

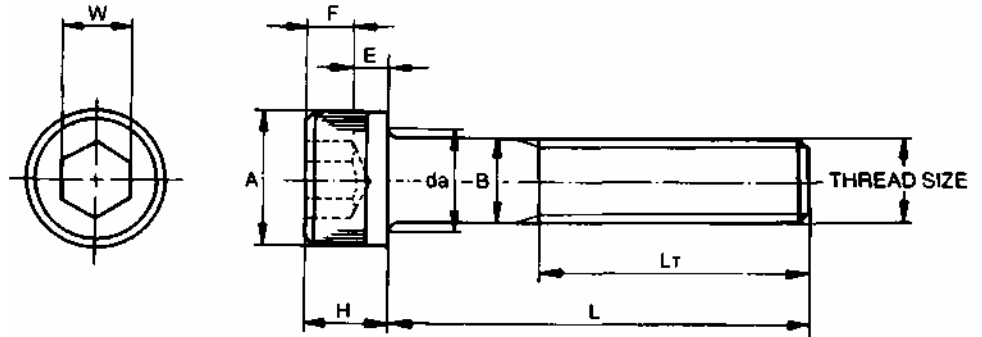
Socket Head Cap Screws

Metric Series - M3 - M20

Dimensions - Physical Properties - Tightening Torques

Notes :

- 1 The screws will generally conform to IS : 2269, ISO : 4762, DIN : 912
2. Threads will conform to class 4g6g of IS: 4218. ISO-261/965. Coarse Series
- 3 Material : "UNILOK¹¹ High Grade Alloy Steel
- 4 Heat Treatment : HRc 38-44
5. Property Class : 12.9.
6. For Grip Lengths, see page 10, 11.
- 7 Sizes in brackets are non-preferred standards
8. All dimensions are in millimeters



Thread Size	M3	M4	M5	M6	M8	M10	M12	(M14)	M16	(M18)	M20
Pitch	0.50	0.70	0.80	1.00	1.25	1.50	1.75	2.00	2.00	2.50	2.50
A Max.	5.5	7.0	8.5	10.0	13.0	16.0	18.0	21.0	24.0	27.0	30.0
BMax.	3.0	4.0	5.0	6.0	8.0	10.0	12.0	14.0	16.0	18.0	20.0
EMin.	1.20*	1.70	2.15	2.60	3.50	4.55	5.50	6.50	7.50	8.10	8.90
FMin.	1.5	2.0	2.5	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0
HMax.	3.0	4.0	5.0	6.0	8.0	10.0	12.0	14.0	16.0	18.0	20.0
da Max.	3.6	4.7	5.7	6.8	9.2	11.2	14.2	16.2	18.2	20.2	22.4
WNom.	2.5	3.0	4.0	5.0	6.0	8.0	10.0	12.0	14.0	14.0	17.0
LT Basic	18	20	22	24	28	32	36	40	44	48	52

Physical Properties

Inclusive diameters	Upto 16 mm		Above 16 mm	
Ultimate tensile strength, Min.	1,300N/mm ²	132.5Kgf/mm ²	1,250 N/mm ²	127.4 Kgf/mm ²
Yield strength, 0.2% offset, Min.	1,170N/mm ²	119.3Kgf/mm ²	1,124 N/mm ²	114.6 Kgf/mm ²
Shear strength, Min.	780 N/mm ²	79.5 Kgf/mm ²	750 N/mm ²	76.5 Kgf/mm ²
Elongation % on GL=5.65 V~A Where A=Cross sectional area .	9% Min.		9% Min.	

Typical Tightening Torque (Max) and induced Load

Thread Size	Stress Area mm ²	Tightening Torque		Induced Load	
		Unplated*		N	Kgf
		Nm	Kgfm		
M3	5.03	2.1	0.21	4,024	410
M4	8.78	4.6	0.47	7,024	716
M5	14.20	9.5	0.97	11,360	1,158
M6	20.10	16.0	1.63	16,080	1,639
M8	36.60	39.0	3.98	29,280	2,985
M10	58.00	77.0	7.85	46,400	4,730
M12	84.30	135.0	13.80	67,440	6,875
(M14)	115.00	215.0	21.90	92,000	9,378
M16	157.00	330.00	33.60	1,25,600	12,803
(M18)	192.00	450.00	46.40	1,53,600	15,658
M20	245.00	650.00	66.30	1,96,000	19,980

Note:

The tightening torque calculated to induce 800 N/mm² stress in screw threads.

* Torque values listed are for plain screws. For Cadmium plated screws, multiply listed values by 0.75. For Zinc plated screws, multiply listed values by 1.40.

Socket Head Cap Screws

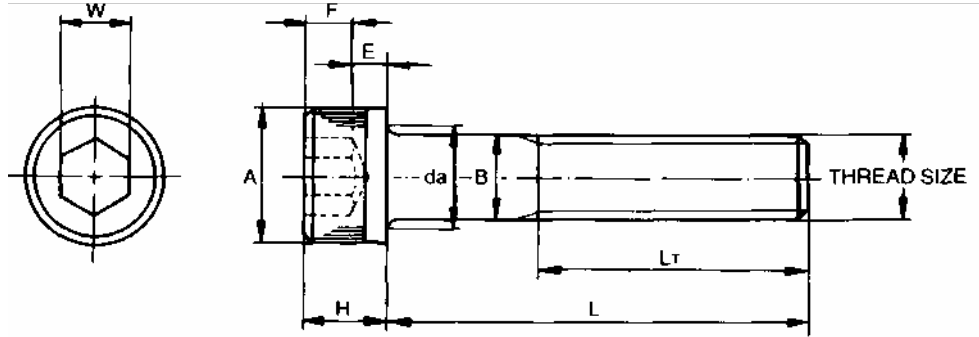


Metric Series-M22 - M42

Dimensions - Physical Properties - Tightening Torques

Notes :

