



CORPORATE PURCHASING SPECIFICATION

AA10108

Rev No. 11

PAGE 1 of 2

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

(ORDERING DESCRIPTION)

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. of IS: 2062 – 2011, Gr: E250, Quality A

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:

Material shall comply with the requirements of IS: 2062 – 2011, Gr: E250, Quality A

Material offered to EN 10025-2:2004 Gr. S275JR is also acceptable. The tolerance on dimensions for plates shall comply with 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 6 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.

Revisions:
As per Cl. No. 38.1 of MOM of MRC-S&GPS

APPROVED:
INTERPLANT MATERIAL RATIONALISATION
COMMITTEE – MRC(S&GPS)

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5.2.2 Straight for hot rolled bars:

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

6.0 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.

7.0 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 dispatch documents to facilitate quick clearance of the material.

The test certificate shall bear the following information.

AA10108 Rev.11 / IS:2062 Grade: E250 Quality A / EN 10025-2 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.

8.0 PACKING AND MARKING:

Plates shall be transported suitably to avoid damage during transit.

For plates below 10 mm thick, each pile (preferably of 16 plates) and each plate 10 mm thick & over shall be marked with melt no. AA10108, BHEL order no., Supplier's name, Identification no., Size & weight on any one corner and encircled with paint preferably of white colour.

9.0 REFERRED STANDARDS (Latest publications including amendments):

1) IS: 1500

2) IS: 1852

3) EN 10029



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AA10119

Rev No. 15

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STRUCTURAL STEEL - WELDABLE QUALITY (PLATES, SECTIONS, STRIPS, FLATS AND BARS)

ORDERING DESCRIPTION

1.0 GENERAL:

The material shall conform to IS 2062 – 2011, E250-Gr.BR (with mandatory Impact Test) or DIN EN 10025-2:2005, Gr. S275JR and comply with following additional requirements.

2.0 APPLICATION:

For general engineering purposes, suitable for welding.

3.0 CONDITION OF DELIVERY:

3.1 Bars & Sections shall be supplied in Hot rolled in straight lengths without twists and bends.

3.2 The material shall be supplied as per IS: 2062 – 2011, E250 Gr.BR (with mandatory Impact Test) or as per DIN EN 10025-2:2005 Gr. 275JR.

3.3 Any other additional requirement as per BHEL Purchase order.

4.0 DIMENSIONS AND TOLERANCES:

4.1 Sizes:

Material shall be supplied to the dimensions specified in BHEL Order.

4.2 Tolerances:

The tolerances on hot rolled material shall comply with IS: 1852 or any other equivalent national standard.

4.3 Straightness for hot rolled bars:

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

5.0 TEST SAMPLES:

The selection of test pieces for all tests like Chemical, Mechanical etc. shall be as per IS: 2062, E250-Gr.BR or DIN EN 10025-2, Gr. S275JR.

Revisions:

Clause No. 1, 3, 5 & 8 revised (as per MOM of 38th MRC meeting), Clause 10 added

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6.0 ULTRASONIC EXAMINATION:

Plates shall be ultrasonically examined in accordance with BHEL standard AA0850120 (or ASTM-A435) as detailed below and shall comply with the acceptance standards specified therein.

6.1 For plates above 40 mm thick:

Shall be ultrasonically examined unless when otherwise specified in order.

7.0 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 dispatch documents to facilitate quick clearance of the material.

The test certificate shall bear the following information:

AA10119 - Rev.No.15/ IS: 2062-Gr: BR (with mandatory Impact test) or DIN EN 10025-2, Gr. S275JR,

BHEL order No.

Melt No, Size & Quantity, Batch No with heat treatment details, Results of Chemical analysis,

Mechanical tests & NDT, Supplier's name, Identification No, TC No, Signature of Competent Authority, etc.

8.0 PACKING AND MARKING:

Plates shall be transported suitably to avoid damage during transit.

Each plate shall be marked with Melt No. Material grade and specification, BHEL Order No, Supplier's Name Identification No, Size & weight, on any one corner and encircled with paint preferably of white colour.

9.0 REJECTION AND REPLACEMENT

If the material does not comply with the requirements of this specification during receipt inspection at BHEL or if any defect is found during further processing of material, BHEL reserves the right to reject the whole consignment and the supplier shall replace the material free of cost. The rejected material shall be taken back by the supplier after fulfilling the commercial terms and conditions.

