

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



CPRI

Type Test Certificate Number	: CPRI BLRCAB20T0002 Date: 17 January 2020
Name and Address of the Customer	: M/s. National Cables Industry P.O.Box : 27472 Al Sajja, Industrial Area Al Dhaid Road, Near Sharjah Cement Factory Sharjah, UAE
Name and Address of the Manufacturer	: M/s. National Cables Industry P.O.Box : 27472 Al Sajja, Industrial Area Al Dhaid Road, Near Sharjah Cement Factory Sharjah, UAE
Particulars of Sample Tested	: 6.35/11(12) kV, 3C x 300 sq.mm. Copper conductor XLPE Insulated, PE Sheathed, Armoured Cable
Type	: CU/XLPE/LAT/SWA/PE
Description of test sample	: Refer Sheet 2 of 16
Serial Number	: Nil
Number of Samples tested	: One only
Date(s) of test(s)	: 19 November 2019 to 13 January 2020
CPRI sample Code Number	: CDDCAB19S0215
Particulars of tests conducted	: Type test (Refer Sheet 3 of 16)
Test in accordance with	
Standard/ Specification	: As per IEC 60502 -2:2014 & DEWA Spec 1.5.1.3.4.03 Rev 1.
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 Type test Certificate (in words)	
Number of Sheets	: Sixteen
Number of Oscillogram(s)	: Twelve (3 Sheets)
Number of Graph(s)	: Nil
Number of Photograph(s)	: Nil
Number of Test Circuit Diagram(s)	: Nil
Number of Drawing(s)	: One


(Thirumurthy)
Test Engineer




(R. Arunjothi)
Head of Division
Approved By

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DISCRIPTION OF SAMPLE TESTED

(Rating as assigned by the Customer)

Sample	:	11 kV XLPE Cable
Voltage Rating	:	6.35/11 kV
Conductor	:	Copper, Round Stranded. Compacted water tight (with water swellable tapes)
Size	:	300 sq.mm
Number of cores	:	Three
Conductor screen	:	Extruded Bonded Semi-Conductive
Insulation	:	XLPE Extruded
Insulation screen	:	Extruded Semi-Conductive (Strippable)
Longitudinal Water barrier	:	Semi-conductive Water Swellable Tape
Metallic screen	:	Copper Wires + an Open HELIX Copper Tape
Radial Water Barrier	:	PE Laminated aluminium Tape
Primary Sheath	:	Extruded Polyethylene (PE)
Assembly/Fillers	:	Polypropylene String Fillers
Binding Tape	:	Polypropylene Tape(s)
Inner Sheath	:	Extruded Polyvinyl chloride (PVC- ST2)
Armour	:	Galvanised Steel Round Wires
Outer sheath	:	Extruded Polyethylenene (PE-ST7) Black with Graphite Powder coating
Embossing	:	DEWA ELECTRIC CABLE 11000 V ,3 X 300 SQMM, CU/XLPE/LAT/PVC/SWA/PE IEC 60502-2,NATIONAL CABLES INDUSTRY, SHARJAH,UAE,RFX : 2051900021 2019

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SUMMARY OF TESTS CONDUCTED

1. Tests conducted : Type tests
2. Rating for which tested : 6.35/11 (12) kV
3. Schedule of tests :

Sl. No.	Tests	IEC 60502-2 Clause Number	Sheet No.
1.0	TESTS ON CONDUCTOR		
1.1	Conductor Resistance test	16.2	5 of 16
1.2	Conductor Examination	17.4	5 of 16
2.0	TESTS ON ARMOUR (ROUND WIRE)		
2.1	Dimensions	13.4	5 of 16
2.2	No of Armour wires	Customer Requirement	5 of 16
2.3	Mass of Zinc coating		5 of 16
3.0	TESTS ON INSULATION		
3.1	Test for Thickness of Insulation, Eccentricity of Insulation	19.2	5 of 16
3.2	Tensile Strength and Elongation at Break	19.5	6 of 16
3.3	Additional Ageing test (Compatibility Test)	19.7	6 of 16
3.4	Water Absorption Test	19.15	7 of 16
3.5	Shrinkage Test	19.18	7 of 16
3.6	Hot Set Test	19.13	7 of 16
4.0	TESTS ON SEMICONDUCTING SCREEN		
4.1	Test for Thickness of Semiconducting Screen	18.2.10	8 of 16
4.1.1	Resistivity of Semiconducting Screens (Before Ageing)		
4.1.2	Resistivity of Semiconducting Screens (After Ageing)		
4.2	Strippability Test for Insulation Screen	19.23	8 of 16
5.0	TESTS ON NON METALLIC PE OVER SHEATH		
5.1	Thickness	19.3	8 of 16
5.2	Tensile Strength and Elongation at Break	19.6	9 of 16
5.3	Additional Ageing test (Compatibility Test)	19.7	9 of 16
5.4	Pressure Test at High Temperature	19.9	9 of 16
5.5	Shrinkage Test	19.22	9 of 16
5.6	Carbon black content Test	19.17	10 of 16
6.0	TESTS ON NON METALLIC PVC SEPARATION SHEATH		
6.1	Thickness	19.3	10 of 16
6.2	Tensile Strength and Elongation at Break	19.6	10 of 16
6.3	Additional Ageing test (Compatibility Test)	19.7	10 of 16
6.4	Pressure Test at High Temperature	19.9	11 of 16
6.5,6.6	Cold Impact Test, Cold Elongation Test	19.10	11 of 16
6.7	Loss of Mass Test	19.8	11 of 16
6.8	Heat Shock Test	19.11	11 of 16
7.0	WATER PENETRATION TEST	19.24	12 of 16


