



## CORPORATE STANDARD

AA 712 11 23

Rev. No. 07

PAGE 1 OF 3

### SCREWS, HEXAGON HEAD, PRODUCT GRADE 'A' COARSE PITCH, STEEL, PROPERTY CLASS 8.8 (M6 - M24)

#### 1.0 DESIGNATION:

A product Gr. A hexagon head, steel screws of thread M8, length 50mm, coarse pitch and conforming to property class 8.8 shall be designated as:

#### 1.1 On drawings:

- i) Material specification column : AA 712 11 23
- ii) Description column : SCRU HEX A M8X50 - 8.8.

#### 1.2 On indents:

Screws Hex A M8 X 50 - 8.8 ; AA 712 11 23.

#### 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 2 - 2002.

##### 2.2 Mechanical Properties:

To conform to property class 8.8 as specified in Table - 3 of IS:1367, Part.3-2002.  
Permissible hardness 238-350 HB for sizes M6-M10

##### 2.3 Threads:

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

##### 2.4 Identification Marking:

As stated in Cl.9.2.1 of IS:1367, Part.3.

##### 2.5 Surface Discontinuity: As per IS:1367, Part.9.

##### 2.6 Finish: Plated as specified in BHEL order

#### Revisions :

Cl. 25.7.11 of MOM of WG-F

#### APPROVED :

INTERPLANT  
STANDARDIZATION COMMITTEE (WG-F)

Rev. No. 07

Amd.No.

Prepared

Issued

Dt. of 1st Issue

Dt:01.10.2004

Dt :

Year :

HARDWAR

Corp. R&D

January, 1977

**3.0 NOTE:**

- 3.1** Length and diameter combination (refer Table 1 on page 3 of 3) between the bold lines should only be used.
- 3.2** For screw threads, general (Metric) refer to BHEL standard AA 023 18 00.
- 3.3** For tolerance grade, position and class refer to BHEL standard AA 023 02 01.
- 3.4** Screws to this standard would be unplated, divisions wishing to have plated bolts 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 amendment):**

- 1) IS: 1364, Pt.2      2) IS:1367 Pt.3, 9&17      3) IS: 4218, Pt.2      4) AA 023 02 01  
5) AA 023 18 00      6) AA 023 18 50

**EXPLANATORY NOTE:**

**The following changes have been made in the revision:**

- New clause 2.5 Surface Discontinuity is added.
- Existing clause 2.5 is renumbered as 2.6.
- In Cl.2.2, year of IS is modified as 2002.
- Clause 9 of IS:1367 is included in Cl 4.0





## CORPORATE STANDARD

AA 715 11 15

Rev. No. 07

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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 : AA 715 11 15.
- ii) Description column : NUT HEX A M10 - 8.

#### 1.2 On indents:

Nut Hex A M10 – 8: AA 715 11 15.

#### 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.

##### 2.2 Mechanical Properties:

To conform to property class 8 as specified in Table-5&6 of IS:1367, Part 6-1994.  
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: Plated as specified in BHEL order.

Revisions :

Cl. 25.7.27 of MOM of WG-F

APPROVED :

INTERPLANT  
STANDARDIZATION COMMITTEE (WG-F)

Rev. No. 07

Amd.No.

Prepared

Issued

Dt. of 1st Issue

Dt:01.10.2004

Dt :

Year :

HARDWAR

Corp. R&D

January, 1977

**3.0 NOTE:**

- 3.1** For nuts, hexagon, product Gr.A Coarse pitch, brass (M1.6 -M16) refer to BHEL standard AA 715 11 13.
- 3.2** For screw threads, general (Metric) refer to BHEL standard AA 023 18 00.
- 3.3** For tolerance grade, position and class refer to BHEL standard AA 023 02 01.
- 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 as per IS: 1367 part 17.