10.0 REFERRED STANDARDS (Latest publications including amendments):

1) IS: 1852

2) ASTM - A435

3) AA0850120



CORPORATE PURCHASE SPECIFICATION

AA 102 08

Rev. No. 07

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HOT ROLLED / FORGED CARBON STEEL BARS, Gr: 40 C8-NORMALISED**1.0 GENERAL**

This specification governs the quality requirements of Hot Rolled / forged Carbon Steel Bars, Normalised.

2.0 APPLICATION

Production of machined parts for general engineering purposes.

3.0 CONDITION OF DELIVERY

Hot Rolled / forged and Normalised.

Note: Sizes upto 100mm in hot rolled
>100 to 180mm in hot rolled or forged
abov 180mm in forged.

Bars shall be supplied in straight lengths with ends square and true.

4.0 COMPLIANCE WITH NATIONAL STANDARDS:

Material shall comply with the requirements of the following National Standards and also meet the requirements of this specification.

IS : 1570-Part II, Section 1-1979 : Schedule for wrought Steels-Carbon steels
Gr:40C8 (C40), Normalised : (Unalloyed Steels)

5.0 DIMENSION AND TOLERANCES**5.1 Sizes**

Bars shall be supplied to the dimensions in BHEL order.

5.2 Length:

Unless otherwise specified, hot rolled bars shall be supplied in 3 to 6 metres length and forged bars shall be supplied in lengths of 1.5 to 3 metres

Revisions :

CI 26.6.18 of MOM of MRC-S&GPS

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5.2 Tolerances:

5.2.1 For Forged bars: The tolerances shall be as per Cl 5.2.2 for bars ≤ 100 mm.
The tolerances shall be +8 mm -0 mm for bars > 100 mm

5.2.2 Tolerances on hot rolled bars shall comply with those of Grade 2 of IS:3739: Dimensional Tolerances for Carbon and Alloy Constructional Steel Products, reproduced below:

5.2.2.1 Round Square Bars:

Nominal Size mm		Tolerances, mm	
Over	Up to & Including	Permissible deviation	Out of round / square
--	25	± 0.50	0.50
25	50	± 0.75	0.75
50	80	± 1.00	1.00
80	100	± 1.25	1.25
> 100		$\pm 1.6\%$ of diameter or width of side	75 % of total tolerance (+ and -)

5.2.2.2 Flats:

Nominal width, mm		On width	Tolerance, mm		
Over	Up to & Including		On thickness		
			6 to 13	Over 13 to 25 including	Over 25 to 50 including
--	50	± 1.0	± 0.5	± 0.8	± 1.0
50	100	± 2.0	± 0.5	± 1.0	± 1.5
100	150	± 3.0	---	---	± 2.0

5.2.3 Straightness:

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

6.0 MANUFACTURE:

Material shall be manufactured from fully killed steel.



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7.0 FREEDOM FROM DEFECTS :

The bars shall be sound, straight and free from internal and surface defects such as seams, laps, cracks or any other defects which may impair the end use.

Bars shall be free from twists and bends.

8.0 HEAT TREATMENT :

The bars shall be normalised at a temperature of 830 - 860°C

9.0 CHEMICAL COMPOSITION :

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

Element	<u>Melt analysis, percent</u>		Permissible Variation, percent
	Min.	Max.	
Carbon	0.35	0.45	± 0.02
Silicon	0.10	0.35	± 0.03
Manganese	0.60	0.90	± 0.04
Sulphur	---	0.035	+ 0.005
Phosphorus	---	0.035	+0.005

10.0 TEST SAMPLES :

10.1 One sample shall be taken from each melt for chemical analysis.

10.2 One sample shall be taken from each heat treatment batch for testing of mechanical properties. Test pieces for mechanical tests shall be taken in the longitudinal direction of the piece.

10.3 For ruling section upto & including 40mm, the test piece shall be machined coaxially from the test bars. For ruling section above 40mm the longitudinal axis shall be atleast 12.5 mm from surface of the test bars.

Test methods for determining mechanical properties shall be as per IS:1608 (For tensile test).

