

CPRI

TEST REPORT



Central Power Research Institute

(A Govt. of India Society,)

P.B. No.8066, Sadashivanagar Post Office

Prof. Sir.C.V. Raman Road,

Bangalore - 560 080(INDIA)

CENTRAL POWER RESEARCH INSTITUTE



TYPE TEST CERTIFICATE

Test Certificate Number : CPRI BLCAB20T0041 **Date:** 03 March 2020

Name and Address of the Customer : M/s. Jay Industries
"BINTEX HOUSE", Near Rajmoti Industries
Bhavnagar Road, Rajkot,
Gujarat – 360 003, India

Name and Address of the Manufacturer : M/s. Jay Industries
"BINTEX HOUSE", Near Rajmoti Industries
Bhavnagar Road, Rajkot,
Gujarat – 360 003, India

Particulars of sample tested : 450/750V, 1C x 185 sq.mm PVC insulated unsheathed
Flexible Copper Cable

Type : PVC Cable

Description of test sample : Refer Sheet 2 of 7

Serial Number : Nil

Number of Samples tested : One

Date(s) of test(s) : 20 January 2020 to 27 February 2020

CPRI sample Code Number(s) : CDDCAB20S0013

Particulars of tests conducted : Type test (Refer Sheet 3 of 7)

Test in accordance with Standard / Specification : As per IEC - 60227-3: 1997

Sampling Plan : Nil

Customer's requirement : Nil

Deviation, if any : Nil

Name of the witnessing persons

Customer's representative : Nil

Other than Customer's representative : Nil

Test subcontracted with address of the laboratory : None

Document constituting this certificate (in words)

Number of Sheets : Seven

Number of Oscillogram(s) : Nil

Number of Graph(s) : Nil


Number of Photograph(s) : Nil

Number of Test Circuit Diagram(s) : Nil

Number of Drawing(s) : Nil


(P.V. Satheesh Kumar)
Test Engineer




(R. Arunjothi)
Head of Division
Approved By

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DESCRIPTION OF SAMPLE TESTED

(As assigned by the Customer)

Sample	: 450/750V, 1C x 185 sq.mm PVC insulated unsheathed Flexible Copper Cable
Voltage Rating	: 450 / 750 kV
Conductor	: Flexible Copper, Class 5
Size	: 185 sq.mm
Number of cores	: One
Insulation	: PVC (Brown colour)
Printing	: BINTEX FR 1C X 185.00 SQ.MM PVC CABLE 1100 V

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- 1.0 Tests conducted : Type tests (as per below table)
2.0 Rating for which tested : 450 / 750 V
3.0 Schedule of tests

SUMMARY OF TESTS CONDUCTED

Sl. No.	Tests Conducted	Clause Numbers IEC 60227-3, Table 4	Sheet
1.0	Conductor Resistance test	1.1	4 of 7
2.0	Voltage test	1.2	4 of 7
3.0	Insulation Resistance test	1.3	4 of 7
2.0	Overall Dimension	2	4 of 7
2.1	Thickness of Insulation	2.1	4 of 7
2.2	Overall Diameter	2.2	4 of 7
3.0	Mechanical properties of Insulation	3.1 & 3.2	4 of 7
3.1	Tensile Strength and Elongation Before Ageing		4 of 7
3.2	Ageing		4 of 7
3.3	Tensile Strength and Elongation After Ageing		5 of 7
3.4	Variation observed before Ageing		5 of 7
4.0	Loss of Mass test	3.3	5 of 7
5.0	Pressure test at High Temperature	4	5 of 7
6.0	Cold Elongation test	5.2	5 of 7
7.0	Heat shock test	6	5 of 7
8.0	Flame Retardance test	IEC 60332-1	6 of 7


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TEST RESULTS

1.1. CONDUCTOR RESISTANCE TEST:

Resistance, Ω /km at 20° C	
Observed values	Specified value (Maximum)
0.093	0.106

