

5.1 General Specification

This contract covers the manufacture, testing at factory, packing and delivery, C.I.F. Kuwait, clearing charges, custom and import duties and transport to MINISTRY OF ELECTRICITY & WATER Stores of Outdoor & Indoor Cable sealing end (cable termination) employing heat shrinkable or cold shrinkable materials associated with 11 KV XLPE & PILC Cables

5.2 Purchaser's System

The cable termination are required to extend the purchaser's existing 11 KV power distribution system, characteristics of which are as follows: -

- | | | | |
|----|---|---|--|
| A) | System voltage | : | 11 KV |
| B) | System high voltage | : | 12 KV |
| C) | Frequency | : | 50 HZ |
| D) | Fault level (maximum) | : | 350 MVA, at 11 KV, (500 MVA for 11 KV, 3-core 300 SQ.MM, U/G cable with copper conductor). |
| E) | Maximum time for which such a fault may exist | : | 1.25 seconds. |
| F) | Method of earthing | : | Solidly earthed or through a 10.5 ohms resistance. |

5.3 Site Condition

Climatic conditions in Kuwait are rigorous and the summer season during which the termination's will work under continuous maximum load condition is long and shall be considered to fall during the period starting from 15th of April till 15th November. The remainder of the year shall be considered as a winter season since autumn and spring seasons are very short in Kuwait.

The following are prevalent atmospheric conditions based on our latest records.

- | | | | |
|----|--|---|-----------------------|
| A) | Maximum sun radiation's temperature measured with black bulb thermometer | : | 85 degree centigrade |
| B) | Highest shade temperature | : | 52 degree centigrade. |
| C) | Average maximum ambient temperature | : | 45 degree centigrade |
| D) | Lowest temperature during winter | : | -6 degree centigrade. |

Periods of high humidity are common and relative humidity of 100% at 30 degree centigrade has been recorded. Violent sand and dust storms occur and even on comparatively still days. Fine dust is carried in suspension in the atmosphere.

The termination will be installed near the seashore where the atmosphere is salt laden and very corrosive.

An average rain fall during the year is about 15 cms. But this may be concentrated in two or three severe downpours.

The termination offered must give continuous and trouble free service under the arduous condition mentioned above.

5.4 Standard Specifications

Attention of all tenderers are hereby drawn to the following:-

All materials and equipment shall comply as minimum with:-

- A) The latest relevant recommendations of the International Electrotechnical commission (I.E.C.), BSS, IEEE 48. And German standard VDE 0278
- B) This applies to quality of material and testing, etc. If standards as mentioned above contradict with this tender specification, then the requirements of this specification shall apply.

5.5 Pre-requisite for submission of offers

ALL THE FOLLOWING POINTS MUST BE SUBMITTED WITH THE OFFER, WITHOUT THE FOLLOWING POINTS THE OFFER WILL BE REJECTED AND THE TENDERER WILL NOT HAVE ANY RIGHT TO OBJECT .

- A) Samples to be presented to MEW for testing and/or checking and shall remain at the disposal of MEW.
- B) The manufacturer of the offered materials must have ISO 9001 certificate. Or better.
- C) Materials offered should have passed test by an independent internationally approved laboratory (ASTA / KEMA / CESI or CPRI), relevant certificate to be provided to MEW along with the offer.
The test certificate should comply with MEW specifications.
- D) Materials offered should have passed MEW's minimum requirements of preliminary testing to satisfaction of MEW engineer.
- E) The offered termination kit and accessories shall be manufactured in the same year of tender/purchase order.
- F) Fully detailed and dimensioned drawings for each type of termination shall be submitted with the offer.
- G) Technical details and catalogues of offer must be submitted.
- H) Supply record of last (5) five years with specific reference of the client shall be submitted

5.6 Identification of Material

Before leaving the contractor's works, all materials and fittings shall be stamped in two places with the reference marks prior to galvanizing (whichever applicable), which shall be clearly legible after galvanizing.

The termination shall be marked with the name of trademark of manufacturer and the year and month of manufacture, the working voltage and the marking shall be legible and indelible.

