



GUJARAT ENERGY TRANSMISSION
CORPORATION LTD.
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TECHNICAL SPECIFICATIONS
OF
11 / 22 KV XLPE POWER CABLE
FOR
SUB-STATION

GETCO/E/TS– PCBL025/R2 DT. Feb 2023

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TECHNICAL SPECIFICATION FOR 11 / 22 kV XLPE POWER CABLE (CROSS LINKED POLYTHELENE DRY GAS CURED)

SECTION – I

1.1 SCOPE:

1.1.1 This Section of the Specification covers design, manufacturing, testing, packing, supply & delivery of 11 / 22 kV (E), XLPE Insulated, Dry/gas cured power cable for effectively earthed system.

1.2 STANDARDS:

1.2.1 Unless otherwise specified, the cable shall conform in all respect to IS: 7098 (Part-II)- 2011 amended up to date.

1.3 CLIMATIC CONDITIONS:

1.3.1 The climatic conditions under which cables shall operate satisfactorily are as follows:

- | | | | |
|-----|--|----------------------------|--------|
| (a) | Maximum ambient temperature of air | $^{\circ}\text{C}$ | : 50 |
| (b) | Minimum ambient temperature of air in shade | $^{\circ}\text{C}$ | : 4 |
| (c) | Maximum daily average ambient temperature | $^{\circ}\text{C}$ | : 40 |
| (d) | Maximum yearly average ambient temperature | $^{\circ}\text{C}$ | : 30 |
| (e) | Maximum relative humidity | % | : 95 |
| (f) | Average number of thunder storm days per annum | | : 15 |
| (g) | Average annual rainfall | cm | : 150 |
| (h) | Maximum wind pressure | Kg/cm^2 | : 150 |
| (i) | Altitudes not exceeding above MSL | mtrs. | : 1000 |
| (j) | Maximum soil temperature at cable depth | $^{\circ}\text{C}$ | : 30 |
| (k) | Maximum soil thermal resistivity | $^{\circ}\text{C cm/watt}$ | : 150 |

1.4 PRINCIPAL PARAMETERS:

1.4.1 11 / 22 kV (E) XLPE, 3-Core, power cable shall be of high conductivity H.D. aluminum, stranded compacted circular shaped conductor with XLPE (cross linked Poly Ethelene) Dry/Gas cured insulation provided with shielding of extruded semi-conducting materials over conductor and XLPE insulation. Each insulated core

shall have copper tape screen, laid together and provided with common covering of PVC ST-2 Inner Sheath (Extruded). Overall galvanized steel strip armour and PVC ST-2 outer sheath shall be provided. The specification for manufacture of cable shall be conforming to IS: 7098 (Part-II) 2011, amended up to date for 11KV (E), 3-phase, 50 Hz. Earthed systems.

1.4.2 Outer sheath shall be designed to afford high degree of mechanical protection and shall also be heat, oil, chemical and weather resistant, Common acid, alkalis and sealing solution shall not have adverse effect on material of PVC sheath.

1.4.3 Cable shall be suitable for laying in covered trenches and / or buried under-ground in outdoor.

1.4.4 **Cable Parameters:**

		<u>11 kV</u>	<u>22 kV</u>
(i)	Voltage grade (U ₀ / U) kV	6.35 / 11	12.17 / 22
(ii)	Cores (Nos)	3	3
(iii)	Nominal system voltage kV	11	22
(iv)	Highest system voltage kV	12	24
(v)	System frequency Hz	50	50
(vi)	Variation in frequency %	± 3	± 3
(vii)	(a) Maximum allowable temp. of conductor during continuous normal operation at rated full load current. °C	90	90
	(b) Maximum allowable temp. under short circuit condition °C	250	250
(viii)	1.2/50 microsecond lightning impulse withstand voltage wave value. kVp	75	125
(ix)	5 Min, Power frequency withstand voltage kV rms	17	32
(x)	System earthing	Effectively earthed.	