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Sl. No.	Tests	IEC 60502-2 Clause Number	Sheet No.
8.0	ELECTRICAL TESTS		
8.1	Bending Test	18.2.4	13 of 16
8.2	Partial Discharge Test	18.2.5	13 of 16
8.3	Tan Delta Measurement	18.2.6	13 of 16
8.4,8.5	Heating Cycle Test followed by partial discharge Test	18.2.7	13 & 14 of 16
8.6,8.7	Impulse test followed by a Voltage Test	18.2.8	14 & 15 of 16
8.8	Voltage Test for 4 Hours	18.2.9	15 of 16
9.0	CONCLUSION		15 of 16

4. Oscillograms Numbers : 1,10,12,21,23,32,34,43,45,54,56,65

5. Drawing Numbers

The manufacturer has guaranteed that the sample submitted for the test(s) has been manufactured in accordance with the following drawings.

Sl. No.	Drawing Number	Sheet Number	Revision Number
1	NCI – 3 X 300 – CU -11- CW -LAT	--	1

It is verified that these drawings adequately represent the sample tested. Verification of this drawing by CPRI is limited to dimensional check only wherever possible

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TEST RESULTS

1.0. TESTS ON CONDUCTOR

1.1 Conductor Resistance Test:

Sl. No.	Core Identification	Resistance, Ω/km at 20 ⁰ C	
		Observed values	Specified value (maximum)
1.	Red	0.05948	0.0601
2.	Yellow	0.05954	
3.	Blue	0.05956	

1.2. CONDUCTOR EXAMINATION:

Sl. No.	Core Identification	No. of wires in conductor	
		Observed	Specified (Minimum)
1.	Red	61	34
2.	Yellow	61	
3.	Blue	61	

2.0. TESTS ON ARMOUR (GALVANISED STEEL ROUND WIRE)

2.1. Dimensions:

Type	Observed, Diameter mm	Specified Diameter, mm
Round Wire	3.15	3.15

2.2. No of Armour Wires

Observed	Declared
82	78

2.3. Mass of Zinc coating:

Observed g/m^2	Declared g/m^2
289	275

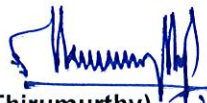
3.0. TESTS ON INSULATION

3.1. Test for Thickness of Insulation:

Sl. No.	Core Identification	Observed values, mm		Specified values, mm	
		Minimum	Average	Minimum	Average
1.	Red	3.483	3.570	2.96	3.40
2.	Yellow	3.472	3.612		
3.	Blue	3.472	3.549		

3.1.1. Eccentricity of Insulation:

Sl. No.	Core Identification	Observed, %	Specified, % (Maximum)
1.	Red	5.07	15
2.	Yellow	4.93	
3.	Blue	5.06	


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3.2. Tensile Strength and Elongation at Break

3.2.1. Before Ageing:

Sl. No.	Core Identification	Observed values		Specified values (minimum)	
		Tensile strength, N/mm ²	Elongation at break, %	Tensile strength, N/mm ²	Elongation at break, %
1.	Red	19.85	404.50	12.5	200
2.	Yellow	18.70	436.00		
3.	Blue	18.50	418.00		

3.2.2. Ageing:

Sample	Temperature	Duration
Dumb- bell Specimens	135 ± 3 °C	168 Hours

3.2.3. After Ageing:

Sl. No.	Core Identification	Observed values	
		Tensile Strength, N/mm ²	Elongation at break, %
1.	Red	17.74	399.50
2.	Yellow	16.82	432.00
3.	Blue	19.32	399.00

3.2.4. Variation Observed From Before Ageing:

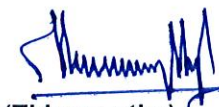
Sl. No.	Core Identification	Observed variation, %		Specified variation, % (maximum)	
		Tensile strength	Elongation at break	Tensile strength	Elongation at break
1.	Red	-10.66	-1.24	± 25	± 25
2.	Yellow	-10.06	-0.92		
3.	Blue	4.42	-4.55		

3.3. Additional Ageing (Complete Cable):

Sample	Temperature	Duration
Complete cable piece	100 ± 2 °C	168 Hours

3.3.1. After Ageing:

Sl. No.	Core Identification	Observed values	
		Tensile strength, N/mm ²	Elongation at break, %
1.	Red	17.39	416.65
2.	Yellow	17.84	415.00
3.	Blue	17.91	438.00


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3.3.2. Variation Observed From Before Ageing:

Sl. No.	Core Identification	Observed variation, %		Specified variation, % (Maximum)	
		Tensile strength	Elongation at break	Tensile strength	Elongation at break
1.	Red	-12.40	3.00	± 25	± 25
2.	Yellow	-4.57	-4.82		
3.	Blue	-3.19	4.78		

3.4. Water Absorption Test: (Gravimetric)

Treatment		Temperature	Duration
		85 ± 2 °C	14 days
Sl. No.	Core Identification	Water absorbed, mg/cm ²	
		Observed values	Specified Value (Maximum)
1.	Red	0.02	1.0
2.	Yellow	0.04	
3.	Blue	0.03	

3.5. Shrinkage Test:

Treatment		Temperature	Duration
		130 ± 3°C	1 hour
Sl. No.	Core Identification	Shrinkage, %	
		Observed values	Specified value (maximum)
1.	Red	0.88	4.0
2.	Yellow	1.17	
3.	Blue	0.79	