5.7 General

Only termination employing heat/cold shrinkable materials/ construction will be considered. The heat/cold shrinkable materials such as mouldings, tubing and sealant etc. shall be fully in accordance with and tested to the latest standards namely IEEE, BSS, IEC and German standard VDE 0278. The combined severe test conditions of the above shall be applicable. Test reports from an independent authority (ASTA/KEMA/CESI or CPRI) for the proposed termination's and accessories shall be submitted with each offer.

The termination shall be designed such that they are fully suitable for terminating the 11 KV cables specified in this specification. The termination shall be of an approved design and shall be suitable in construction and operation to withstand all the mechanical/electrical stresses expected under the severe climatic and site conditions encountered in the state of Kuwait. Evidence shall be submitted with the offer, to prove that termination identical in design to the proposed are working satisfactorily for the last 5 years in identical weather conditions.

All tubing's & moulded parts must be marked clearly with the manufacturer's name, part number and quality assurance batch number.

A) Heat/Cold Shrinkable Termination Kit (Indoor)

The termination kits are for use inside cable-end boxes of switch-gears and transformers and shall be suitable in all respects for the below mentioned types of 11 KV, aluminum and copper conductor cables, which are generally according to IEC/6502 for XLPE cables or BSS 6480 for PILC cables.

3-Core 300 or 185 SQ.MM. CU or AL SC / XLPE / SC / SWA / PVC cables or 3-core 300 or 185 SQ.MM. PILC cables.

Construction details of the cables are given in the specification.

The kits shall be complete with all accessories such as sealing boots, stress control tubing, non-tracking weather resistant tubes, sealant, tapes etc., and shall be suitable for a cable tail length of 650 MM. The components and accessories shall be of good quality. The tubing's /mouldings/sealant etc., shall be flame retardant having good electrical/mechanical strength and resistance to tracking, corrosion, fungus, weather and the ingress of water, moisture etc.

Kits shall be complete with the required earthing accessories suitable for use with the above mentioned heat/cold shrinkable termination and shall include galvanized cable glands with earth stud, clamps, fixing bolts, earth bonding braids, lugs sealant, tape, heat/cold shrinkable tubing etc., compression type mechanical glands are not acceptable. Clamping of armour by worm drive clips will not be accepted. The offered earthing system should have a minimum short time rating of 20 KA for 3 seconds. Evidence to this effect shall be submitted in the form of a test report from an Internationally recognized testing authority.

A complete list of materials supplied in each type of termination kit along with the part No. And quantity per kit is to be submitted with the offer.

Full technical details including dimensional drawings, catalogues, type test reports from an Internationally recognized testing authority as mentioned above shall be submitted for the offered termination kits. A dimensional drawing, to scale, of the assembled termination, showing all the dimensions and clearances, shall be submitted with the offer along with the instruction manuals and a sample kit for our consideration.

B) Heat/cold shrinkable termination kits (outdoor)

These termination kits are for use as outdoors pole termination's and shall be suitable in all respects for use with the below mentioned types of 11 KV copper and aluminum conductor cables.

3-core 300 or 185 SQ.MM. CU or AL SC / XLPE / SC / SWA / PVC cables or 3-core 300 or 185 SQ.MM. PILC cables.

Construction details of the cables are given in the specification.

The outdoors pole termination's shall include the following accessories, in addition to those mentioned under (A) above.

- I Umbrella skirt.
- Ii Watershed skirts.
- Iii Support insulators.

The kits shall be suitable for a cable tail length of at least 650 MM. The components and accessories shall be of good quality. The tubing /mouldings/sealant etc., shall be flame-retardant, having good electrical/mechanical strength and resistance to tracking, corrosion, fungus, weather and the ingress of water, moisture etc.

The umbrella skirts and watershed skirts shall be heat/cold shrinkable, flexible, polymeric moulding, possessing anti-tracking and erosion resistant properties, for application over the prepared cores of the above specified cables. The watershed shall conform to the requirements of latest International standard.

The pole termination support insulators shall be made from a polymeric material, and this shall be clearly confirmed in the offer. Insulators made of glass or ceramic materials are not acceptable. The support insulator shall be outdoor type, vandal proof, unaffected by heavy pollution, resistant to weather ingress of water/moisture etc.