1.5 GENERAL TECHNICAL REQUIREMENTS:

1.5.1 Conductor:

The cable conductor shall be made from high conductivity stranded High Density aluminum to form compacted circular shaped conductor having resistance within limits specified in IS: 8130/1984 and any latest amendment to it. However, number of strands & diameter shall be selected, so as to achieve guaranteed minimum conductor cross section area of the specified cable.

1.5.2 Conductor shield:

The conductor having semi-conducting screen shall ensure perfectly smooth profile & avoid concentration of stress. The conductor screen shall be extruded in the same operation as the insulation. The semi-conducting polymer shall be cross linked.

1.5.3 Insulation:

The XLPE insulation shall be suitable for 11 / 22 kV system voltage and should be manufactured with **Dry / Gas curing process only**. The bidder shall submit the description of dry / gas curing process, with the clear inclusion of equipments / parameters involved. The manufacturing process shall ensure that the insulation shall be free of voids. The insulation shall withstand mechanical and thermal stress under steady state and transient operating conditions. The extrusion method should give very smooth interface between semi-conducting screen and insulation. The insulation of the cable shall be of high standard quality generally conforming to IS: 7098 (Part – II) – 2011 amended up to date.

Eccentricity of insulation shall not exceed 15%.

1.5.4 Insulation screen:

Non-metallic semi-conducting shield shall be provided over the insulation to confine electrical field to the insulation. The insulation shield shall be extruded in the same operation as the conductor shield and the insulation by suitable extrusion process. The XLPE insulation shield shall be of bonded type.

Metallic insulation screen shall be provided by copper tape screen applied with overlap.

The continuous current carrying capacity & S.C. current withstand capacity for 1 sec. shall be as per IEC 60949.

1.5.5. Filler and Inner-Sheath:

The sheath shall be suitable to withstand the site conditions and the desired temperature. It shall be of adequate thickness, consistent quality and free from all defects. The PVC ST-2 type sheath shall be extruded. The material of fillers and inner-sheath shall be compatible with the temperature ratings of the cable and shall have no deteriorating effect on any other component of the cable. Filler shall be PVC solid type.

Central PVC filler shall also, be provided with other peripheral PVC fillers to have proper circular section.

1.5.6 Armour:

Armouring of galvanized steel strip shall be provided. The dimensions of steel strips shall be as per latest edition of IS: 3975 – 1979. However minimum 90% coverage shall be provided.

1.5.7 Outer-Sheath:

Extruded type ST-2 PVC outer-sheath, conforming to IS: 5831-(1984) (latest edition) over armouring with suitable additives (to prevent attack by rodents & termites), shall be provided.

Outer sheath of PVC shall be designed to afford high degree of mechanical protection and shall also be heat, oil, chemical and weather resistant, Common acid, alkalis and sealing solution shall not have adverse effect on sheath.

Outer sheath of cable used in GIS shall be with FRLSH property, if mentioned in schedule-A of respective tender.

1.5.8 Construction:

1.5.8.1 The cable shall have suitable PVC fillers laid up with insulation cores to have subsequently circular cross-section before the inner sheath is applied. The fillers shall be suitable for operating temperature of the cable.

1.5.8.2 All materials used in manufacturing of cable shall be new, unused and of finest quality. All materials should comply with the requirements / tests as per applicable IS / IEC specification, Indian Electricity Rules and any other statutory provision of rules & regulations.

1.5.8.3 The PVC material used in the manufacture of cable shall be of reputed manufacturer. No recycling of PVC is permitted. The purchaser reserves the right to ask for documentary

evidence of the purchase of various materials, (to be used for the manufacture of cable) as per Quality Assurance plan.

