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Ordnance Factory Project
Hyderabad.

(6)

Steel 20X7CHM (TBD)

I - 1111

I - 1444

SECRET/CLASSIFIED

NUMBER 14-1-2320-72

SHEET 1

OF 6

SUPERSEDES.

The present technical specifications refer to section
hot-rolled round and rectangular (strip) steel, of grade
20 x 1 CM (TBM) intended for hot mechanical working.

1. Assortment

1.1. Dimensions and limit deviations should comply with table 1

Table 1

Diameter or
thickness, in mm
Width
in
mm
Limit duration

Round or strip	25, 30, 35	-	As per GOST 2590-71
Round or strip	20	140	As per GOST 103-76
Round or strip	30	180	As per GOST 103-76
Round or strip	35	190	As per GOST 103-76
Round or strip	36	130	As per GOST 103-76
Round or strip	40	125, 150, 170	As per GOST 103-76
Round or strip	42	170	As per GOST 103-76.

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Note: 1. Steel can be supplied in other sizes with the consent of the parties.

2. For strips, shape corners may be not provided at a distance of upto 8mm from the bigger side and upto 4mm from the smaller side.

1.2. Strip steel is supplied of unmeasured or multiple lengths, round steel - of unmeasured length. It is allowed to deliver unmeasured strips with length from 2 to 3m and bars with length not shorter than 1.5m in amounts not exceeding 10% of the total weight of a batch in compliance with GOST 103-76 and GOST 2590-71.

1.3. Permissible curvature for round steel is as per GOST 2590-71, flatness for strip steel is as per GOST 103-76 as per class 2.

1.4. Front and rear ends of strips should be trimmed evenly. Obliguity of cut upto 10mm is allowed. Trimming of ends of round steel should comply with GOST 2590-71.

2. Technical requirements

2.1. Chemical composition of steel should conform to table 2.

Contents of elements in %

Table 2

Carbon	Manganese	Silicon	Sulphur	Phosphorus	Nickel	Chromium
0,18	0,90	1,20	max	0,035	0,035	1,20
0,24	1,20	1,50		0,035	0,035	1,20
0,18	0,90	1,20	max	0,035	0,035	1,20
0,24	1,20	1,50		0,035	0,035	1,20

Notes:

1. Residual content of copper not exceeding 0.30% is allowed.
2. In finished rolled stock deviations in conformity with requirements of GOST 1543-71 are allowed.
3. Deviation in content of sulphur and phosphorus not exceeding 0.005% each is allowed if agreed by the customer.

- 2.2. Impact strength and hardness are tested on heat-treated samples and should be:

Impact strength - 10 kgm/cm², min
 Brinell Hardness - 477 to 387 HB
 Rockwell Hardness - 49 to 41 HRC

- 2.3. Macrostructure of steel on pickled templates should not

have shrink holes, porosity, blisters, cracks, slag inclusions and flakes visible to the naked eye.

Laminations are not allowed. Metal is checked for the

presence of laminations by visually inspecting strips and bars in the as-delivered condition.

- 2.4. Quality of surface of all sections excluding strips of size 125 x 40mm should meet the requirements of GOST 535-58.

- 2.5. Surface of strip of size 125 x 40mm may have separate line lines, scabs, marks, nipples and fine hair line cracks of depth not exceeding 1/2 of the tolerance (sum of deviations).

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3. Acceptance rules and test procedures

3.1. General rules of acceptance are as per GOST 7566-69.

3.2. ~~Steel containing~~ ~~xxxxx~~ ~~xxxx~~

Steel is supplied by batches containing steel of the

same melt and size.

3.3. Quality inspection of strip and round steel is done by

the user in the as-delivered condition in accordance with rules

and procedures set forth in the present technical specifications.

3.4. Quality of surface and geometrical dimensions are

checked at random, taking atleast 10% of the weight of

a batch.

3.5. Sampling for test chemical analysis is done as per GOST

7565-73. Chemical analysis is carried out in conformity

with GOST 12344-66 to 12365-66 and GOST 20560-75 or by other

methods, ensuring the necessary accuracy.

To test impact strength and hardness, two samples are taken

from a melt. Impact strength is tested as per GOST 9454-59 and

Samples, type I, hardness as per GOST 9012-59.

