 Flexible cords	
		a) Braided	N.A.
		b) Elastomer sheathed (Normal duty)	N.A.
		c) Unkinkable flexible cords-braided and compounded (Workshop type)	N.A.
		d) Unkinkable flexible cord-braided and compounded	N.A.
2	**Conductor** Cl. 3.1, 3.2, 3.3	Copper/ Aluminium/ Separator Tape	**Tinned Annealed Copper Conductor/ A seperator tape applied over the conductor**
3	**Type of Insulation** Cl. 4.1, 4.2, 4.3	General service IE1 Heat Resisting IE2 Silicon rubber IE5	**IE2**
4	**Tape** Cl. 5.1, 5.2, 5.3	Proofed Tape PETP Tape Glass Tape	**Proofed Tape**
5	**Filler** Cl. 6.1	Natural or synthetic fibres or Elastomer suitable for the operating temperature and compatible with insulating material	**Elastomeric Filler**
6	**Braid** Cl. 7.1,7.2	**Textile Braid-**The textile braid shall consist of textile material (natural or synthetic), such as cotton. Artificial silk mercerized or rayon (excluding jute or hemp.)	N.A.
		Glass Braid- The glass braid shall consist of glass fibre yarn of suitable quality.	
7	**Sheath** Cl. 8.1.1, 8.1.2, 8.2.1, 8.2.2	SE 1 for fixed wiring and flexible cord	N.A.
		SE 2 for flexible cable	N.A.
		SE 3 for heat resisting fixed wiring and flexible cords	N.A.
		SE 4 for heat resisting flexible cables	SE4
8	**Compound and Varnish** Cl. 9.1 & 9.2	Preservative compound	N.A.
		Varnish	N.A.

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9	**Conductor Class** Cl. 10.1 & 10.2	Flexibility Class I Solid for 1 and 1.5 mm^2 (Cu) 1.5 mm^2 (Al)	N.A.
		Flexibility Class 1 for solid and class 2 for stranded for 2.5-6 mm^2 (Cu) 2.5-10 mm^2 (Al)	N.A.
		Flexibility class 2 for stranded for >10 mm2 (Cu) > 16 mm^2 (Al)	N.A.
		Class 5 for flexible cable and cords, Plain or Tinned Annealed Copper (ATC)	Class 5
10	**Conductor shape** Cl.10.1.1	The conductor shall be circular	Circular
11	**Earth Continuity Conductor** Cl. 10.1.2	It shall be constructed from the same material as main conductor	N.A.
12	**Separator Tape** Cl. 11.1	May be applied over the conductor	Polyster Tape
13	**Thickness of Insulation, mm** Cl. 12 Table-5		Nom. Min.
	Red Core	1.8 (Nom.) 1.52 (Min.)	2.10 1.92
	Yellow Core		1.98 1.84
	Blue Core		2.05 1.90
	Green Core		2.03 1.87
14	**Application of Insulation** Cl. 12.4	It fits closely to the conductor with or without separator but shall not adhere to it.	Provided with overlap
15	**No. of Cores**	4	4
16	**Core Identification** Cl. 13.1, Visual	Numbered tapes/ coloured insulation/ coloured tape/ number printed on cores	coloured insulation
17	**Colour or Number** Cl. 13.2	Red, Yellow, Blue & Green	Red, Yellow, Blue & Green
18	**Interval between numerals (mm)** Cl. 13.2.1	150 (max.)	N.A.
19	**Tape** Cl. 14 & 18	When provided shall be applied with an overlap	N.A.
20	**Braiding** Cl. 15	Shall be reasonably close but not so tight as to damage the insulation	N.A.
21	**Compounding and Varnishing** Cl. 16.1	The compounding or varnishing shall be provided as required in the respective tables.	N.A.
22	**Laying up of Cores** Cl. 17.1	In case of twin and multicore circular cables and cords, the cores shall be laid together with a suitable right hand lay	Right Hand
		Fillers in interstices may be used to provide reasonable circularity in laid up cable	Provided
23	**Value of lay in flexible cable** Cl. 17.1.1	Maximum 18 times of pitch circle diameter	12.25

