केन्द्रीय विद्युत अनुसंधान संस्थान
(भारत सरकार की सोसाइटी, विद्युता मंत्रालय)
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CENTRAL POWER RESEARCH INSTITUTE
(A.Govt.of India Society, Ministry of Power)
Prof. Sir C.V. Raman Road, Sadashivanagar Post Office, P.B. No. 8066, Bengaluru - 560 080 India
वेबसइट / website :http://www.cpri.in

CABLES & DIAGNOSTIC DIVISION

CABLES LAB

2/1/CDD/CAB/2022-23 **Dated: 22.07.2022**

M/s. Dynamic Cables Ltd.
A-129, A-129A, A-130, SKS Industrial area,
Reengus, Tehsil Shree Madhopur, Dist., Sikar-332404

विषय/Subject: Test on 38/66 kV (E), 3C X 300 sqmm XLPE Insulated EHV Power Cable System.

महोदय / Dear Sir,

कृपया Test on 38/66 kV (E), 3C X 300 sqmm XLPE Insulated EHV Power Cable With 3M Cold Shrink Termination & Heat Shrinkable Straight through Joint. वृद्धि परीक्षण के संबंध में उपरोक्त पत्रका संदर्भ ग्रहण करें। परीक्षण पूरा किया गया और परीक्षण रिपोर्ट सं **CPRIBLRCAB22T0216,** दिनांक: **21.07.2022** संलग्न पाए।

Kindly refer to above Test on 38/66 kV (E), 3C X 300 sqmm XLPE Insulated EHV Power Cable With 3M Cold Shrink Termination & Heat Shrinkable Straight through Joint, has been completed and the test report bearing No.**CPRIBLRCAB22T0216, Dated: 21.07.2022** is enclosed.

परीक्षण रिपोर्ट में हेरफेर रोकने के लिए, 01.10.2007 से प्रभावी परीक्षण रिपोर्ट)मूल प्रति (के प्रथम पृष्ठ पर होलोग्राम शुरू किया है । In order to prevent tampering of test report, CPRI has introduced hologram on the first page of the test report (Original Copy) with effect from 01.10.2007.

परीक्षण रिपोर्ट में कोई विसंगति पाने पर कृपया परीक्षण रिपोर्ट के प्रेषण की तिथि से 45 दिनों के भीतर ध्यान में लाया जाए । Any discrepancy in the test report may please be brought to the notice within 45 days from the date of dispatch of the test report.

परीक्षण रिपोर्ट की कृपया पावती भेजे ।
Receipt of the test report may please be acknowledged.

सादर /Best Regards,
भवदीय /Yours Sincerely,

(K.P. MEENA)
Joint Director

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

TEST REPORT

CPRI

Test Report Number	:	CPRIBLRCAB22T0216 Date: 21 July 2022
Name and Address of the Customer	:	M/s. Dynamic Cables Ltd. A-129, A-129A, A-130, SKS Industrial area, Reengus, Tehsil Shree Madhopur, Dist., Sikar-332404
Name and Address of the Manufacturer	:	**Cable** ; M/s. Dynamic Cables Ltd. A-129, A-129A, A-130, SKS Industrial area, Reengus, Tehsil Shree Madhopur, Dist., Sikar-332404 **Acesssories:** 3M Electro & Communication India Pvt Ltd, Pune.
Particulars of Sample Tested	:	38/66 kV (E), 3C X 300 sqmm XLPE Insulated EHV Power Cable With 3M Cold Shrink Termination & Heat Shrinkable Straight through Joint
Type	:	A2XCEW2Y
Description of test sample	:	Refer Sheet 2 of 14
Serial Number	:	Drum No: 5533
Number of Samples tested	:	One
Date(s)of test(s)	:	11 May 2022 to 18 July 2022
CPRI sample Code Number	:	CDDCAB22S0048
Particulars of tests conducted	:	Type Test on cable system.
Test in accordance with Standard/ Specification	:	IEC 60840-2011
Sampling Plan	:	Nil
Customer's Requirement	:	Nil
Deviation, if any	:	Heating Cycle Voltage test was conducted with 38 kVac only (Due to 3 core construction with wire armour)
Name of the witnessing persons		
Customer's representative	:	None
Other than Customer's representative	:	None
Test subcontracted with address of the laboratory	:	Nil
Document constituting Test Report (in words)		
Number of Sheets	:	Fourteen
Number of Oscillogram(s)	:	Twelve (Three Sheets)
Number of Graph(s)	:	Nil
Number of Photograph(s)	:	Nil
Number of Test Circuit Diagram(s)	:	Nil
Number of Drawing(s)	:	Three

(Thirumurthy)
Test Engineer



(K.P.Meena)
Head of Division
Reviewed and Authorized By

TEST REPORT

Test Report Number: CPRIBLRCAB22T0216 **Date: 21 July 2022**

CPRI

DISCRIPTION OF SAMPLE TESTED
(Rating as assigned by the Customer)

Sample	:	38/66 kV XLPE Cable System
Cable		
Type of Cable	:	A2XCEW2Y
Rated Voltage	:	38/66 kV (E)
Size	:	300 sq.mm
Number of cores	:	Three
Conductor	:	Compacted Stranded circular Alumjnium (Water Tight) Conductor
Conductor Screen	:	Extruded Semi-Conducting Layer
Insulation	:	TR-XLPE
Insulation Screen	:	Extruded Bonded Semi-Conducting Layer
Moisture Barrier	:	Semi conducting water swellable tape
Metallic Screen	:	Copper tape followed by semiconducting water swellable tape
Fillers	:	PP filler + Water Blocking Yarn
Inner Sheath	:	Extruded PE ST-7 followed by non-conducting water swellable tape
Armour	:	G.I round wire with binder of rubberized cotton tape
Outer sheath	:	Extruded HDPE Type ST-7 followed by graphite coating
Embossing / Printing	:	DYNAMIC CABLES 38/66 KV ELECTRIC CABLE 3CX300 SQ.MM.A2XCEW2Y 2021

Accessories

Terminations		
No of Termination	:	Two Outdoor
Type of Termination	:	Cold Shrink 3M QTEN
Joints		
No of Joints	:	One Straight Through
Type of joint	:	'3MHS' Heat Shrink Straight Through Joint
Manufacture	:	3M Electro & Communication India Pvt Ltd

(Thirumurthy)
Test Engineer

CABLES & DIAGNOSTICS DIVISION
P.B.NO.8066, SADASHIVANAGAR P.O
PROF.SIR.C.V.RAMAN ROAD, BANGALORE - 560 080, INDIA
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TEST REPORT

