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BRIGHT STEEL BARS AND SECTIONS (STANDARD QUALITY)

1 GENERAL:

This specification governs the quality requirements of Bright Steel Bars and Sections of standard quality, such as I-beams and equal angles required in very small sections.

2 APPLICATION:

Bars are used in the manufacture of threaded and machined components for general engineering purposes. Sections are used as stator spacer plate vents in generators.

3 CONDITION OF DELIVERY:

3.1 Round Bars - Class 4, surface quality.

Up to 50 mm diameter - Cold drawn.

Above 50mm diameter - Cold drawn or Hot rolled, turned and polished

3.2 Rectangular/Square/Hexagonal Bars - Class 3, surface quality.

All sizes - Cold drawn.

3.3 Sections - Class 4, surface quality.

All sizes - Cold drawn

3.4 Bars and sections shall be straight, with their ends sheared, square and true and shall have a smooth surface.

3.5 The bars and sections shall be given a clear temporary rust preventive (TRP) coating to avoid corrosion during transit and storage.

Black TRP coating is not acceptable.

Clear TRP used shall be free from pungent smell.

The following clear TRP's are suggested:

- Servo RP 150 - M/s Indian Oil Corporation
- HE - 1612 - M/s. BHEL, Bhopal
- Rustilo DW-901 - M/s. Indrol Lubricants and Specialties Ltd.
- Rustpro Special - M/s. Tide water oil co.
- Any other clear TRP conforming to IS: 1154

4 COMPLIANCE WITH NATIONAL STANDARDS:

The material shall comply with the requirements of the following National standards and also meet the requirements of this specification.

IS: 9550-2001 : Bright steel bars

Revisions: CI 27.2.d of MOM of MRC-S&GPS			APPROVED: INTERPLANT MATERIAL RATIONALISATION COMMITTEE – MRC(S&GPS)		
Rev No.07	Amd No.	Reaffirmed	Prepared HEP, Bhopal	Issued Corp.R&D	Dt. of 1 st Issue September 1976
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CORPORATE PURCHASING SPECIFICATION**5 DIMENSIONS AND TOLERANCES:****5.1 Sizes:**

Bars shall be supplied to the dimensions specified in BHEL order.

5.2 Tolerances:**5.2.1 Rectangular/Square/Hexagonal/Flat Bars:**

Unless otherwise specified, tolerances on dimensions shall be as follows:

For drawn round bars and turned bars h10 to table 2 of IS:9550

For hexagonal and square drawn bars upto and including 80mm h11 and above 80mm h12 according to table 2 of IS:9550

For drawn flats in accordance with table 3 and 4 of IS:9550

For ground products in accordance with table 1 and 2 of IS:9550

5.2.2 Sections:

As specified in BHEL order/drawing.

5.3 Length:

Bar and sections shall be supplied in lengths of 2.5 to 4.5 meters with maximum 10% of shorts of not less than 1.5 meters.

5.4 Straightness:

Unless otherwise agreed to, the permissible deviation shall not exceed 1.5mm in any one meter length. Bars and sections shall be free from twists and bends.

6 MATERIAL:

The rolled bars used for purpose of producing the bright bars shall be such, so as to ensure freedom from segregation, piping and other harmful defects.

7 MANUFACTURE:

Steel shall be manufactured by the open-hearth, electric, basic oxygen or a combination of these processes.

8 FREEDOM FROM DEFECTS:

All finished steel bars and section shall be sound and free from internal and surface defects. They shall be bright and clean.

9 SURFACE CONDITION:**9.1 Round Bars and Sections:**

Shall be entirely free from cracks and other surface defects.

9.2 Rectangular/Square/Hexagonal Bar-Type '3' Finish:

Shall comply with IS: 9550, Class 3 of table 5.

10 CHEMICAL COMPOSITION:

The melt analysis of steel and the permissible variation in the composition of the material from the melt analysis shall be as follows:

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Element	Melt analysis percent, max	Permissible variation percent
Carbon	0.25	± 0.02
Sulphur	0.040	+ 0.005
Phosphorus	0.040	+ 0.005

11 TEST SAMPLES:

One sample for chemical and tensile test shall be selected from finished steel for every 20,000 kg or part thereof, with a minimum one per heat.

12 MECHANICAL PROPERTIES:

When tested in accordance with IS:1608, the test pieces shall show the following properties:

12.1 Rectangular/Square/Hexagonal/Section - Cold Drawn:

Tensile Strength : 440 N/mm², min

Elongation on $5.65\sqrt{S_0}$ gauge length : 8 – 20%

12.2 Round Bars:**12.2.1 Bars upto 50mm Diameter – Cold Drawn**

Tensile Strength : 440 N/mm², min

Elongation on $5.65\sqrt{S_0}$ gauge length : 8 – 20%

12.2.2 Bars above 50mm Diameter:

Cold drawn or hot rolled, turned and polished.

Property	Hot rolled, turned and polished	Cold drawn
Tensile strength, min.	: 410 N/mm ²	440 N/mm ²
Elongation on $5.65\sqrt{S_0}$ gauge length	: 23%, min	OR 8-20%

13 TEST CERTIFICATES:

Three copies of test certificates shall be supplied, unless otherwise stated on the order.

In addition, to the above, the supplier shall ensure to enclose one copy of the test certificate along with their despatch documents to facilitate quick clearance of the material.

The test certificate shall bear the following information:

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BHEL order No,

Supplier's Reference:

Name

Identification No.

Melt No.

Results of Tests:

Dimensional inspection.

Results of Chemical analysis and mechanical tests.

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14 PACKING AND MARKING

The material shall be suitably packed in bundles – polythene wrapped to prevent sagging, corrosion and damage during transit. A suitable clear temporary rust preventive shall be applied all the bars as per clause 3.5 above and finally dispatched in wooden boxes.

Each bar over 50mm shall be stamped at one end with 'AA10112'. Bars 50mm and below shall be bundle together and tied with wire at 3 to 4 places along the length of the bar.

A metal label shall be securely attached to each bundle and shall bear the following information:

- AA10112: BRIGHT STEEL BARS AND SECTIONS (STANDARD QUALITY)
- BHEL Order No.
- Consignment/Identification No.
- Melt No.
- Size and Weight.
- Supplier's Name.

15 REFERRED STANDARDS (Latest Publications Including Amendments):

- 1) IS: 1154
- 2) IS: 1608
- 3) IS: 9550