



MSCB 118

# CIMEC Infralabs Private Limited

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CIN: U73100DL2013PTC257132 | ISO 9001-2015 Certified

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TC-5668

Format No: CIL/LAB-QF/7.8-01

ULR-TC566823000000164F

## TEST REPORT

As Per IS 694-2010 with Amend. No.1, 2, 3 &amp; 4

Report No. : CIL/ 221213006

Page No. : 1 of 3

Issued To : M/s BLACK COPPER INDIA PRIVATE LIMITED

Date of Issue : 16.01.2023

Plot No.-22/3, 2<sup>nd</sup> Floor, Gali No.3, Friends Colony Industrial Area, G.T.  
Road Shahdara, Delhi-110095

Date of Receipt : 13.12.2022

Date of Completion : 14.01.2023

### 1. Particulars of Sample (Declared):

a)	Nature of Sample	:	PVC Insulated Unsheathed And Sheathed Cables/Cords With Rigid and Flexible Conductor for Rated voltages up to and including 1100 V
b)	Size/ Type/ Grade/ Variety/ Class/ Designation etc.	:	1Cx1.5 Sq.mm, Flexible (Class-5) Copper Conductor, PVC Insulated Unsheathed Circular Cable, Insulation (Type-D), Cable Code: Y, Cat:-FR-LSH, Colour: RED, Brand:-BLACK COPPER
c)	Batch No./Lot No./ Mfg. date	:	-----
d)	Quantity of Sample	:	25 meter + 5 meter plain Copper wire for Annealing Test.
e)	Sampling done by	:	Customer
f)	Sample Sealed/ Signed	:	Not Sealed
g)	In Case Sealed Sample (Name of Agency)	:	Not Applicable
h)	Test to Carried Out	:	Type Tests as per IS 694-2010 with latest amendments
i)	Any Other Declaration	:	Nil

### 2. Visual Examination of Sample:

a)	Manufacturer's Name/ Trade Mark	:	BLACK COPPER
b)	Marking/Printing/Embossing	:	BLACK COPPER CABLES 1100V 1CX1.5 SQ.MM (ISI) IS:694-2010 Y, FR-LSH
c)	Colour	:	Red
d)	Round/ Flat Cable	:	Round cable
e)	Conductor Material	:	Flexible Copper Conductor
f)	Armouring/ Shielding/ Binder Tape	:	Not Applicable
g)	Sheath	:	N.A.
h)	Condition of sample	:	Satisfactory

Checked By



Authorised Signatory

NB:(1) This Test Report is ONLY FOR THE SAMPLE TESTED. Endorsement of product is neither inferred nor implied. (2) This report is not to be reproduced wholly or in part & forbidden to be used as evidence in the court of law & ought not to be used in any advertising media without special permission in writing. (3) Any discrepancies observed in the test report shall be brought to the notice of the Laboratory within one week. (4) Total Liability of CIMEC is limited to the invoices amount. (5) Visual Examination are not in scope of NABL Accreditation

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TEST RESULTS						
Sl. No.	TEST (Cl. Ref.)	TEST METHOD	SPECIFIED REQUIREMENTS			TEST RESULTS
<b>A. TESTS AS PER TABLE-1 (Cl. 10)</b>						
<b>1 Test on Conductor, IS 8130-2013</b>						
a)	Annealing Test, % (Copper Conductor) (Cl.7.1.2)	IS 10810(Pt-1)-1984	Wire diameter, mm	Elongation, %		18.0
			Up to including 0.21	9.0	Min.	
			above 0.21 to 0.41	13.5		
			above 0.41 to 1.36	18.0		
			above 1.36 mm	22.5		
b)	Tensile Strength, N/mm <sup>2</sup> (Aluminium) (Cl.7.2.1)	IS 10810(Pt-2)-1984	Grade O	100 Max.		N. A.
			Grade H2	>100 to 150		
			Grade H4	>150		
c)	Wrapping Test (Aluminium) (Cl.7.2.2)	IS 10810(Pt-3)-1984	The wire shall not break when tested as per IS 10810(Pt-3).			N. A.
d)	Resistance Test, Ohm/km (Cl.7.3)	IS 10810(Pt-5)-1984	Corrected to Temp. 20°C, Ohm/km	13.30	Max.	12.76
e)	Persulphate Test (For Tinned Cu only) (Cl.7.1.1)	IS 10810(Pt-4)-1984	Permissible mass of copper dissolved, g/m <sup>2</sup> :			N. A.
			Dia.up to & including 0.41 mm	5	Max.	
			Dia. above 0.41 mm	3		
<b>2 Test for overall dimensions and thickness of insulation</b>						
a)	Thickness, mm	IS 10810(Pt-6)-1984	Nominal thickness (ti) (As per Customer Specification)	0.60	Nom.	0.67
			Smallest measured {ti-(0.1+0.1ti)} (As per Customer Specification)	0.44	Min.	0.55
b)	Mean overall dimensions, mm	IS 10810(Pt-6)-1984	Circular Cable, diameter (As per Customer Specification)	3.40	Max.	2.93
			Flat/Parallel Twin cable	---	Max.	N. A.
c)	Ovality, %	IS 10810(Pt-6)-1984	Difference between Max. & Min. measured value of OD.		Max.	N. A.
<b>3 Physical Test for Insulation Type-D (Ref. IS 5831:1984)</b>						
a) Tensile Strength and Elongation at break (Without ageing):						
(i)	Tensile Strength, N/mm <sup>2</sup>	IS 10810(Pt-7)-1984	10	Min.		12.6
(ii)	Elongation at break, %	IS 10810(Pt-7)-1984	150	Min.		245
b) Tensile Strength and Elongation at break (After ageing in air Oven):						
(i)	Tensile Strength, N/mm <sup>2</sup>	IS 10810(Pt-7)-1984	10	Min.		13.4
(ii)	Elongation at break, %	IS 10810(Pt-7)-1984	150	Min.		225
c) Variation in Tensile Strength and Elongation at break (After ageing in air oven):						
(i)	Tensile Strength, Variation, %	IS 10810(Pt-11)-1984	± 20	Max.		- 6.3
(ii)	Elongation, Variation, %	IS 10810(Pt-11)-1984	± 20	Max.		+ 8.2