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SUMMARY OF TESTS CONDUCTED

1. Tests conducted : As per below table
2. Rating for which tested : 38/66 kV
3. Schedule of tests :

Sl. No.	Tests	Clause Number IEC 60840-2011	Sheet
1.0	**TESTS ON CONDUCTOR**		
1.1	Conductor Resistance test	10.5	5 of 14
1.2	Conductor Examination	10.4	5 of 14
2.0	**TESTS ON INSULATION**		
2.1	Test for Thickness of Insulation,	10.6.2	5 of 14
2.1.2	Eccentricity of Insulation		5 of 14
2.2	Tensile Strength and Elongation at Break before & after ageing	12.5.2	5 of 14
2.3	Complete Cable Ageing	12.5.4	6 of 14
2.4	Shrinkage Test	12.5.16	7 of 14
2.5	Hot Set Test	12.5.10	7 of 14
3.0	**TESTS ON SEMICONDUCTING SCREEN**		
3.1	Test for Thickness of Semiconducting Screen	12.4.9	7 of 14
3.2	Resistivity of Semiconducting Screens		
4.0	**TESTS ON OUTER PE ST- 7 OUTER SHEATH**		
4.1	Thickness	10.6.3	8 of 14
4.2	Tensile Strength and Elongation at Break before & after ageing	12.5.3	8 of 14
4.3	Complete Cable Ageing	12.5.4	8 of 14
4.4	Pressure Test at High Temperature	12.5.6	8 of 14
4.5	Shrinkage Test	12.5.17	9 of 14
4.6	Carbon black content	12.5.12	9 of 14
5.0	**TEST ON ARMOUR**		
5.1	Dimension	10.6.2	9 of 14
6.0	**TESTS ON INNER SHEATH**		
6.1	Dimension	10.6.3	9 of 14
7.0	**WATER PENETRATION TEST**	12.5.14	9 of 14

(Thirumurthy)
Test Engineer

Sl. No.	Tests	Clause Number IEC 60840-2011	Sheet
8.0	ELECTRICAL TESTS		
8.1	Bending Test	12.4.3	10 of 14
8.2	Partial Discharge Test	12.4.4	10 of 14
8.3	Tan Delta Measurement	12.4.5	10 of 14
8.4	Measurement of capacitance	10.10	10 of 14
8.5	Heating Cycle Voltage Test	12.4.6	11 of 14
8.6	Partial Discharge Test at Ambient Temperature	12.4.4	11 of 14
8.7	Partial Discharge Test at Elevated Temperature		11 of 14
8.8	Lightning Impulse Voltage Test	12.4.7	12 of 14
8.9	Power Frequency Voltage Test	12.4.7	12 of 14
8.10	Water immersion and Heat Cycling	12.4.2(g)	13 of 14
8.11	DC Voltage test	12.4.2(g)	13 of 14
8.12	Visual Examination after electrical type tests	12.4.8	13 of 14
9.0	CONCLUSION		13 of 14

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	DCL/21-22/001	--	--
2	C066E311	1 OF 1	00
3	HS66E301	1 OF 1	00

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 Engineer

CENTRAL POWER RESEARCH INSTITUTE

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TEST RESULTS

1.0. TESTS ON CONDUCTOR:

1.1. Conductor Resistance Test:

Sl. No.	Core Identification	Resistance in Ω/Km at 20⁰ C	
		Observed values	Specified Value(Max)
1	Red	0.0995	0.100
2	Yellow	0.0996	
3	Blue	0.0994	

1.2. Conductor examination test:

Sl. No.	Core Identification	Number of Wires in Conductor	
		Observed values	Specified value(Min)
1	Red	61	30
2	Yellow	61	
3	Blue	61	

2.0. TESTS ON INSULATION:

2.1. Test for Thickness of insulation

Sl. No	Core Identification	Observed Values(mm)		Specified Values(mm)	
		Minimum	Nominal	Minimum	Nominal
1	Red	10.863	11.309	9.90	11
2	Yellow	10.725	11.309		
3	Blue	10.803	11.228		

2.1.2. Eccentricity of Insulation:

Sl. No.	Core Identification	Eccentricity	
		Observed values	Specified value(Max)
1	Red	7.793	15.0 %
2	Yellow	9.886	
3	Blue	8.920	

2.2. Tensile Strength and Elongation at Break

2.2.1. Before Ageing:

Sl. No	Core Identification	Observed Values		Specified Values(Min)	
		Tensile Strength N/mm²	Elongation at Break (%)	Tensile Strength N/mm²	Elongation at Break (%)
1.	Red	17.15	548.8	12.5	200
2.	Yellow	17.19	518.5		
3.	Blue	17.24	558.5		

(Thirumurthy)
Test Engineer

TEST REPORT

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TEST RESULTS

2.2.2. Ageing:

Sample	Temperature	Duration
Dumb- bell Specimens	135 ±3 ^{0} C	168 hours

2.2.3. After Ageing:

Sl. No	Core Identification	Observed Values	
		Tensile Strength N/mm^2	Elongation at Break (%)
1.	Red	18.50	520.5
2.	Yellow	18.14	538.5
3.	Blue	18.47	565.0

2.2.4. Variations Observed From Before Ageing Samples:

Sl. No	Core Identification	Observed % Variations		Specified % Variations (Max)	
		Tensile Strength (%)	Elongation at Break (%)	Tensile Strength (%)	Elongation at Break (%)
1.	Red	7.86	-5.16	± 25	± 25
2.	Yellow	5.52	3.86		
3.	Blue	7.12	1.16		

2.3. Completed Cable Ageing:

Sample	Temperature	Duration
200 mm of completed Cable	100 ± 2 ^{0} C	168 Hours

2.3.1. Tensile Strength & Elongation at Break after completed cable ageing:

Sl. No	Core Identification	Observed Values	
		Tensile Strength N/mm^2	Elongation at Break (%)
1.	Red	17.49	510.5
2.	Yellow	17.81	506.0
3.	Blue	17.79	504.5

2.3.2. Variations Observed from Before Ageing Samples

Sl. No	Core Identification	Observed % Variations		Specified % Variations (Max)	
		Tensile Strength (%)	Elongation At Break (%)	Tensile Strength (%)	Elongation at Break (%)
1.	Red	1.97	-6.98	±25	± 25
2.	Yellow	3.62	-2.41		
3.	Blue	3.23	-9.67		

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Test Engineer

TEST RESULTS

2.4. Shrinkage Test:

Temperature	Duration
130 ±3 Deg.C	Six hours

Sl. No	Core Identification	Shrinkage in Percentage (%)	
		Observed values	Specified Value(Max)
1.	Red	0.80	4.5
2.	Yellow	1.10	
3.	Blue	1.05	

2.5. Hot Set Test:

Sl. No.	Core Identification	Observed Values (%)		Specified Values (Max) (%)	
		Hot set Elongation at 200^0 C	Permanent set Elongation	Hot set Elongation at 200^0 C	Permanent set Elongation
1.	Red	59.7	1.0	175	15
2.	Yellow	57.9	1.0		
3.	Blue	59.6	0.9		

3.0 TESTS ON SEMICONDUCTING SCREEN:

3.1.1 Test for Thickness of conductor Semiconducting screen:

Sl. No.	Core Identification	Observed Values(mm)		Specified Values(mm)	
		Minimum	Nominal	Minimum	Nominal
1.	Red	1.320	1.415	0.80 mm	--
2.	Yellow	1.337	1.393		
3.	Blue	1.220	1.382		

