

## **GENERAL TECHNICAL REQUIREMENT OF MODULAR VARIABLE-DIAMETER CABLE SEALING SYSTEM**

### **A. GENERAL REQUIREMENT:**

1. The Modular Variable diameter cable sealing system is required for proper cable management with accommodating cable and ensuring proper water tightness, fire resistance, gas tightness, humidity and prevention against rodents.
2. Modular Variable diameter cable sealing system shall consist of cable sealing blocks of EPDM rubber having centre core, stay plates, frames, single piece compressing wedge with galvanized steel bolts etc. complete in all respect.
3. Modular Variable diameter cable sealing system consisting of above shall be installed wherever the electrical / instrumentation / communication / LT Power cables underground and over-ground enter or leave Bay kiosks, control rooms of substations / cable trench / basement.
4. It shall be repeatedly re-openable and re-useable without the use of special tools and discarding any blocks in operation.
5. The Modular Variable diameter cable sealing system supplier shall have to provide after sales service support and training as and when asked in future.

### **B. CABLE SEALING SYSTEM REQUIREMENT:**

1. The frames consisting of blocks having Variable diameter arrangement shall be provided for cable sealing in cutouts of floor/wall of control room/ Kiosk. Frames shall be sized supplied and installed by contractor as per site requirement.
2. Frames and Variable diameter type of blocks shall be from same supplier and shall have been tested for water tightness, gas tightness and fire test.
3. The supply shall be complete with Variable diameter blocks having centre plug in all blocks, Stay plates, Single piece compression wedge with galvanized steel bolts and frames.
4. Any balance space left on frame shall be filled only with Variable diameter type of blocks having center plug for the future use. Solid blocks should not be used in frame. Modular Variable diameter cable sealing system must have the flexibility towards future addition of cables in frame without affecting other cables.
5. 30% spare blocks shall be provided with usable Variable diameter blocks having center plug in respective frames.

### **C. CABLE SEALING SYSTEM COMPONENTS:**

Scope of supply shall include cable sealing blocks, frames, Stay Plates and Wedges with galvanized steel bolts as specified below.

#### **1. Modular Variable diameter type cable sealing blocks:**

Modular Variable diameter block with centre plug arrangement and having adjustable OD with peeling off arrangement shall be made of super resistant Halogen free EPDM having low smoke index. Blocks shall be suitable for following cable diameters. For cables having diameter larger than 99mm; Multi-diameter Seals shall be used for individual cables.

Blocks Size in mm	Nos of Cables	For Cable Diameter (mm)
20x20	1	0+4.0 – 14.5
30x30	1	0+10.0 – 25.0
40X40	1	0+21.5 – 34.5
60X60	1	0+28.0 – 54.0
90X90	1	0+48.0 – 71.0
120X120	1	0+67.5 – 99.0

## 2. Frames:

Frames of suitable size shall be installed before laying the cables and cable shall be passed from the frame according to blocks. Material of sealing frames for installing blocks shall be of galvanized steel.

## 3. Stay plates:

Stay plates for separating the block raw layers shall be provided. Material of stay plates for installing blocks shall be of galvanized steel.

## 4. Wedges:

The wedge shall be of single piece to be made of super resistant halogen free EPDM with low smoke index having galvanized steel bolts to compress the blocks in the frame. The wedge shall be such that it can be used at any position within the frame openings and should not require any special tools for installation.

## D. TESTS:

### a) TYPE TESTS: -

**The following tests from NABL accredited laboratory shall be carried out in accordance with the latest / amended / up to date IS/IEC. The bidder has to submit the all type test reports as stated hereunder for the offered item along with the technical bid. The type test reports from NABL approved laboratory shall not be older than seven years. Type test reports shall be valid as on the last date of submission of bid.**

1. Water tightness test as per relevant applicable standard
2. Gas tightness test as per EN 12266-1 Or Equivalent
3. Fire resistance test (Class A) as per IMO 2010 FTP code Or Equivalent
4. Thermal conductivity test as per ASTM D 5930 Or Equivalent
5. Dielectric strength test as per ASTM D 149-75 Or Equivalent
6. Heat radiation classification test (M2 type) as per NF P 92-512-1986 Or Equivalent
7. Smoke index test as per NF F 16-101 & NF F 16-102 Or Equivalent

