DGVCL

TECHNICAL SPECIFICATION OF JOINTS FOR 1.1kV XLPE ALUMINIUM / COPPER POWER CABLES

1 Scope

This specification covers design and manufacturing, supply and jointing of cable joints suitable for 1.1kV Armored PVC/XLPE Al/Cu Conductor Cables.

2 Service Conditions:

Equipment to be supplied against this specification shall be suitable for satisfactory continuous operation under the following tropical conditions.

a) Maximum ambient temperature of air: 50˚C
b) Maximum temperature of air in shade: 4˚C
c) Maximum daily average ambient temperature: 40˚C
d) Maximum yearly average ambient temperature: 30˚C
e) Relative Humidity: up to 95%
f) Average number of thunder storm days per annum: 15
g) Maximum annual Rainfall: 150cm
h) Maximum Altitude above mean sea level: 1000Meter
i) Maximum Wind Pressure: 150 Kg/cm2 (As per IS 802 latest code)
j) Maximum soil temperature at cable depth: 30˚C
k) Maximum soil thermal resistively: 150˚C cm/watt

3 General Technical Requirements: -

i. The accessories shall be supplied in kit form. Each component of the kit shall carry the manufacturer's mark of origin.
ii. The supplied joint shall have a range taking feature.
iii. The kits must have unlimited shelf life.
iv. The insulating tubing over the connector should be Dual Wall design sleeve with entrapped lubricant.
v. Type tests should have been carried out to prove the general qualities and design of a given type of jointing system. The sleeve shall be tested for ANSI C1191.1-1986 or equivalent standard. Type Test Report for the same shall be submitted along with offer.
vi. The installation of joint shall be done without use of special tools like crimping tool.
vii. Conductor connection shall be achieved by use of connectors with pre-defined shear off bolt head design. The connector should be range taking which can be used for both copper & Aluminium cables.
viii. Armour Connectivity shall be maintained by using Tinned copper braid.
ix. Armour Wrap to be provided for mechanical protection of joint body.
x. The design of joint shall be such that on completion of joint the cable can be charged immediately.

4 Marking & Labeling.

As per the IS 13573 (Part-I&II):2011 all kits shall be marked and labeled suitably for identification.

a. Manufacturer's name or logo and the name of components wherever feasible;
b. Type of jointing materials, the application;
c. Batch number(s), where relevant;
d. Product reference;
e. Defined storage conditions and expiry date, if any;

f. If relevant, the manufacturing date;
g. Health and safety marking and handling instructions, where relevant; and
h. Reference to compliance with this standard.

5 Tests

(I) TYPE TESTS

The Jointing Kit offered, shall be fully type tested at NABL Lab as per the relevant standards. The tenderer shall furnish the type test reports along with the offer. Offer without Type test reports will not be considered. For any change in the design/type, already type tested and the design/type offered against this specification the purchaser reserved the right to demand repetition of type tests without any extra cost in presence of purchaser' representative.

TYPE TEST SEQUENCE

The type test shall be carried out as per the test sequence given in IS 13573/2011(Part –I, II & III)

(II) ACCEPTANCE & ROUTINE TESTS:

All acceptance and routine tests as stipulated in the relevant standards shall be carried out by the supplier in presence of purchaser's representative. The purchaser reserves the right to insist for witnessing the acceptance/routine testing of the bought-out items.

(III) ADDITIONAL TESTS:

Additional test to be carried out in GUVNL'S Lab are Volume Resistivity, B.D.V., Tensile & Elongation etc. Supplier may depute his representative for witnessing the test conforming the date from relevant GUVNL'S Lab.

(IV) PRE-DESPATCH INSPECTION

All acceptance tests and inspection shall be carried out at the place of manufacturer unless otherwise specially agreed upon the manufacturer and purchase at the time purchase. Manufacturer shall offer to the inspector representing the purchaser, all the reasonable facilities, free of charge, for inspection and testing to satisfy him that the material is being supplied in accordance with this specification. The GUVNL representative/Engineer attending the above test will carried out testing for suitable number of cable joints/terminations as per sampling procedure laid down in IS:13573(Part-I, II, III):2011 (amended up to date) and issue test certificate approval to the manufacturer and give clearance for dispatch. The cable jointing/termination kit shall be sealed after the inspection.

(V) INSPECTION AFTER RECEIPT AT STORES

For Random sample testing (RST) the sample Cable Termination/jointing kit will be drawn from any one of the store.

(VI) DEMONSTRATION & TRANING:

The purchaser reserves the right to ask for demonstration of the equipment offered at the purchaser's place. The Tenderer shall arrange for demonstration of installation of jointing/termination kits free of cost for giving training to purchaser's representative to get acquainted with the jointing method. The jointing/termination kit along with required length of the kits to be used for demonstration purpose shall be specified the cable will be provided by the Purchaser.