1.5.9

Current Rating:

The indicative value of continuous current carrying capacities at Maximum conductor temperature of 90° C (for design purpose by field) of the various sizes of the cables are given below:

Sr. No.	Size of 3 Core Cable (Sq.mm)	Continuous Current Carrying Capacity in Amp (For 11 / 22 kV cable)	
		IN Ground	In air
1	50	130	140
2	95	185	200
3	150	235	265
4	185	270	310
5	240	305	345
6	300	340	396

1.5.9.1

Short circuit ratings of various sizes of 3 core cable calculated for duration of one second at maximum temperature of 250° C, are given below:

Sr. No.	Size of 3 Core Cable (Sq.mm)	Conductor short circuit rating in kA (rms) (For 11 / 22 kV cable)
1	50	4.70
2	95	8.93
3	150	14.1
4	185	17.4
5	240	22.6
6	300	28.2

1.5.9.2

The current rating shall be based on maximum conductor temperature of 90° with ambient site condition specified for continuous operation at the rated current.

1.5.10 Operation:

- 1.5.10.1 Cable shall be suitable for operation under frequency variation of $\pm 3\%$ and voltage variation of +10% to -15% and combined frequency - voltage variation of 10% (absolute sum).
- 1.5.10.2 Cable shall be suitable for laying in duct or buried underground.
- 1.5.10.3 Cable shall have heat & moisture resistance properties. These shall be of type & design with proven record on distribution network service.

1.5.11 STEEL DRUM:

- 1.5.11.1 The cable shall be wound on returnable steel drums as per 10418-1982 & drum shall be manufactured from MS Steel confirming to IS 2062 with latest amendment.
Drum flanges shall be applied with non-corrosive primer coat & two coat of oil paint shade 631 of IS:5.
"PROPERTY OF GETCO" shall be marked on both the flanges (on cross arms), Inner & outer side of barrel shall be painted with white shade.
- 1.5.11.2 Name plate shall be containing details of (a) Name of the manufacturer/supplier along with works (b) Order no. (c) Year of manufacture (d) Tare weight of drum (e) Cable weight (f) Gross weight of drum (g) Serial number (h) Voltage class, Size of cable & code (i) Length of cable (j) Arrow marking for rewinding.
The parameters as mentioned above shall be punched & painted on name plate of steel of suitable size and thickness and shall be fixed on the drum in addition to the painting.
- 1.5.11.3 The ends of the cable shall be sealed by means of non-hygroscopic sealing materials.
- 1.5.11.4 The bidder shall be responsible for any damage to the cables during transit due to improper and inadequate packing. Wherever necessary, proper arrangement for lifting, such as lifting hooks, shall be provided.
- 1.5.11.5 At least 5% of the total number of drums subject to minimum of two in any lot put up for inspection, shall be selected at random to ascertain the length of cable by following method:
"At the works of the manufacturer of the cable, the cable shall be transferred from one drum to another at the same

time measuring its length with the help of a graduated pulley & Cyclometer. The difference in the average length thus obtained and as declared by the Supplier in the packing list shall be applied to all the drums if the cable is found short during checking."

The drum shall be designed to cater load of specified cable length along with drum strength test as specified in Cl. No. 1.6.2.3.

1.5.11.6 Length :

The cable shall be supplied in standard drum length of 300 mtrs. $\pm 5\%$ tolerance for all the sizes of cable except for 3 C x 240 mm² and 3 C x 300 mm² size cable. The drum length for 3 C x 240 mm² and 3C x 300 mm² cable shall be 200 mtrs. $\pm 5\%$.

Over all tolerance in total quantity of ordered cables shall be $\pm 2\%$.

1.5.11.7 Identification Mark :

- i. The cable drum shall be printed with information as per cl. 2.1.2 of IS and ISI Certification mark. Bidder shall submit xerox copy of valid ISI Licenses with technical bid.
- ii. For identification of cores, coloured strip of Red, Yellow and Blue colours shall be used for identification of phases.
- iii. **Following details of identification shall be embossed at intervals of length of one meter of cable outer sheath.**
 - (a) Name of manufacturer (b) year of manufacture (c) size of cable & voltage grade (d) Name of purchaser "GETCO".

