	CORPORATE PURCHASING SPECIFICATION	AA 101 08
		Rev. No. 09
		PREFACE SHEET

STRUCTURAL STEEL-STANDARD QUALITY (PLATES, SECTIONS, STRIPS, FLATS & BARS)

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Comparable Standards:

1. INDIAN	:	IS : 2062-1999 Gr : A (Fe 410 WA)
2. AMERICAN	:	ASTM A 131 M-1994
3. JAPANESE	:	JIS G 3106-1992
4. GERMAN	:	DIN EN 10025 Gr. S275JR

Suggested/Probable Suppliers And Grades:

1.	M/S TISCO	:	TISTEN 42
2.	M/S SAIL	: i)	MA 300 HY
		ii)	Lloyds, Gr :A
		iii)	IS : 2062, Gr : A

User Plant References:

1.	BHOPAL	:	PS 101 08
2.	JHANSI	:	PS 101 08
3.	HEEP, HARDWAR	:	0500.001
4.	HYDERABAD	:	HY 021 02 99
5.	TIRUCHY	:	BM-C 20

Revisions : Cl 24.4.2 of MOM of MRC-S&GPS			APPROVED : Interplant Material Rationalisation Committee-MRC (S&GPS)		
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STRUCTURAL STEEL - STANDARD QUALITY (PLATES, SECTIONS, STRIPS, FLATS & BARS)

1.0 GENERAL

This specification governs the quality requirements of Structural Steel plates, strips, flats, bars and sections such as angles, beams, channels and tees etc.

2.0 APPLICATION :

For general engineering purpose.

3.0 CONDITION OF DELIVERY :

Plates, Bars & Sections : Hot rolled in straight lengths without twists & bends

4.0 COMPLIANCE WITH NATIONAL STANDARDS:

4.1 Material shall comply with the requirements of IS : 2062-1999, Gr:A (Fe 410 WA).

4.2 Material offered to DIN EN 10025-1994 Gr. S 275JR is also acceptable. The tolerance on dimensions for plates shall comply with DIN EN 10029.

5.0 DIMENSIONS AND TOLERANCES :

5.1 Dimensions :

5.1.1 Sizes

Material shall be supplied to the dimensions specified on 'BHEL Order.

5.1.2 Length

Unless otherwise specified, hot rolled bars and sections shall be supplied in 3 to 5 metres length.

5.2 Tolerances:

5.2.1 The tolerances on hot rolled material shall comply with IS:1852. However, no plate shall be under the specified thickness at any point.

5.2.2 Straightness for hot rolled bars :

Unless otherwise specified, the permissible deviation in straightness shall not exceed 5 mm in any 1000 mm length.

6.0 MANUFACTURE:

Material shall be manufactured from semi-killed or killed steel having a carbon equivalent of 0.42 max. (melt analysis). The ends shall be cut square and true.

7.0 FREEDOM FROM DEFECTS :

All finished steel shall be well and cleanly rolled to the dimensions, sections and weights specified. The finished material shall be free from cracks, surface flaws, laminations, rough, jagged and imperfect edges and internal & surface defects. Bars shall be free from twists and bends.

Minor surface defects may be removed provided that the specified thickness is not reduced locally by more than 4% below the minimum specified thickness provided the tolerances are met with.

8.0 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:

Element	Percent, max.	Permissible variation, percent, max
Carbon	0.23	0.02
Silicon	0.40	0.03
Manganese	1.50	0.05
Sulphur	0.050	0.005
Phosphorus	0.050	0.005

Note : 1. Copper bearing steels as per IS : 2062 are also acceptable.

2. Carbon Equivalent (C.E) based on melt analysis : 0.42, max.

$$CE = C + \frac{Mn}{6} + \frac{Cr+Mo+V}{5} + \frac{Ni+Cu}{15}$$

3. The minimum silicon content in silicon killed steel shall not be less than 0.10% and when the steel is Al / Al-Si killed, the requirement regarding minimum silicon content need not apply.

4. Nitrogen content of steel should not exceed 0.012% and supplier should guarantee the same.

9.0 TEST SAMPLES :

9.1 Tensile Test Pieces :

One tensile test shall be made from finished steel for every 50,000 kg or part thereof from each melt for each class of product.

9.2 Bend Test Pieces :

Bend test piece shall be made from finished steel from each melt. The number of tests for every 50,000 kg of material or part thereof shall be as follows:

Sections	:	1 lengthwise (for each type)
Plates	:	1 lengthwise or 1 cross-wise
Flats & Bars	:	1 lengthwise

Note :

1. When more than one thickness or diameter is rolled from the same melt one additional tensile and bend test piece shall be taken for each variation in thickness of 6 mm for plates and 3 mm for bars above or below the thickness of the test piece first selected in such a class.

2. When melt No./individual identification of material is not available, one sample for every 20,000 kg or part thereof per size shall be selected for testing.

10.0 MECHANICAL PROPERTIES (On longitudinal test samples) :

10.1 Tensile :

The test pieces shall show the following properties, when tested in accordance with IS : 1608. The final value, observed or calculated shall be rounded off in accordance with IS : 2 Rules for rounding off numerical value.

Nominal thickness/ Cross section/size mm	Tensile strength N/mm^2, min.	Yield strength N/mm^2, min.	Elongation on 5.65 $\sqrt{So}$ gauge length, percent, min.
Below 20	410	250	23
From 20 upto & including 40	410	240	23
Over 40	410	230	23

10.2 Bend :

Bend test shall be conducted in accordance with IS :1599.

The test piece when cold, shall withstand without fracture, being doubled over (180^0), either by pressure or by blows from a hammer, until the internal diameter is not greater than three times the thickness of the test piece.

11.0 HARDNESS (BRINELL) :

When tested in accordance with IS : 1500, the material shall show a Brinell hardness in the range of 120-156 HB.

Note :

Hardness test shall be conducted only when tensile test cannot be performed.

12.0 TEST CERTIFICATES :

Unless otherwise specified, three copies of test certificates shall be supplied.

In addition, 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 :

AA 101 08-Rev. No.09 / IS : 2062-Gr:A / DIN EN 100 25 Gr. S275JR, BHEL order No, Melt No, Size, Results of Chemical analysis and Mechanical tests, Supplier's name, Identification No TC No, Signature of Competent authority, etc.

13.0 PACKING AND MARKING :

Plates shall be transported suitably to avoid damage during transit.

For plates below 10mm thick, each pile (preferably of 16 plates) and each plate 10 mm thick & over shall be marked with Melt No. AA 101 08, BHEL Order No, Supplier's Name, Identification No, Size & weight, on any one corner and encircled with paint preferably of white colour.

14.0 Referred Standards (Latest Publications Including amendments):

1. IS : 2	2. IS : 1500
3. IS : 1599	4. IS : 1608
5. IS : 1852	6. IS : 2062
7. DIN EN 100 25	8. DIN EN 100 29