11.0 MECHANICAL PROPERTIES (IN NORMALISED CONDITION) :

Mechanical properties of the material shall be as follows:

Tensile strength : 580 - 680 N/mm²

Yield strength : 320 N/mm², min

Elongation on 5.65 √So : 18%, min.

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12.0 ULTRASONIC TEST:

12.1 Each bar above 100 mm shall be tested ultrasonically in accordance with BHEL standard AA 085 01 18 to ensure freedom from internal defects. The norms of acceptance shall be as per category 2 of the above standard.

12.2 **Optional tests:** If specified on order, each bar > 40 to 100mm shall be tested ultrasonically in accordance with BHEL standard AA 085 01 18 to ensure freedom from internal defects and the norms of acceptance shall be as per category 2.

13.0 TEST CERTIFICATES :

Three copies of test certificates shall be supplied, unless otherwise stated on the order. 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 102 08; Rev. No. 07: Hot rolled /forged carbon steel bars, Gr.:40 Normalised
 BHEL order No,
 Supplier's Reference :
 Name
 Identification No.
 Melt No.
 Details of heat treatment.
 Results of Tests :
 Results of Dimensional inspection.
 Results of chemical analysis, mechanical tests & Ultrasonic test.

14.0 PACKING AND MARKING :

The material shall be suitably packed in bundles-hessian wrapped to prevent sagging, corrosion and damage during transit. A suitable clear temporary rust preventive shall be applied on all the bars. Each bar of 50 mm and above shall be stamped with AA 102 08, melt no, BHEL order no, at one end or on the end face.

Bars below 50mm shall be bundled together and tied with wire at 3 to 4 places along the length of the bars.

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

AA 102 08 : Hot Rolled / Forged Carbon Steel Bars, 40C8-Normalised.
 BHEL Order No.
 Consignment/Identification No.
 Melt No.
 Size and Weight.
 Supplier's Name.

15.0 REFERRED STANDARDS (Latest Publications Including amendments):

1. IS : 1570 Part II	2. IS : 1608	3. IS : 3739	4. AA 085 01 18
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CORPORATE STANDARD

AA 712 21 01

Rev. No. 05

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SCREWS, SLOTTED, COUNTERSUNK HEAD, COARSE PITCH, STEEL PRODUCT Gr: A, PROPERTY CLASS 4.8 (M1.6 - M20)

1.0 DESIGNATION:

A Product Gr: A slotted, countersunk head, steel screw of thread M8, length 20mm, coarse pitch, and conforming to property class 4.8 shall be designated as:

1.1 On drawings:

- i) Material specification column : AA 712 21 01
- ii) Description column : SCRU SLT CSK A M8x20-4.8.

1.2 On indents:

Screw Slotted Countersunk Head A , M8 X 20 - 4.8: AA 712 21 01.

1.3 For issuing enquiries and on purchase orders:

While issuing enquiries and purchase orders, delete BHEL standard number from above description and add the information given under clause 2.0.

2.0 COMPLIANCE WITH STANDARDS:

2.1 Dimensions, Tolerances & General Requirements:

As per IS:1365 - 1978.

2.2 Mechanical properties:

To conform to property Cl. 4.8, as specified in table 3 of IS: 1367, Part.3-2002.
Permissible hardness 124-250 HB for sizes M 1.6 to M 10.

2.3 Threads:

Pitch-coarse to IS:4218, Part 2.
Tolerance quality - Medium.
Tolerance class - 6g.

2.4 Identification and Marking:

As per clause 9 of IS:1367, part 3.

2.5 Finish: Plated as specified in BHEL order.

Revisions :

Cl. 25.2.9 of MOM of WG-F

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AA 712 21 01	CORPORATE STANDARD	
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3.0 NOTE:

3.1 Length and diameter combination (refer Table 1 in page 3 of 3) between the bold lines should only be used.

3.2 In table-1 sizes to the left side of broken stepped line are threaded upto the head.

3.3 For screw threads, general (Metric) refer to BHEL standard AA 023 18 00.

3.4 For tolerance grade, position and class refer to BHEL standard AA 023 02 01.

3.5 For slotted, counter sunk head, brass screws refer to BHEL standard AA 712 21 03.

3.6 Screws to this standard would be unplated, divisions wishing to have plated Screws would have to get them plated.

3.7 Weights given in this standard are for general reference only and are not meant for commercial transaction.

3.8 When the fasteners are to be tested, within BHEL, the sampling and acceptance shall be as per IS:1367, Part.17

4.0 REFERRED STANDARDS (Latest publications including amendment):

1) IS:1365	2) IS: 1367 (Pt.3&17)	3) IS: 4218, Pt.2	4) AA 023 02 01
5) AA 023 18 00	6) AA 023 18 50	7) AA 023 18 52	8) AA 712 21 03