The termination kits shall be complete with the required earthing accessories suitable for use with specific termination, and shall include marine alloy clamps, fixing bolts, earth bonding straps, sealant, tape, fixing bolts/nuts/washers, heat/cold shrinkable tubing etc. Clamping of armour by means of worm drive clips will not be accepted. The offered earthing system should have a minimum short time rating of 20 KA for 3 seconds. Evidence to this effect shall be submitted in the form of a test report from an internationally approved testing authority. Compression type mechanical glands are not acceptable.

A complete list of materials supplied in each type of termination kit along with the part No. And quantity is to be submitted with the offer.

Full technical details including dimensional drawings, catalogues, type test reports from an internationally recognized testing authority as mentioned above shall be submitted for the offered termination kits.

A dimensional drawing, to scale, of the assembled termination, showing all dimensions and clearances, shall also be submitted with the offer along with the instruction manuals and a sample kit for our consideration.

C) Straight boots

The straight boots shall be used to cover the cable lugs connection between the cable and the switchgear.

The straight boots shall be of the same material of the heat/cold shrinkable cable termination's offered, suitable for both (3 x 300 and 3 x 185 SQ. MM.) XLPE or PILC cables with a larger diameter at the switchgear side to fit around the switchgear terminal. The length of the straight boot shall not be less than (23 CMS).

Each kit of straight boots shall consist of

- I 3 NOS. Straight boots.
- ii 150 CMS. X 7 CMS. Black mastic sealing tape.

D) Right Angle Boots

The right angle boots shall be used to cover the cable lugs connection between the cable and the switchgear or transformer. The right angle boots shall be of the same material of the offered heat/cold shrinkable termination's, suitable for both (3 x 300 and 3 x 185 SQ. MM.) XLPE or PILC cables, with a larger diameter at the bushing side to fit around the bushing. The portion of the bushing covered by the right angle boot shall not be less than 12 CMS.

Each kit of right angle boots shall consist of

- I 3 Nos. Right angle boots.
- ii 150 CMS. X 7 CMS. Black mastic sealing tape.

5.8 Packing

Tenderers are warned that the material enroute from the factory to Kuwait is liable to very rough handling. Therefore it is essential that all material are suitably packed and protected. Each complete termination kit shall be packed in its individual carton, **and each carton shall be clearly marked with the contractors identification, MEW Vocab number, and addressed to MINISTRY OF ELECTRICITY & WATER, Kuwait.** All individual packages shall then be packed in larger packages. All the markings as specified above shall also be put on the larger packages . All markings shall be in bold and legible letters. A packing list is to be included in each package.

5.9 Inspection

The contractor shall provide facilities for an inspector appointed by the MINISTRY OF ELECTRICITY & WATER to inspect the materials during manufacture and after completion.

All materials shall be inspected. The contractor shall eliminate all materials he considers defective according to the specifications before presenting any lot for inspection or before shipping.

Inspection charges of the nominated inspecting authority only will be to our account and cost of any labour or materials used in inspection etc., will be entirely the responsibility of the successful bidder.

Tests shall be according to latest international standards and specifications included in the tender. Delivery periods quoted should allow such inspection/test, which will be carried out by inspecting authorities in the country of manufacture. Where the material inspected is found to be not to our specifications for whatever reason, the cost of such inspection will have to be refunded to us by the bidder concerned.

Manufacturers are not allowed to effect shipment of materials on contract unless they obtain a copy of our nominated inspectors certificate and/or release note certifying the acceptance of the material. Notwithstanding the fact that the material's on tender order have passed inspection by the nominated inspection authority, the manufacturers/suppliers/tenderers will not be relieved from any of their obligations/responsibilities should such materials prove, at any later date, not comply with the Ministry requirements.

5.10 Drawings, Schedules and Technical Information

It is essential that each offer shall be accompanied by comprehensive supporting information to enable the purchaser to assess the merits of each offer.

The Following Drawings are Required.

A) Drawing to be Submitted with the Offer

Fully detailed and dimensioned drawings for each type of termination shall be submitted with the offer. Each type of termination shall be shown on the drawing with its elevations, sectional elevation to a suitable scale. Showing a plan view and sectional view of armour/sheath bonding must also be submitted with the offer.