3.6. Hot Set Test:

Treatment		Temperature : 200 ± 3°C, Time under load : 15 minutes Mechanical stress : 20 N/cm ²			
Sl. No.	Core Identification	Observed values, %		Specified values, % (maximum)	
		Hot set elongation	Permanent set elongation	Hot set elongation	Permanent set elongation
1.	Red	75.08	2.08	175	15
2.	Yellow	61.76	1.89		
3.	Blue	52.44	2.57		


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4.0. TEST ON SEMICONDUCTING SCREEN:

4.1. Test for Thickness of Semiconducting Screens:

Sl. No.	Core Identification	Observed Nominal values, mm		Observed minimum values, mm	
		Insulation screen	Conductor screen	Insulation screen	Conductor screen
1.	Red	1.532	1.391	1.315	1.245
2.	Yellow	1.385	1.363	1.194	1.173
3.	Blue	1.408	1.224	1.226	1.126

4.1.1. Resistivity of Semiconducting Screens (Before Ageing):

Sl. No.	Core Identification	Observed, Ω -m		Specified, Ω -m (Maximum)	
		Insulation screen	Conductor screen	Insulation screen	Conductor screen
1.	Red	9.014	1.200	500	1000
2.	Yellow	5.634	0.960		
3.	Blue	4.389	0.845		

4.1.2. Resistivity of Semiconducting Screens (After Ageing):

Sl. No.	Core Identification	Observed, Ω -m		Specified, Ω -m (Maximum)	
		Insulation screen	Conductor screen	Insulation screen	Conductor screen
1.	Red	3.182	1.212	500	1000
2.	Yellow	2.952	1.289		
3.	Blue	2.963	1.095		

4.2. Strippability Test for Insulation Screen:

Sl. No.	Core Identification	Force required to remove 10 mm strip of Insulation screen from the insulation			
		Observed Values		Specified Values	
		Unaged Sample	Aged sample		
1.	Red	12.13	11.67	Between 4 N to 45 N	
2.	Yellow	12.83	9.17		
3.	Blue	15.15	13.42		

5.0. TESTS ON NON METALLIC OVER SHEATH (PE ST7):

5.1. Thickness:

Observed, mm		Specified, mm	
Nominal	Minimum	Nominal	Minimum
4.25	4.10	3.70	2.76

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5.2. Tensile Strength and Elongation at Break

5.2.1. Before Ageing:

Observed		Specified (Minimum)	
Tensile strength, N/mm ²	Elongation at Break, %	Tensile strength, N/mm ²	Elongation at Break, %
17.92	618.50	12.5	300.0

5.2.2. Ageing:

Sample	Temperature	Duration
Dumb- bell Specimens	110 ± 2 ° C	240 Hours

5.2.3. After Ageing:

Observed		Specified
Tensile strength, N/mm ²	Elongation at break, %	Elongation at break, % (Minimum)
17.51	500	300.0

5.3. Complete Cable Ageing:

Sample	Temperature	Duration
200 mm of Complete cable	100 ± 2 ° C	168 Hours

5.3.1. After Complete Cable Ageing:

Observed		Specified
Tensile strength, N/mm ²	Elongation at break, %	Elongation at break, % (Minimum)
17.35	675	300.0

5.4. Pressure Test at High Temperature:

Temperature	Duration
110±2 ° C	6 Hours

Indentation, %	
Observed	Specified (Maximum)
2.99	50

5.5. Shrinkage Test:

Temperature	Heating Period	No. of Heating Cycles
80±2 ° C	5 Hours	5

Shrinkage, %	
Observed	Specified (Maximum)
1.80	3.0

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5.6. Carbon Black Content:

Carbon Black Content, %	
Observed	Specified
2.647	2.5 ± 0.5 %

6.0. TESTS ON NON METALLIC PVC SEPARATION SHEATH:

6.1. Thickness:

Observed value, mm		Specified value, mm	
Nominal	Minimum	Nominal	Minimum
2.09	1.92	1.90	1.32

6.2. Tensile Strength and Elongation at Break

6.2.1. Before Ageing:

Observed		Specified (Minimum)	
Tensile strength, N/mm ²	Elongation at Break, %	Tensile strength, N/mm ²	Elongation at Break, %
14.10	252	12.5	150

6.2.2. Ageing:

Sample	Temperature	Duration
Dumb- bell Specimens	100 ± 2 °C	168 Hours

6.2.3. After Ageing:

Observed		Specified (Minimum)	
Tensile strength, N/mm ²	Elongation at break, %	Tensile strength, N/mm ²	Elongation at break, %
13.49	235	12.5	150

6.2.4. Variation Observed From Before Ageing Sample:

Observed variation, %		Specified variation, % (Maximum)	
Tensile strength	Elongation at break	Tensile strength	Elongation at break
-4.34	-6.75	± 25	± 25

6.3. Complete Cable Ageing:

Sample	Temperature	Duration
200 mm of Complete cable	100 ± 2 °C	168 Hours

6.3.1. After Complete Cable Ageing:

Observed		Specified (Minimum)	
Tensile strength, N/mm ²	Elongation at break, %	Tensile strength, N/mm ²	Elongation at break, %
13.10	212	12.5	150


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6.3.2. Variation Observed From Before Ageing Sample:

Observed variation, %		Specified variation, % (Maximum)	
Tensile strength	Elongation at break	Tensile strength	Elongation at break
-7.11	-15.87	± 25	± 25

