



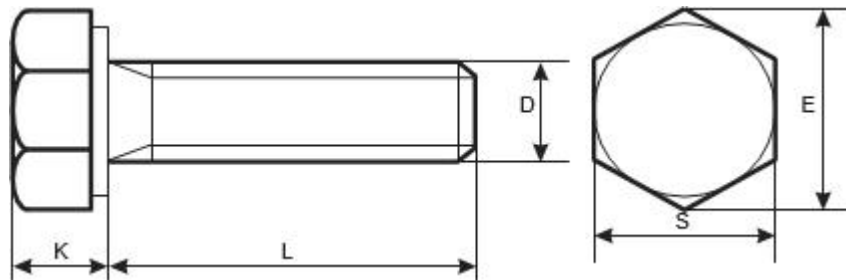
Fasteners fasten you and me.

Product Dimensions, Standards and Weights

DIN 933 / ISO 4017 Technical Specifications

Metric DIN 933 Hexagon Head Cap Screws / Bolts Full Thread

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Dimensions of Metric DIN 933 Hexagon Head Cap Screws / Bolts Full Thread

Thread D	M4	M5	M6	M8	M10	M12	M14	M16	M18	M20	M22	M24
S	7	8	10	13	17	19	22	24	27	30	32	36
E	7.74	8.87	11.05	14.38	18.9	21.1	24.49	26.75	30.14	33.14	35.72	39.98
K	2.8	3.5	4	5.5	7	8	9	10	12	13	14	15

Thread D	M27	M30	M33	M36	M39	M42	M45	M48	
S	41	46	50	55	60	65	70	75	
E	45.63	51.28	55.8	61.31	66.96	72.61	78.26	83.91	
K	17	19	21	23	25	26	28	30	
B	X	60	66	72	78	84	90	96	102
	Y	66	72	78	84	90	96	102	108
	Z	79	85	91	97	103	109	115	121

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Weights of Metric DIN 933 Hexagon Head Cap Screws / Bolts Full Thread

Thread D	M4	M5	M6	M8	M10	M12	M14	M16	M18	M20	M22	M24
L (mm)	Weight in Kg(s)/1000pcs											
8	1.49	2.38	3.74	8.55	17.2							
10	1.64	2.63	4.08	9.1	18.2	25.8	38					
12	1.8	2.87	4.42	9.8	19.2	27.4	40	52.9				
16	2.1	3.37	5.31	11.1	21.2	30.2	44	58.3	82.7	107	133	173
20	2.41	3.87	5.8	12.3	23.2	33	48	63.5	87.9	116	143	184
25	2.8	4.49	6.65	13.9	25.7	36.6	53	70.2	96.5	126	155	199
30	3.19	5.11	7.51	15.5	28.2	40.2	57.9	76.9	105	136	168	214
35	3.57	5.73	8.37	17.1	30.7	43.8	62.9	83.5	113	147	181	229
40	3.96	6.35	9.23	18.7	33.2	47.4	67.9	90.2	121	157	193	244
45	3.34	6.99	10.1	20.3	35.7	51	72.9	97.1	129	167	206	259
50	4.73	7.59	11	21.8	38.2	54.5	77.9	103	137	178	219	274
55	5.12	8.21	11.9	23.4	40.7	58.1	82.9	110	146	188	232	289
60	5.5	8.83	12.7	25	43.3	61.7	87.8	117	154	199	244	304
65	5.89	9.45	13.6	26.6	45.8	65.3	92.8	123	162	209	257	319
70	6.28	10.1	14.4	28.2	48.8	68.9	97.8	130	170	219	269	334
75		10.7	15.3	29.8	50.8	72.5	102	137	178	229	282	348
80		11.3	16.2	31.4	53.3	76.1	107	144	187	240	295	363
90			17.9	34.6	58.3	83.3	117	157	203	260	321	393
100				37.7	63.3	90.5	127	170	219	281	346	423
110				40.9	68.4	97.7	137	184	236	302	371	453
120					73.4	105	147	197	252	322	397	483
130					78.4	112	157	210	269	343	421	513
140					83.4	119	167	224	255	364	448	543
150					88.4	126	177	237	301	384	473	572

Metric DIN 933 Hexagon Head Cap Screws / Bolts are externally threaded fasteners with a hexagonal washer faced head and a chamfered tip to facilitate mating with an internally threaded component. DIN 933 hex screws have a fully threaded shank and are manufactured to very strict tolerances.

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DIN (Deutsches Institut für Normung - German Institute for Standardization) standards are issued for a variety of components including industrial fasteners as Metric DIN 933 Hexagon Head Cap Screws / Bolts. The DIN standards remain common in Germany, Europe and globally even though the transition to ISO standards is taking place. DIN standards continue to be used for parts which do not have ISO equivalents or for which there is no need for standardization. IN this case the ISO equivalent for DIN 933 is ISO 4017.