**4.0 REFERRED STANDARDS (Latest publications including amendment):**

- |                    |                           |                   |
|--------------------|---------------------------|-------------------|
| 1) IS: 1364 (Pt.3) | 2) IS: 1367 (Pt.6, 9 &17) | 3) IS:4218 (Pt.2) |
| 4) AA 023 02 01    | 5) AA 023 18 00           | 6) AA 715 11 13   |

**EXPLANATORY NOTE:**

**The following changes have been made in the present revision:**

- New clause 2.5 Surface Discontinuity is added.
- Existing clause 2.5 is renumbered as 2.6.
- Clause 9 of IS:1367 is included in Cl 4.0

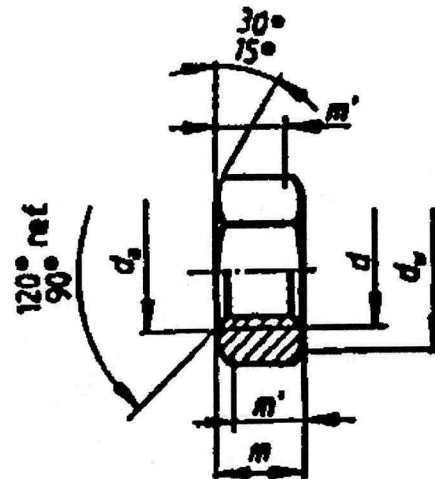
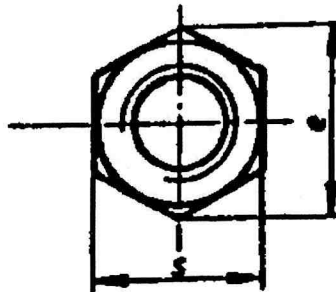


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All dimensions are in mm.

TABLE 1

| Size<br>d<br>Non. | Flats<br>s |       | Corners<br>c<br>nun. | Thickness<br>m |       | Wrenching<br>Height<br>m<br>min | dw<br>min. | da   |       | Sub-code/<br>Weight |
|-------------------|------------|-------|----------------------|----------------|-------|---------------------------------|------------|------|-------|---------------------|
|                   | max.       | min.  |                      | max.           | min.  |                                 |            | min. | max.  |                     |
| 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  | 2.90  | 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  | 2.32                            | 5.90       | 4.0  | 4.60  | 075/0.82            |
| M5                | 8.0        | 7.78  | 8.79                 | 4.7            | 4.40  | 3.5                             | 6.90       | 5.0  | 5.75  | 0.83/1.24           |
| 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 | 10.80 | 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           | 14.10 | 11.3                            | 22.5       | 16.0 | 17.3  | 059/33.58           |

**Note :** 1. Corporate sub code No. only given in the Table.

2. Weights have been shown in kg. per 1000 no.



## CORPORATE STANDARD

AA 716 10 05

Rev. No. 03

PAGE 1 OF 3

### WASHERS, PUNCHED, TYPE-A, STEEL

#### 1.0 DESIGNATION:

A punched washer type-A of size 6.6mm and made of steel shall be designated as:

#### 1.1 On drawings:

- i) Material specification column : AA 716 10 05.
- ii) Description column : WASHER PNCHD A 6.6 -ST

#### 1.2 On indents:

Washer Punched A 6.6 – Steel: AA 716 10 05.

#### 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: 2016-1967, Table-1.

##### 2.2 Material:

Suitable low carbon steel 20C8, as stated in IS: 1570, part 2-1987.

##### 2.3 Finish:

Plated as specified in BHEL order.

#### 3.0 NOTE:

3.1 For multi tooth, lock washer, type-A (External) refer to BHEL standard AA 716 10 01.

3.2 Washers to this standard would be unplated, divisions wishing to have plated washers would have to get them plated.

3.3 For general requirements of washers, refer BHEL standard AA 023 04 08.

Revisions :

Cl. 24.8.47 of MOM of WG-F

APPROVED :

INTERPLANT  
STANDARDIZATION COMMITTEE (WG-F)

Rev. No. 03

Amd.No.