6.4. Pressure Test at High Temperature:

Temperature	Duration
90±2° C	6 Hours

Indentation, %	
Observed	Specified (Maximum)
23.06	50

6.5. Cold Impact Test:

Temperature : -15±2° C	Mass of hammer: 1500 gms.
------------------------	---------------------------

Visual Examination	
Observation	Specified
No Cracks or scales observed on outer & inner surface	No signs of cracks or scales to be observed on outer & inner surface

6.6. Cold Elongation Test:

Temperature	-15±2° C
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Observed elongation, %	Specified elongation, % (Minimum)
88.80	20.0

6.7. Loss of Mass Test:

Sample	Temperature	Duration	Observed, mg/cm ²	Specified, mg/cm ² (maximum)
Dumb-bell specimens	100 ±2° C	168 hours	0.43	1.5

6.8. Heat Shock Test:

Temperature	Duration
150±3° C	1 Hour

Observed	Specified
No Cracks or any other abnormalities observed	No signs of cracks or scales to be observed


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TEST RESULTS

7.0. WATER PENETRATION TEST:

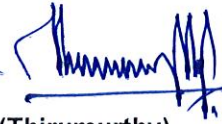
7.1. Bending test:

A six metre length of completed cable was subjected for bending test under the following parameters.

- 7.1.1. Diameter of conductor : 20.50 mm
7.1.2. Diameter of Cable : 100 mm
7.1.3. Diameter of test cylinder : 2400 mm
7.1.4. Number of bending cycles : Three

7.1.5. A three metre long cable was cut from the cable sample which has been subjected to the bending test, all cores removed and placed horizontally. A ring approx. 50 mm wide removed from the centre of the length up to the conductor for two cores (Red and Yellow cores). A suitable water enclosure with tube of 10mm diameter was so arranged as to position the tube vertically above the ring. The enclosure was filled with water so that the water level in the tube was maintained at 1 metre height above the cable axis. The sample was subjected to heating cycle as given below, after allowing it to remain for 24 hours.

- 7.1.6. Length of cable cores : 3 metres each
7.1.7. No. of heating cycles : 10
7.1.8. Total Duration of heating cycle : 8 hours
7.1.9. Heating period after attaining Temperature : 2 hours
7.1.10. Temperature of the Conductor during heating cycle : 95 - 100 °C
7.1.11. Duration of cooling : 3 hours
7.1.12. Result: No traces of water were observed at the ends of the sample during the test and after the test



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8.0. ELECTRICAL TESTS:

The following electrical tests were carried out in the order of sequence

8.1. Bending Test:

- 8.1.1. Outer Diameter of conductor : 20.50 mm
8.1.2. Outer Dia. Of Cable : 100 mm
8.1.3. Diameter of test cylinder : 2400 mm
8.1.4. Number of bending cycles : Three

8.2. Partial Discharge Test:

- 8.2.1. Length of the sample : 10.90 meters
8.2.2. Sensitivity of the detector : 5 pC
8.2.3. Method of connection : Two ends of the cable were immersed in oil with high voltage applied to the conductor and metallic screen grounded.
8.2.4. Measuring voltage (1.73 U₀) : 11 kV ac
8.2.5. Specified discharge magnitude at 1.73U₀ : 5 pC(maximum)
8.2.6. Observed Discharge magnitudes :

Sl. No.	Core Identification	Discharge magnitude, pC
1	Red	Less than 5 pC
2	Yellow	Less than 5 pC
3	Blue	Less than 5 pC

8.3. Tan Delta Measurement as A Function of Temperature:

- 8.3.1. Temperature of the conductor during test : 95° – 100°C
8.3.2. Test Voltage during measurement : 2 kV ac
8.3.3. Specified tan delta at ambient temperature : 0.004(maximum)
8.3.4. Result :

Sl. No.	Core Identification	Tan delta at 95° – 100°C	Capacitance, pF
1	Red	0.000190	4508.2
2	Yellow	0.000115	4511.9
3	Blue	0.000263	4589.1

8.4. Heating Cycle Test:

- 8.4.1. Conductor Temperature during Heating Cycle : 95°C - 100° C
8.4.2. Total Duration of heating cycle : 8 hours
8.4.3. Heating period after attaining Temperature : 2 hours
8.4.4. Natural Cooling Period : 3 hours
8.4.5. Number of heating cycles : 20 only

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8.5. Partial Discharge Test:

- 8.5.1. Length of the sample : 10.90 meters
 8.5.2. Sensitivity of the detector : 5 pC
 8.5.3. Method of connection : Two ends of the cable were immersed in oil with high voltage applied to the conductor and metallic screen grounded.
 8.5.4. Measuring voltage (1.73 U₀) : 11 kV ac
 8.5.5. Specified discharge magnitude at 1.73U₀ : 5 pC(maximum)
 8.5.6. Observed Discharge magnitudes :

Sl. No.	Core Identification	Discharge magnitude, pC
1	Red	Less than 5 pC
2	Yellow	Less than 5 pC
3	Blue	Less than 5 pC

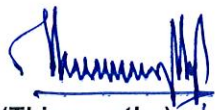
8.6. Impulse Withstand Test:

Test Voltage kV peak	Temperature of Conductor during Test (°C)	Ambient Temperature, °C		No. of Impulses
		Dry Bulb	Wet Bulb	
75	95 - 100	24	20	10 Positive & 10 Negative