The dimensions of the components shall be as per purchasers requirements

B) Documents to be Submitted with the Offer

Technical details and catalogues must be submitted

All the schedules attached must be completely filled in by the tenderers. The tenderers shall submit detailed lists of materials and quantities used in the termination on offer.

Tender shall give complete information of the offered material.

The successful tenderer shall submit one set of jointing instructions in every kit. The instruction must be in the English language.

The termination shall meet the requirements of latest standards namely IEEE, BSS, IEC and German standard VDE 0278. Combined severe test conditions of the above shall be applicable.

Copy of international standard specification followed for the manufacture of termination kit shall be submitted with the offer.

5.11 Technical Description of Cable Associated with Termination's

A) XLPE 11 KV Cables

The under mentioned (3 x 300 or 3 x 185 SQ.MM.), XLPE cable is in general use in Kuwait.

I Conductor : 300 SQ.MM., copper or aluminum compact circular stranded, in accordance with BS 6791 (see note below).

II Conductor screen : Extruded semi-conducting compound layer.

III	Insulation	: Cross-linked polyethylene in accordance with I.E.C. 6502. Extruded solid dielectric insulated power cable
IV	Insulation screen	: Extruded semi-conducting compound layer.
V	Metallic screen	: None (see note below).
VI	Core assembly	: Longitudinal applied tape fillers.
VII	Bedding	: 4 layers of semi-conducting tape.
VIII	Armour	: Galvanized steel wire of 3.15 MM, DIA (comprising a total of about 65 wires).
IX	Outer sheath	: Red PVC in accordance with BS 6746; type 9.

Note:- Other 11 KV XLPE cables may be used. The main difference being the use of a metallic core screen and stranded sector shaped aluminum conductors.

Standard PILC cables are also used.

B) Conductor Fittings

The conductor fitting for the termination shall be compression lugs for both aluminum and copper conductors and the same shall be supplied as spare items. Further bimetallic compression lug suitable for 300 SQMM Aluminium conductor with copper palm shall be supplied.

Also copper compression lug for 185 SQMM copper conductor cable shall be supplied. The compression lugs shall be suitable for crimping with crimping tools CEMBRE or BICC.

C) Termination Materials

I General

The completed termination shall be sufficiently strong and fully suitable for the climatic conditions of Kuwait. The supplier must submit full technical details of materials used in the termination's in respect of mechanical and electrical properties and all other relevant information to enable the purchaser to assess the suitability of the cable termination.

II Termination Insulating Materials

The insulating materials of the termination shall be heat/cold shrinkable material. Full technical details, manufacturer's literature and test results of insulating materials shall be submitted with the offer. The heat/cold shrinkable products used in the termination shall be either extruded or moulded cross-linked polymeric non-tracking insulating material, suitable for use with PILC cables to BS 6480 and XLPE cables TO I.E.C. 6502. Suitable means of preventing the ingress of moisture into the layers of the lugs insulation shall be provided.

5.12 Other Materials

- A) The termination kit shall contain all the necessary materials and accessories to complete the termination as mentioned in kit content list and the relevant drawings.

Contents List ' A – 1 '

Content of Heat Shrinkable Termination Kit for XLPE Cable Termination
(IN -DOOR TYPE).

Sr. No.	Description	Quantity
1	Heat shrinkable, adhesive lined conductive breakout made from erosion and weather resistant polymer.	1 NO.
2	Heat shrinkable non tracking, weather resistant earthing sealing sleeve (gland sleeve) length (350 MM.)	1 NO.
3	Heat shrinkable non-tracking tubing length (650 MM.)	3 NOS.
4	Heat shrinkable stress control tubing length (190 MM.)	3 NOS.
5	Heat shrinkable lug sleeve made from insulating and non tracking weather resistance polymer. And internally coated with hot-melt sealant length (120 MM.).	3 NOS.
6	Red sealant mastic tape (100 MM.)	6 NOS.
7	Hot dipped zinc plated steel gland body with stainless steel screw clips and pressure die cast aluminum clamping ring with fixing bolts.	1 SET.
8	Electric grade copper wire.	1 ROLL
9	Yellow stress relief mastic (100 MM.)	3 PCS.
10	Nylon string for cutting XLPE insulation.	3 MTRS.
11	Aloxite emery tape (750 MM.) Long.	1 PC.
12	Core cleaning solvent (100 CC.)	1 PC.
13	Self-vulcanizing insulation tape for lug sealing (38 MM. * 2 MTRS.).	1 ROLL.
14	Mopping cloth + disposable gloves.	1 SET.
15	Insulated (50 SQ.MM.) Earth conductor, (750 MM.) Long with pre-installed lugs at both ends.	1 PC.
16	Allen key for clamping ring bolts	1 PC.
17	White sealant mastic (500 MM.)	1 PC.
18	Silicon grease	1 PACK
19	Installation instructions	1 NO.