3.1.2. Test for Thickness of insulation Semiconducting screen

Sl. No	Core Identification	Observed Values(mm)		Specified Values(mm)	
		Minimum	Nominal	Minimum	Nominal
1.	Red	1.124	1.204	0.80 mm	--
2.	Yellow	1.171	1.209		
3.	Blue	1.210	1.315		

3.2. Resistivity of Semiconducting Screens

3.2.1. Resistivity of Semiconducting Insulation Screen

Sl. No	Core Identification	Resistivity of insulation screen in Ω-m at 90^0 C			
		Observed Values		Specified Value (max)	
		Unaged Sample	Aged sample	Unaged sample	Aged sample
1.	Red	1.869	3.738	500	500
2.	Yellow	1.816	3.446		
3.	Blue	1.672	3.590		

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TEST RESULTS

3.2.2. Resistivity of Semiconducting Conductor Screen

Sl. No	Core Identification	Resistivity Of Conductor Screen In Ω-M At 90^0 C			
		Observed Values		Specified Value (Max)	
		Unaged Sample	Aged sample	Unaged Sample	Aged Sample
1.	Red	0.470	1.224	1000	1000
2.	Yellow	0.482	1.287		
3.	Blue	0.491	1.360		

4.0 TESTS ON OUTER SHEATH:

4.1. Thickness of HDPE Outer Sheath

Observed Values in mm (Minimum)	Specified Values in mm (Minimum)
4.06	3.0

4.2. Tensile Strength and Elongation at Break:

4.2.1. Before Ageing:

Tensile Strength in N/mm^2		Elongation at break (%)	
Specified (Min)	Observed	Specified(Min)	Observed
12.5	16.45	300.0	576.5

4.2.2. Ageing:

Sample	Temperature	Duration
Dumb-bell specimens	110 ± 2 ^{0}C	240 Hours

4.2.3. After Ageing:

Observed Tensile Strength in N/mm^2	Elongation at break (%)	
	Specified(Min)	Observed
17.70	300.0	591

4.3. Additional Ageing (Completed Cable Ageing):

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

4.3.1. After Completed Cable Ageing:

Observed Tensile Strength in N/mm^2	Elongation at break (%)	
	Specified(Min)	Observed
17.33	300.0	575.4

4.4. Pressure Test at High Temperature:

Temperature (Deg.C)	Duration	Hot Deformation, %	
		Observed value	Specified value (maximum)
110 ± 2 ^{0}C	6 hours	4.00	50.0

(Thirumurthy)
Test Engineer

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TEST RESULTS

4.5. Shrinkage Test:

Sample length	Test temperature	Duration of Heating	Number of Heating cycles	Percentage Shrinkage (%)	
				Observed	Specified (Max)
500 mm	80 ± 2 ^{0} C	5 hours	Five	0.7	3 %

4.6 Carbon Black Content Test:

Observed	Specified (Max)
2.65	2.5 ± 0.5 %

5.0. TESTS ON ARMOUR

5.1. Dimension

Observed Diameter Nominal in mm	Specified Diameter Nominal in mm
4.00	4.00

6.0. TESTS ON INNER SHEATH

6.1. Dimension

Observed (mm)		Specified (mm)	
Average mm	Min mm	Average mm	Min mm
2.58	2.35	--	1.50

7.0. WATER PENETRATION TEST:

7.1. Bending test:

An eight metre length of completed cable was subjected for bending test under the following parameters.

7.1.1. Outer dia of conductor : 20.73 mm
7.1.2. Outer dia. Of Cable : 124.48 mm
7.1.3. Diameter of test cylinder : 2200 mm
7.1.4. Number of bending cycles : Three

7.2. A six metre long cable was cut from the cable sample which has been subjected to the bending test, cores were separated and placed horizontally. A ring approx. 50 mm wide was removed from the centre of the length of the cores, up to the conductor. A suitable water enclosure with tube of 10 mm 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 core axis. The cores were subjected to heating cycle as given below, after allowing it to remain for 24 hours.

7.2.1. Length of cable(core) : 6 metres
7.2.2. No. of heating cycles : 10
7.2.3. Duration of heating : 8 hours
7.2.4. Temperature of the Conductor during heating cycle : 95 - 100 ^{0}C
7.2.5. Duration of cooling : 16 hours
7.2.6. Result : No traces of water were observed at the ends of the sample during the test and after the test

(Thirumurthy)
Test Engineer

TEST RESULTS

8.0. ELECTRICAL TESTS:

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

8.1. BENDING TEST

8.1.1. Outer dia of conductor : 20.73 mm
8.1.2. Outer dia. Of cable : 124.48 mm
8.1.3. Diameter of test cylinder : 2200 mm
8.1.4. Number of bending cycles : Three

The cable was provided with 3M cold shrinkable outdoor terminations and a Heat Shrink straight through joint. Then the sample was subjected to the following tests.

8.2. PARTIAL DISCHARGE TEST:

8.2.1. Length of the sample : 16.95 metres
8.2.2. Sensitivity of the detector : 5 pC
8.2.3. Status of the sample : Cable with cold shrink Terminations & a Heat Shrink straight through joint
8.2.4. Method of connection : High voltage applied to test conductor, metallic screen & armour Grounded
8.2.5. Pre stressed voltage for 10 sec (1.75 Uo) : 67 kV ac
8.2.6. Measuring voltage (1.5 Uo) : 57 kV ac
8.2.7. Specified discharge magnitude at 1.5 Uo (Max) : 5 pC
8.2.8. Observed Discharge magnitudes:

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

8.3. TAN DELTA MEASUREMENT:

8.3.1. Temperature of Conductor during Measurement : 95 to 100 °C
8.3.2. Test Voltage : 38 kV ac
8.3.4. Specified tan delta at Uo (Max) absolute : 0.0010
8.3.5. Observed tan delta at Uo absolute :

Sl. No.	Core Identification	Tan delta (Absolute Value)
1.	Red	0.000233
2.	Yellow	0.000250
3.	Blue	0.000262

8.4. MEASUREMENT OF CAPACITANCE:

8.4.1 Ambient Temperature : 28 °C
8.4.2 Test Voltage : 38 kV ac
8.4.3 **Observed Capacitance at Uo**

Sl. No	Core Identification	Capacitance in µF/km	
		Observed values	Declared Value(Max)
1.	Red	0.1970	0.202 µF/km
2.	Yellow	0.1970	
3.	Blue	0.1974	

(Thirumurthy)
Test Engineer

TEST RESULTS

8.5. HEATING CYCLE VOLTAGE TEST:

8.5.1. Voltage applied : 38 kV ac
8.5.2. Duration of heating cycle voltage test : 24 hours
8.5.3. Duration of heating period : 8 Hours
8.5.4. Duration of natural cooling period : 16 Hours
8.5.5. Temperature of the conductor during heating cycle : 95-100 ^{0}C
8.5.6. Total number of heating cycle test : 20
8.5.7. Result : Withstood

