



# PRODUCT STANDARD

## SWITCHGEAR ENGINEERING DIVISION

SG 12985 REV.00

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### SPECIFICATION OF ELASTOMER INSULATING MATS FOR ELECTRICAL PURPOSES

**OBJECTIVE:** This Product Standard covers specification of Insulating Mats upto 33kv HT switchgear application.

#### A.1 Technical Parameters for Item-01- 11KV Insulating Mat

| S/No | Parameters                                                                | Value          | Vendor Compliance     |
|------|---------------------------------------------------------------------------|----------------|-----------------------|
| 1    | Nominal Voltage                                                           | 11KV           | Complied/Not Complied |
| 2    | Thickness                                                                 | 2.5 mm         | Complied/Not Complied |
| 3    | Piece Length                                                              | 2 Mtr          | Complied/Not Complied |
| 4    | Width                                                                     | 1 Mtr          | Complied/Not Complied |
| 5    | Applicable Standard                                                       | IS 15652: 2006 | Complied/Not Complied |
| 6    | Class of Mat As per IS 15652:2006                                         | Class B        | Complied/Not Complied |
| 7    | Operating Temperature Range                                               | -10 to 55 °C   | Complied/Not Complied |
| 8    | Minimum Tensile Strength(N/MM <sup>2</sup> )                              | 15             | Complied/Not Complied |
| 9    | Minimum Elongation (%)                                                    | 250            | Complied/Not Complied |
| 10   | Insulation resistance with water at 500 V                                 | 1,000,000 M Ω  | Complied/Not Complied |
| 11   | Maximum Leakage Current at 11 KV                                          | 10 mA          | Complied/Not Complied |
| 12   | AC Dielectric Strength                                                    | 45 KV          | Complied/Not Complied |
| 13   | AC Proof Voltage<br>1) Type Test for 3 Min.<br>2) Routine Test for 1 min. | 22 KV          | Complied/Not Complied |
| 14   | Flame Retardance                                                          | 5.0 Sec        | Complied/Not Complied |

#### A.2 Technical Parameters for Item-02- 33 KV Insulating Mat

| S/No | Parameters                                   | Value           | Vendor Compliance     |
|------|----------------------------------------------|-----------------|-----------------------|
| 1    | Nominal Voltage                              | 33 KV           | Complied/Not Complied |
| 2    | Thickness                                    | 3.0 mm          | Complied/Not Complied |
| 3    | Piece Length                                 | 4 Mtr           | Complied/Not Complied |
| 4    | Width                                        | 1 Mtr           | Complied/Not Complied |
| 5    | Applicable Standard                          | IS 15652: 2006  | Complied/Not Complied |
| 6    | Class of Mat As per IS 15652:2006            | Class C         | Complied/Not Complied |
| 7    | Operating Temperature Range                  | -10 to 55 °C    | Complied/Not Complied |
| 8    | Minimum Tensile Strength(N/MM <sup>2</sup> ) | 15              | Complied/Not Complied |
| 9    | Minimum Elongation (%)                       | 250             | Complied/No Complied  |
| 10   | Insulation resistance with water at 500 V    | 1,000,000 M Ω   | Complied/Not Complied |
| 11   | Maximum Leakage Current at 11 KV             | 10 mA           | Complied/Not Complied |
| 12   | AC Dielectric Strength                       | 65 KV           | Complied/Not Complied |
| 13   | AC Proof Voltage                             | 36 KV for 1 min | omplied/Not Complied  |
| 14   | Flame Retardance                             | 5.0 Sec         | Complied/Not Complied |

|       |  |                               |                      |
|-------|--|-------------------------------|----------------------|
| REV.  |  | PRINTS TO:-                   | APPROVED –<br>MHN    |
| ALTD. |  | SWE-CEG<br>SWE-PDG<br>SWE-TDR | 1<br>1<br>1          |
| APPD. |  |                               | PREPARED ISSUED DATE |
| DATE. |  |                               | SKS NM 06.03.2020    |

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### B. Other Salient Points to be complied by bidder for Item-01 & 02

| S/No | Parameters                                                                                                                                                                                                                                          | Value                       | Vendor Compliance                                                                                                                               |
|------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
| 1    | Effect of Acid as per IS 15652 clause 8.5 and conditioning procedure described in C-6<br>(Tensile Strength<br>Elongation)                                                                                                                           | (%age change from original) | Vendor to provide test reports as per IS along with offer and establish applicability of test reports inline with requirements mentioned in IS. |
| 2    | Effect of Alkali as per IS 15652 clause 8.5 and conditioning procedure described in C-6<br>(Tensile Strength<br>Elongation)                                                                                                                         |                             |                                                                                                                                                 |
| 3    | Effect of Oil as per IS 15652 clause 8.5 and conditioning procedure described in C-6<br>(Tensile Strength<br>Elongation)                                                                                                                            |                             |                                                                                                                                                 |
| 4    | Effect of Diesel as per IS 15652 clause 8.5 and conditioning procedure described in C-6<br>(Tensile Strength<br>Elongation)                                                                                                                         |                             |                                                                                                                                                 |
| 5    | Ageing Properties at 70±1°C for 168 hrs.<br>(Tensile Strength<br>Elongation (%))                                                                                                                                                                    |                             |                                                                                                                                                 |
| 6    | MAT shall be ISI marked                                                                                                                                                                                                                             |                             | Complied/Not Complied                                                                                                                           |
| 7    | Mats shall be free from cracks, blisters, cuts, voids etc                                                                                                                                                                                           |                             | Complied/Not Complied                                                                                                                           |
| 8    | One surface shall be Anti-Skid, surface shall have small aberration (rough surface without edges) to avoid slippery effect                                                                                                                          |                             | Complied/Not Complied                                                                                                                           |
| 9    | Other surface shall be plane finished slip resistant                                                                                                                                                                                                |                             | Complied/Not Complied                                                                                                                           |
| 10   | Mat should be marked at every meter with ISI mark, Class, Lot no. and manufacturers identity                                                                                                                                                        |                             | Complied/Not Complied                                                                                                                           |
| 11   | Vendor to specify Insulating mat shall be pastable type, to be fixed permanently on the front/rear side of the switchgear panels.                                                                                                                   |                             | Complied/Not Complied                                                                                                                           |
| 12   | Supply to accompany additional sample pieces for tests called in IS.                                                                                                                                                                                |                             | Complied/Not Complied                                                                                                                           |
| 13   | Vendor to give quality plan along-with offer clearly mentioning the routine tests to be conducted before dispatch.                                                                                                                                  |                             | Complied/Not Complied                                                                                                                           |
| 14   | Vendor to enclose 1 set of type tests (as per IS) along-with the offer. Type test reports from NABL accredited is only acceptable. Further 2 sets of all routine test reports (as per IS) shall be submitted along-with each supplied lot of items. |                             | Complied/Not Complied                                                                                                                           |
| 15   | Colour shall be informed at the time of order placement. Vendor shall take conformation of color from BHEL before mass manufacturing                                                                                                                |                             | Complied/Not Complied                                                                                                                           |

### C. Packing and Shipping

Mat shall be suitably packed so that no damage is done during transport. Suitable separation between pieces/rolls, if needed to be ensured by vendor.

### D. ACCEPTANCE CRITERIA :

- 1) Visual checks for cracks and surface finish.
- 2) Availability of all routine test certificates as per IS.

### E. PERFORMANCE GUARANTEE :

The supplier shall guarantee satisfactory performance of the Mats for 63 months from the date of supply.