1.6 TESTS:

1.6.1 (A) **Type Tests:**

All the cable sizes i.e. items offered should have been fully type tested as per the relevant standards at any NABL/Govt. recognized Laboratory. The bidder shall furnish One sets of type test reports/colour scan copy along with the offer. The Type test reports shall not be older than **Ten** years and shall be valid as on last date of submission of bid.

For any change in design/type, already type tested and the design / type offered against this specification, the purchaser reserves the right to demand repetition of type tests without any extra cost.

The purchaser also reserves the right to have tests carried out at his own cost by an independent agency, whenever there is a dispute regarding the quality of supply.

Type Test reports for cable of construction other than specified in tender, will be considered for evaluation purpose, but the bidder shall have to carry out all Type Tests at Govt. approved NABL approved/ laboratory without affecting delivery schedule and at no extra cost to GETCO, on required construction, **for which necessary confirmation shall be submitted with technical bid.**

- 1.6.1 (B) The following type test reports shall be furnished with the offer as per IS:7098(P2) 2011 amended up to date:
- (a) Tests on conductor :
 - (i) Tensile test
 - (ii) Resistance test
 - (b) Tests for armouring strips / wires. :
 - (c) Tests for eccentricity of Insulation & thickness of insulation and sheath.
 - (d) Physical tests for insulation. :
 - (i) Tensile strength and elongation at break.
 - (ii) Ageing in air oven
 - (iii) Hot set
 - (iv) Shrinkage test
 - (v) Water absorption
 - (e) Physical tests on outer sheath :
 - (i) Tensile strength and elongation at break.
 - (ii) Ageing in air oven
 - (iii) Shrinkage test
 - (iv) Hot deformation
 - (v) Loss of mass in air oven
 - (vi) Heat shock
 - (vii) Thermal stability
 - (f) Test on extruded semi conducting screens
 - i) Volume resistivity
 - (g) Thermal ageing test for complete cable

- (h) Partial discharge test
- (i) Bending test followed by PD test
- (j) Dielectric power factor test
 - i) as a function of voltage
 - ii) as a function of temperature
- (k) Insulation resistance test (volume resistivity)
- (l) Heating cycle test followed by dielectric power factor as a function of voltage and Partial discharge test.
- (m) Impulse withstand test followed by 15 min. High voltage test
- (n) High voltage test for 4 Hrs.
- (o) Flammability test
- (p) Test on outer sheath to confirm FRLSH property (In case of supply for GIS)

IMPORTANT NOTE:

In case of non-submission of some of the type test reports, the bidder shall confirm the submission of same before commencement of supply, without affecting delivery schedule, from Govt./NABL accredited laboratory, without any extra cost to GETCO. Confirmation for above shall be invariably submitted along with technical bid.

In absence of this confirmation, the offer will be evaluated as non-submission of type test report.

1.6.2

Acceptance Test:

- 1.6.2.1 The selection of sample pieces for acceptance test shall be from 10% drums of each lot offered for inspection or part thereof. The minimum shall be one drum.
- 1.6.2.2 The following acceptance tests shall be carried out on the selected samples as per IS: 7098 (Part-II) –2011 amended up to date.
 - (a) Conductor resistance test.
 - (b) Test for eccentricity of Insulation & thickness of insulation and sheath

- (c) Hot set test for insulation
- (d) Tensile strength and elongation at break test for insulation and sheath.
- (e) Partial discharge test
- (f) High voltage test for 4 hours (as per cl. No. 20.7.1)
- (g) Insulation resistance (volume resistivity) test.
- (h) Tests on outer sheath for conformity of FR property (if applicable)
- (i) Cable weight Kg/Meter (For reference only)
- (j) % coverage of armour

1.6.2.3 Following Acceptance tests on Minimum two or 5% of the total number of offered steel drums whichever is higher, shall be performed.

- a) Visual examination & verification of dimension
- b) Verification of length of cable by rewinding.