Prepared

Issued

Dt. of 1st Issue

Dt:01.03.2004

Dt :

Year :

HYDERABAD

Corp. R&D

January, 1977



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

**3.5** 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 amendment):**

- 1) IS:1570, part 2      2) IS: 1367, part 17      3) IS:2016      4) AA 023 04 08  
5) AA 716 10 01

**EXPLANATORY NOTE**

**The following changes have been made in this revision:**

- Cl.2.0 Material (Rev 02) is deleted due to duplication and all other clauses are renumbered..
- Cl 2.3 Finish is modified.
- In Cl 3.5 Sampling and acceptance plan as per IS:1367, Part 17 in place IS:6821 and table is deleted..
- A new clause .4.0 Referred standard is added.
- Four pages made to three pages.

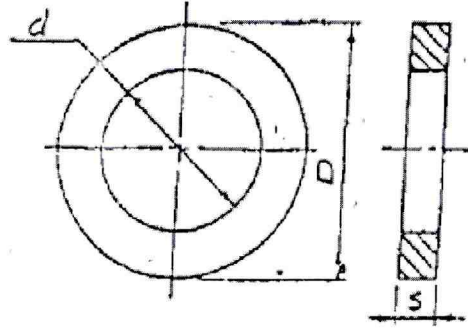


## CORPORATE STANDARD

AA 716 10 05

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### Note:

1. Corporate sub-code numbers are shown below.
2. Weights have been shown in kg/1000 nos.

### TABLE

All dimensions are in 'mm'.

| SIZE<br>d, NOM | OUT SIDE<br>DIA.D, NOM | THICKNESS<br>S, NOM | SUITABLE FOR<br>BOLT/SCREW SIZE | SUB-CODE | WEIGHT |
|----------------|------------------------|---------------------|---------------------------------|----------|--------|
| 1.8            | 4                      | 0.4                 | M 1.6                           |          |        |
| 2.4            | 5                      | 0.4                 | M 2                             |          |        |
| 2.9            | 6.5                    | 0.4                 | M 2.5                           |          |        |
| 3.4            | 7                      | 0.5                 | M 3                             | 019      | 0.11   |
| 4.5            | 9                      | 0.8                 | M 4                             |          |        |
| 5.5            | 10                     | 1.0                 | M 5                             |          |        |
| 6.6            | 12.5                   | 1.6                 | M 6                             | 027      | 1.11   |
| 9.0            | 17.0                   | 1.6                 | M 8                             | 035      | 2.05   |
| 11.0           | 21.0                   | 2.0                 | M 10                            | 043      | 3.94   |
| 14.0           | 24.0                   | 2.5                 | M 12                            | 051      | 5.85   |
| 18.0           | 30.0                   | 3.15                | M 16                            | 060*     | 11.10  |
| 22.0           | 37.0                   | 3.16                | M 20                            | 078      | 17.10  |
| 26.0           | 44.0                   | 4.0                 | M 24                            | 086      | 31.00  |
| (30.0)         | 50.0                   | 4.0                 | (M 27)                          |          |        |
| 33.0           | 56.0                   | 4.0                 | M 30                            | 108      | 50.80  |
| (36.0)         | 60.0                   | 5.0                 | (M 33)                          | 116      | 71.02  |
| 39.0           | 66.0                   | 5.0                 | M 36                            | 124      | 87.30  |
| (42)           | 72.0                   | 6.0                 | (M 39)                          | 132      | 126.51 |
| 45.0           | 78.0                   | 6.0                 | M 42                            |          |        |
| 52.0           | 92.0                   | 8.0                 | M 48                            |          |        |



## CORPORATE STANDARD

A A 716 40 01

REV. No. 03

PAGE 1 OF 4

### WASHERS, SPRING LOCK, SINGLE COIL, RECTANGULAR SECTION, TYPE - A (WITH BENT ENDS) STEEL

#### 1.0 DESIGNATION:

A single coil, rectangular section, spring lock washer, Type -A (with bent 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-AA 716 40 01.
- ii) Description column- WASHER SPRING LOCK SC A 5-ST.