Contents List "A-2"

Content of Cold Shrinkable Termination Kit for XLPE Cable Termination
(IN -DOOR TYPE).

Sr. No.	Description	Quantity
1	Cold shrinkable, adhesive lined conductive breakout made from erosion and weather resistant polymer.	1 No.
2	Cold shrinkable non tracking, weather resistant earthing sealing sleeve (gland sleeve) length (350 MM.)	1 No.
3	Cold shrinkable non-tracking tubing length (650 MM.)	3 Nos.
4	Cold shrinkable stress control tubing length (190 MM.)	3 Nos.
5	Cold shrinkable lug sleeve made from insulating and non tracking weather resistance polymer. And internally coated with hot-melt sealant length (120 MM.).	3 Nos.
6	Red sealant mastic tape (100 MM.)	6 Nos.
7	Hot dipped zinc plated steel gland body with stainless steel screw clips and pressure die cast aluminum clamping ring with fixing bolts.	1 SET.
8	Electric grade copper wire.	1 ROLL
9	Yellow stress relief mastic (100 MM.)	3 PCS.
10	Nylon string for cutting XLPE insulation.	3 MTRS.
11	Aloxite emery tape (750 MM.) Long.	1 PC.
12	Core cleaning solvent (100 CC.)	1 PC.
13	Self-vulcanizing insulation tape for lug sealing (38 MM. * 2 MTRS.).	1 ROLL.
14	Disposable gloves.	1 SET.
15	Insulated (50 SQ.MM.) Earth conductor, (750 MM.) Long with pre-installed lugs at both ends.	1 PC.
16	Allen key for clamping ring bolts	1 PC.
17	White sealant mastic (500 MM.)	1 PC.
18	Silicon grease	1 PACK
19	Installation instructions	1 NO.

Contents list ' B – 1 '

Content of Heat Shrinkable Termination Kit for XLPE Cable Termination
(Out-Door Type).

Sr. No.	Description	Quantity
1	Heat shrinkable, adhesive lined conductive breakout made from erosion and weather resistant polymer.	1 NO.
2	Heat shrinkable non tracking weather resistant earthing, sleeve length (300 MM.)	1 PC.
3	Heat shrinkable non tracking tubing length (650 MM.)	3 NOS.
4	Heat shrinkable stress control tubing length (190 MM.)	3 NOS.
5	Heat shrinkable lug sleeve made from insulating and non tracking weather resistance polymer. And internally coated with hot-melt sealant length (120 MM.).	3 NOS.
6	Heat shrinkable anti-tracking skirts.	6 NOS.
7	Red sealant mastic tape (100 MM.)	6 NOS.
8	Armour earthing clamping rings set.	1 NO.
9	Electric grade copper wire.	1 ROLL
10	Yellow stress relief mastic (100 MM.)	3 PCS.
11	Nylon string for cutting XLPE insulation.	3 MTRS.
12	Aloxite emery tape (750 MM.) Long.	1 PC.
13	Core cleaning solvent (100 CC.).	1 PC.
14	Disposable gloves.	1 SET.
15	Insulated (50 SQ.MM.) Earth conductor, (500 MM.) Long with pre-installed lugs at two ends.	1 PC.
16	Allen key for clamping ring bolts	1 PC.
17	White sealant mastic (500 MM.)	1 PC.
18	Support insulator set consisting of (3) polymeric vandal proof support insulators.	1 SET.
19	Silicon grease	1 PACK
20	Installation instructions	1 NO.

Contents list ' B – 2 '

Content of Cold Shrinkable Termination Kit for XLPE Cable Termination
(Out-Door Type).