8.6. PARTIAL DISCHARGE TEST AT AMBIENT TEMPERATURE:

8.6.1. Length of the sample : 16.95 meters
8.6.2. Sensitivity of the detector : 5 pC
8.6.3. Status of the sample : Cable with cold Shrink Terminations & a Heat Shrink Straight through joint
8.6.4. Method of connection : High voltage applied to test conductor, metallic screen & armour Grounded
8.6.5. Pre stressed voltage for 10 sec (1.75 Uo) : 67 kV ac
8.6.6. Measuring voltage (1.5 Uo) : 57 kV ac
8.6.7. Specified discharge magnitude at 1.5 Uo (Max) : 5 pC
8.6.8. Ambient Temperature : 26 °C
8.6.9. Observed Discharge magnitudes at ambient temperature:

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

8.7. PARTIAL DISCHARGE TEST AT ELEVATED TEMPERATURE:

8.7.1. Length of the sample : 16.95 meters
8.7.2. Sensitivity of the detector : 5 pC
8.7.3. Status of the sample : Cable with cold Shrink Terminations & a Heat Shrink Straight through joint
8.7.4. Method of connection : High voltage applied to test conductor, metallic screen & armour Grounded
8.7.5. Pre stressed voltage for 10 sec (1.75 Uo) : 67 kV ac
8.7.6. Measuring voltage (1.5 Uo) : 57 kV ac
8.7.7. Specified discharge magnitude at 1.5 Uo (Max) : 5 pC
8.7.8. Temperature of conductor during test : 95 to 100 Deg.C
8.7.9. Observed Discharge magnitudes at elevated temperature:

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

(Thirumurthy)
Test Engineer

CPRI

TEST REPORT

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TEST RESULTS

8.8. LIGHTNING IMPULSE VOLTAGE TEST:

Test Voltage kV peak	Temperature of Conductor during Test(^{0}C)	Ambient Temperature (^{0}C)		No. of Impulses
		Dry Bulb	Wet Bulb	
325	95-100	26	24	10 Positive & 10 Negative

Test Connection	The impulse source was connected to the conductor of the particular core (ends shorted) under test and metallic screen & armour connected to ground. The conductors of the other two cores which were not under test were shorted together with metallic screen and armour connected to ground
Test Result	The three cores of cable withstood ten positive and ten negative polarity lightning impulse voltage applications of 325 kV peak.

Core	Polarity	Shot Number	Oscillogram Number
Red	Positive	First	1
		Tenth	10
	Negative	First	12
		Tenth	21
Yellow	Positive	First	23
		Tenth	32
	Negative	First	34
		Tenth	43
Blue	Positive	First	45
		Tenth	54
	Negative	First	56
		Tenth	65

(OSCILLOGRAMS ENCLOSED)

8.9. POWER FREQUENCY VOLTAGE TEST:

8.9.1 Test connection : High voltage connected to conductor metallic screen & armour grounded
8.9.2 Test Voltage : 95 kV ac
8.9.3 Duration of test : Fifteen minutes
8.9.4 Ambient Temperature : 25 ^{0}C
8.9.5 Length of Sample : 16.95 metres
8.9.6 Result

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

(Thirumurthy)
Test Engineer

TEST RESULTS

8.10. Water immersion and Heat Cycling

The Joint Assembly was cut after all electrical test & immersed inside the water to a depth of not less than 1 metre at the highest point of the outer protection. Then the samples was subjected to heating/cooling cycles as given below

Temperature of Water during Heating Cycle	: 70 to 75 Deg.C
Duration of Heating Period after attaining temperature	: 5 Hours
Total No. of Cycles	: Twenty

On Completion of Heating cycles and with the test assembly still immersed, voltage tests are carried out as follows.

8.11. DC Voltage Test:

8.11.1. Test Voltage	: 25 kV dc
8.11.2. Duration	: One Minute
8.11.3 Ambient Temperature	: 26°C
8.11.4. Test Connection	: Between the metallic sheath and the earthed exterior of the joint outer Protection
8.11.5. Test Result	: Withstood

8.12. Visual Examination of Cable, Terminations & joint after completing electrical type tests:
No abnormalities observed to cable and its accessories to affect the performance

9.0. CONCLUSION: The Cable system consisting of cable, two outdoor termination and one straight through joint submitted meets the customer requirement for the above tests conducted.

(Thirumurthy)
Test Engineer

Test Report Number: CPRIBLRCAB22T0216 **Date: 21 July 2022**

CPRI

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) 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

----------**End of Test Report**----------

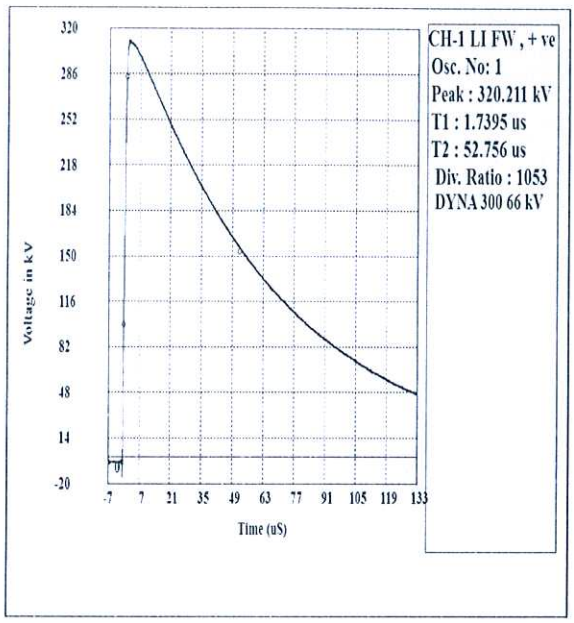
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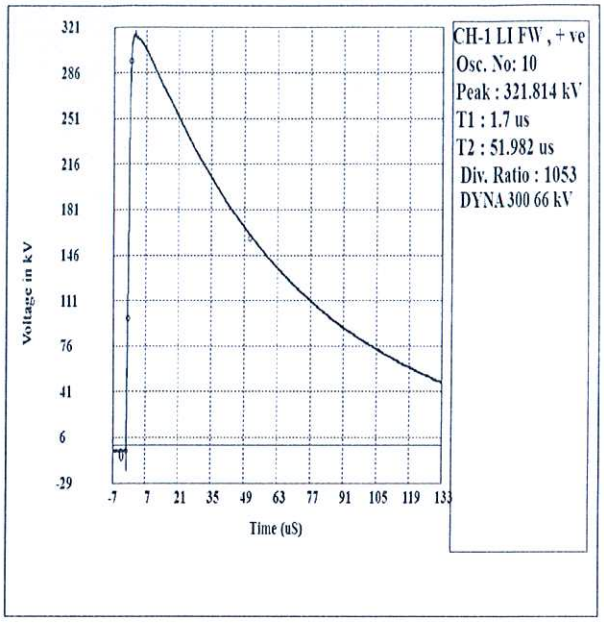
TEST REPORT

