



TSD6206

PLANT PURCHASING SPECIFICATION BHOPAL

BP 12070

REV NO. 06

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SUPERSEDES

BP12070 Rev 05

SILVER BEARING HARD DRAWN COPPER COMMUTATOR SEGMENT Ag 0.08 to 0.15%

1. GENERAL

This specification *governs* the quality of silver bearing hard drawn copper commutator segments, over 6 mm in height & upto 15 mm thick in which the inclination of the two surfaces is constant throughout the height.

2. COMPLIANCE WITH NATIONAL STANDARDS

This specification shall comply, in general, with the requirements of the following National Standards and also meet the requirement of this specification :

Material:

IS : 5885-1977 (Reaffirmed 2016)

Grade: Copper silver alloy, (except silver content)

3. Dimensions and Tolerances

BS : 1434-1985 (Reaffirmed 2017).

3.1 Sizes

All sizes shall be according to the drawing accompanying our order.

3.2 Tolerance

The tolerances on dimensions and shapes shall comply with C1.6 of BS : 1434 -1985 (Reaffirmed 2002) as detailed below and in addition shall comply to the following.

The measurement shall be made by a suitable programme co-ordinate measuring machine and readings shall be recorded in Test Certificate (C1.9).

Revision :

Reviewed & IS,BS Reaffirmed

Issued by :

Prayal
STANDARDS AND MATERIALS GROUP
TECHNICAL SERVICES DEPARTMENT

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3.2.1	<u>End Squareness</u>	To cl. 6.2
3.2.2	<u>Height</u>	To cl. 6.3
3.2.3	<u>Thickness</u>	To cl. 6.4 (Close Gr.)
3.2.4	<u>Angle</u>	To cl. 6.5 (Close Gr.)
3.2.5	<u>Shape of side faces-Convexity or concavity</u>	To cl. 6.6 (Close Gr.)
	Note:- Convexity or concavity may also be Checked on computer aided profile projector	
3.2.6	<u>Straightness</u>	To cl. 6.7
3.2.7	<u>Twist</u>	To cl. 6.8

BS:1434-85
(Reaffirmed 2017)

3.2.8 Segment Length

For bars ordered as segments for assembly, the length when measured at any position across the width of the bar shall not deviate from the specified length by more than ± 0.8 mm.

3.2.9 Sharpness of Corners

Any loss of sharpness of corners shall not exceed 10% of bar thickness at thick edge. The min. & max. values being 0.25 and 0.76 mm.

4.0 FREEDOM FROM DEFECTS

The segment shall be clean, smooth & free from harmful defects.

5.0 CHEMICAL COMPOSITION

The copper used for the manufacture of this alloy shall be of ETP Gr. except silver content, as mentioned in IS:5885 / BS: 1434.

The material when analysed in accordance with IS:440 shall have following chemical composition:

Element	Percent
Silver	0.08 to 0.15
Copper and Silver	99.9 Min.

6.0 TEST SAMPLES

One sample per size per consignment of 3 tonnes or part there of shall be selected for testing.



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7.0 MECHANICAL PROPERTIES

7.1 Tensile

Test sample when tested in accordance with IS: 1608 shall show the tensile strength as given below :

Thickness		Tensile Strength
Over mm	upto & incld mm -	Min. N/mm ²
-	5	310
5	10	280
10	-	255

7.2 Hardness:

The hardness shall be determined by the Vickers hardness test in accordance with IS:1601 Pt.1/BSEN IS:6507. Routine measurements shall be made on the side face of the bar segment or blank.

Thickness		Hardness Hv Min
Over mm	upto & incl. mm	
-	5	95
5	10	90
10	-	85

8.0 ELECTRICAL RESISTIVITY:

The resistance at 20°C shall be not greater than 0.01777 Ohm. mm²/m which is equivalent to 97% min. of electrical conductivity of IACS Standard when measured on the sample in as received condition.

Alternatively, the method of measurement employing eddy current probes.

As per ASTM-E 1004 shall also be acceptable.

Refer IS: 613 Appendix "B" for temperature correction factor.

9.0 TEST CERTIFICATE:

Unless otherwise specified, three copies of a test certificate shall be supplied along with each consignment.

In addition, the supplier shall ensure to enclose one copy of the test certificate along with dispatch documents/shipping list to facilitate quick clearance of the material.



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The test certificate shall bear the following information:

BP12070 Rev.06 : Silver Bearing Hard Drawn Copper Commutator Segments.
(Ag 0.08 to 0.15%)

BHEL Order No.

Size

Batch No.

Test results obtained for electrical, mechanical properties and chemical composition.

Dimensional tolerance, measured by a suitable programme Co-ordinate measuring machine, as per specification & drawing.

10.0 PACKING AND MARKING:

Segments shall be adequately packed to prevent damage during transit.

Each bundle/package shall bear the following information

BP12070 : Silver Bearing Hard Drawn Copper commutator Segments.
(Ag 0.08 to 0.15%)

BHEL Order No.

Supplier's Name

Size & Weight