



# PLANT STANDARD

HPBP TIRUCHIRAPALLI

BPS: 41202

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Based on IS: 2269-1981

## HEXAGON SOCKET HEAD CAP SCREWS

### 1.0 SCOPE

Covers the requirements of Hexagon Socket Head Cap Screws in the size range M3 to M30.

### 2.0 SPECIFICATION AND REFERENCE STANDARDS

Dimensions and preferred sizes	Table 1 of this standard	
Preferred length-size combination	Table 2 of this standard	
Tolerance	Product grade	A
	Indian Standard	IS: 1367 (Part 2)
Thread	Pitch	Coarse
	Tolerance	6g
	Indian Standard	IS: 4218 (Part 3, 5 & 6)
Material	Steel	
Mechanical properties	Property class	8.8
	Indian Standard	IS: 1367 (Part 3)
Sampling and Acceptability	Indian Standard	IS: 2614
General requirements	Screws shall comply with IS: 2269 in respect of requirements not covered in this standard	

### 2.1 Referred Standards (Only the relevant parts of current versions are applicable)

- IS: 1367 Technical supply conditions for threaded steel fasteners
- IS: 2269 Specification for hexagon socket head cap screws
- IS: 2614 Methods for sampling of fasteners
- IS: 4218 ISO Metric screw threads

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REVISIONS

DATE

APPROVED

STANDARDS SECTION  
ENGINEERING AND DEVELOPMENT CENTRE  
HPBP TIRUCHIRAPALLI

PREPARED

HPBP TIRUCHY

ISSUED

STANDARDS  
ENGG

DATE

DEC 1986



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## 3.0 DESIGNATION

A Grade A Hexagon Socket Head Cap Screw to this standard of thread size M10 and nominal length 60mm shall be designated as:

### 3.1 On Drawings:

- i) Material specification column : IS: 2269
- ii) Description column : SCRU CAP SOC GR A -3.8-M10x60
- iii) Drawing Number column : 4120210060
- iv) Material Code column : 4120210060

### 3.2 Ordering Description

For placing indents, issuing enquiries and on purchase order, the Ordering Description given below shall be followed.

Hexagon Socket Head Cap Screw M10x60-IS:2269-8.8

## 4.0 ADDITIONAL INFORMATION

- 4.1 Property class 10.9 is also acceptable
- 4.2 Cap screws supplied with knurled heads are acceptable
- 4.3 For cadmium plated hexagon socket head cap screws, refer BPS: 41242.

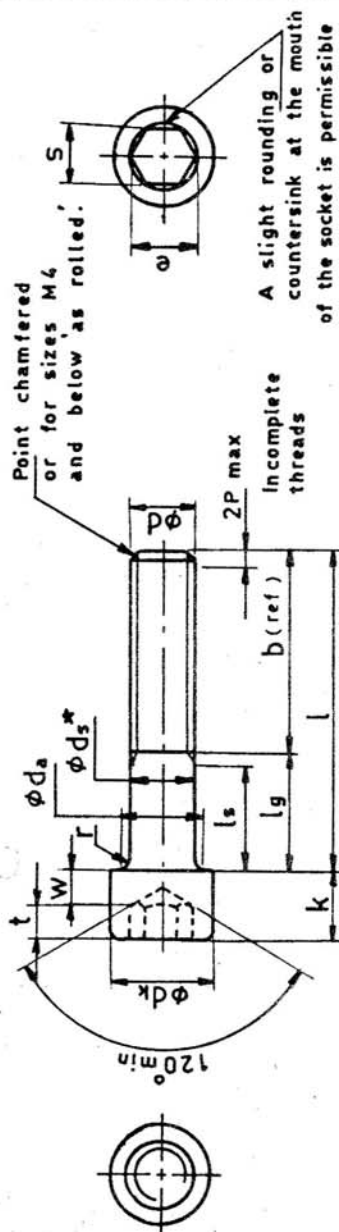
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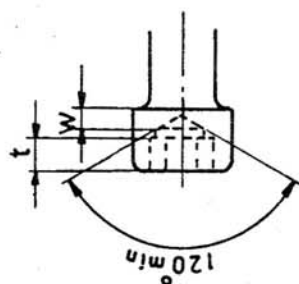
**HEXAGON SOCKET HEAD CAP SCREWS**

(Figure)

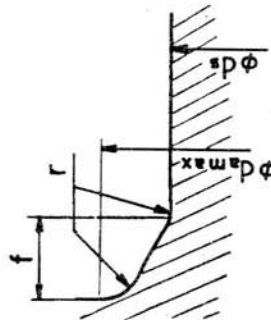


$d_s^*$  Applies to positive value of  $l_s$

Bottom edge of head may be rounded or chamfered to  $d_w$  but in every case must be deburred.



