

PSGSG 2019-20 / 003	Product Specifications for ELECTRICAL GRADE PTFE BUSHES	Drawing No.	
		Date	29.08.2019
		Product	CGSM 145
S. No.	BHEL Specification	Vendor compliance	Vendor remarks / description

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 - Grey		
2.3	Dimensions: 1) Ø125±0.5 mm x Ø15±0.5 mm x 300±1 mm long 2) Ø60±0.5 mm x Ø20±0.5 mm x 300±1 mm long		
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.		
2.6	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.		

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2.7	Properties: <table><tr><th>#</th><th>Property</th><th>Value</th></tr><tr><td>1</td><td>Density</td><td>2.1 to 2.2 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 °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>50 – 60 Kgf/Cm²</td></tr><tr><td>7</td><td>Hardness</td><td>60+/- 2</td></tr><tr><td>8</td><td>Elongation</td><td>200 to 350 %</td></tr><tr><td colspan="3"> </td></tr><tr><td>9</td><td>Tensile modulus</td><td>4000 Kgf/cm²</td></tr><tr><td>10</td><td>Impact strength</td><td>~ 3.0 J/cm</td></tr><tr><td>11</td><td>Static coefficient of friction</td><td><0.1</td></tr><tr><td>12</td><td>Dielectric break down strength (0.4mm sample)</td><td>40 –60 kV/mm.</td></tr><tr><td>13</td><td>Tracking index</td><td>Min. 600 volts</td></tr><tr><td>14</td><td>Volume resistivity</td><td>>1x10¹⁶ohm/ cm</td></tr><tr><td>15</td><td>Dielectric constant</td><td>1.9 to 2.1</td></tr><tr><td>16</td><td>Dissipation factor</td><td>< 0.0002</td></tr></table>	#	Property	Value	1	Density	2.1 to 2.2 gm/cc	2	Water absorption	< 0.01% max	3	Melting point	320 to 340°C	4	Continuous use	260 °C	5	Thermal conductivity	6x10 ⁻⁴ cal/sec/cm	6	Compressive strength	50 – 60 Kgf/Cm ²	7	Hardness	60+/- 2	8	Elongation	200 to 350 %				9	Tensile modulus	4000 Kgf/cm ²	10	Impact strength	~ 3.0 J/cm	11	Static coefficient of friction	<0.1	12	Dielectric break down strength (0.4mm sample)	40 –60 kV/mm.	13	Tracking index	Min. 600 volts	14	Volume resistivity	>1x10 ¹⁶ ohm/ cm	15	Dielectric constant	1.9 to 2.1	16	Dissipation factor	< 0.0002		
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3.0	Tests: Test reports for the properties like density, hardness shall be furnished along with the supply.																																																								
4.0	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 orality, 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.																																																								
5.0	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.																																																								