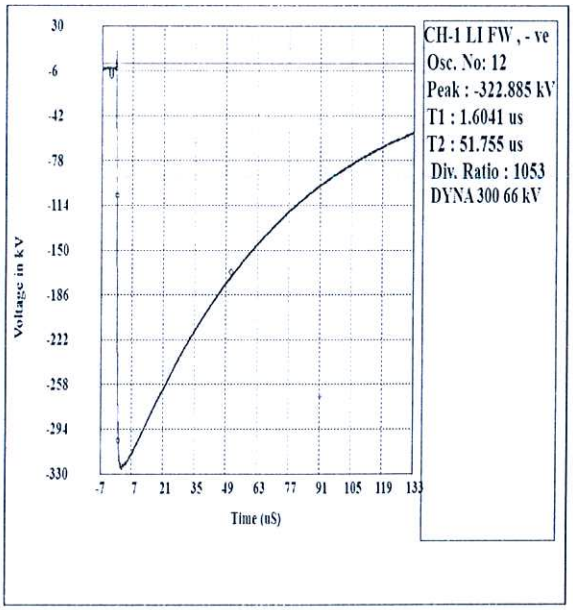
Test Report Number: CPRIBLRCAB22T0216 **Date: 21 July 2022**

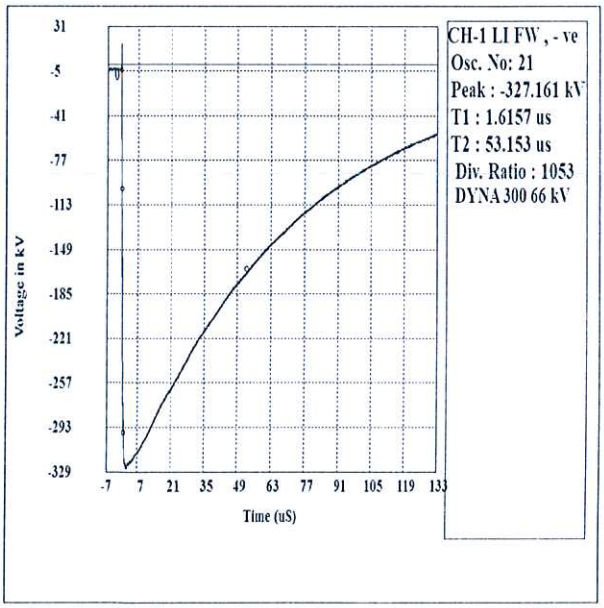
TEST RESULT

Sample Code: CDDCAB22S0048
Oscillograms: Red









(Thirumurthy)
Test Engineer

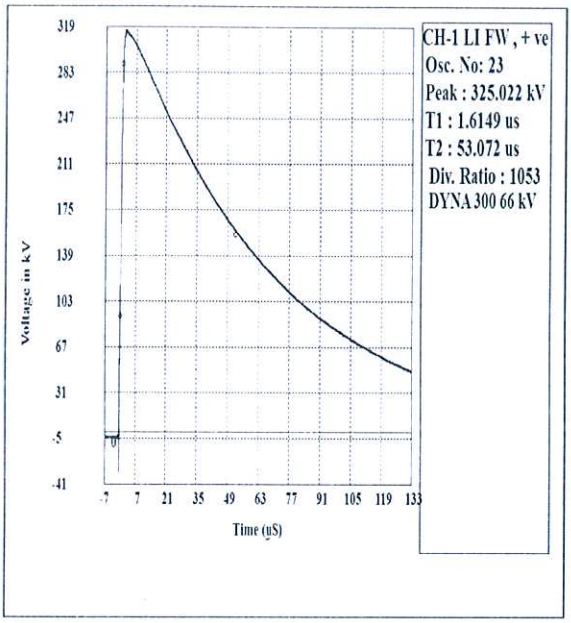
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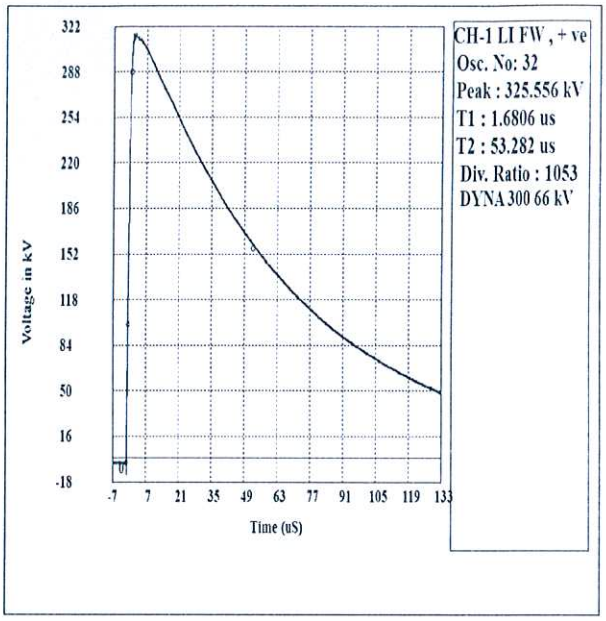
TEST REPORT

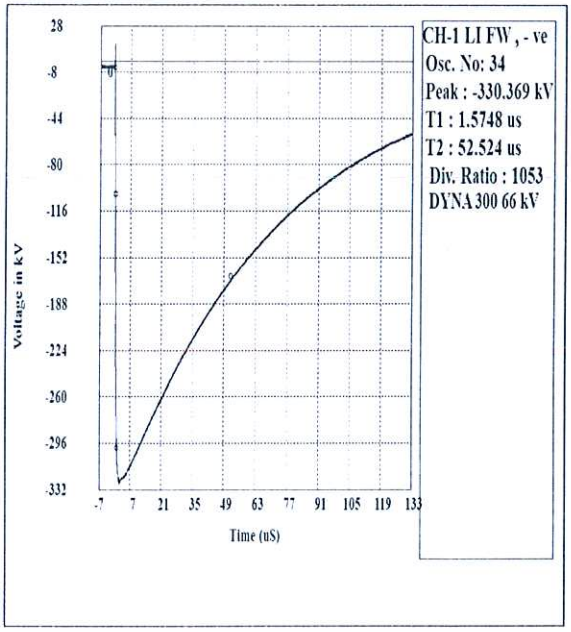
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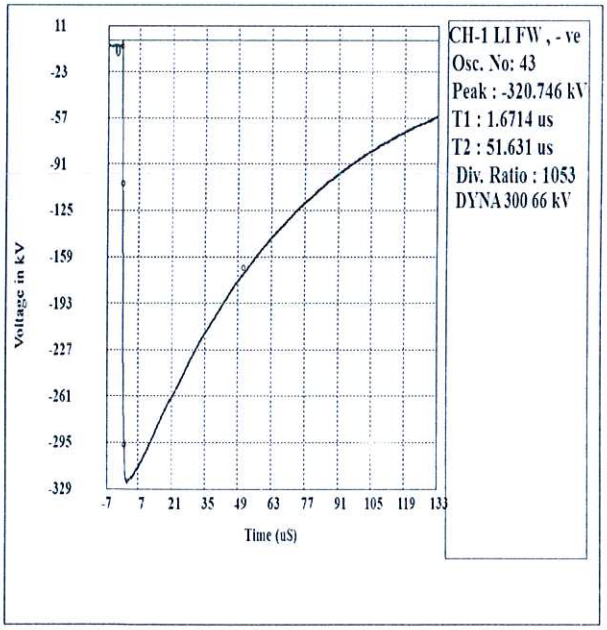
TEST RESULT