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SL.NO.	TESTS/ CL. REF.	SPECIFIED REQUIREMENTS	RESULTS
24	**Binder Type** Cl.18.1	The proofed tape or Glass tape or PETP tape or plastic tape or any other suitable tape over laid up cores shall be applied as required in the respective tables with and overlap.	Proofed tape
25	**Thickness of sheath, mm** Cl. 19, Table 5	4.1 mm (Nom.) 2.99 mm (Min.)	4.85 4.10
26	**Colour of Sheath** Cl. 19.4	Black unless otherwise agreed between the purchaser and supplier	Black
27	**Overall Diameter, mm** Cl. 20.1		N.A.
28	**No. of Wires in Conductor**		484
29	**Dia. of one wire, mm** Cl. 6.4.3, Table 3 of IS:8130 :2013	0.51 (Max.)	0.501
30	**Size of Cable, sq. mm**	95	95
31	**Persulphate Test (For Copper), gm/m² Mass of Copper Dissolved (After Stranding)** Cl. 21.1,7.1.1 of IS : 8130:2013 (Pt-4) of IS 10810/1984		
	Red Core Yellow Core Blue Core Green Core	Wire Diameter mm: Upto and including 0.41 — Permissible Mass of Copper Dissolved, Max g/m²: 5 Above 0.41: 3	1.12 1.08 1.16 1.10
31.1	Persulphate Test (For Copper), gm/m² Mass of Copper Dissolved, (Before stranding) Cl. 21.1,7.1.1 of IS : 8130:2013 (Pt-4) of IS 10810/1984	Wire Diameter mm: Upto and including 0.41 — Permissible Mass of Copper Dissolved, Max g/m²: 5 Above 0.41: 3	1.02
32	**Annealing Test (for Copper) (%) Elongation on gauge length of 250 mm, Before stranding** Cl. 7.1.2.1 of IS: 8130:2013 (Pt-1) of IS 10810/1984	Wire Diameter mm: Over — Up to and including mm — Elongation, Min Percent: 0.21 — 9.0 0.21 — 0.41 — 13.5 0.41 — 1.36 — 18.0 1.36 — 22.5	25.2
33	**Tensile strength (For Aluminium)** Cl. 21.1, 7.1.2.1 of IS: 8130:2013 (Pt-2) of IS 10810/1984		N.A.
34	**Wrapping Test (For Aluminium)** Cl. 21.1, 7.2.2 of IS 8130:2013 (Pt-3) of IS:10810/1984	The wire should not break	N.A.
35	**Conductor Resistance at 20°C ohm/km** Cl. 21.1,7.3, 7.3.1 and table 3 of IS : 8130:2013(Pt-5) of IS 10810/1884		
	Red Core Yellow Core Blue Core Green Core	0.210 (Max.)	0.197 0.198 0.197 0.199

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PART C. TEST RESULTS

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36	**Physical Tests for Insulation (IE2)**		
36.1	Without Ageing		
36.1.1	Tensile Strength ,N/mm^2 Cl. 21.1,Table 2 of IS 6380:1984 (Pt-7) of IS 10810/1984		
	Red Core	4.2 (Min.)	7.46
	Yellow Core		7.14
	Blue Core		7.80
	Green Core		7.92
36.1.2	Elongation at Break ,%		
	Red Core	200 (Min.)	310
	Yellow Core		305
	Blue Core		315
	Green Core		300
36.2	After Ageing in Air Oven Cl. 21.1, Table 2 of IS 6380:1984 (Pt-11) of IS 10810/1984		
36.1.2	Tensile Strength Variation, %		
	Red Core	± 30 (Max.)	-6.70
	Yellow Core		-7.56
	Blue Core		-8.21
	Green Core		-5.43
36.2.2	Elongation Variation, %		
	Red Core	± 30 (Max.)	+6.45
	Yellow Core		+8.20
	Blue Core		+6.35
	Green Core		+8.33
37	**After Ageing in Air bomb** Cl. 21.1,Table 2 of IS 6380:1984, Appendix A, (Pt-56) of IS 10810/1984		
37.1	Tensile Strength Variation, %		
	Red Core	± 30 (Max.)	-8.58
	Yellow Core		-11.06
	Blue Core		-12.05
	Green Core		-10.10
37.2	Elongation Variation, %		
	Red Core	± 30 (Max.)	+9.68
	Yellow Core		+9.84
	Blue Core		+11.11
	Green Core		+12.33
38	**After Ageing in Oxygen Bomb** Cl. 21.1,Table 2 of IS 6380:1984 Appendix A, (Pt-56) of IS 10810/1984		
38.1	Tensile Strength Variation, %		
	Red Core		N.A.
	Yellow Core		N.A.
	Blue Core		N.A.
	Green Core		N.A.