EXPLANATORY NOTE:

The following changes have been made in this revision:

- In clause 2.2 , year of IS:1367-part 3 is modified.

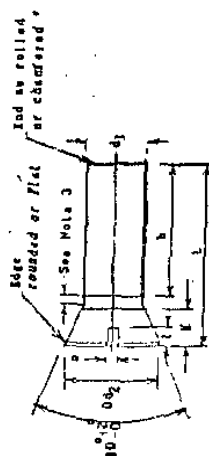
**Rev. No. 05**

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Corporate Sub-Code Numbers are shown below
Weights have been shown in kg. per 100 Nos.
For Threaded Run out Refer AA 023 18 50.
For ends refer AA 023 18 52. when chamfered.

TABLE 1
All dimensions are in mm

NOM. LENGTH (L)

[illegible]

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NUTS, HEXAGON, PRODUCT GRADE 'A' COARSE PITCH, STEEL PROPERTY CLASS 8 (M1.6 - M16)

1.0 DESIGNATION

A product Gr.A, hexagon, Steel, nut thread M10, coarse pitch and conforming to property class 8 shall be designated as:

1.1 On drawings

- i) Material specification column : AA7151115
- ii) Description column : NUT HEX A M10 – 8

1.2 On indents

Nut Hex A M10 – 8; AA7151115

1.3 For issuing enquiries and on purchase orders

While issuing enquiries and purchase orders, delete BHEL standard number from the above description and add the information given under clause 2.0

2.0 COMPLIANCE WITH STANDARDS

2.1 Dimensions, Tolerances & General Requirements

As per IS: 1364, Part 3-2002, Reaffirmed 2007

2.2 Mechanical Properties

To conform to property class 8 as specified in Table-5 & 6 of IS: 1367, Part 6, Permissible Hardness 188 to 330 HB for sizes M3 to M10

2.3 Threads

- Pitch - Coarse to IS: 4218, Part 2
- Tolerance quality - Medium
- Tolerance class - 6H

2.4 Identification Marking

As stated in clause 9 of IS: 1367, Part 6

2.5 Surface Discontinuity

As per IS: 1367, Part 9

2.6 Finish

As specified in BHEL order.

Revisions: As per Clause 32.4.6 of MOM of MRC-F			APPROVED: INTERPLANT MATERIAL RATIONALISATION COMMITTEE – MRC (F)		
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AA7151115

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CORPORATE STANDARD**3.0 NOTE**

- 3.1** For nuts, hexagon, product Gr.A, coarse pitch, brass (M1.6 - M16) refer to BHEL standard AA7151113
- 3.2** For screw threads, general (Metric) refer to BHEL standard AA0231800
- 3.3** For tolerance grade, position and class refer to BHEL standard AA0230201
- 3.4** Nuts to this standard would be unplated, divisions wishing to have plated nuts would have to get them plated.
- 3.5** Weights given in this standard are for general reference only and are not for commercial transactions.
- 3.6** When fasteners are to be tested with in BHEL, the sampling and acceptance plan shall be as per IS: 1367, Part 17

4.0 REFERRED STANDARDS (Latest Publications including Amendments)

- 1) IS: 1367, Part 6, 9 & 17
- 2) IS: 4218, Part 2
- 3) AA0230201
- 4) AA0231800
- 5) AA7151113

EXPLANATORY NOTE

The following major changes have been made in the present revision

- Clause 2.1: “Reaffirmation 2007” has been added at end of the clause.
- Clause 2.2: The “Part 6-1994” has been modified as “Part 6”
- Clause 3.6: “Sampling Plan” has been modified in accordance with IS: 1367, Part 17
- Clause 4 has been modified accordingly.
- On Page-3: Table-1: The dimension of “Wrenching height” m’ has been corrected from 2.32 to 2.3 for thread size M4 in accordance with IS: 1364, Part 3-2002, Reaffirmed 2007
- On Page-3: Table-1 & Fig.-1 have been modified and made more visible.