(VII) GUARANTEE

The Kits shall be suitable for storage without deteriorating at a temperature up to 50degree Celsius under normal conditions of storage and shall have unlimited shelf storage life. The tenderer shall guarantee the installed cable accessories for a minimum period of not less than 5 years from the date of installation. The stores/materials found defective within the above

guarantee period, shall be replaced by the supplier free of cost within one month of receipt of intimation.

(VIII) QUALITY CONTROL

The purchaser has a right to send team of experienced Engineers for assessing the capability of the firm for manufacturing and testing of Cable jointing kit as per this specification. The purchaser representative should be given all assistances and cooperation for inspection and testing at the bidder's work.

(IX) QUALITY ASSURANCE PLAN

The tendered shall invariably furnish QAP along with his offer, The QAP adopted by him in the process of manufacturing shall be consist of List of Plant and Machinery available at the manufacturers premises. List of Testing equipment's available at the manufacturers premises with their calibration schedule.

(X) PACKING

The Cable jointing kits shall be suitably packed to avoid damage or disturbance during transit or handling. Each Cable jointing kits may be suitably packed in the first instance to prevent ingress of moisture and dust and then placed in a cushioned carton of a suitable material to prevent damage due to shocks during transit. The lid of the cartoon may be suitably sealed. A suitable number of sealed cartons may be packed in a case of adequate strength with extra cushioning if considered necessary. The cases may then be properly sealed against accidental opening in transit.

The following information shall be furnished with the consignment:

- Name of consignee
- Details of consignment
- Destination
- Total Weight of consignment.
- Sign showing upper / lower side of the crate
- Sign showing fragility of the material.
- Handling and unpacking instructions.
- Bill of Materials indicating contents of each component and spare materials.
- Installation instructions including drawing or other information specific to the accessories.

MARKING/EMBOSSING

1.1. The following words shall be duly embossed on the sheath of every meter length of cables. The embossing should be clear and visible.

a) Name of Purchaser (i.e. MGVCL/DGVCL/UGVCL/PGVCL)
b) Name of manufacturer
c) Year of manufacture
d) Property of "DGVCL"

6 GTP FOR LT CABLE ACCESSORIES i.e. JOINTS &TERMINATIONS (Heat Shrinkable)

Sr. No.	Particulars	GUVNL Requirement	Bidder Offer.
1	Manufacturer' Name& Address		
2	Brand Name &Country of Origin		
3	Kit Storage Temperature	50°C max	
4	Voltage Grade	1.1kv	

5	Applicable Standards	Indicated in Cl.No.4 of Technical Spec.	
6	Material to be used	Polymeric Heat shrink tubes.	
7	Type of Kit Offered	1)Straight through Joint. 2)Transition joint. 3)Termination joint.	
8	Shelf life of components in the kit	Unlimited.	
9	Time Required for energization after completion of termination/joint.	Immediate.	
10	Impulse withstand on Low voltage kits.	As per IS 13573 joints classification for cable size less than50sqmm.it will be 8kv & for cable size more than 50sqmm.it will be 20kv	
11	Heating cycle in Air	As per IS-13573 part-I See 8.3	
12	Heat Cycle in Water(Over sheath damage)	As per IS-13573 part-I See 8.3	
13	Insulation resistance(Immersed)	As per IS-13573 part-I See 8.4	
14	Insulation resistance(Air)	As per IS-13573 part-I See 8.4	
15	Impact at ambient temp.	As per IS-13573 part-I See 8.5	
16	AC High voltage withstand(In Air)	As per IS-13573 part-I See 8.6	
17	AC High voltage withstand(immersed)	As per IS-13573 part-I See 8.6	
18	Examination of joint.	As per IS-13573 part-I See 8.8	
19	Dielectric Strength for insulating Tube.	12kv/mm	
20	Dielectric constant for insulating tube	3.5(min)	
21	Tensile strength for insulating tube	8N/mm2	
22	Ultimate Elongation for insulating tube	200 to 500%	
23	Water Absorption for Insulating Tube	0.3%	
24	Longitudinal Change for insulating tube	+10%	
25	Heat Shock for insulating tube	30min@2000c,	
26	Flammability for insulating tube	pass	
27	Heat Shrink Outer insulating tubes	As per specification (clause no.5.01& 5.02)	
28	G.I. Wire mesh / Canister	As per cable size	
29	Red mastic	As per cable size	
30	G.I. Solid Collet	As per cable size	
31	Earthing Conductor	As per requirement	
32	Ferrule	As per specification (clause no.5.01&5.02)	
33	PVC NA Tape	As per requirement	

34	PVC Adhesive Tape	As per requirement	
35	Cleaning Liquid	As per requirement	
36	Aluminum Oxide cloth	As per requirement	
37	Heat shrink break boot(Termination)	boot(Termination) As per specification (clause no.5.02)	
38	List Of Contents Of Kit (To Be Furnished Separately)	Detailed component list with Quantity etc.	