1. The screws will generally conform to IS : 2269, ISO : 4762, DIN : 912.
2. Threads will conform to class 4g6g of IS: 4218. ISO-261/965, Coarse Series
3. Material : "UNILOK" High Grade Alloy Steel
4. Heat Treatment : HRC 38-44.
5. Property Class : 12.9.
6. For Grip Lengths, see page 10, 11.
7. Sizes in brackets are non-preferred standards.
8. All dimensions are in millimeters.



Thread Size	(M22)	M24	(M27)	M30	M33	M36	M42
Pitch	2.50	3.00	3.00	3.50	3.50	4.00	4.50
A Max.	33.0	36.0	40.0	45.0	50.0	54.0	63.0
BMax.	22.0	24.0	27.0	30.0	33.0	36.0	42.0
EMin.	10.30	11.10	12.5	13.35	14.16	16.0	17.2
FMin.	11.0	12.0	13.5	15.5	18.0	19.0	24.0
HMax.	22.0	24.0	27.0	30.0	33.0	36.0	42.0
da Max.	24.4	26.4	30.4	33.4	36.4	39.4	45.6
WNom.	17.0	19.0	19.0	22.0	24.0	27.0	32.0
LT Basic	56	60	66	72	78	84	96

Physical Properties

Diameters	Above 16mm	
Ultimate tensile strength, Min.	1,250 N/mm ²	127.4Kgf/mm ²
Yeild strength, 0.2% offset, Min.	1,124N/mm ²	114.6Kgf/mm ²
Shear Strength, Min.	750 NAnm ²	76.5 kgf/mm ²
Elongation % on GL = 5.65 VA~ Where A = Cross sectional area.	9% Min.	

Typical Tightening Torque (Max) and induced Load

Note:

The tightening torque calculated to induce 800 N/mm² stress in screw threads.

* Torque values listed are for plain screws. For Cadmium plated screws, multiply listed values by 0.75. For Zinc plated screws, multiply listed values by 1.40.

Thread Size	Stress Area mm ²	Tightening Torque		Induced Load	
		Unplated*		N	Kgf
		Nm	Kgfm		
(M22)	303.00	870.0	88.70	2,42,400	24,709
M24	353.00	1110.0	112.00	2,82,400	28,787
(M27)	459.00	1650.0	169.00	3,67,200	37,431
M30	561.00	2250.0	229.00	4,48,800	45,749
(M33)	694.00	3050.0	311.00	5,55,200	56,595
M36	817.00	3850.0	392.00	6,53,600	66,626
M42	1120.00	6270.0	639.00	8,96,000	91,335

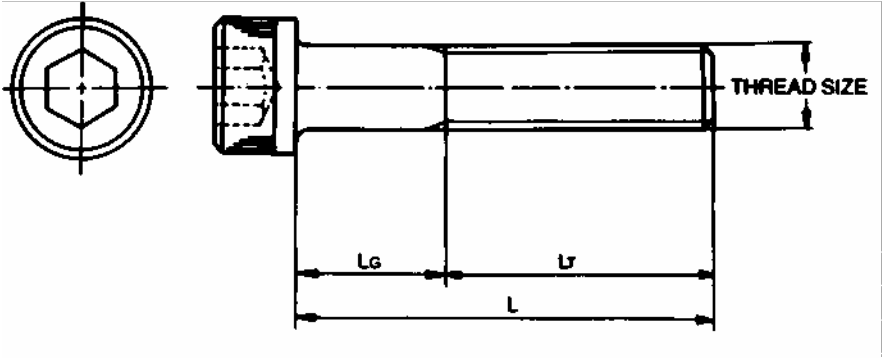
Socket Head Cap Screws

Metric Series

Grip Lengths

Notes:

1. LG is the maximum grip length, and represents the minimum design grip length for the screw.
2. LT Ref. = (2 x Nominal Dia.) plus 12 mm.
LG Max. = Nominal Length "L" minus "Li".
3. Tolerance on Grip Length will be + 0-2.1/2 Pitch.
Tolerance on Thread Length will be +2.1/2 Pitch-0.
4. Sizes in brackets are non-preferred standards.
5. All dimensions are in millimeters.



Size	(M18)	M20	(M22)	M24	(M27)	M30	(M33)	M36	M42
Length									
20							Sizes to the top of the heavy lines will be threaded to head.		
25									
30									
35									
40									
45									
50									
55									
60									
65									
70	22								
75	27	23	19						
80	32	28	24						
90	42	38	34	30					
100	52	48	44	40	34				
110	62	58	54	50	44	38	32		
120	72	68	64	60	54	48	42	36	
130	82	78	74	70	64	58	52	46	
140	92	88	84	80	74	68	62	56	44
150	102	98	94	90	84	78	72	66	54
160	112	108	104	100	94	88	82	76	64
180	132	128	124	120	114	108	102	96	84
200	152	148	144	140	134	128	122	116	104
220			164	160	154	148	142	136	124
240			184	180	174	168	162	156	144
260			204	200	194	188	182	176	164
280			224	220	214	208	202	196	184
300					234	228	222	216	204