**In case of non-submission /partial submission or type test reports of which validity is over, bidder shall submit pending type test report/s from NABL accredited laboratory, in the event of an order, before commencement of supply without affecting delivery schedule, free of cost to GETCO. Confirmation for above shall be invariably submitted along with technical bid.**

### b) ROUTINE AND ACCEPTANCE TESTS: -

Following tests shall be performed on each module of the Modular variable diameter cable sealing system. Samples shall be selected by purchaser from offered lot for the purpose of acceptance testing.

**1. Visual Examination:**

The Cable transit system shall be examined physically for the workmanship and the design technology employed. It shall be checked for any flaw/defect, roughness of samples cracks visible to naked eye and shall consist of verifying manufacturer's identity & dimensional range, compression of system & system configuration.

**2. Manufacturer's Identity & Dimensional Range:**

Cable Transit system shall be examined visually to check the manufacturer's trademark. The location of the trademark on the system shall be matched with concerned drawing of system. Each variable diameter type module shall be visually checked for the range of diameter of cables it can hold & shall be verified by printed/ marked dimensional range mentioned on each module

**3. Compression of System:**

Cable Transit system shall be examined visually to check proper compression of variable diameter type modules. The rays of light shall not pass through system / modules.

**E. INSPECTION:-**

Inspection of the material shall be offered only after successful completion of routine testing at the works. 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 a reasonable time when the work is in progress. The purchaser reserves the right to insist for witnessing the acceptance testing of bought out items. The dispatch of the material shall be only after successful completion of inspection and issue of dispatch clearance from the purchaser.

**F. Technical Parameters for Modular Variable diameter Cable sealing system & components:-**

Sr. No.	Item	Specification
1.	<b>Modular Variable diameter Cable sealing system</b>	<b>Parameters:</b> <ol style="list-style-type: none"> <li>1. Water tightness: <math>\leq 3.5</math> Bar</li> <li>2. Gas tightness: <math>\leq 2.5</math> Bar</li> <li>3. Fire resistance and integrity: <math>\leq A 60</math> (A class approved)</li> <li>4. Curing requirement : NO</li> </ol>
2.	<b>Modular Variable diameter type cable blocks with centre core arrangement and having adjustable outer diameter with peeling-off arrangement</b>	<b>(A) Parameters:</b> <ol style="list-style-type: none"> <li>1. Material: Halogen free cross linkable rubber compound based on EPDM (Ethylene Propylene rubber)</li> <li>2. Sp. Gravity: 1200-1600 Kg/M<sup>3</sup></li> <li>3. Temperature of decomposition: <math>&gt; +300</math> Deg. C</li> <li>4. Thermal conductivity: <math>\leq 0.64W</math> (m/K)</li> <li>5. Depth of block: 60mm</li> <li>6. Diameter adaptability of module: 4 mm <math>\geq</math> &lt; 99 mm</li> <li>7. Shelf life of module: <math>\leq 15</math> Years</li> <li>8. Shape: With centre plug arrangement</li> <li>9. Di-electric strength: 22KV/mm or Better</li> <li>10. Colour: Any Colour</li> <li>11. Odour: Rubber</li> <li>12. Heat radiation classification: M2 type</li> <li>13. Storage requirement: Room temperature</li> </ol>