2.0. VOLTAGE TEST:

2.1. Test connection	: Between conductor and water.
2.2. Test Voltage	: 2.5 kV ac
2.3. Duration of test	: 5 minutes
2.4. Ambient Temperature	: 28°C
2.5. Length of Sample	: 10.0 meters
2.6. Result	: Withstood

3.0. INSULATION RESISTANCE TEST:

Observed Insulation Resistance Constant at 70° C, M Ω -km	Specified Insulation Resistance Constant at 70° C, M Ω -km (Minimum)
1.49	0.0029

2.0. OVERALL DIMENSION

2.1. THICKNESS OF INSULATION:

Observed values, mm		Specified values, mm	
Minimum	Average	Minimum	Average
2.34	2.84	1.70	2.00

2.2. OVERALL DIAMETER OF INSULATION:

Observed Diameter, mm	Observed Ovality, %	Specified Diameter, mm	Specified Ovality, % (Maximum)
24.53	2.40	20.6 to 24.9	15.0

3.0. MECHANICAL PROPERTIES OF INSULATION

3.1. TENSILE STRENGTH AND ELONGATION AT BREAK BEFORE AGEING:

Observed values		Specified values (Minimum)	
Tensile strength, N/mm ²	Elongation at break, %	Tensile strength, N/mm ²	Elongation at break, %
15.95	225.20	12.5	125

3.2. AGEING:

Sample	Temperature	Duration
Dumbell Specimens	80 \pm 2 ° C	168 Hours


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3.3. TENSILE STRENGTH AND ELONGATION AT BREAK AFTER AGEING:

Observed values		Specified values (Minimum)	
Tensile strength, N/mm ²	Elongation at break, %	Tensile strength, N/mm ²	Elongation at break, %
15.77	209.00	12.5	125

3.4. VARIATION OBSERVED FROM BEFORE AGEING:

Observed variation, %		Specified variation, % (Maximum)	
Tensile strength	Elongation at break	Tensile strength	Elongation at break
-1.16	-7.19	± 20	± 20

4.0. LOSS OF MASS TEST:

Sample	Temperature	Duration	Observed, mg/cm ²	Specified, mg/cm ² (maximum)
Dumb-bell specimens	80 ± 2° C	168 hours	0.27	2.0

5.0. PRESSURE TEST AT HIGH TEMPERATURE:

Treatment	Temperature	Duration
	80 ± 2° C	4 hours

Hot Deformation (Depth of indentation), %	
Observed values	Specified value (Maximum)
13.42	50

6.0. COLD ELONGATION TEST:

Temperature	-15 ± 2° C
Observed elongation, %	Specified elongation, % (Minimum)
77.5	20.0

7.0. HEAT SHOCK TEST:

Treatment	Temperature	Duration
	150 ± 2° C	1 hour

Visual Examination	
Observation	Specified
No cracks or scales observed	No signs of cracks or scales to be observed


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8.0. FLAME RETARDANCE TEST:

Diameter of cable : 29.69 mm
Duration of Flame Applied : 120 seconds

	Observed, mm	Specified, mm
Distance from the lower edge of the top support to the upper onset of charred portion	285	50 (Minimum)
Distance from the lower edge of the top support to the lower onset of charred portion	495	540 ((Maximum)

Conclusion: The sample tested complies with the requirement of IEC 60227-3: 1997 for the tests conducted.

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NOTE

- a) The Test results relate only to the sample(s) tested.
- b) Publication or reproduction of the Test Report / Test Certificate in any form other than by complete set of the whole Test Report / Test Certificate and in the language written is not permitted without the written consent of CPRI.
- c) Any Corrections/erasure invalidates the Test Report / Test Certificate
- d) NABL has accredited this laboratory as per ISO / IEC17025-2017 standard, vide certificate no.TC-5452 for the tests carried out.
- e) Any anomaly/discrepancy in the Test Report / Test Certificate should be brought to the notice of CPRI within 45 days from the date of issue.


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Test Engineer