Samples are cut out from strips or round bars of finished

rolled stock in the rolling direction. Samples should be cut in

such a manner that the axis of sample should be 20mm away from

the edge and for round the axis should pass through half radius.

Samples subjected to test for impact strength and hardness

are heat-treated under the conditions given below:

a) heating upto 930°C;

b) hardening in water at a water temperature of 30°C to 50°C;

c) tempering at 250°C $\pm$ 10°C for 1.5 to 2 hours and subsequent cooling in air.

is stamped with conventional melt No. Each strip with size 125 x 40, 170 x 40, 170 x 42. TID stamp and a band is additionally applied with paint. conventional designation of grade of steel with mark I, three bars of each bundle is the following: melt No., Besides additionally stamped on the butt end of two or 4.2. Packing of steel should comply with GOST 7566-69. Weight of bundle (stack) is 10t. 4.1. Bars or strips are supplied in bundles (stacks).

IV Marking, packing and documentation

Further acceptance of this batch is not allowed. samples, the entire metal of given batch is rejected and one for acceptance. If flakes are found even in one of the sation and annealing) and present the batch again as a new the whole batch under acceptance to heat treatment (normal test of steel are unsatisfactory, manufacturer may subject for double the number of samples. If the results of repeated macrostructure are found unsatisfactory, repeated test is done 3.8. If the results of tests for impact strength, hardness or testing cut and hardened macro templates for fracture. Checking of metal for flakes is carried out additionally by sample to reveal the macro-structure by deep etching. Cross-out template is cut out from the middle portion of each macrostructure. Length of samples is 200 to 250mm. 3.7. Three samples from the melt are selected for checking

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Date: 30.4.87.

NOTIFICATION OF AMENDMENTS TO SPECIFICATIONS

The following corrections/amendments are now required to be carried out in the documents as below:

Document details : FY14-1-2320-78

OFPM Regn.No. : I 14/4

Details of amendments :-

Sl.No. Details

1. Ref : Page No.3 of 6, point 1.2, 1 & 2nd lines

Delete : UNMEASURED

Add : UNMEASURED

2. Ref : Page no. 3 of 6, point 1.3, 1st line

Delete : "Bound" - (after - permissible curvature

for)

Add : ROUND

3. Ref : Page No. 4 of 6, point 2.2, 4th line.

Delete : "BRYNELL HARDNESS"

Add : "BRYNELL HARDNESS"

4. Ref : Page No.6 of 6, point 4.2, 5th line

a) Insert : White - (before - paint)

To read as " applied with white paint"

b) Line-6

Insert : mm - after 125x40; 170x40, 170x42;

To read as "125x40mm; 170x40mm; 170x42mm"

AMM/DS

AE/P.D.O

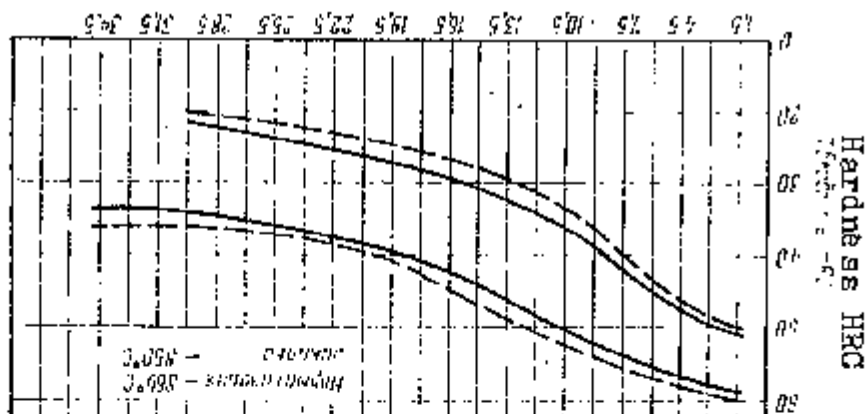
COPY FOR CLICV.

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Steel Grade 40X

[illegible]

0-098- ZUTUPREH
0-096- WOTTEZITATION



Distance from the face of the specimen being cooled, mm

9. 3. 17

- | | |
|----|--|
| 1. | Place three handpans of red in woodboxes |
| 2. | Hardening medium |
| 3. | Placed water |
| 4. | Placed oil |
| 5. | Surfaced |
| 6. | 3/4 H. from control |
| 7. | Control |