Sr. No.	Description	Quantity
21	Cold shrinkable, adhesive lined conductive breakout made from erosion and weather resistant polymer.	1 NO.
22	Cold shrinkable non tracking weather resistant earthing, sleeve length (300 MM.)	1 PC.
23	Cold shrinkable non tracking tubing length (650 MM.)	3 NOS.
24	Cold shrinkable stress control tubing length (190 MM.)	3 NOS.
25	Cold shrinkable lug sleeve made from insulating and non tracking weather resistance polymer. And internally coated with hot-melt sealant length (120 MM.).	3 NOS.
26	Cold shrinkable anti-tracking skirts.	6 NOS.
27	Red sealant mastic tape (100 MM.)	6 NOS.
28	Armour earthing clamping rings set.	1 NO.
29	Electric grade copper wire.	1 ROLL
30	Yellow stress relief mastic (100 MM.)	3 PCS.
31	Nylon string for cutting XLPE insulation.	3 MTRS.
32	Aloxite emery tape (750 MM.) Long.	1 PC.
33	Core cleaning solvent (100 CC.).	1 PC.
34	Disposable gloves.	1 SET.
35	Insulated (50 SQ.MM.) Earth conductor, (500 MM.) Long with pre-installed lugs at two ends.	1 PC.
36	Allen key for clamping ring bolts	1 PC.
37	White sealant mastic (500 MM.)	1 PC.
38	Support insulator set consisting of (3) polymeric vandal proof support insulators.	1 SET.
39	Silicon grease	1 PACK
40	Installation instructions	1 NO.

- B) The main termination kit will also contains the following items sufficient to complete the termination.
- I One box of tissues not less than 30 Nos. For cleaning purpose.
- II 100 ml. of suitable cleaning agent or equivalent cleaning tissues for XLPE insulation.
- III Aluminum oxide strip or similar abrasive strip.
- IV Protective 20 MM. Wide cotton tape similar to BICC 0515.
- C) Where the termination contains plumbing metal, it shall be to British standard grade "D" and supplied in approximately 500 GMS. Sticks. Each stick shall be indelibly branded "MEW".
- D) The materials supplied for insulating and other purposes shall be to the best of their kind to suit the application and shall satisfy the relevant British standard specification as a minimum requirement.

5.13 Kit Contents

The tenderer shall state in the relevant schedule, the total quantity of materials to be supplied for each termination.

For the following items: wipers, cleaning agent, abrasive strips, protective cotton tapes and other insulating or screening tapes, an extra 20% of over and above the actual quantity will be supplied to allow for wastage. The additional material will be included in the main kit.

5.14 Type Tests on Termination and Termination Materials

- A) The results of mechanical, electrical, chemical and other type tests carried out by the manufacturer for termination must be submitted with the offer. Type test certificates carried out at an independent internationally approved laboratory (ASTA/KEMA/CESI or CPRI) shall be as per test procedure specified by the testing authority. This must include the following:-
- | | | | |
|------|---|-----------------------------|-----------------------------|
| I | AC withstand voltage test | (1 minute dry- 28 KV) | As per VDE 0278 |
| II | AC withstand voltage test | (1 minute in rain - 28 KV) | As per VDE 0278 |
| III | Partial discharge | | As per VDE 0278 |
| IV | Lightning impulse withstand | (BIL dry-95 KV) | As per IEC publication 71-1 |
| V | Load cycling 63 cycles 5 H/3 H to rated cable temp +50 ⁰ C | | As per VDE 0278 |
| VI | Humidity withstand (100 HRS in saturated air) | | As per VDE 0278 |
| VII | DC voltage withstand (30 minutes at 48 KV) | | As per VDE 0278 |
| VIII | Short circuit withstand | | As per VDE 0278 |

IX Salt fog test (for out door termination).

Further more if there is a change in the design of the material originally offered or supplied earlier to MEW, then new type test certificate from KEMA/ASTA/CESI or CPRI must be supplied.