Sample Code: CDDCAB22S0048
Oscillograms: Yellow









(Thirumurthy)
Test Engineer

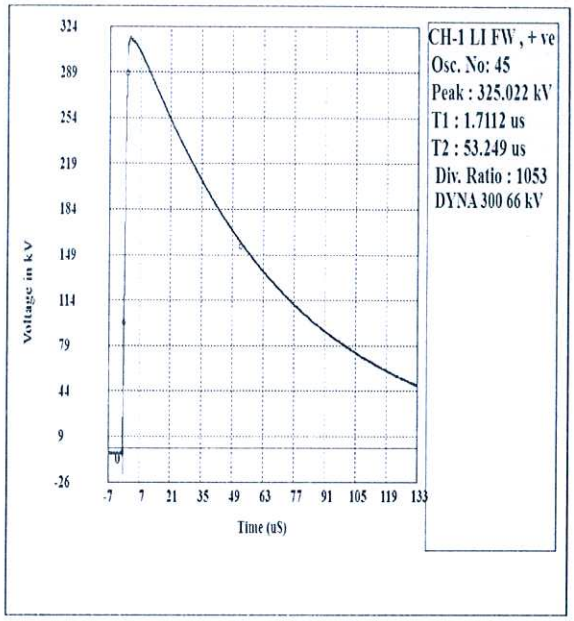
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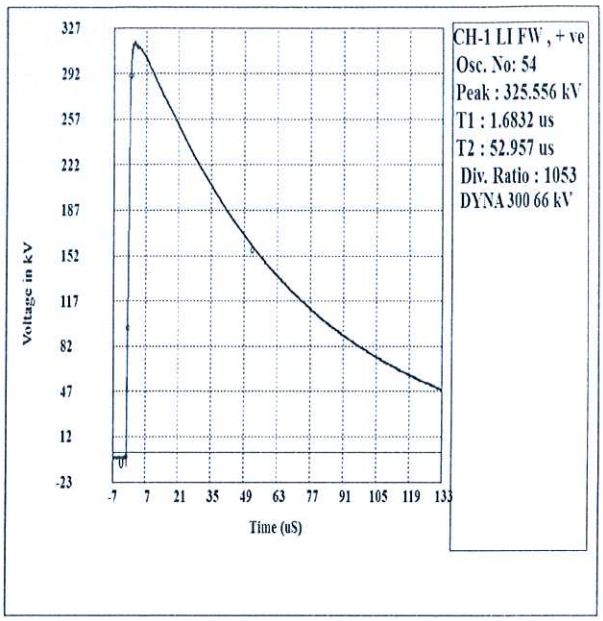
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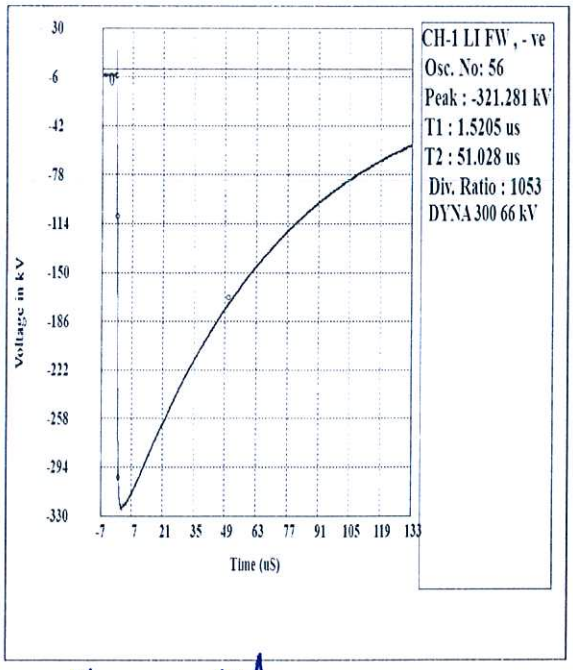
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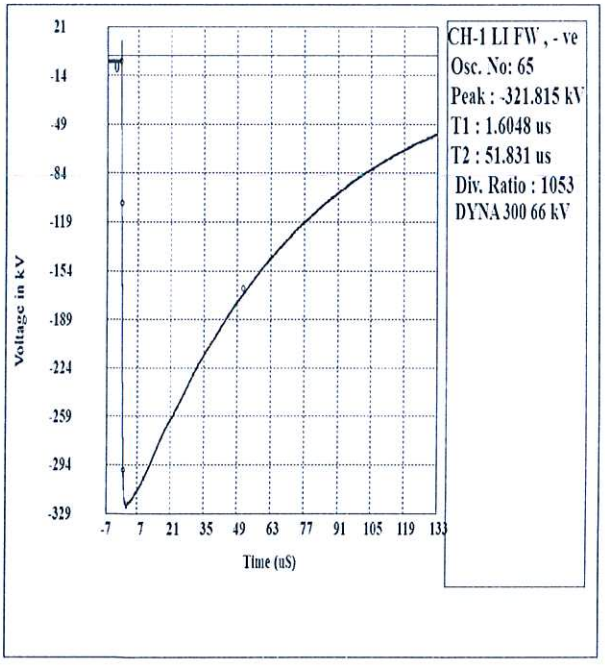
TEST RESULT