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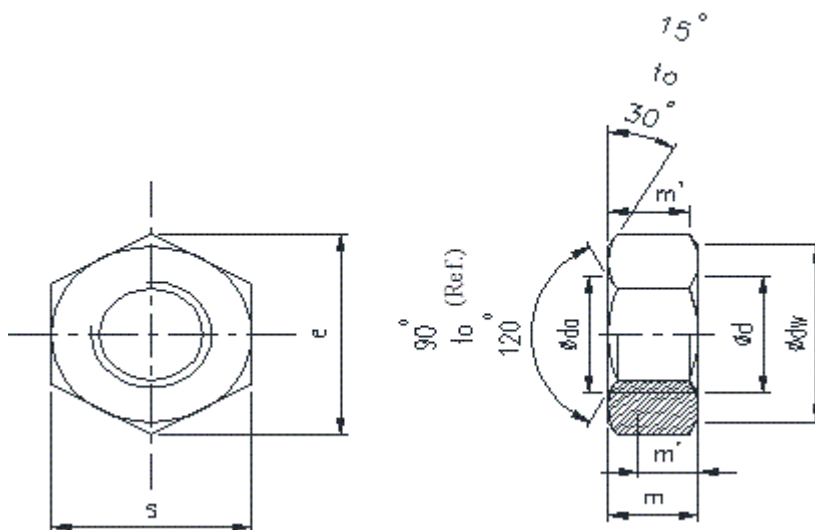


Table – 1

All dimensions in mm

Thread Size	Flats		Corners	Thickness		Wrenching Height				Sub-Code	Weight
d	s		e	m		m'	dw	da			
Nom.	Max.	Min.	Min.	Max.	Min.		Min.	Min.	Min.		
M1.6	3.2	3.02	3.41	1.3	1.05	0.8	2.4	1.6	1.84	091	
M2	4.0	3.82	4.32	1.6	1.35	1.1	3.1	2.0	2.3	105	
M2.5	5.0	4.82	5.45	2.0	1.75	1.4	4.1	2.5	2.9	113	
M3	5.5	5.32	6.01	2.40	2.15	1.7	4.6	3.0	3.45	067	0.39
M4	7.0	6.78	7.66	3.2	2.90	2.3	5.90	4.0	4.6	075	0.82
M5	8.0	7.78	8.79	4.7	4.40	3.5	6.90	5.0	5.75	083	1.24
M6	10.0	9.78	11.05	5.20	4.90	3.9	8.90	6.0	6.75	016	2.52
M8	13.0	12.73	14.38	6.8	6.44	5.2	11.6	8.0	8.75	024	5.40
M10	16.0	15.73	17.77	8.4	8.04	6.4	14.6	10.0	10.8	032	11.69
M12	18.0	17.73	20.03	10.8	10.37	8.30	16.6	12.0	13.0	040	17.69
M16	24.0	23.67	26.75	14.8	14.1	11.3	22.5	16.0	17.3	059	33.58

	CORPORATE STANDARD	AA7164002
		Rev. No. 06
		PAGE 1 of 3

WASHERS, SPRING LOCK, SINGLE COIL, RECTANGULAR SECTION, TYPE-B (WITH FLAT ENDS), STEEL

1.0 DESIGNATION

A single coil, rectangular section, spring lock washer, Type-B (with flat ends) for right hand threads, of nominal size 5 mm, and made of steel shall be designated as

1.1 On Drawings

- i) Material specification column - AA7164002
- ii) Description column - WASHER SPRING LOCK SC B5 – St

1.2 On Indents

Washer Spring Lock B5; AA7164002

1.3 For issuing enquiries and on purchase orders

While issuing enquiries and purchase orders, delete the BHEL Standard No. from the above description and add the information given under clause 2.0

2.0 COMPLIANCE WITH STANDARDS

2.1 Dimensions, Tolerances and General Requirements

To IS: 3063-1994, Reaffirmed 2010 Type-B (Table – 1A)

2.2 Material

Spring steel Gr.3 to Gr.6, as specified in IS: 4072

2.3 Heat Treatment and Hardness

Spring washer after coiling shall be suitably heat treated, so as to result in the finished washer having hardness in the range of 430-530 HV

2.4 Finish

Unplated.

