



CORPORATE PURCHASING SPECIFICATION

AA10758

Rev No.08

PREFACE SHEET

STAINLESS STEEL BILLETS AND BLOOMS, X12Cr13

FOR INTERNAL USE ONLY

REMOVE THIS PREFACE BEFORE ISSUE TO SUPPLIERS

Comparable Standards:

- | | | |
|-------------|---|--|
| 1. EUROPEAN | : | EN 10250 – 4:1999, Gr.:X12Cr13 (Material No. 1.4006) |
| 2. INDIAN | : | IS: 6529 – 1996, Gr.: 12Cr13 |

Suggested / Probable Suppliers and Grades:

Use plant vendors list

User Plant References:

- | | | |
|------------------|---|-----|
| 1. HEEP, HARDWAR | : | --- |
|------------------|---|-----|

Revisions: As per clause No. 39.7.2 of MOM
of MRC – FCF+HTM**APPROVED:**
INTERPLANT MATERIAL RATIONALISATION
COMMITTEE – MRC(FCF+HTM)

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STAINLESS STEEL BILLETS AND BLOOMS, X12Cr13

1.0 GENERAL:

This specification governs the quality requirements of 13% Chromium Stainless Steel Billets and Blooms, Gr.:X12Cr13.

This specification covers raw material for forgings to BHEL specification AA19320: Stainless Steel Forgings – Gr.:X12Cr13, H & T.

2.0 APPLICATION:

Suitable for forging various components.

3.0 CONDITION OF DELIVERY:

Hot rolled/Forged and annealed.

4.0 COMPLIANCE WITH NATIONAL STANDARDS:

The material shall comply with the requirement of the following national standard and also meet the requirements of this specification.

EN 10250 – 4:1999 : Open die steel forgings for general engineering
Gr:X12Cr13, (Material No.1.4006) purposes – Stainless steels

5.0 DIMENSIONS AND TOLERANCES:

5.1 Sizes:

The sizes of billets and blooms shall be as specified in BHEL order.

5.2 Tolerances:

5.2.1 Hot Rolled:

The tolerance and radii of curvature for various hot rolled square billets and blooms be as follows:

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Side of square of billet/bloom, mm	Radius of curvature, mm	Tolerance on side of square, mm	
		(+)	(-)
100	15	+ 1.8	- 3.0
150	21	+ 2.4	- 4.0
200	30	+ 4.0	- 6.0
250	35	+ 5.0	- 7.0
300	45	+ 7.0	- 8.0

5.3 Forged:

The tolerance on various forged square billets/blooms shall be as follows:

Side of square of billet/bloom, mm	Tolerance, mm
Upto 100	± 6
125 to 150	± 7
160 to 200	± 8
250 to 300	± 10
300 to 400	± 12

5.4 Length:

Billets/blooms shall be supplied in standard lengths of 2 to 6 meters in multiples of 1 meter length.

6.0 MANUFACTURE:

Billets and blooms shall be manufactured from steel made by the open hearth, electric or such other process as may be agreed to between BHEL and the manufacturer.

The steel shall be fully killed.

Sufficient discard shall be made from the top and bottom of each ingot to ensure freedom from piping, undue segregation, shrinkage, cavities and other metallurgical defects.

Billets and blooms shall be made after giving sufficient reduction to each ingot ensuring that the cast structure is completely broken.



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7.0 HEAT TREATMENT:

Billets and bloom shall be annealed.

8.0 FREEDOM FROM DEFECTS:

The material shall be free from internal and surface defects.

The billets and blooms shall be free scales, tears, seams, laps, rough, jagged and imperfect edges and all other surface defects which may result in defects in forgings made therefrom.

The billets and blooms shall be free from internal defects such as shrinkage, porosity, pipes, laminations, cracks, harmful non-metallic inclusions and other defects.

9.0 SURFACE-CONDITIONING:

Surface defects on billets/blooms are removed by longitudinal chipping and cleaning.

The material may be conditioned to remove injurious surface defects, provided the depth of conditioning does not exceed 1 mm for every 15 mm of dimensions concerned up to a maximum depth of 20 mm and provided that the width of the conditioning is at least four times its greatest depth. The maximum depth of conditioning on two parallel sides at opposite locations shall not exceed one and half times the maximum allowed for one side. The transition between conditioned and non-conditioned areas shall be gradual.

10.0 CHEMICAL COMPOSITION:

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

Element	<u>Melt analysis percent</u>		<u>Permissible variation percent</u>
	Min.	Max.	
Carbon	0.08	0.15	± 0.001
Silicon	---	1.00	± 0.05
Manganese	---	1.50	± 0.04
Chromium	11.50	13.50	± 0.15
Nickel	---	0.75	± 0.03
Phosphorus	---	0.040	+ 0.005
Sulphur	---	0.015	+ 0.005

11.0 HARDNESS (Brinell):

When tested to accordance with IS: 1500 the material shall show a Brinell hardness value of 220 HB, max. in annealed condition.

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12.0 ULTRASONIC TEST:

Each billet/bloom shall be tested ultrasonically in accordance with BHEL standard AA0850118 to ensure from internal defects. The norms of acceptance shall be as per category 2 of the above standard.

13.0 TEST CERTIFICATES:

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

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

The test certificates shall bear the following information.

BHEL References

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BHEL Order No:

Supplier's References:

Supplier's Name:

Melt No.:

Test Results:

Dimensional inspection:

Heat treatment details:

Chemical Composition:

Hardness test:

Ultrasonic test:

Reduction ration:

14.0 PACKING AND MARKING:

Billets/blooms shall be properly protected from corrosion and damage during transit and shall be transported in lots consisting of billets/bloom of size and same melt.

Specification No. and Melt No. shall be stamped/punched and other particulars mentioned below shall be marked on each billets/bloom on the side near the end or on the end face:

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BHEL Order No.:

Consignment/Identification No:

Melt No.:

Size & Weight:

Supplier's Name:

15.0 REFERRED STANDARDS (Latest publications including amendments):

1) IS: 1500

2) AA0850118