- B) Visual and dimensional checks on selected samples of each batch of termination (not less than one termination of each 50 terminations).
- C) Tests should be carried out on samples of plumbing material selected from each batch (but not less than one sample of each 400 sticks and one sample of each 100 containers).
- D) As many tests as in the option of the purchaser's representative as possible shall be arranged together. Three copies of the records of all tests shall be furnished to the purchaser.
- E) The time for carrying out any required tests or checks shall not delay the delivery schedules.

Note:- Tests (B) to (D) will be witnessed by our inspectors and only upon their approval, should the materials be shipped.

At least fourteen days notice shall be given to the inspector for arranging dates of inspection/test. The contractor shall provide free of cost all materials for tests and any testing equipment necessary for carrying out the test. The charges of the inspector only shall be to the account of the purchaser.

5.15 License

Where the contracted materials are to be manufactured by a company, who has a license from another company, the tenderer should get from his company who owns the design, an assurance addressed to the purchaser confirming the safety of the used design. At the same time, the owners of the design are to confirm that the produced materials to be in good condition and in accordance with their design and to the purchaser's specification. If the joints offered are designed by the manufacturer himself, this must be confirmed in the offer.

5.16 Delivery

Termination materials shall be delivered into the Ministry of Electricity & Water's central stores at sabhan.

The delivery of materials shall be as mentioned in the schedule of delivery.

In case of delay in delivery of material penalty shall be imposed as per relevant clause of the specification.

5.17 Guarantee

The tenderer shall guarantee the termination for a period of twelve (12) calendar months after delivery of the last consignment.

5.18 Letter of Capacity

The tenderer must submit with his offer satisfactory evidence that the manufacturer whose termination's he is offering has manufactured and supplied previously to other clients similar types of termination's and of about the same quantity as mentioned in this tender document over a period of not less than 5 years.

5.19 Sample with Offer

Each tenderer shall submit with this offer one complete termination of each type with all accessories and jointing instructions.

5.20 Final Sample

The successful tenderer shall submit within one month from the date of purchase order, one complete sample of each type of termination, complete with all accessories. Any modifications required by MEW. After carrying out test on sample termination shall be incorporated. Only after this final sample is approved, should the manufacture of termination commence. Any delay in submitting the final sample in accordance with specification requirement will be on suppliers account.

5.21 Cold Shrink Materials

The offer for cable termination employing cold shrinkable materials shall be adhered to the following.

The term cold shrink applies to materials, which are capable of shrinking without raising the material above the ambient temperature of its immediate surroundings.

The material of the rubber insulator used in the cold shrink termination shall be silicone, which shall be factory expanded and placed on a removable core. The removing of core when the termination is positioned shall maintain a compressive force on the cable continuously throughout the life of the product. This pressure must ensure a complete moisture seal without the use of adhesives.

Electrical field stress control shall be achieved by using a high dielectric constant cold shrink elastomeric tube. This tube shall be completely covered by a cold shrink silicone insulator having sufficient track resistance. The two pieces shall be pre-stretched in the factory and placed on the one removable core.

The term PST refers to pre-stretched tubing.

The materials used for the termination's shall display a high surface tension or hydrophobic property. This is essential to minimize surface wetting and in turn minimize or eliminate damaging leakage currents.

These components shall be weather, ultraviolet light salt pollution resistant.

A full drawing of the termination including all parts must be submitted with the offer.

Technical characteristics already established for the termination's must meet the minimum requirements of VDE 0278

A) Main components

The termination's must have the following main component's

- I 3-Finger PST silicone rubber cold shrink break out boot
- II PST silicone rubber insulator

- III PST silicone rubber cold shrink insulator with water shed skirts and with high dielectric constant PST cold shrink stress relief tube (outdoor termination).
- IV PST silicone rubber cold shrink insulator without water shed skirts and with a high dielectric constant PST cold shrink stress relief tube (indoor termination 11 KV)
- V Termination accessories including sealing and semi conductive tapes, earthing clamps and earthing braid.

B) Installed Termination's

The installed termination's must provide the following

- I Complete external leakage insulation between high voltage conductor and earth potential using anti-track cold shrink material.
- II Electrical stress control using a stress relief tube incorporated inside the PST silicone rubber cold shrink insulator.
- III The installed termination's shall meet the electrical requirement's laid down in this specification.