#### 1.2 On Indents:

Washer Spring Lock A 5-AA 716 40 01

#### 1.3 For issuing enquiries and on purchase orders:

While issuing enquiries and purchase orders, delete the corporate standard No. from the above description and add the information given under clause 2.

#### 2.0 COMPLIANCE WITH STANDARDS:

- 2.1 Dimensions, Tolerances : To IS 3063:1994, Type A (Table-1A)  
& General Requirements

|                                      |          |            |                                                             |           |                  |
|--------------------------------------|----------|------------|-------------------------------------------------------------|-----------|------------------|
| Revision : Cl. 20.4 of MOM of WG (F) |          |            | Approved : INTERPLANT<br>STANDARDIZATION COMMITTEE - WG (F) |           |                  |
| Rev No. 03                           | Amd. No. | Reaffirmed | Prepared                                                    | Issued    | Dt. of 1st issue |
| Dt. April '99                        | Dt.      | Year:      | HYDERABAD                                                   | CORP. R&D | April '93        |

**2.2 Material:**

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

**2.3 Heat Treatment and Hardness:**

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

**2.4 Finish:**

Unplated.

**3.0 NOTE:**

**3.1** For washers spring lock (Type - B) refer corporate standard AA 716 40 02.

**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 plan shall be followed for physical properties.

| LOT SIZE      | SAMPLE SIZE | ACCEPTANCE No. |
|---------------|-------------|----------------|
| Upto 1000     | 5           | 0              |
| 1001 - 3000   | 8           | 0              |
| 3001 - 10000  | 13          | 0              |
| 10000 - 35000 | 20          | 0              |
| Over 35000    | 32          | 1              |

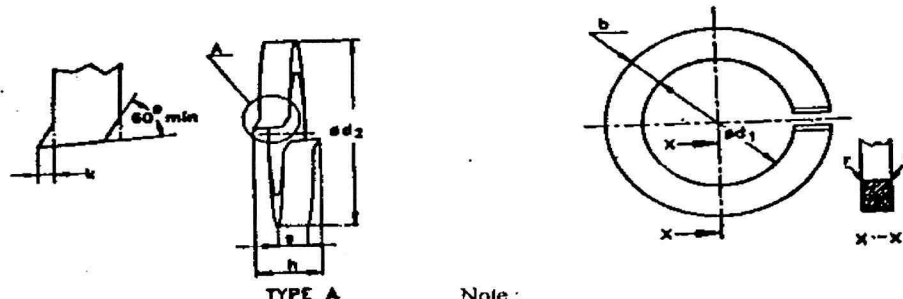


# CORPORATE STANDARD

A A 716 40 01

REV. No. 03

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$$b = 2s + 2k$$

TYPE A

FIG. 1

Note :

1. Corporate sub-code Numbers only are shown in Table 1
2. Weights have been shown in kg per 1000 No.

TABLE I  
All dimensions are in 'mm'