Test Connection	The impulse source was connected to the conductor of the particular core of the cable (ends shorted) under test and the screen connected to ground. The conductors of the other two cores of the cable, which were not under test were shorted together with screen and connected to ground.
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Core	Polarity	Shot Number	Oscillogram Number	
Red	Positive	First	1	Withstood
		Tenth	10	
	Negative	First	12	
		Tenth	21	
Yellow	Positive	First	23	Withstood
		Tenth	32	
	Negative	First	34	
		Tenth	43	
Blue	Positive	First	45	Withstood
		Tenth	54	
	Negative	First	56	
		Tenth	65	

(Oscillograms Enclosed)


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8.7. High Voltage Test:

- 8.7.1. Test connection : Between conductor and grounded copper screen & armour
8.7.2. Test Voltage : 22.20 kV ac
8.7.3. Duration of test : Fifteen minutes
8.7.4. Ambient Temperature : 26°C
8.7.5. Length of Sample : 10.90 meters
8.7.6. Result :

Sl. No.	Core Identification	Remarks
1	Red	Withstood
2	Yellow	Withstood
3	Blue	Withstood

8.8. High Voltage Test:

- 8.8.1. Test connection : Between conductor and grounded copper screen & armour
8.8.2. Test Voltage : 25.40 kV ac
8.8.3. Duration of test : Four Hours
8.8.4. Ambient Temperature : 26°C
8.8.5. Length of Sample : 10.90 meters
8.8.6. Result :

Sl. No.	Core Identification	Remarks
1	Red	Withstood
2	Yellow	Withstood
3	Blue	Withstood

9.0. CONCLUSION: The sample tested complies with Type test requirement of IEC 60502-2 – 2014 for the above tests conducted.

(Thirumurthy)
Test Engineer

CENTRAL POWER RESEARCH INSTITUTE

TYPE TEST CERTIFICATE



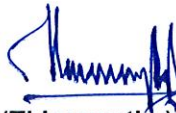
CPRI

Type Test Certificate Number: CPRI/LRCAB20T0002

Date: 17 January 2020

NOTE

- a) The test results relate only to the sample(s) tested.
- b) Publication or reproduction of this 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 / erasures invalidate this Test Report /Test Certificate.
- d) NABL has Accredited this laboratory as per IEC / ISO 17025-2017 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


(Thirumurthy)
Test Engineer

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TYPE TEST CERTIFICATE



Type Test Certificate Number: CPRI BLRCAB20T0002

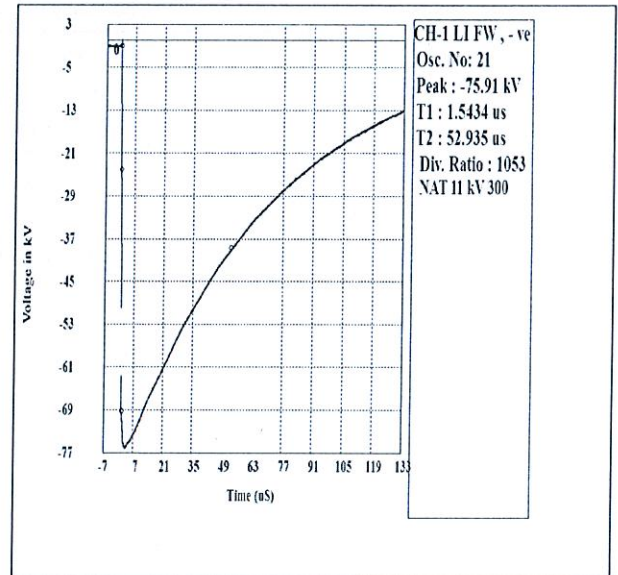
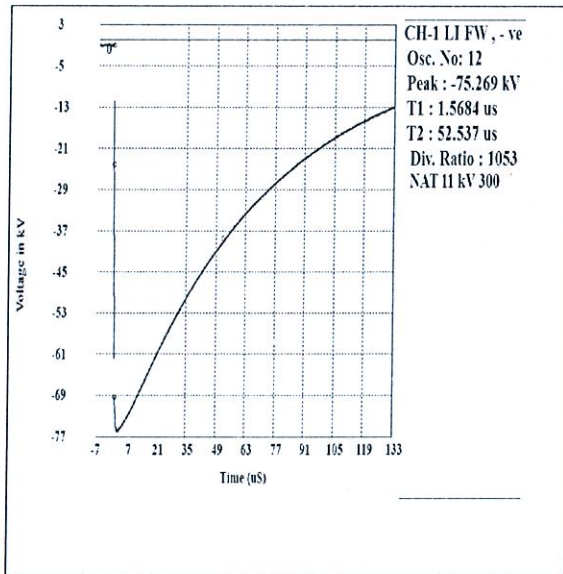
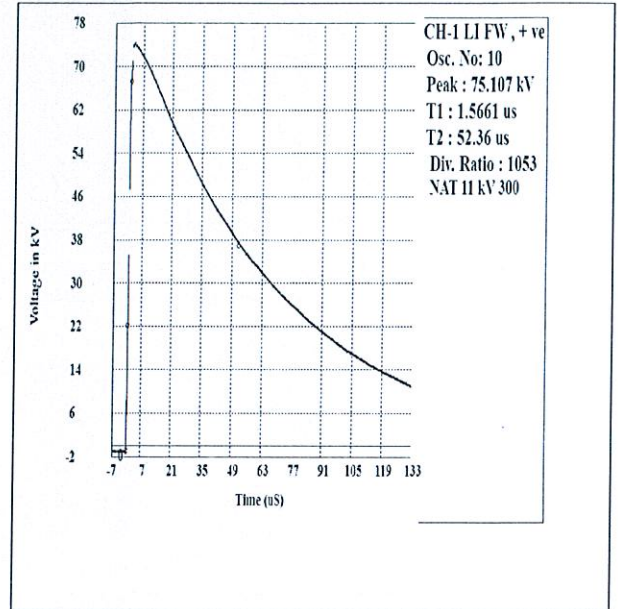
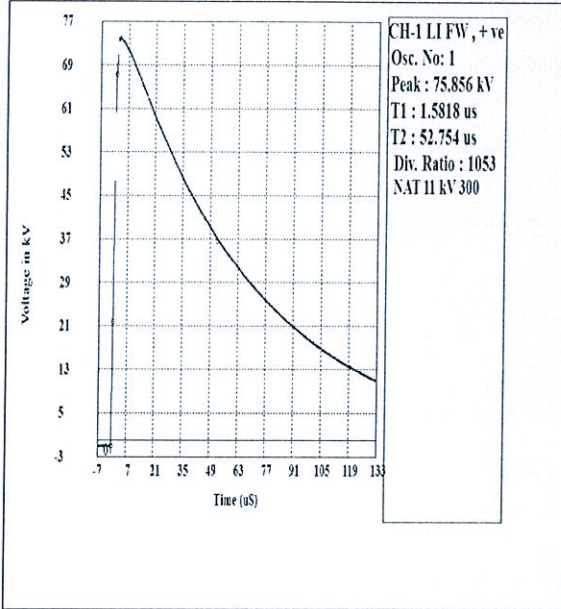
Date: 17 January 2020