Revisions: As per clause 32.2 of MOM of MRC-F			APPROVED: INTERPLANT MATERIAL RATIONALISATION COMMITTEE – MRC (F)		
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AA7164002

Rev. No. 06

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CORPORATE STANDARD**3.0 NOTE**

- 3.1** For washers spring lock, Type-A refer BHEL Corporate Standard AA7164001
- 3.2** Lock washers to this standard would be unplated, divisions wishing to have plated washers would have to get them plated.
- 3.3** Weights given in this standard are for general reference only and are not meant for commercial transactions.
- 3.4** When the fasteners are to be tested within BHEL, the following sampling and acceptance plan based on IS: 6821 (Table-1) shall be followed as detailed below for physical properties.

Lot Size	Sample Size	Acceptance No.
Up to 1000	5	0
1001-3000	8	0
3001-10000	13	0
10001-35000	20	0
Over 35000	32	1

4.0 Referred standards (Latest Publications including Amendments)

- 1) IS: 4072
- 2) AA7164001
- 3) IS: 6821



CORPORATE STANDARD

AA7164002

Rev. No. 06

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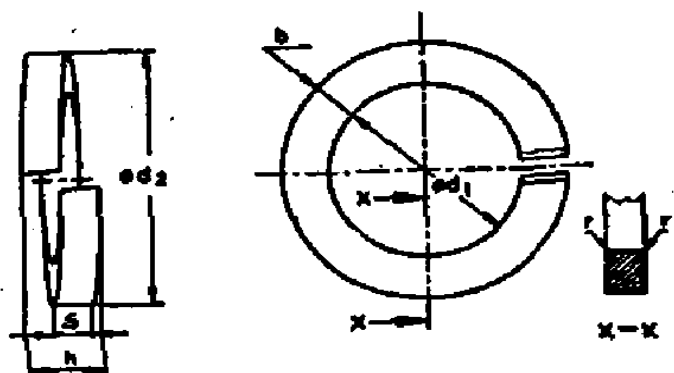


FIG-1

Note:

- 1) Corporate sub code numbers only are shown in Table-1
- 2) Weights have been shown in kg per 1000 Nos.

TABLE-1

All dimensions are in 'mm'

Nom size	Internal Dia. d_1		Outside Dia. d_2	Width b		Thickness s		Radius r	For Bolt, Nut or Screw size	Sub-Code	Weight
	Basic	Tol +	Max.	Basic	Tol $\pm$	Basic	Tol $\pm$	Nom.			
2	2.1	0.3	4.4	0.9	0.1	0.5	0.1	0.1	M2		0.033
2.2	2.3	0.3	4.8	1.0	0.1	0.6	0.1	0.1	M2.2		0.050
2.5	2.6	0.3	5.1	1.0	0.1	0.6	0.1	0.1	M2.5		0.053
3.0	3.1	0.3	6.2	1.3	0.1	0.8	0.1	0.2	M3	010	0.11
4.0	4.1	0.3	7.6	1.5	0.1	0.9	0.1	0.2	M4	029	0.18
5.0	5.1	0.3	9.2	1.8	0.1	1.2	0.1	0.2	M5	037	0.36
6.0	6.1	0.4	11.8	2.5	0.15	1.6	0.1	0.3	M6	045	0.83
8.0	8.1	0.4	14.8	3.0	0.15	2.0	0.1	0.5	M8	053	1.60
10.0	10.2	0.5	18.1	3.5	0.2	2.2	0.15	0.5	M10	061	2.53
12.0	12.2	0.5	21.1	4.0	0.2	2.5	0.15	1.0	M12	070	3.82
16.0	16.2	0.8	27.4	5.0	0.2	3.5	0.2	1.0	M16	088	8.91
20.0	20.2	1.0	33.6	6.0	0.2	4.0	0.2	1.0	M20	096	15.2
24.0	24.5	1.0	40.0	7.0	0.25	5.0	0.2	1.6	M24	100	26.2
30.0	30.5	1.2	48.2	8.0	0.25	6.0	0.2	1.6	M30	118	44.3
36.0	36.5	1.2	58.2	10.0	0.25	6.0	0.2	1.6	M36	126	67.3
42.0	42.5	1.2	68.2	12.0	0.25	7.0	0.25	2.0	M42		111
48.0	49.0	1.5	75.0	12.0	0.25	7.0	0.25	2.0	M48		123
52.0	53.0	1.5	83.0	14.0	0.25	8.0	0.25	2.0	M52		182
56.0	57.0	1.5	87.0	14.0	0.25	8.0	0.25	2.0	M56		193
60.0	61.0	1.5	91.0	14.0	0.25	8.0	0.25	2.0	M60		203
64.0	65.0	1.5	95.0	14.0	0.25	8.0	0.25	2.0	M64		218