1.6.2.4 All the acceptance tests shall be carried out by the firm, in the presence of purchaser's representative at their works. The firm shall give atleast 15 days' advance notice to the purchaser to enable him to depute the engineer for witnessing the tests. The test certificates for acceptance tests witnessed by inspecting officer/ engineer shall be submitted for approval before dispatch of material.

1.6.3 Routine Tests:

1.6.3.1 The bidder shall have to submit, well in advance, the test certificates for the following routine test for approval prior to inspection of the materials for the complete lot offered for inspection at a time.

- (a) Conductor resistance test
- (b) Partial discharge test
- (c) High-voltage test for 5 minutes [as per clause 20.7.2 of IS: 7098 (Part-II) – 2011].

1.7 STAGE INSPECTION:

- 1.7.1 The inspection may be carried out by the purchaser at any stage of manufacture. The successful bidder shall grant free access to the purchaser's representative at reasonable time, when the work is in progress. Inspection and acceptance, of any cables under this specification by the purchaser, shall not relieve the supplier of his obligation of supplying cable in accordance with the specification and shall not prevent subsequent rejection, if the cables are found defective.
- 1.7.2 The supplier shall keep the purchaser informed in advance about the programme of manufacturing of cables so that arrangement can be made for inspection.
- 1.7.3 The purchaser reserves the right to insist for witnessing the acceptance / routing tests of the bought out items.

1.8 DOCUMENTATION:

- 1.8.1 The bidder shall furnish following documents alongwith his offer.
 - 1.8.1.1 Sectional view, showing the General constructional feature with conductor / conductor screen / insulation / armouring / inner and outer sheath etc.
 - 1.8.1.2 Drawing of cable drums with details of material, dimension, as per relevant IS and paint etc. shall be submitted in Auto CAD.
 - 1.8.1.3 All the required type test reports for offered items tested at any NABL/Government recognized Laboratory as stated under Clause No. 1.6.1.
 - 1.8.1.4 Literature, pamphlets etc.
 - 1.8.1.5 The bidder shall submit Quality Assurance Plan for manufacturing process and Field Quality Plan with the technical bid.
 - 1.8.1.6 All the points other than GTP, which are asked to confirm in technical specifications must be submitted separately with the bid.

1.9 PACKING AND FORWARDING:

- 1.9.1 Cable shall be packed in steel drums suitable for vertical / horizontal transport, as the case may be and shall be suitable to withstand rough handling during transport and outer storage.
- 1.9.2 The firm shall be responsible for any damage to the cables during transit due to improper and inadequate packing. Wherever necessary, proper arrangement for lifting, such as lifting hooks, shall be provided.
- 1.9.3 Each consignment shall be accompanied by a detailed packing list, containing the following information:
- (a) Name of consignee
 - (b) Details of consignment
 - (c) Destination
 - (d) Total weight of consignment
 - (e) Handling and unpacking instruction
 - (f) Bill of materials, indicating contents of each package.

1.10 TECHNICAL AND GUARANTEED PARTICULARS:

The bidder shall invariably furnish all Guaranteed Technical Particulars, in Appendix - I of this Specification & in e-GTP of tender. Particulars, which are subject to guarantee, shall be clearly identified. Offer not containing this information will not be considered for acceptance.

1.11 GENERAL PARTICULARS:

- a) The bidder is required to impart training in view of manufacture, assembly, erection, operation and maintenance for offered item, at his works, to the person/s identified by GETCO, in the event of an order, free of cost. The cost of logistics will be bear by GETCO.
- b) Please note that the evaluation will be carried out on the strength of content of bid only. No further correspondence will be made.
- c) The bidder shall bring out all the technical deviation/s only at the specified annexure.
- d) The bidder should indicate manufacturing capacity by submitting latest updated certificate of a Chartered Engineer (CE).

1.12 QUALITY ASSURANCE PLAN:

The Bidder shall invariably furnish following information along with his offer.