CPRI

TEST RESULT

Sample Code: CDDCAB19S0215

Oscillograms: Core Red




(Thirumurthy)
Test Engineer

CENTRAL POWER RESEARCH INSTITUTE

TYPE TEST CERTIFICATE



Type Test Certificate Number: CPRIBLCAB20T0002

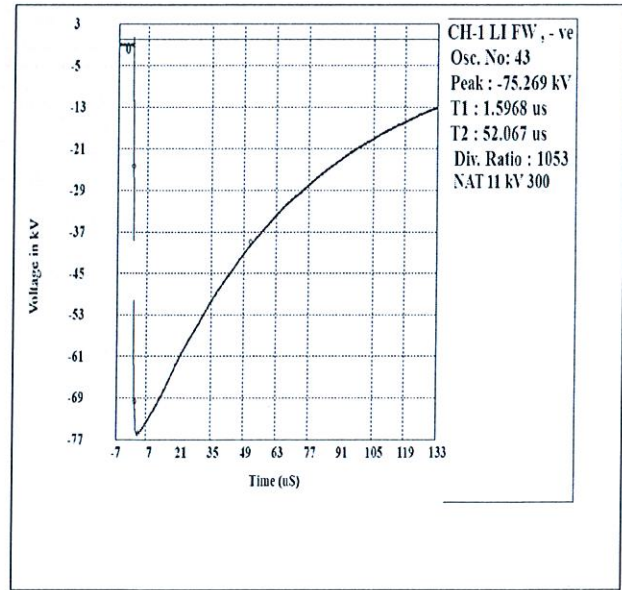
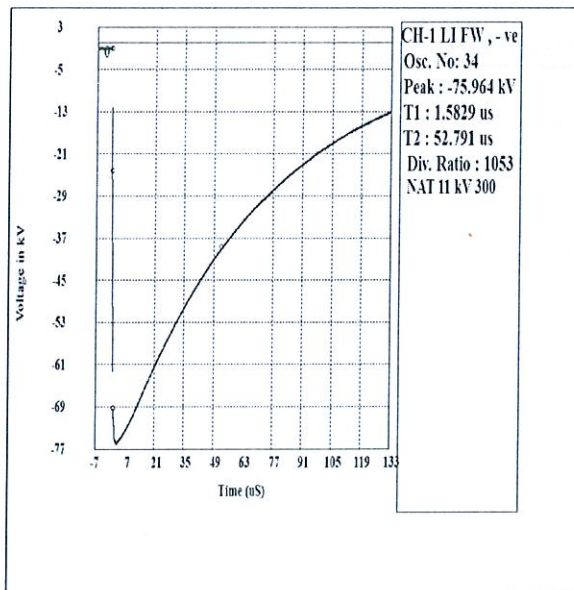
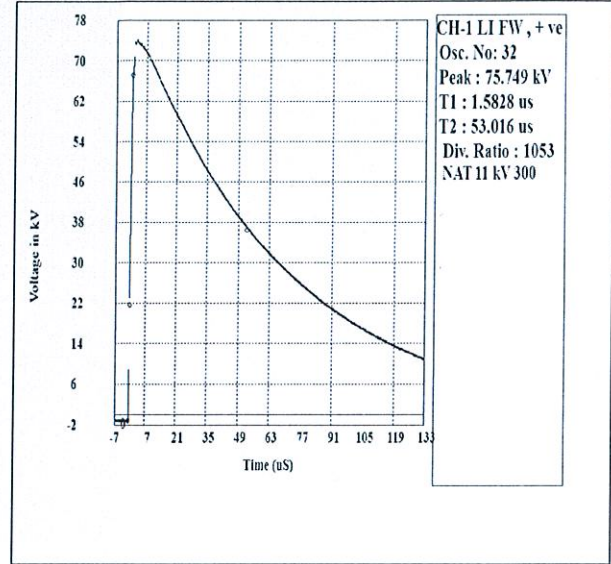
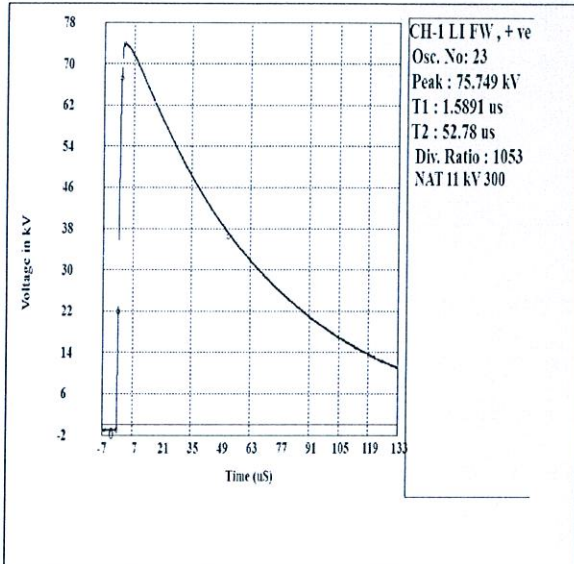
Date: 17 January 2020