Sample Code: CDDCAB22S0048
Oscillograms: Blue







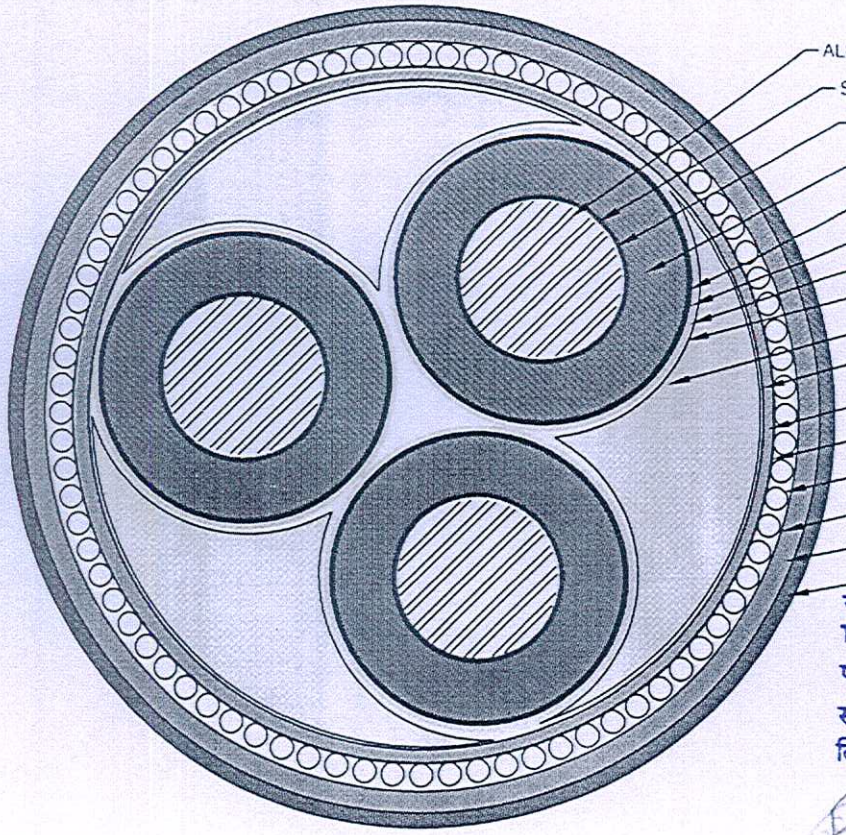


(Thirumurthy)
Test Engineer

CONSTRUCTIONAL DRAWING OF 38/66KV 3CX300 SQ.MM HT XLPE INSULATED POWER CABLE

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1. ALUMINIUM WATER TIGHT CONDUCTOR
2. SEMI CONDUCTING WATER SWELLABLE TAPE
3. CONDUCTOR SCREEN
4. TR-XLPE INSULATION
5. INSULATION SCREEN
6. SEMI CONDUCTING WATER SWELLABLE TAPE
7. COPPER TAPE SCREEN
8. SEMI CONDUCTING WATER SWELLABLE TAPE
9. PP FILLER + WATER BLOCKING TAPE
10. POLYSTER BINDER TAPE
11. PE ST-7 INNER SHEATH
12. NON CONDUCTING WATER SWELLABLE TAPE
13. ARM. GI WIRE
14. RUBBERISED COTTON TAPE
15. HDPE OUTER SHEATH
16. GRAPHITE COATING

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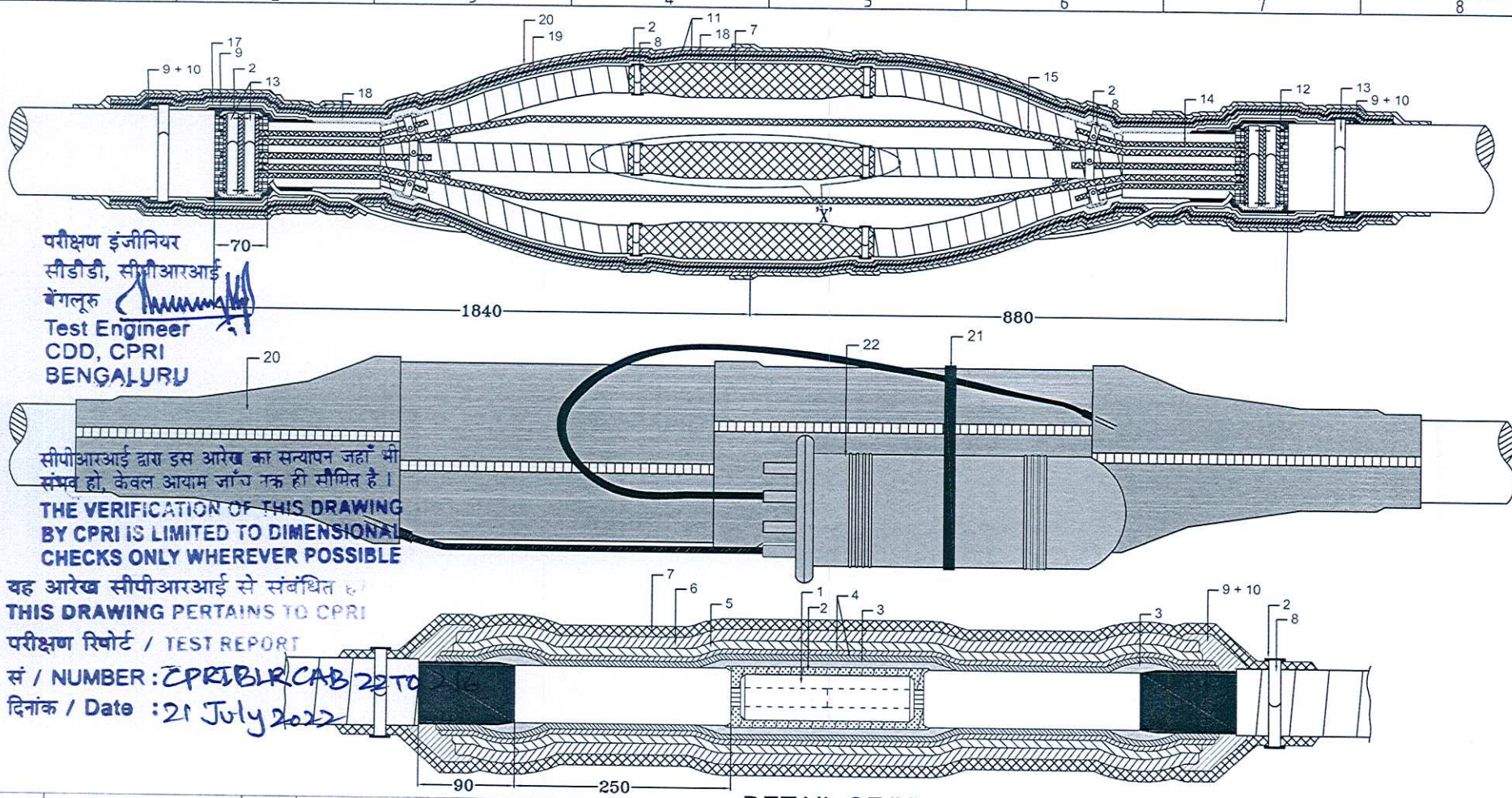
परीक्षण इंजीनियर
सीडीडी, सीपीआरआई
बेंगलूरु
Test Engineer
CDD, CPRI
BENGALURU

DESIGN BY	FAIZ CHISHTY	38/66KV 3CX300 SQMM HT XLPE INSU. POWER CABLE
APPROVED BY	GAURAV AGARWAL	
DRAWING NO.	DCL/21-22/001	DYNAMIC CABLES LTD. JAIPUR
DATE	09.09.2021	
SCALE	N.T.S	

For Dynamic Cables Limited

S. Kedam
Asst. Vice President (Mktg.)

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Test Engineer
CDD, CPRI
BENGALURU

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DETAIL OF 'X'

Sr. No.	Item Description	Sr. No.	Item Description	Sr. No.	Item Description
1	Connector	12	Backup Ring/ Collet	23	Branch Clip (In case of cable with OFC)
2	Scotch 13 Tape	13	Worm Drive Clip/ Constant Force Spring	24	Cable Cleaning Pad
3	Stress Grading Mastic	14	Small Tinned Copper Braid	25	Cleaning Liquid
4	Stress Control Tube	15	Tinned Copper Braid	26	Cleaning Cloth
5	Red Dual Layer Tube	16	Scotch 13 Tape	27	Ruler
6	Tri Layer Tube	17	Insulating Tube	28	Al. Oxide Cloth
7	Tinned Copper Wire Mesh	18	GI Wire Mesh	29	Nylon String
8	Contant Force Spring	19	2229i Sealing Mastic roll	30	Copper Binding Wire
9	Sealing Mastic	20	Wraparound Tube	31	Silicone Grease
10	Vinyl Tape	21	Cable Tie	32	Plastic Gloves
11	Tartan Tape	22	FO Closure (In case of cable with OFC)	33	Instruction Manual

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PIMPRI, PUNE-411018.