		<p>14. Smoke Index: Low 15. Solubility: Insoluble in water</p> <p><b>(B) Modular Variable diameter blocks type and dimensions</b></p> <table border="1"> <thead> <tr> <th>Blocks Type</th> <th>Nos of Cables</th> <th>External dimension (mm)</th> <th>For Cable Diameter (mm)</th> </tr> </thead> <tbody> <tr> <td>Variable</td> <td>1</td> <td>20x20</td> <td>0+4.0 – 14.5</td> </tr> <tr> <td>Variable</td> <td>1</td> <td>30x30</td> <td>0+10.0 – 25.0</td> </tr> <tr> <td>Variable</td> <td>1</td> <td>40x40</td> <td>0+21.5 – 34.5</td> </tr> <tr> <td>Variable</td> <td>1</td> <td>60x60</td> <td>0+28.0 – 54.0</td> </tr> <tr> <td>Variable</td> <td>1</td> <td>90x90</td> <td>0+48.0 – 71.0</td> </tr> <tr> <td>Variable</td> <td>1</td> <td>120x120</td> <td>0+67.5 – 99.0</td> </tr> </tbody> </table>	Blocks Type	Nos of Cables	External dimension (mm)	For Cable Diameter (mm)	Variable	1	20x20	0+4.0 – 14.5	Variable	1	30x30	0+10.0 – 25.0	Variable	1	40x40	0+21.5 – 34.5	Variable	1	60x60	0+28.0 – 54.0	Variable	1	90x90	0+48.0 – 71.0	Variable	1	120x120	0+67.5 – 99.0
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<b>3</b>	<b>Sealing frames</b>	<p><b>Parameters:</b></p> <ol style="list-style-type: none"> <li>1. Material of frame – Galvanized Mild steel</li> <li>2. Installation of frame in wall – Bolting / Casting / Welding</li> <li>3. Width in individual packing space – 120mm</li> <li>4. Protective coating - Galvanized</li> <li>5. Thickness of frame – More than 5 mm</li> </ol>																												
<b>4</b>	<b>Stay plates (For separating blocks of row layers and anchor them axially in frame)</b>	<p><b>Parameters:</b></p> <ol style="list-style-type: none"> <li>1. Material – Galvanized Mild steel</li> <li>2. Thickness – 0.5 mm</li> <li>3. Depth – 62 mm</li> <li>4. Width - 120 mm</li> </ol>																												
<b>5</b>	<b>Wedge (For compression and it shall be used at any position within the frame opening and shall not require any special tools for installation)</b>	<p><b>Parameters:</b></p> <ol style="list-style-type: none"> <li>1. Material: Halogen free cross linkable rubber compound based on EPDM (Ethylene Propylene rubber)</li> <li>2. Sp. Gravity: 1200-1600 Kg/M<sup>3</sup></li> <li>3. Temperature of decomposition: &gt; +300 Deg. C</li> <li>4. Thermal conductivity: ≤ 0.64W (m/K)</li> <li>5. Width: 120mm</li> <li>6. Height: 29 mm (un compressed)</li> <li>7. Height: 48 mm (compressed)</li> <li>8. Di-electric strength: 22KV/mm or Better</li> <li>9. Colour: Any Colour</li> <li>10. Odour: Rubber</li> <li>11. Heat radiation classification: M2 type</li> <li>12. Storage requirement: Room temperature</li> <li>13. Smoke Index: Low</li> <li><b>14. Solubility : Insoluble in water</b></li> </ol>																												

## GTP - To be filled by 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.**

MODULAR VARIABLE DIAMETER CABLE SEALING SYSTEM						
	Supplier					
	Manufacturer					
	Quantity in Nos.					
Sr. No.	Item	Specification	Particulars to be filled by Bidder	Remarks		
1	Modular Variable diameter Cable sealing system	<b>Parameters:</b>				
		1. Water tightness				
		2. Gas tightness				
		3. Fire resistance and integrity				
		4. Curing requirement				
2	Modular Variable diameter type cable blocks with centre core arrangement and having adjustable outer diameter with peeling-off arrangement	<b>(A) Parameters:</b>				
		1. Material				
		2. Sp. Gravity				
		3. Temperature of decomposition				
		4. Thermal conductivity				
		5. Depth of block				
		6. Diameter adaptability of module				
		7. Shelf life of module				
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				<b>(B) Modular Variable diameter blocks type and dimensions</b>		
				<b>Blocks Type</b>	<b>Nos. of Cables</b>	<b>External dimension (mm)</b>
		Variable	1	20x20	0+4.0 – 14.5	
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3	Sealing frames	<b>Parameters:</b>							
		1. Material of frame							
		2. Installation of frame in wall							
		3. Width in individual packing space							
		4. Protective coating							
4	Stay plates (For separating blocks of row layers and anchor them axially in frame)	<b>Parameters:</b>							
		1. Material							
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