CPRI

TEST RESULT

Sample Code: CDDCAB19S0215

Oscillograms: Core Yellow



(Thirumurthy)
Test Engineer

CENTRAL POWER RESEARCH INSTITUTE

TYPE TEST CERTIFICATE



Type Test Certificate Number: CPRIBLRCAB20T0002

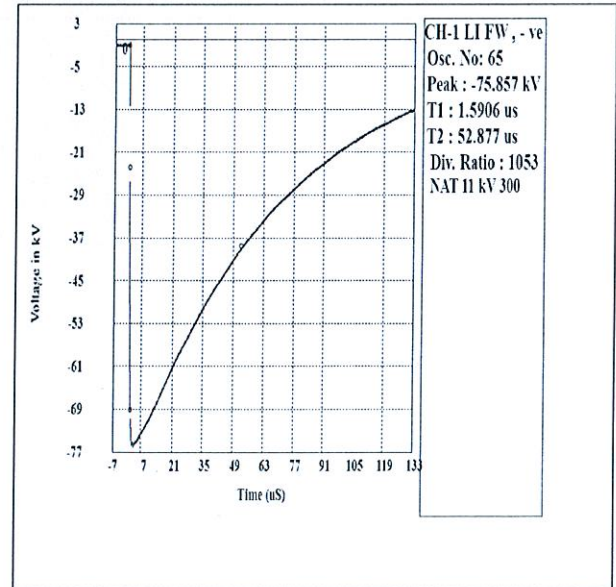
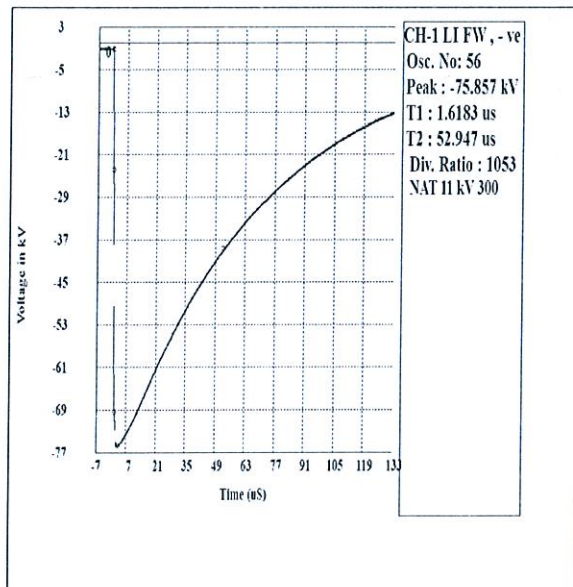
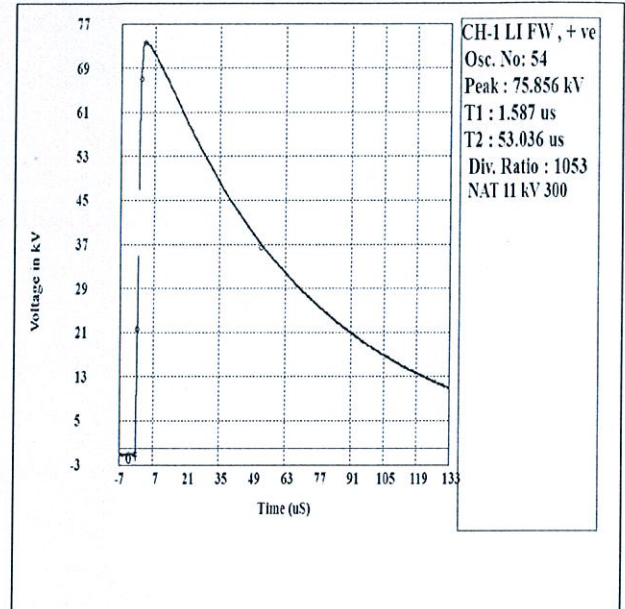
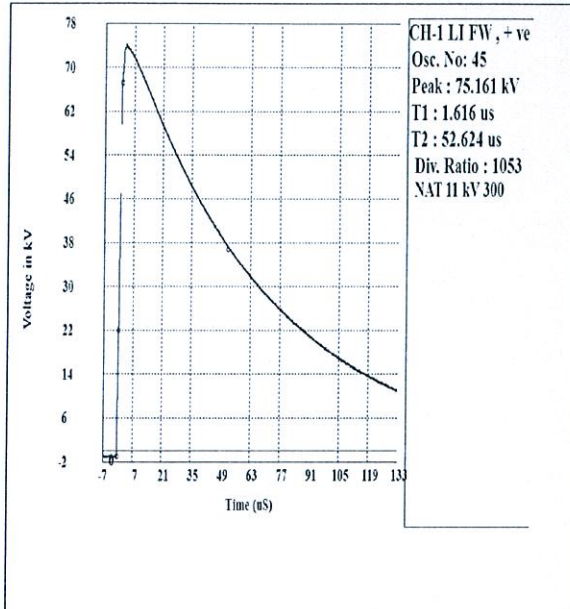
Date: 17 January 2020