- i) Statement giving list of important raw materials, names of sub suppliers for the raw materials, list of standards according to which the raw material tested, in presence of Bidder's representative, if any, copies of test certificates.
- ii) Information and copies of test certificates as in (i) above in respect of bought out items.
- iii) List of manufacturing facilities available.
- iv) Level of automation achieved and list of areas where manual processing exists.
- v) List of areas in manufacturing process, where stage inspections are normally carried out for quality control and details of such tests and inspections.
- vi) List of testing equipment available with the Bidder for final testing of equipment specified and test plant limitation, if any, vis-à-vis type, special, acceptance and routine tests specified in the relevant standards. These limitations shall be very clearly brought out in schedule of deviations from specified test equipments.
- vii) All test set up shall be calibrated at NABL accredited laboratory and report shall be submitted with inspection report.

SEAL OF THE FIRM

SIGNATURE OF THE BIDDER

The bidder must fill up all the point of GTP for offered item/s. Instead of indicating “refer drawing, or as per IS/IEC”, the exact value/s must be filled in.

APPENDIX – I

SCHEDULE OF GUARANTEED TECHNICAL PARTICULARS FOR 11 / 22 KV XLPE INSULATED DRY/GAS CURED POWER CABLE (To be filled in and signed by the Bidder)

1.00.0	GENERAL:		
1.01.0	Name of Manufacturer	:	
1.02.0	Place of Manufacturing	:	
1.03.0	Applicable standard IS/IEC	:	
1.04.0	Design ambient temperature °C	:	
1.05.0	Cable particulars, whether, confirmed, as per clause 1.5 of Section I of Technical Specification (Yes/No)	:	
Note: (Fill – up separate column for the following particulars for each type & size of cable)			
2.00.0	CABLES:		
2.01.0	Voltage grade (U _o / U)	:	
2.02.0	Whether suitable for neutral earthed	:	Neutral Earthed
2.03.0	Permissible voltage & frequency variation for satisfactory operation	:	Frequency variation +3% and voltage variation of +10% to -15% of rated value and combined frequency - voltage variation of 10% (absolute sum).

2.04.0	Nos. of cores & size	:	
2.05.0	Continuous current carrying capacity	:	
2.05.1	For standard condition as per IS 1) In air (Amp.) 2) In ground (“) 3) In duct (“) 4) In trench (“)	: : : :	
2.05.2	For site condition [Amb.Temp-40°C, Gnd.Temp.-30°C, Depth of burial 1.0 meter, Soil resistivity 150 °C Cm/watt, Single run per phase (Outer sheath touching)] 1) In air (Amp.) 2) In ground (“) 3) In duct (“) 4) In aerated trench (“)	: : : : :	
2.05.3	For site condition [Amb.Temp-40°C, Gnd.Temp.-30°C, Depth of burial 1.0 meter, Soil resistivity 150 °C Cm/watt, Double run per phase (Outer sheath touching)] 1) In air (Amp.) 2) In ground (“) 3) In duct (“)		
2.05.4	For site condition [Amb.Temp-40°C, Gnd.Temp.-30°C, Depth of burial 1.0 meter, Soil resistivity 150 °C Cm/watt, three run per phase (Outer sheath touching)] 1) In air (Amp.) 2) In ground (“) 3) In duct (“) 4) In aerated trench (“)		
3.00.0	CONDUCTOR:		

3.01.0	Material & its applicable IS.	:	
3.02.0	Shape of conductor	:	
3.03.0	Nominal cross section area (mm ²)	:	
3.04.0	Number of wires per core	:	
3.05.0	Nominal diameter of each wire used in each core of the conductor	:	
3.06.0	Cross section area of each wire used in each core of the conductor		
4.00.0	CONDUCTOR SCREENING:		
4.01.0	Type	:	
4.02.0	Material & its applicable IS.	:	
4.03.0	Continuous working temp °C	:	
4.04.0	Nominal thickness (mm)	:	
5.00.0	INSULATION:		
5.01.0	Material & its applicable IS	:	
5.02.0	Thickness of insulation (mm) a) Nominal b) Minimum	: :	
5.03.0	Tolerance in thickness (percent) of insulation	:	
5.04.0	Diameter of core over insulation (mm)	:	
5.05.0	Max. Eccentricity		
5.06.0	Volume Resistivity at 27°C (Ω cm., Min.)	:	

