



FORM NO : NTH/CHN/F5



भारत सरकार Government of India  
राष्ट्रीय परीक्षण शाला (द.क्षे.)  
NATIONAL TEST HOUSE (SR)  
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Phone : 22432374, 22431157 Fax : 22433158 email : nthsr@tn.nic.in

NABL  
T-0183, 0184  
T-0185, 0189

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ii. dc test (as per Cl. 16.2.2 of IS: 694 - 1990 & IS: 10810 (part - 45) - 1984)	Specified	Observed
After completion of ac test the sample was subsequently tested with dc voltage of 1.2 kV in the same water bath at same temperature for 240hours.	Shall withstand the test without breakdown or flash over.	The cable with stood the test satisfactorily
<b>g. Flammability test</b> (as per cl. 16.5 of IS: 694 - 1990 & IS: 10810 (part - 53) - 1984.		
i. Period of burning after removal of the flame, seconds	60 (Max)	4
ii. Unaffected portion from the lower edge the top clamp in mm	50 (Min)	330
<b>h. Test for improved fire performance</b> (as per Cl. 15.2.1 of IS: 694 - 1990)		
<b>i. Oxygen Index Test</b> (as per IS: 10810 (Part 58 )		
The Oxygen index (Percentage of O <sub>2</sub> )	29 (Min)	33.5
<b>ii. Smoke Density</b>		
Under Preparation by BIS		
<b>iii. Test for halogen acid gas evaluation</b> (as per IS: 10810 (part 59) The level of HCL evolved in percent by weight		
	16	20 (Max)
<b>iv. Temperature Index Test</b> (as per IS: 10810 (Part 64)		
Temperature required for sustained burning at 21 Percentage of O <sub>2</sub> in °C	250 (Min)	320

**Note:**

The average ambient conditions of the laboratory during the above test were as follows

Room temperature, deg C : 27 ± 2  
Relative humidity, percent : 65 to 70%

««« END OF TEST CERTIFICATE »»»

Tested by

V. Sivaguru  
Scientific Assistant (Elect.)

Checked &amp; Approved by

P. Somu  
Scientist.SC (Elect.)



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	Specified	Observed
iii. Shrinkage in % (as per IS:10810(Part-12)-1984) (150±2°C for 15minutes)	4 (Max)	2
iv. Hot deformation test (80±2°C for 4 hours) (as per IS: 10810 (Part - 15) - 1984)		
Depth of indentation in percent	50 (Max)	26
iv. Heat shock test (150±2°C for 1 hour) (as per IS: 10810 (Part - 14) - 1984)	Shall not show scales or cracks	Satisfactory as no signs of scales or cracks observed
d. Insulation resistance test (as per Cl. 15.1 of IS: 694 - 1990 & IS: 10810 (part - 43) - 1984)		
i. Volume resistivity in $\Omega$ Cm		
At Room temperature	1 X 10 <sup>13</sup> (Min)	8 x 10 <sup>13</sup>
At 70°C	1 X 10 <sup>10</sup> (Min)	7 x 10 <sup>10</sup>
ii. Insulation Resistance Constant in M $\Omega$ km		
At Room temperature	36.7 (Min)	289.0
At 70°C	0.037 (Min)	0.259
e. High voltage test (at room temperature) (as per Cl. 16.3 of IS: 694 - 1990 & IS: 10810 (part - 45) - 1984)		
The sample was immersed in water at room temperature for one hour. After that an ac voltage of 3kV(rms) 50Hz was applied and kept for 5 minutes.	Shall withstand without breakdown or flash over	The cable with stood the test satisfactorily
f. High voltage test (Water immersion test) (as per Cl. 16.2 of IS: 694 - 1990 & IS: 10810 (part - 45) - 1984)		
i. ac test (as per Cl. 16.2.1 of IS: 694 - 1990 & IS: 10810 (part - 45) - 1984)		
The sample was kept in water at 60±3°C for 24 hrs. after that an ac voltage of 3kV(rms) 50Hz was applied and raised to 6kV(rms) 50 Hz within 10seconds and kept for 5 minutes.	Shall withstand the test without breakdown or flash over.	The cable with stood the test satisfactorily

