

PSGSG / 14-15/ 005, Rev-01	Process Specifications for Electrical Grade PTFE Bushes	Drg.No.	
		Date	16.07.2016
		Product	GSM-400
S.NO	BHEL Specification	Vendor compliance	
		YES/NO	Remarks
1.0	APPLICATION: PTFE bushes are used as nozzles in gas circuit breakers for effective short circuit current interruption.		
2.0	SPECIFICATIONS:		
2.1	Configuration: Hollow cylindrical bush.		
2.2	Material : MoS ₂ filled PTFE PTFE – 99.8% (By weight) Molybdenum disulphide ~ 0.2% (By weight) Color - Light Grey		
2.3	Dimensions & Quantities: Ø150±0.5 mm x Ø20±0.5 mm x 350±1 mm long – 20 Nos.		
2.4	Exposure to high current arcing should not carbonize the material and result in deep penetration burns, impairing the dielectric strength of the material. Quality control check certificate should be furnished.		
2.5	Compression-molded PTFE bush with MoS ₂ filler uniformly distributed, free from occlusion and air pockets suitable for High Voltage Applications.		
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2.6	Properties: <table><tr><td>#</td><td>Property</td><td>Value</td></tr><tr><td>1</td><td>Density</td><td>2.14 to 2.18 gm/cc</td></tr><tr><td>2</td><td>Water absorption</td><td>< 0.01% max</td></tr><tr><td>3</td><td>Melting point</td><td>320 to 340°C</td></tr><tr><td>4</td><td>Continuous use</td><td>-260/ +280 °C</td></tr><tr><td>5</td><td>Thermal conductivity</td><td>6x10-4 cal/sec/cm</td></tr><tr><td>6</td><td>Compressive strength</td><td>≥ 4.3 N/mm²</td></tr><tr><td>7</td><td>Hardness</td><td>55+/- 2</td></tr><tr><td>8</td><td>Elongation at break</td><td>>250 %</td></tr><tr><td>9</td><td>Tensile modulus</td><td>4000 Kgf/cm²</td></tr><tr><td>10</td><td>Tensile Strength</td><td>>25Mpa</td></tr><tr><td>11</td><td>Impact strength</td><td>~ 3.0 J/cm</td></tr><tr><td>12</td><td>Static coefficient of friction</td><td><0.1</td></tr><tr><td>13</td><td>Dielectric break down Strength (0.5mm sample)</td><td>40 –60 kV/mm</td></tr><tr><td>14</td><td>Tracking index</td><td>Min. 600 volts</td></tr><tr><td>15</td><td>Volume resistivity</td><td>>1x1016ohm/ cm</td></tr><tr><td>16</td><td>Dielectric constant</td><td>1.9 to 2.1</td></tr><tr><td>17</td><td>Dissipation factor</td><td>< 0.0002</td></tr></table>	#	Property	Value	1	Density	2.14 to 2.18 gm/cc	2	Water absorption	< 0.01% max	3	Melting point	320 to 340°C	4	Continuous use	-260/ +280 °C	5	Thermal conductivity	6x10-4 cal/sec/cm	6	Compressive strength	≥ 4.3 N/mm²	7	Hardness	55+/- 2	8	Elongation at break	>250 %	9	Tensile modulus	4000 Kgf/cm²	10	Tensile Strength	>25Mpa	11	Impact strength	~ 3.0 J/cm	12	Static coefficient of friction	<0.1	13	Dielectric break down Strength (0.5mm sample)	40 –60 kV/mm	14	Tracking index	Min. 600 volts	15	Volume resistivity	>1x1016ohm/ cm	16	Dielectric constant	1.9 to 2.1	17	Dissipation factor	< 0.0002		
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2.7	This filler shall improve surface hardness, stiffness, and to reduce the starting coefficient of friction and steady-state wear. Its effect on electrical and chemical properties must be negligible.																																																								
2.8	Qualifying Requirements: The supplier shall be of International repute with proven record and should have supplied MOS2 filled PTFE bushes for arcing applications in the field of high power circuit breakers globally. The supplier must submit along with the quotation a few references to whom the supplier has supplied a similar material.																																																								
2.9	Tests: Test reports for the properties like density, hardness shall be furnished along with the supply.																																																								
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2.10	General: Material must be free from defects, cavities, pin holes and the same shall be ensured by the supplier. Uniform composition of the material shall be ensured. The finished bush shall not have any ovality, bend and the outer surface should be free from dents/visible surface defects. Perpendicularity of the flat surface (base) shall be maintained at +/- 0.1. The component shall be free from dirt, grease and moisture.		
2.11	Packing: Each bush should be individually wrapped in polyethylene and packed in separate high density, dust free card board boxes. The lot should be supplied in shock proof, unbreakable containers.		
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