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38.2	Elongation Variation, %		
	Red Core		N.A.
	Yellow Core		N.A.
	Blue Core		N.A.
	Green Core		N.A.
39	**Water Absorption (Electrical)**		
	Cl.21.1,Table 2 of IS 6380:1984 (Pt-28) of IS 10810/1984		
39.1	**Increase in Capacitance**		
39.1.1	**1 to 14 days**		
	Red Core	10 % (Max.)	3.6
	Yellow Core		3.7
	Blue Core		3.7
	Green Core		3.6
39.1.2	**7 to 14 days**		
	Red Core	3 % (Max.)	1.4
	Yellow Core		1.5
	Blue Core		1.5
	Green Core		1.4
39.2	Hot set test %		
	Cl.21.1,Table 2 of IS 6380:1984 (Pt-30) of IS 10810/1984		
39.2.1	Hot set elongation		
	Red Core	175 % (Max.)	42.65
	Yellow Core		44.10
	Blue Core		40.90
	Green Core		43.35
39.2.2	Parmanent Set		
	Red Core	15 % (Max.)	2.95
	Yellow Core		3.30
	Blue Core		3.10
	Green Core		2.85
40	**Physical Tests for Sheath (SE4)**		
40.1	Without Ageing		
40.1.1	Tensile Strength, N/mm^2 Cl. 21.1,Table 3 of IS 6380:1984 (Pt-7) of IS 10810/1984	11.0 (Min.)	14.63
40.1.2	Tensile stress at 200% elongation, N/mm^2	4.0 (Min.)	6.5
40.1.3	Elongation at break, %	250 (Min.)	480
40.2	After Ageing in Air Oven Cl. 21.1,Table 3 of IS 6380:1984 (Pt-11) of IS 10810/1984		
40.2.1	Tensile Strength Variation, %		N.A.
40.2.2	Elongation Variation, %		N.A.
40.3	After Ageing in Air Bomb Cl. 21.1,Table 3 of IS 6380:1984 Appendix A, (Pt-56) of IS 10810/1984		
40.3.1	Tensile Strength Variation, %	± 50 (Max.)	-8.34

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40.3.2	Elongation Variation, %	± 50 (Max.)	+9.38
41	**Oil Resistance Test** Cl. 21.1,Table 3 of IS 6380:1984 (Pt-31) of IS 10810/1984		
41.1	Tensile Strength Variation, %	± 40 (Max.)	-6.97
41.2	Elongation Variation, %	± 40 (Max.)	+8.33
42	**Tear Resistance, N/mm** Cl. 21.1,Table 3 of IS 6380:1984 (Pt-17) of IS 10810/1984	5.0 (Min.)	8.24
43	**Hot set test** Cl. 21.1,Table 3 of IS 6380:1984 (Pt-30) of IS 10810/1984		
43.1	Hot set elongation %	175 % (Max.)	40.65
43.2	Parmanent Set %	15 % (Max.)	4.05
44	**Insulation Resistance Constant, M ohm km** Cl. 21.1,Table 2 of IS 6380:1984 (Pt-43) of IS 10810/1984		
44.1	At 27°C	Type IE 2	
	Red Core	3670 (Min.)	69345.2
	Yellow Core		74185.8
	Blue Core		73684.2
	Green Core		78416.6
44.2	At 90°C	Type IE 2	
	Red Core	3.67 (Min.)	968.55
	Yellow Core		1212.58
	Blue Core		1168.12
	Green Core		1368.93
45	**High Voltage (Water Immersion) Test** Cl. 21.1,22.2 (Pt-45) of IS 10810/1984	The Core(s) shall be carefully removed from a sample approximately 3 meters long taken from the finished cable or cord. They shall be so immersed in a water bath at room temperature that their ends protrude at least 200 mm above the water level. After 24 hours, an ac voltage of 3 kV (rms) shall be applied between conductor and water. This voltage shall be raised to 6 kV (rms) within 10 seconds and held constant at this value for 5 minutes.	
	Red Core		No Breakdown Observed
	Yellow Core		No Breakdown Observed
	Blue Core		No Breakdown Observed
	Green Core		No Breakdown Observed
46	**Flammability Test (Only for SE3 & SE4)** Cl. 22.3 Pt-53 of IS. 10810/1984		
46.1	Period of Buring after removal of the Flame	60 Sec. (Max.)	5
46.2	Unaffected(uncharred) portion from the lower edge of the top clamp	50 mm (Min)	310

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47	Manufacturer's Identification	The manufacturer shall be identified throughout the length of the cable by means of a tape bearing the manufacturer's name or trade mark, or by manufacturer's name or trade-mark being printed, indented or embosossed on the cable or cord or if the purchaser so desires, colour identification threads in accordance with a scheme to be approved by the Bureau of Indian Standard shall be employed. The Printing indentation or embossing shall be done on sheathed cables. The distance between any two consecutive printings, indentations or embosiings shall be not more than 1 meter.	The manufacturer's name "UNIQUE" is printed on the sheath of the cable throught the length and the distance between any two consecutive printing found to be 1 meter
48	Cable Identification	Cables or cords shall be identified throughout the length of cable or cords by legends shown below, either printed or intended or embossed on cable Type of cable Insulation — Legend Heat resisting rubber — HR 90 Silicone Rubber — HR 150	HR 90 by printing

PART D REMARKS: The Sample conforms to requirements specified in IS:9968 (Pt-1)/1988 with amendments no.1,2 & 3

Note: Any Deviation from the Standard,Test method/Specification - NIL

XXXXXXXXXX END OF TEST REPORT XXXXXXXXXX

Notes :

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