



CORPORATE PURCHASING SPECIFICATION

AA10530

Rev No.01

PREFACE SHEET

NON-MAGNETIC STEEL FLATS (GR: X120Mn12)

FOR INTERNAL USE ONLY

REMOVE THIS PREFACE BEFORE ISSUE TO SUPPLIERS

Equivalent/Comparable Standards:

Acceptable Suppliers & Commercial Grades:

User Plants and Replaced Plant Specifications/References:

1. HEP, BHOPAL : BP10599
2. HEEP, HARDWAR : HW10578
3. HPEP, HYDERABAD : HY10570

Revisions:

As per Cl.No.38.5 of MOM of MRC-S&GPS

APPROVED:

INTERPLANT MATERIAL RATIONALISATION
COMMITTEE – MRC(S&GPS)

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NON-MAGNETIC STEEL FLATS (GR: X120Mn12)

1.0 GENERAL:

This specification governs the quality requirements of non-magnetic steel flats of grade X120Mn12 (1.3401).

2.0 APPLICATION:

For the manufacture of components like press fingers / clampings fingers, terminal box, wearing plates of traction motors etc for turbogenerators.

3.0 CONDITION OF DELIVERY:

The flats shall be supplied in hot rolled heat treated and straightened condition.

4.0 COMPLIANCE WITH STANDARDS:

There is no Indian Standard covering this material.

5.0 DIMENSIONS AND TOLERANCES:

5.1 Dimensions:

The sizes shall be as specified in the order.

5.2 Tolerances:

5.2.1 The tolerance on exact cut length shall be $\begin{matrix} +3 \\ -0 \end{matrix}$ mm.

5.2.2 If the flats are ordered as full length pieces then the tolerance shall be as per EN 10058

5.2.3 Unless otherwise specified in the enquiry / order, the tolerances on width and thickness shall be as follows:

Dimensions	Tolerances
50 X 10 to 70 X 20	± 0.60
80 X 15	± 0.80

5.2.4 **Straightness:** Unless otherwise specified in enquiry / order, the flats supplied according to this specification shall be straight within following permissible limits.

Cross sectional area, mm ²		Permissible variation from straightness
Over	To	
-	1000	0.004 x length
1000	-	0.0025 x length

Revisions:
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6.0 MANUFACTURE:

The steel shall be manufactured by basic electric furnace process or any other processes mutually agreed upon.

7.0 HEAT TREATMENT:

Following heat treatment is suggested:

Heating at 1000 – 1050° C, followed by water / air quenching depending on the thickness.

8.0 FREEDOM FROM DEFECTS:

The bars shall be free from cracks, flakes or any other defects detrimental to the application.

9.0 SELECTION OF TEST SAMPLES:

9.1 Each melt shall be analysed for chemical composition.

9.2 Mechanical test shall be conducted in longitudinal direction per melt per heat treatment batch (upto 10mm, round or flat tensile specimen).

10.0 CHEMICAL COMPOSITION:

The melt analysis of the material shall be as follows:

Melt Analysis	Element	C	Si	Mn	P	S	Cr
	Min .%	1.10	0.30	12.00	-	-	-
	Max. %	1.30	0.50	13.00	0.100	0.040	1.50

11.0 MECHANICAL PROPERTIES:

The material shall conform to the following mechanical properties in delivery condition.

Tensile Strength N/mm ²	0.2% Proof Stress N/mm ² Min .	% Elongation (L=5d) Min .	Charpy Impact Strength (ISO-V) J Min.	Hardness BHN Max.
800-1100	350	40	150	230

NOTE:

A. Unless otherwise specified, Mechanical properties – Tensile, Proof Stress, % Elongation and Impact Strength need not be tested and reported for the orders placed by BHEL, Bhopal. However, the hardness of all the bars shall be 230 BHN Max.

B.

- 1) The tensile test shall be carried out in accordance with IS: 1608 or any reputed National Standard.
- 2) The Charpy impact test shall be performed in accordance with IS: 1757 or any reputed national standards. The specimen size shall be 10x10x55mm with 2 mm ISO-V notch.

An impact test shall consist of three specimens from a single location, the average value of which shall be more than as specified above.

Only one value of the three can be below the specified minimum value, but in no case below 100 J.

All the three test results shall be reported in Test certificate.



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12.0 OUTER AND INNER QUALITY/NDE:

Following checks shall be performed on all the bars and reported in test certificates.

i) Visual inspection ii) Dimensional control iii) Verification inspection (to avoid mix-up of material).

13.0 RETESTS:

If any of the test specimens fails to meet the requirements specified in clause 10, the sample bar from which the test specimen was cut shall be rejected and two further sample bars from the same lot shall be taken for retests.

If the retests also fail, manufacturer is at liberty to reheat the bars in question. However, not more than two re-heat treatments are allowed.

If after re-heat treatment, the mechanical properties are not complied with, the entire lot shall be rejected.

14.0 INSPECTION AT SUPPLIER'S WORKS:

The representative of BHEL shall have free access to the supplier's works at all times during the execution of the order to satisfy himself that the material is procured as per the quality requirements of this specification. All reasonable facilities shall be extended to him free of charge. He may also witness the sampling, testing and marking called for in this specification.

15.0 TEST CERTIFICATE:

Five copies of the test certificate shall be furnished giving the following details:

- a) Specification No: AA10530/Rev.01
- b) BHEL Order No.
- c) Name of the Manufacturer.
- d) Melt No.
- e) Heat Treatment Batch No. and heat treatment cycles followed.
- f) Process of manufacture.
- g) Results of Chemical Analysis and Mechanical tests.
- h) Results of Inner/Outer Quality/NDE.

16.0 PACKING AND MARKING:

16.1 Marking: All bars with cross sectional size greater than 500 sq. mm shall be stamped with melt No, Specification Number and Manufacturer's trade mark on both the end faces of the bars.

Bars of sectional size 500 sq. mm and below shall be bundled as per each size and a metal tag bearing the following information shall be securely attached to each bundle.

- a) BHEL Order No.
- b) Specification No. AA 10530/Rev. 00
- c) Melt No. and Heat Treatment Batch No.
- d) Weight and size
- e) Manufacturer's Trade Mark.

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16.2 Packing: The bars shall be suitably packed to prevent corrosion and damage during transit. (Including bending and twist).

17.0 REJECTION & REPLACEMENT:

In the event of the bar material proving defective in the course of further processing at BHEL, the same shall be rejected notwithstanding any previous acceptance.

The supplier shall replace the material at his own cost and the rejected bars shall be returned after all the commercial conditions are satisfied.

18.0 REFERRED STANDARDS (Latest publications including amendments):

1) EN 10058

2) IS: 1608

3) IS: 1757