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Sl. No.	TEST (Cl. Ref.)	TEST METHOD	SPECIFIED REQUIREMENTS			TEST RESULTS	
d)	Loss of Mass Test, mg/cm <sup>2</sup>	IS 10810(Pt-10)-1984	2	Max.	0.69		
e)	Shrinkage Test, %	IS 10810(Pt-12)-1984	6	Max.	1.75		
f)	Heat Shock Test	IS 10810(Pt-14)-1984	No sign of cracks or scales			No cracks or scales	
g)	Hot Deformation Test, %	IS 10810(Pt-15)-1984	65	Max.	33		
h)	Thermal Stability Test, Minutes (At 200°C)	IS 10810(Pt-60)-1988	80	Min.	> 80		
i)	Cold Bend Test (≤12.5mm)	IS 10810(Pt-20)-1984	No sign of cracks or scales			No cracks or scales	
j)	Cold Impact Test (>12.5mm)	IS 10810(Pt-21)-1984	No sign of cracks or scales			N.A.	
<b>B. TEST ON COMPLETE CABLE</b>							
<b>1 Insulation Resistance, IS 5831-1984</b>							
a)	Volume Resistivity, Ohm-cm	IS 10810(Pt-43)-1984	At room temperature	27°C	1x10 <sup>12</sup>	Min.	12.4 x10 <sup>12</sup>
			At max.rated temperature	70°C	1x10 <sup>9</sup>	Min.	8.2 x10 <sup>9</sup>
b)	Insulation Resistance Constant, MΩ-km	IS 10810(Pt-43)-1984	At room temperature	27°C	3.67	Min.	45.5
			At max.rated temperature	70°C	0.004	Min.	0.0328
<b>2 High Voltage Test (Water Immersion, Temp. 60±3°C) (Cl.10.1)</b>							
a)	AC Voltage Test	IS 10810(Pt-45)-1984	Shall withstand ac 6 kV (rms) for 5 minutes.			Withstood	
b)	DC Voltage Test	IS 10810(Pt-45)-1984	Shall withstand dc 1.2 kV for 240 hours.			Withstood	
<b>3 High Voltage Test (at room Temperature) (Cl.10.2)</b>							
a)	AC Voltage Test	IS 10810(Pt-45)-1984	Shall withstand ac 3.0 kV (rms) for 5 minutes.			Withstood	
4	Flammability Test (Cl.10.4)	IS 10810(Pt-53)-1984	The period of burning, sec.	60	Max.	3	
			Unaffected portion, mm	50	Min.	372	
<b>5 IMPROVED FIRE PERFORMANCE TESTS (For Cat-FR &amp; FR-LSH)</b>							
a)	Oxygen Index Test, % (Cl.10.5) (For FR & FR-LSH)	IS 10810(Pt-58)-1984	Insulation	29	Min.	31.5	
b)	Temperature Index, °C at oxygen Index 21 (Cl.10.7) (For FR & FR-LSH)	IS 10810(Pt-64)-1984	Insulation	250	Min.	315	
c)	Halogen Acid Gas Evolution, % by wt. (Cl.10.6) (For FR-LSH)	IS 10810(Pt-59)-1984	Insulation	20	Max.	17.5	
d)	Smoke Density Rating, % (Cl. 10.8)	IS 13360 (Pt-6/Sec-9) 2001	Insulation	60	Max.	49.5	

Remarks: The sample conforms to IS 694-2010 with respect to above requirements .

-----End of the Report-----

  
S Rana, Director)  
Authorised Signatory