CPRI

TEST RESULT

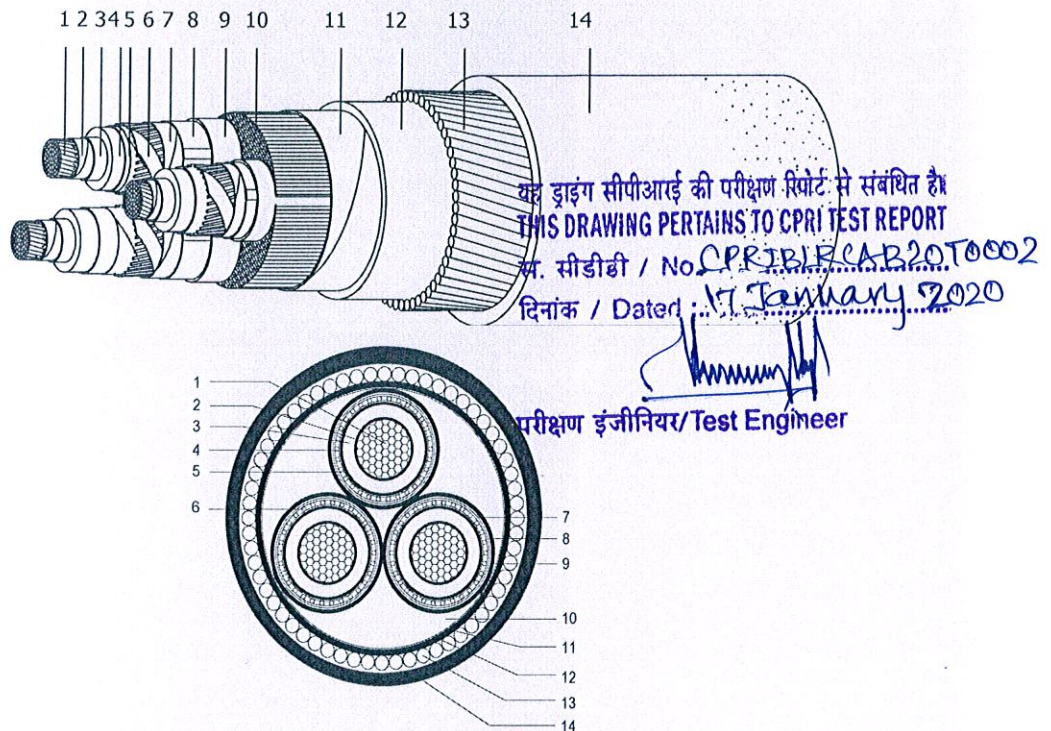
Sample Code: CDDCAB19S0215

Oscillograms: Core Blue



(Thirumurthy)
Test Engineer

DRAWING
3x300 mm² CU/XLPE/LAT/PVC/SWA/PE, 11 kV CABLE



Sl. No	DESCRIPTION	DETAILS	Nom. thick / dia (mm)	Approx. dia (mm)
	Reference Standard	IEC Publication No. 60502-2 & DEWA Specs. 1.5.1.3.4.03-Rev.1		
01	Conductor	Copper, Round Stranded Compacted, Water tight (with water swellable tapes)		20.4
02	Conductor Screen	Extruded semi-conductive compound (Bonded Type)	Min 0.6	22.3
03	Insulation	Extruded Cross-linked Polyethylene (XLPE)	3.4 (Avg.)	29.1
04	Insulation Screen	Extruded semi-conductive compound (Strippable Type)	1.0 (Min.)	31.3
05	Longi. water barrier	Semi-conductive Water Swellable Tape	0.3	32.4
06	Metallic Screen	Copper Wires + an open helix of Copper Tape	0.8	34.0
07	Longi. water barrier	Semi-conductive Water Swellable Tape	0.3	35.1
08	Radial water barrier	PE Laminated Aluminium Tape	0.2	36.0
09	Primary Sheath	Extruded Polyethylene (PE)	1.2	38.4
10	Assembly / Fillers	Polypropylene String Fillers	-	82.9
11	Binding Tape	Polypropylene Tape(s)	0.125	83.3
12	Inner Sheath	Extruded Polyvinyl Chloride (PVC Type- ST2)	1.32 (Min.)	87.1
13	Armour	Galvanized Round Steel Wires (Min: 255 g/m ²)	3.15	93.4
14	Outer Sheath	Extruded Polyethylene (PE Type-ST7) Black with Graphite Powder Coating	2.76 (Min.)	101.0

Embossing on the Outer Sheath in Max 150 mm Spacing along TWO lines equally spaced:
DEWA ELECTRIC CABLE 11000 V, 3x300 SQMM, CU/XLPE/LAT/PVC/SWA/PE
IEC 60502-2, NATIONAL CABLES INDUSTRY, SHARJAH, UAE, 2019

DWG No.: NCI-3x300-CU-11-CW-LAT

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