| Nom. size | Internal Diameter $d_1$ |      | Outside Dia $d_2$ | Width $b$ |      | Thickness $s$ |      | Radius $r$ Nom | Bent End $k^*$ | For Bolt Nut or Screw Size | Sub-code | Weight |
|-----------|-------------------------|------|-------------------|-----------|------|---------------|------|----------------|----------------|----------------------------|----------|--------|
|           | Basic                   | Tol+ |                   | Basic     | Tol+ | Basic         | Tol+ |                |                |                            |          |        |
| 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                       |          | 0.052  |
| 3.0       | 3.1                     | 0.3  | 6.2               | 1.3       | 0.1  | 0.8           | 0.1  | 0.2            | 0.15           | M3                         | 014      | 0.11   |
| 4.0       | 4.1                     | 0.3  | 7.6               | 1.5       | 0.1  | 0.9           | 0.1  | 0.2            | 0.15           | M4                         | 022      | 0.18   |
| 5.0       | 5.1                     | 0.3  | 9.2               | 1.8       | 0.1  | 1.2           | 0.1  | 0.2            | 0.15           | M5                         | 030      | 0.36   |
| 6.0       | 6.1                     | 0.4  | 11.8              | 2.5       | 0.15 | 1.6           | 0.1  | 0.3            | 0.2            | M6                         | 049      | 0.83   |
| 8.0       | 8.1                     | 0.4  | 14.8              | 3.0       | 0.2  | 2.0           | 0.1  | 0.5            | 0.3            | M8                         | 057      | 1.60   |
| 10.0      | 10.2                    | 0.5  | 18.1              | 3.5       | 0.2  | 2.2           | 0.15 | 0.5            | 0.3            | M10                        | 065      | 2.53   |
| 12.0      | 12.2                    | 0.5  | 21.1              | 4.0       | 0.2  | 2.5           | 0.15 | 1.0            | 0.4            | M12                        | 073      | 3.82   |
| 16.0      | 16.2                    | 0.8  | 27.4              | 5.0       | 0.2  | 3.5           | 0.2  | 1.0            | 0.4            | M16                        | 081      | 8.91   |
| 20.0      | 20.2                    | 1.0  | 33.6              | 6.0       | 0.2  | 4.0           | 0.2  | 1.0            | 0.4            | M20                        | 090      | 15.2   |
| 24.0      | 24.5                    | 1.0  | 40.0              | 7.0       | 0.25 | 5.0           | 0.2  | 1.6            | 0.5            | M24                        | 103      | 26.2   |
| 30.0      | 30.5                    | 1.2  | 48.2              | 8.0       | 0.25 | 6.0           | 0.2  | 1.6            | 0.8            | M30                        | 111      | 44.3   |
| 36.0      | 36.5                    | 1.2  | 58.2              | 10.0      | 0.25 | 6.0           | 0.2  | 1.6            | 0.8            | M36                        |          | 67.3   |
| 42.0      | 42.5                    | 1.2  | 68.2              | 12.0      | 0.25 | 7.0           | 0.25 | 2.0            | 0.8            | M42                        |          | 111    |
| 48.0      | 49.0                    | 1.5  | 75.0              | 12.0      | 0.25 | 7.0           | 0.25 | 2.0            | 0.8            | M48                        |          | 123    |
| 52.0      | 53.0                    | 1.5  | 83.0              | 14.0      | 0.25 | 8.0           | 0.25 | 2.0            | 1              | M52                        |          | 182    |
| 56.0      | 57.0                    | 1.5  | 87.0              | 14.0      | 0.25 | 8.0           | 0.25 | 2.0            | 1              | M56                        |          | 193    |
| 60.0      | 61.0                    | 1.5  | 91.0              | 14.0      | 0.25 | 8.0           | 0.25 | 2.0            | 1              | M60                        |          | 203    |
| 64.0      | 65.0                    | 1.5  | 95.0              | 14.0      | 0.25 | 8.0           | 0.25 | 2.0            | 1              | M64                        | 120      | 218    |

\*The bend "k" shall be made on the last length of the washer's circumference without any sharp angle.

**4.0 Referred Standards : (Latest Publications including amendments)**

AA 7164002

IS 4072

**EXPLANATORY NOTE**

- This standard was first issued in Apr 1993. It was subsequently revised in Jan. 1997 in line with IS: 3063 -1994.
- The following changes have been incorporated in this revision.
- Hardness range changed from 430 - 450 HV to 430 - 530 HV in line with the latest version of IS: 3063 - 1994.
- New corporate codes have been added in Table 1.
- (Cl 2.0 'Material' has been deleted due to its duplication in Cl 3.2).

*Note: The clause numbers given within the brackets refer to the earlier version of the CS.*