	CORPORATE STANDARD	AA7171001
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PINS, CYLINDRICAL, STEEL, UNHARDENED (TOLERANCE m6)

1.0 DESIGNATION

A cylindrical pin of nominal diameter 8 mm, tolerance on diameter m6 and nominal length 65 mm shall be designated as:

1.1 On drawings:

- i) Material specification column : AA7171001
- ii) Description column : PIN CYL RND END 8 m 6 x 65-St

1.2 On indents:

Pin cylindrical 8 m 6 x 65: AA7171001

1.3 For issuing enquiries and on purchase orders:

While issuing enquiries and purchase orders, delete BHEL standard number from the above description and add the information given under clause 2.0.

2.0 COMPLIANCE WITH STANDARDS:

2.1 Dimensions, Tolerances and General requirements:

As per IS: 2393-2010 Table-1.

2.2 Material:

Carbon steel with minimum tensile strength of 500 N/mm² as specified in IS: 5517.

2.3 Finish:

Free from burrs, scales and tool marks. The surface finish of the various surfaces shall be as shown in Table-1 of IS: 2393.

Revisions: As per Clause 32.4 of MOM of MRC-F

APPROVED:
INTERPLANT MATERIAL RATIONALISATION
COMMITTEE – MRC (F)

Rev. No. 06	Amd. No.	Reaffirmed	Prepared EDN, Bangalore	Issued Corp. R&D	Dt. of 1 st Issue 01-01-1977
Dt: 08-12-2014	Dt:	Year:			

CORPORATE STANDARD



3.0 NOTE

3.1 Sizes (refer Table-1 on page 3 of 3) between the bold lines should only be used.

3.2 Weights given in this standard are for general reference only and are not meant for commercial transactions.

3.3 When the fasteners are to be tested within BHEL, the following sampling plan based on IS: 6821 (Table-1) shall be followed as detailed below for physical properties.

LOT SIZE	SAMPLE SIZE	ACCEPTANCE NOS.
Up to 1000	5	0
1001 – 3000	8	0
3001 – 10000	13	0
10001 – 35000	20	0
over 35000	32	1

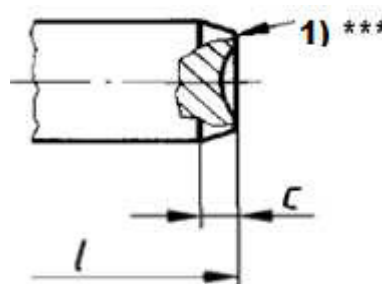
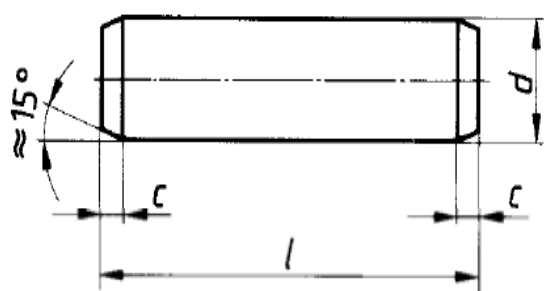
4.0 REFERRED STANDARDS (Latest publications including amendment):

- 1) IS: 5517 2) IS: 6821

EXPLANATORY NOTE:

The following changes have been made in this revision:

- In Clause 2.1, year of IS: 2393 is changed to 2010.
- In Clause 2.2, year of IS: 5517 is removed.
- Table-1 and figures modified



Note:

- 1) *** Radius and dimpled pin end permissible.
- 2) Corporate sub-code numbers are shown in Table-1.
- 3) Weights have been shown in kg per 1000 Nos.



