

Technical Requirement of Bushings

- 1.0 A) Long Bushings : Drg. No. 613 44 059
 B) Medium Bushings : Drg. No. 613 44 060
 C) Short Bushings : Drg. No. 613 44 061

1.1 **Material** : The Bushing shall be made of cold deformed tube with inner hexagonal profile of **Chrome Silicon Steel** of good quality.

Grade : 40 x GOST 4543 – 71 or alternative material **Chrome Molybdenum Steel 40 (Cr 1Mo 28)** to IS 5517 : 1969 or EN19A to BS 970.

1.2 **Chemical Composition (in %)**

C	Si	Mn	Cr	S	P
0.36 - 0.44	0.17 – 0.37	0.50 - 0.80	0.80 - 1.10	0.035 Max	0.035 Max

Residual content of Copper and Nickel should not exceed 0.30% each

1.3 **Mechanical Properties**

UTS Kgf / mm ² (Min.)	Yield Point Kgf / mm ² (Min.)	Elongation % (Min.)	Reduction of Area % (Min.)	Impact Strength Kg m / Cm ² (Min.)	Hardness HRC
100	80	10	45	6	35.5 - 45.5

1.4 **Condition of supply** : The Bushes shall be hardened & tempered to achieve required mechanical properties. The sample shall be selected from each H.T. batch for evaluating mechanical properties as specified above.

2.0 Sample for mechanical tests should represent the longitudinal direction of the components and specimens to be prepared from heat-treated blank correspond to the norms as per table given in clause no.1.2 & 1.3. Cutting out of test pieces should be done by cold technique and with use of protective measures, to avoid surface hardening and overheating.

2.1 100% Bush will be subjected to hardness test.

2.2 Impact strength will be determined on Type I / II specimens as per GOST 9454 - 78 at room temp. Length = 55 ±0.6mm, Width = 10 / 7.5 ±0.10mm, Height = 10 ±0.1mm, U type Notch of 2 x 2 mm, Radius of concentrator = 1 ±0.07mm, Height of working section = 8 ±0.1mm.

2.3 All the bushes should be subjected to magnetic crack detection test to show their freedom from hairline crack.

2.4 Scales, Fissures, Cavities and Back fins are not permissible on the surface of the Bushings.

3.0 **Visual Inspection** : Bushings are to be free from the following defects :

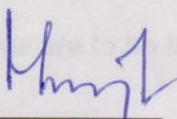
3.1 Corrosion

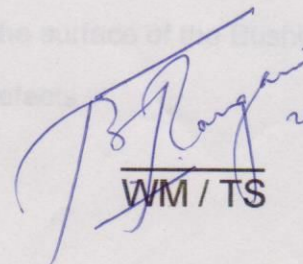
3.2 Defects in construction

3.3 Presence of Foreign bodies

3.4 Moisture & Dust

- 3.5 Any form of deterioration of material & finishing
 - 3.6 Distortion
 - 3.7 Mechanical Imperfections
 - 4.0 **Packing :**
 - 4.1 The components should be packed properly to avoid transit damage.
 - 5.0 **Dimension Controlling :** As per Drg. No. 613-44-059, 613-44-060 & 613-044-061.
 - 5.1 Tolerance on dimensions unless other wise stated as per **IS 2102 : Latest.**
 - 5.2 Depth of wrinkles in Bushings (0.50 mm max.) at corners of hexagon and the profile confirming to photo (specimen refer sketch P 1) is checked by metallographic method at specimens selected from 3% bushings of each batch, per batch representing 400 pieces maximum.
 - 5.3 For dimensional check the firm will design and manufacture its own gauges duly calibrated by NABL accredited laboratory. Gauges will be the property of purchaser & firm will have to return them back after completion of order.
 - 6.0 Before commencement of processing the supplier will offer the material batch wise for inspection accompanied with pre-inspection report & test certificate. Firm can take help of outside NABL certified laboratory and its test report are accompanied with its NABL validation certificate.
 - 6.1 Batch means the nos. of components, heat treated continuously without stopping heat treatment line.
 - 6.2 Pilot Sample to be approved before Bulk Supply.
 - 7.0 **Test Certificate :**
- The test certificate should contain following:
- Chemical composition of material batch wise as obtained from the supplier of raw material
 - Mechanical Properties report.
 - Magnetic crack detection test report.
 - Heat Treatment Schedule.
 - Dimension reports.


Jt.GM / FP-II


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