5.07.0	Volume Resistivity at 90°C (Ω cm., Min.)		
5.08.0	Whether Dry/Gas curing adopted(Yes/No)		Yes
6.00.0	INSULATION SCREENING:		
6.01.0	Material & its applicable IS.	:	
6.02.0	Thickness (mm): 1) Semi-conducting part 2) Metallic part (copper tape)	: :	
6.03.0	Copper tape overlapping length		
6.04.0	Current carrying capacity a) Continuous (Amps.) b) S.C. current duration of 3-Sec. (KA)	:	
6.05.0	Diameter of core over screening (mm)	:	
6.06.0	Whether insulation screen is removable without the application of heat (for “YES” – give explanation)	:	
7.00.0	FILLER:		
7.01.0	Material & its applicable IS	:	
7.02.0	Whether suitable for operating temperature of Cable	:	Yes
7.03.0	No of fillers provided including central filler	:	10
8.00.0	EXTRUDED INNER SHEATH:		TYPE ST2
8.01.0	Material & its applicable IS	:	
8.02.0	Thickness (mm)	:	

8.03.0	Diameter of cable over inner-sheath (mm)	:	
9.00.0	ARMOURING:		
9.01.0	Material & its applicable IS	:	
9.02.0	Type of armouring (Strip/Wire)	:	
9.03.0	Nos. of strips/wires	:	
9.04.0	Diameter of cable over armouring	:	
9.05.0	% Coverage of armour		
9.06.0	Current carrying capacity of armour a) on continuous basis (Amp) b) short circuit current duration of 1 sec (KA)	: : :	
10.00.0	EXTRUDED OUTER SHEATH:		TYPE ST2
10.01.0	Material & its applicable IS.	:	
10.02.0	Thickness of sheath	:	
10.03.0	Tolerance on thickness of sheath	:	
10.04.0	Over all diameter of cable (mm)	:	
10.05.0	Colour of outer sheath	:	Black
11.00.0	CABLE CONSTANT:		
11.01.0	AC resistance per core at operating temp. (Ohm/KM)	:	
11.02.0	DC resistance per core at 20°C (Ohm/KM)	:	
11.03.0	Reactance per core (Ohm/KM)	:	
11.04.0	Capacitance per core (Microfarad/ KM)	:	

11.06.0	Loss tangent	:	
11.06.1	Dielectric constant as a function of voltage (a) at U_0 (b) increment from $0.5U_0$ to $2U_0$:	
11.06.2	Dielectric constant as a function of temperature (a) at Ambient Temp. (b) $5-10^{\circ}\text{C}$ above Max. conductor temperature		
11.07.0	Maxi. Cable charging current at normal operating voltage (Amp/KM)	:	
11.07.1	(a) Positive sequence impedance: (b) Zero sequence impedance		
12.00.0	OTHER PARAMETERS:		
12.01.0	Recommended minimum bending radius (mm)	:	
12.02.0	Safe pulling force	:	
12.03.0	Cable weight (Kg./KM)	:	
13.00.0	CABLE DRUM:		
13.01.0	Material		
13.02.0	Tare weight (Kg.)	:	
13.03.0	Gross weight (Kg.)	:	
13.04.0	Whether ISI Mark shall be indicated on drum (Yes/No)	:	

13.05.0	Length of cable per drum (Meter)	:	
13.06.0	Whether details shall be embossed as stated under Cl. 1.5.11.7. of Technical Specification	:	Yes

Signature of the Bidder: _____

Name: _____

Designation: _____

Date: _____

Authorized common rubber

Stamp / seal of the bidder: _____