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### 4. Tests (Cl.15.1 of the specification)

a. Test on Conductor	Specified	Observed
<b>i. Annealing Test (Before stranding)</b> (as per Cl. 6.1.2 of IS: 8130 - 1984 & IS: 10810 (Part-1) - 1984) Elongation percent	13.5	26
<b>ii. Conductor resistance test</b> (as per Cl. 6.3 & Table 2 of IS: 8130 - 1984 & IS: 10810 (Part-5) - 1984) Calculated resistance corrected to 20 °C in Ohm/km	Class 2 conductor 7.41 (Max)	7.24
<b>b. Test for overall dimensions and thickness of insulation.</b> (as per Cl. 14.1, 10 and table 2 of IS: 694 - 1990 & IS: 10810 (Part-6) - 1984)		
<b>i. Overall dimension in mm</b>	4.2 (Max)	3.7
<b>ii. Average thickness of insulation in mm</b>	0.8 (Nominal)	0.9
<b>iii. Minimum thickness of insulation in mm</b>	0.62 (Min)	0.76
<b>c. Physical Test on Insulation (as per Table 1 of IS: 5831 - 1984)</b>		
<b>i. Tensile strength &amp; elongation at break (as per IS: 10810 (Part - 7) - 1984)</b>		
Tensile strength in N/mm <sup>2</sup>	12.5 (Min)	14.9
Elongation at break in percent	150 (Min)	200
<b>ii. Ageing test (Sample kept at 80±2°C for 7 days) (as per IS: 10810 (Part - 11) - 1984)</b>		
Loss of mass in mg/cm <sup>2</sup> (as per IS:10810(Part-10)-1984)	2 (Max)	1
Tensile strength in N/mm <sup>2</sup>	12.5 (Min)	16.2
Elongation at break in percent	150 (Min)	190
Tensile strength variation in percent	±20 (Max)	(-)8
Elongation variation in percent	±20 (Max)	(+)5

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3. Construction (Section 2 of the specification)	Specified	Observed
a. Number of cores	Single core or multi core	Single core
b. Number of strands (Cl.9)	3 wires (Min) for Class 2 conductor Table 2 of IS: 8130 – 1984	36 wires of 0.3mm dia. each Conductor Class 2
c. Area of the conductor (Cl. 9)	2.5 sq.mm. (Nominal)	2.5 sqmm (Calculated)
d. Insulation (Cl.10)	Insulation shall be applied by extrusion by PVC compound. It shall fit closely to the conductor and shall be possible to remove the insulation without damage to the conductor.	FRLSH (Cat-C2) PVC Insulation applied over the conductor by extrusion and found fit closely to the conductor. It is possible to remove it without damage to the conductor. Satisfactory
e. Core identification (Cl. 11)	Red, Black, Yellow, Blue, White or grey	Yellow
f. Laying up of cores (Cl. 12)	Flat cable: Shall be laid side by side Circular multi core cable: Laid together with suitable right hand lay.	Not applicable as sample is a single core cable.

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### 1. Description of the sample :

- a. Nomenclature : Single core, Type-A FRLSH PVC insulated cable with bunched copper conductor.
- b. Size : 2.5 mm<sup>2</sup>(36/0.3mm)
- c. Quantity : 1 Number of cut length coil of cable approximately 50 meter & Plain annealed copper wire (Before stranding) of diameter 0.3mm length 2m
- d. Packing : Packed in a carton box.
- e. Markings : Markings found printed on the cable at regular interval "WALNA FRLSH 2.5mm<sup>2</sup> SQMM 1100V"

As requested the sample has been subjected to the Type tests as per IS: 694 -1990, reaffirmed 2005(up to amendment no. 5) with the results noted below.

2. Material (Section 2 of the specification)	Specified	Observed
a. Conductor (Cl. 4)	Plain copper	Plain Copper
b. Insulation (Cl. 5)	Shall be Type 'A' PVC Compound	PVC Compound Type 'A'
c. Fillers (Cl.6)	Fillers shall be vulcanized rubber, unvulcanized rubber, thermoplastic compound or textile materials.	Not applicable
d. Binder tape (Cl.7)	Binder tape shall consists of plastic or proofed textile material.	Not applicable

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