1) Mechanical properties of stainless steel for metric DIN 933 Hexagon Head Cap Screws / Bolts Full Thread

Stainless steels can be divided into three groups of steel - austenitic, ferritic and martensitic. Austenitic steel is by far the most common type (>90% of commercial fasteners). The steel groups and strength classes are designated by a four-digit sequence of letters and numbers (eg A2-70) as shown in the following table. DIN EN ISO 3506 governs screws and nuts made from stainless steel.

Steel group	Steel grade	Strength class	Screws, Nuts and Bolts			
			Tensile strength N/mm ²	Tensile strength PSI	Dia range	Nut Load N/mm ²
Austenitic	A2 and A4	50	500	70,000	<=M39	500
		70	700	100,000	<=M20	700
		80	800	118,000	<=M20	800

The tensile stress is calculated with reference to the tensile stress area (see DIN EN ISO 3506-1979). Nuts to be paired with same grade of stainless steel screws

Steel group	Property Strength class	Made From	Characteristics
Austenitic	50	A1, A2	Soft; cold worked, turned and soft pressed fasteners
	70	A2, A4	Cold worked, normal strength formed fasteners
	80	A2, A4	Extreme cold worked, high strength, special

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2) Chemical composition of stainless steel metric DIN 933 Hexagon Head Cap Screws / Bolts Full Thread

Grade	USA Grade	Material designation	Material no.	C %	Si ≤ %	Mn ≤ %	Cr %	Mo %	Ni %
A 2	304	X 5Cr Ni 1810	1.4301	≤ 0.07	1.0	2.0	17.5 to	-	8.0 to
		X 2 Cr Ni 1811	1.4306	≤ 0.03	1.0	2.0	18.0 to	-	1.0 to
		X 8 Cr Ni 19/10	1.4303	≤ 0.07	1.0	2.0	17.0 to	-	11.0 to
A 4	316	X 5 Cr Ni Mo 1712	1.4401	≤ 0.07	1.0	2.0	16.5 to	2.0	10.0 to
		X 2 Cr Ni Mo 1712	1.4404	≤ 0.03	1.0	2.0	16.5 to	2.0	1.0 to

3) Chemical composition of steel metric DIN 933 Hexagon Head Cap Screws / Bolts Full Thread

PROPERTY CLASS	MATERIAL AND TREATMENT	CHEMICAL COMPOSITION LIMITS %				TEMPERING TEMP °C MIN.
		C		P	S	
		min.	max.	max.	max.	
4.6, 4.8, 5.8, 6.8	Low or medium carbon steel	-	0.55	0.05	0.06	-
8.8	Medium carbon steel quenched, tempered	0.25	0.55	0.04	0.05	425
9.8	Medium carbon steel quenched, tempered	0.25	0.55	0.04	0.05	425
10.9	Medium carbon steel additives e.g. boron, Mn, Cr or Alloy steel - quenched, tempered	0.20	0.55	0.04	0.05	425
12.9	Alloy steel - quenched, tempered	0.20	0.50	0.035	0.035	380

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4) Mechanical properties of steel for metric DIN 933 Hexagon Head Cap Screws / Bolts Full Thread

MECHANICAL PROPERTY		PROPERTY CLASS									
		4.8	5.6	5.8	6.8	8.8		9.8	10.9	12.9	
						Up to	Over				
Tensile Strength	nom.	400	500		600	800		900	100	120	
	min.	420	500	520	600	800	830	900	104	122	
Vickers Hardness	min.	130	155	160	190	250	255	290	320	385	
	max.	250				320	336	360	380	435	
Brinell Hardness	min.	124	147	152	181	319	242	266	295	353	
	max.	238				385	319	342	363	412	
Rockwell Hardness	min.	71	79	82	89	-					
	HRC	-	-	-	-	20	23	28	32	39	
	HR	95				99	-				
	max.	-	-	-	-	32	34	37	39	44	
Yield Stress ReL.	nom.	320	300	400	480	-					
	min.	340	300	420	480	-					
Stress at permanent set	nom.	-				640		720	900	108	
	min.	-				640	660	720	940	110	

Disclaimer

Dimensional data and technical information for Metric DIN 933 Hexagon Head Cap Screws / Bolts was obtained from publicly available sources and not acquired through standards agencies. It has been completed and compiled for reference purposes only; where discrepancies are found they are subject to change without notice. Aspen Fasteners makes no warranties or representations regarding the accuracy and validity of the compiled information and data. Contact the relevant standards authorities for accurate and detailed information.