C) Requirement for Submission of Offer

- I Tenderer must submit full specifications and samples of materials offered.
- II Tenderer who have not previously supplied cold shrinkable termination's to MEW must submit a list of all electrical utilities to whom they have supplied cold shrinkable termination's at voltages of 11 KV and above.
- III The following tests shall be performed to verify the quality of material requirement. The tests shall be carried out in the manner specified in International standards. A copy of the relevant International standard specification must be submitted along with the offer.

The test for the components shall include the following.

A) Silicone Rubber Insulator

- 1 Permanent set
- 2 Ultimate tensile strength
- 3 Di-electric constant
- 4 Dissipation factor
- 5 Di-electric strength
- 6 Track resistance

B) Stress Control Tube.

- 1 Permanent set
- 2 Ultimate tensile strength
- 3 Di-electric constant
- 4 Dissipation factor

The electrical performance test as stipulated in IEEE, VDE 0278 shall be carried out to check the performance of the termination's. (please refer clause (5.14-A)

D) Identification and Packages

For the purpose of identification PST silicone cold shrink breakout boots shall be marked clearly and permanently in a prominent position with the supplier's name.

Electrically semi conducting tape shall be marked "semi conducting" clearly and permanently.

Components shall normally be supplied in a package as a complete termination, which shall be clearly marked with the **suppliers name, vocab number, voltage, application and cable size.**

Packaging shall be designed to protect against ingress of moisture and mechanical damage. Self-fusing tapes shall have means to prevent the fusing of surfaces from each other.

The complete cold shrinkable components required to complete in all respect of one termination shall be supplied in a kit form. The kit content list and the installation instruction manual must be available.

E) Storage

Components shall be capable of being stored without deterioration within the temperature range of (-6° C to 52° C)

Components or materials, if subject to shelf life limitation, shall have the date of manufacture prominently and permanently shown on all packaging.

5.22		Terms of Payment	22-5 شروط الدفع
		Confirming the delivery of the material in full and in good condition to MEW stores, the payment can be released against an invoice from the supplier	في حال إثبات تسليم جميع المواد لمخازن وزارة الكهرباء والماء بحالة جيدة تقوم الوزارة بدفع الفاتورة المقدمة من قبل المورد.
		a) payment on completion of supply of materials:	الدفع في حالة التسليم النهائي للمواد :
		On completion of supply of materials in the stores and accepted by MEW Engineer an invoice in triplicate shall be submitted to MEW for payment of the invoice for the price schedule 'D'	عند التسليم النهائي للمواد بالمخازن وبعد الموافقة عليها من قبل المهندس المسئول من وزارة الكهرباء والماء تقوم الشركة بتقديم شهادة دفع من ثلاث نسخ لوزارة الكهرباء والماء وتقوم الوزارة بدفع قيمة الشهادة المقدمة لجدول الأسعار (D).
		Bank guarantee shall be released on completion of '1' One Year guarantee period.	سوف يتم الإفراج عن الكفالة البنكية بعد انتهاء فترة الضمان (سنة واحدة).
5.23		MANUFACTURERS REQUIREMENTS:	
		The contractors supply equipment only from manufacturers who has the following :	
	A	THE MANUFACTURER MUST HAVE ISO 9001 CERTIFICATE. OR BETTER.	
	B	MANUFACTURER`S MATERIALS SHOULD HAVE PASSED TEST BY AN INDEPENDENT INTERNATIONALLY APPROVED LABORATORY (ASTA / KEMA / CESI / cpri), RELEVANT CERTIFICATE TO BE PROVIDED TO MEW ALONG WITH THE OFFER. THE TEST CERTIFICATE SHOULD COMPLY WITH MEW SPECIFICATIONS	
	C	MATCHING THE TECHNICAL SPECIFICATIONS WHICH ARE SHOWN IN SECTION NO.6.	
5.23.1	A	The contractor must submit a certificate from the manufacturer along with his offer stating commitment to the quantity and duration required to execute the subjected contract with manufacturers commitment to manufacture and supply.	
	B	The offer, which is submitted without certificate from manufacturer, shall be rejected.	
5.23.2		The priority in this tender should be for the local national product according to article no. 62 from CAPT public tender Law No. 49 of 2016 (And it's adjustments according to law no. (74) for the year 2019).	