PERMISSIBLE ALTERNATE FORM OF SOCKET



$$f_{Max} = 1.7 r_{Max}$$

$$r_{Max} = \frac{d_a - d_s}{2}$$

MAXIMUM UNDER HEAD FILLET



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**TABLE 1 - DIMENSIONS FOR HEXAGON SOCKET HEAD CAP SCREWS**  
(All dimensions in millimetres)

Thread size d	M3	M4	M5	M6	M8	M10	M12	M16	M20	M24	M30
Pitch P	0.5	0.7	0.8	1.0	1.25	1.5	1.75	2.0	2.5	3.0	3.5
b	Ref	20	22	24	28	32	36	44	52	60	72
d <sub>k</sub>	* Max	7.0	8.5	10.0	13	16	18	24	30	36	45
	** Max	7.22	8.72	10.22	13.27	16.27	18.27	24.33	30.33	36.39	45.39
	Min	6.78	8.28	9.78	12.73	15.73	17.73	23.67	29.67	35.61	44.61
d <sub>a</sub>	Max	4.7	5.7	6.8	9.2	11.2	14.2	18.2	22.4	26.4	33.4
d <sub>g</sub> h13	Max	4	5	6	8	10	12	16	20	24	30
	Min	3.82	4.82	5.82	7.78	9.78	11.73	15.73	19.67	23.67	29.67
e	Min	3.44	4.58	5.72	6.86	9.15	11.43	16.00	19.44	21.73	25.15
	Max	0.60	0.60	0.68	1.02	1.02	1.87	1.87	2.04	2.04	2.89
k h13/h14	Max	4	5	6	8	10	12	16	20	24	30
	Min	3.82	4.82	5.70	7.64	9.64	11.57	15.57	19.48	23.48	29.48
r	Min	0.2	0.2	0.25	0.4	0.4	0.6	0.6	0.8	0.8	1.0
	Max	3	4	5	6	8	10	14	17	19	22
s h13	Min	3.02	4.02	5.02	6.02	8.025	10.025	14.032	17.05	19.065	22.065
	Max	3.071	4.084	5.084	6.14	8.175	10.127	14.159	17.216	19.275	22.275
	Min	2	2.5	3	4	5	6	8	10	12	15.5
v	Max	0.4	0.5	0.6	0.8	1	1.2	1.6	2	2.4	3
d <sub>w</sub>	Min	6.53	8.03	9.38	12.33	15.53	17.23	23.17	28.87	34.81	43.61
	Min	1.15	1.4	1.9	2.3	3.3	4.8	6.8	8.6	10.4	13.1

\* For plain head tol h13  
 \*\* For knurled heads tol ± IT13  
 ● e Min = 1.14 s Min



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**TABLE 2 - PREFERRED LENGTH SIZE COMBINATIONS FOR  
HEXAGON SOCKET HEAD CAP SCREWS**

(All dimensions in millimetres)

size d	size d													
	1			M3	M4	M5	M6	M8	M10	M12	M16	M20	M24	M30
	Nom	Min	Max											
2.5	2.30	2.70												
3	2.80	3.20												
4	3.76	4.24												
5	4.76	5.24												
6	5.76	6.24												
8	7.71	8.29					4.4							
10	9.71	10.29												
12	11.65	12.35					5.1	9.5						
16	15.65	16.35			2.8	5.8	11.1							
20	19.58	20.42				6.5	12.7	21.3	32.4					
25	24.58	25.42						23.8						
30	29.58	30.42					8.8	26.3	41.1	81.7				
35	34.5	35.5						18.4	43.2					
40	39.5	40.5					10.9	32.7		100				
45	44.5	45.5						22.2	35.8	53.8		188		
50	49.5	50.5							57.9			182.2		
55	54.4	55.6						26.0						
60	59.4	60.6					13.2		44.9			224		
65	64.4	65.6								70.2				
70	69.4	70.6										266		
80	79.4	80.6							57.1			272		
90	89.3	90.7												
100	99.3	100.7												
110	109.3	110.7												
120	119.3	120.7												
130	129.2	130.8												
140	139.2	140.8												
150	149.2	150.8												
160	159.2	160.8												
180	179.2	180.8												

WEIGHTS

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**Note:**

- Preferred lengths are in between the stepped bold lines.
- For stocked sizes and weights refer BPS components book-let.
- Lengths above the dotted line are threaded to the head within  $3 \times \text{Pitch}$ . Lengths below the dotted line have values  $l_g$  and  $l_s$  according to the following formulae:  
 $l_g \text{ Max} = l_{\text{Nom}} - b \text{ ref.}$   
 $l_s \text{ Min} = l_g \text{ Max} - 5P.$

MAR 1987