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All dimensions are in mm

Note: 1) Corporate Sub-Code Nos. are shown below
2) Weights has been shown in kg / 1000 Nos.

[illegible]



PLANT PURCHASING SPECIFICATION HYDERABAD

HY 10576

REV. NO: 03

PAGE 1 OF 2

HIGH HARDNESS, QUENCHED AND TEM PERED STEEL PLATES SUITABLE FOR WELDING

1.0 GENERAL:

This specification governs the quality requirements of high hardness, quenched and tempered, alloy / micro-alloy steel plates having high hardness of minimum 370 BHN suitable for welding.

2.0 APPLICATION:

For pulverising mills' components which require high abrasion/ wear resistance.

3.0 CONDITION OF DELIVERY:

Plates shall be supplied in hot rolled, quenched and tempered condition with minimum hardness of 370 BHN.

4.0 COMPLIANCE WITH STANDARDS:

There is no National or International standard which meets the requirement of this standard.

4.1 Equivalent grades: Hardox 400, XAR 400, Dillidur 400V etc. are equivalent grades.

5.0 DIMENSIONS AND TOLERANCES:

5.1 Dimensions: The dimensions shall be as specified in the order.

5.2 Tolerances: The tolerance shall be as per ASTM A6 (the latest).

6.0 MANUFACTURE:

The steel shall be manufactured in open-hearth or basic electric furnace or by basic oxygen process. Any other method of manufacture of steel is acceptable subject to mutual agreement with the manufacturer.

The steel shall be fully killed.

7.0 CHEMICAL COMPOSITION:

7.1 Chemical composition is left to the discretion of the manufacturer. However, complete chemical composition of the melt shall be reported in the test certificate.

7.2 Carbon Equivalent, CE (%):

- For plates thickness upto 20mm (inclusive) = 0.46max.
 - For plates above 20 - 32 mm (inclusive) thickness= 0.56max.
 - For plates above 32mm, CE values shall be mutually agreed with BHEL.
- The actual values of CE shall be reported in the test certificate.

Revisions: Revised Cl. 7.2 & Cl.11.0

Issued : STANDARDS ENGINEERING & IPR COORDINATION
DEPARTMENT

Rev.No. 03	Amd No.	Reaffirmed	Prepared: ENGINEER, MATLS.ENG.	Approved: Sr. DGM (TS)	Date of 1 st Issue:
Dt. SEP. 2014	Dt.	Year:			SEP., 1989

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PAGE 2 OF 2		

8.0 FREEDOM FROM DEFECTS:

The plates shall be free from cracks, scabs, laminations and other harmful defects.

9.0 HEAT TREATMENT:

Suitable heat treatment (quenching and tempering) cycle shall be selected to achieve the hardness. The same shall be reported in the test certificate.

10.0 MECHANICAL PROPERTIES (Hardness):

The plates shall conform to the minimum hardness of 370 BHN. Each plate shall be tested for hardness and the hardness values shall be reported in the test certificate.

11.0 WELDING CHARACTERISTICS:

11.1 Carbon equivalent (CE) shall be as per Cl. 7.2 of this specification.

11.2 The suppliers shall furnish the bending details and full welding details including electrode composition (Brand & Make) preheating temperature, PWHT (if req.), etc. for each size of the plate offered, along with technical offer. These details will be reviewed by BHEL for its suitability.

12.0 TEST CERTIFICATES:

Five copies of the test certificate with the following details shall be furnished.

- a) BHEL Order No.
- b) HY10576 Rev.03
- c) Name of the Mill
- d) Size & Weight
- e) Heat No.
- f) Heat treatment details
- g) Results of chemical analysis
- h) Results of hardness test on each plate.

13.0 MARKING:

Each plate shall be identified (hard punched/ stenciled) with the following details:

- a) BHEL Order No.
- b) HY10576 Rev. 03
- c) Heat/Melt No.
- d) Supplier's name & trade mark

14.0 REJECTION AND REPLACEMENT:

In the event of any plate proving defective during the course of further processing or testing, such material shall be rejected and the supplier shall make immediate arrangements to replace the same at free of cost.