DIVISION: 31

MATERIAL. AS STATED

SUPERSEDES OLD ISSUE DTD. --------

TITLE :
General Assembly Drawing for 3M Heat Shrink Straight Through Joint for 66 kV 3Cx300 sqmm. Al./Cu conductor, XLPE Insulated, Armoured/Unarmoured cable with/without inbuilt FO cable

TYPE:- '3MHS' Straight Through Joint

	BY	SIGN	DATE
DRN.	P.K.C.		22.06.22
CHD.	P.P.I.		22.06.22
APPD.	P.P.I		22.06.22

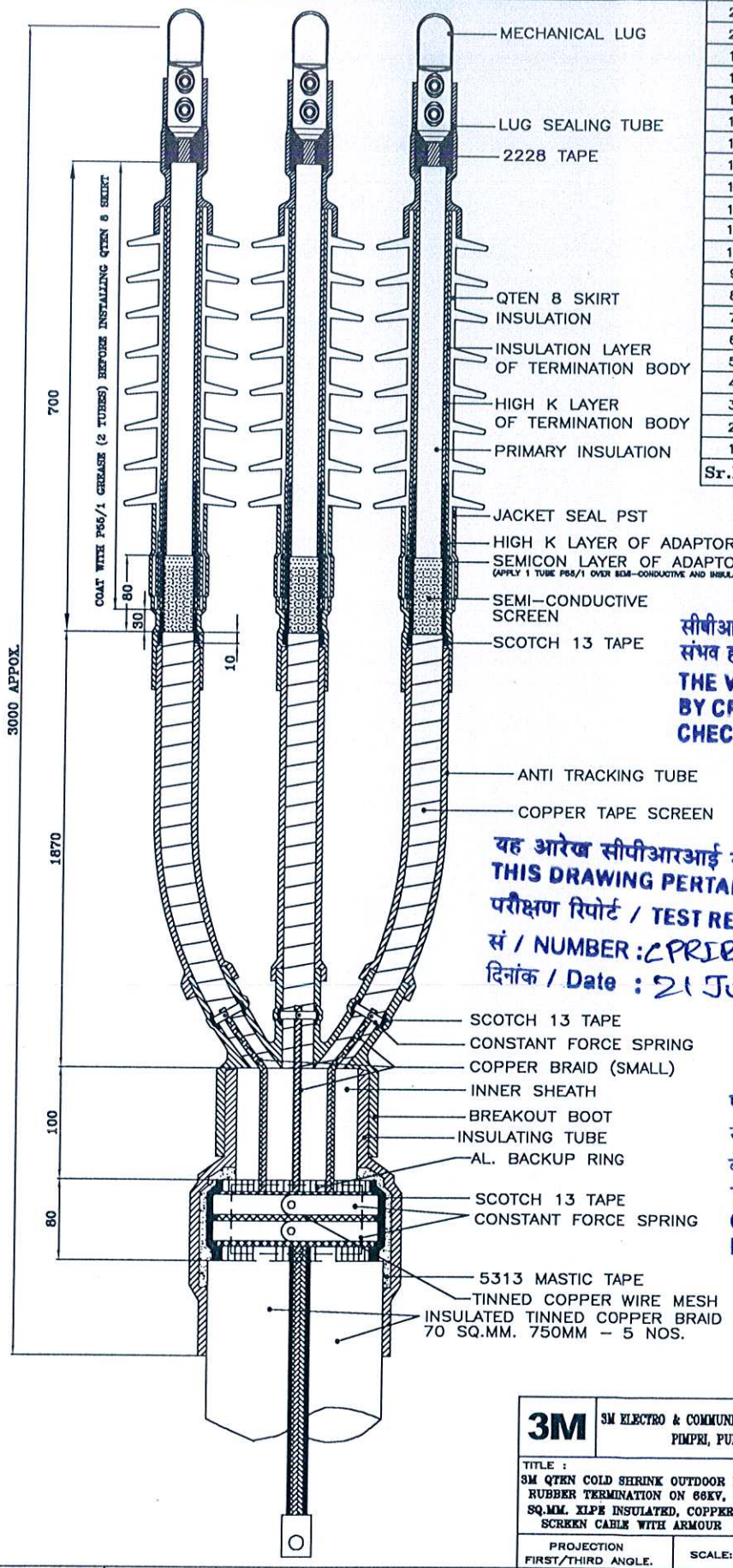
DATE OF RELEASE 22.06.2022

ISSUE NO. 1 | REV. NO. 0

PROJECTION FIRST/THIRD ANGLE. | SCALE: – NTS | SHEET NO. 1 OF 1

DRAWING NO. HS66E301

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Sr.No.	KIT CONTENTS
21	INSTRUCTION SHEET
20	AL. BACKUP RING
19	BREAKOUT BOOT
18	TINNED COPPER WIRE MESH
17	TINNED COPPER BRAID (SMALL)
16	INSULATED TINNED COPPER BRAID
15	MECHANICAL LUG
14	P55/1 GREASE TUBE
13	CLEANING LIQUID
12	AL. OXIDE CLOTH
11	NYLON STRING
10	CABLE TIE
9	5313 MASTIC
8	CONSTANT FORCE SPRING
7	2228 MASTIC TAPE
6	SCOTCH 13 TAPE
5	LUG SEALING TUBE
4	INSULATING TUBE
3	ANTI TRACKING TUBE
2	SEALING PST
1	QTEN 8 SKIRT

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सं / NUMBER : CPRIBLRCAB2270216
दिनांक / Date : 21 July 2022

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बेंगलूरु
Test Engineer
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3M	3M ELECTRO & COMMUNICATION INDIA PVT. LTD. PIMPRI, PUNE-411018.			DIVISION 31	MATERIAL AS STATED
					SUPERSEDES OLD ISSUE DTD.
TITLE : 3M QTEN COLD SHRINK OUTDOOR MOULDED RUBBER TERMINATION ON 66KV, 3CX300 SQ.MM. XLPE INSULATED, COPPER TAPE SCREEN CABLE WITH ARMOUR		BY	SIGN	DATE	DATE OF RELEASE 28.09.2019
		DRN.	P.K.C.	28.09.19	
		CHD.	P.P.I.	28.09.19	ISSUE NO. 1 REV. NO. 0
		APPD.	P.P.I.	28.09.19	
PROJECTION FIRST/THIRD ANGLE.	SCALE:– NTS	SHEET NO. 1 OF 1			DRAWING NO. C066E311

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