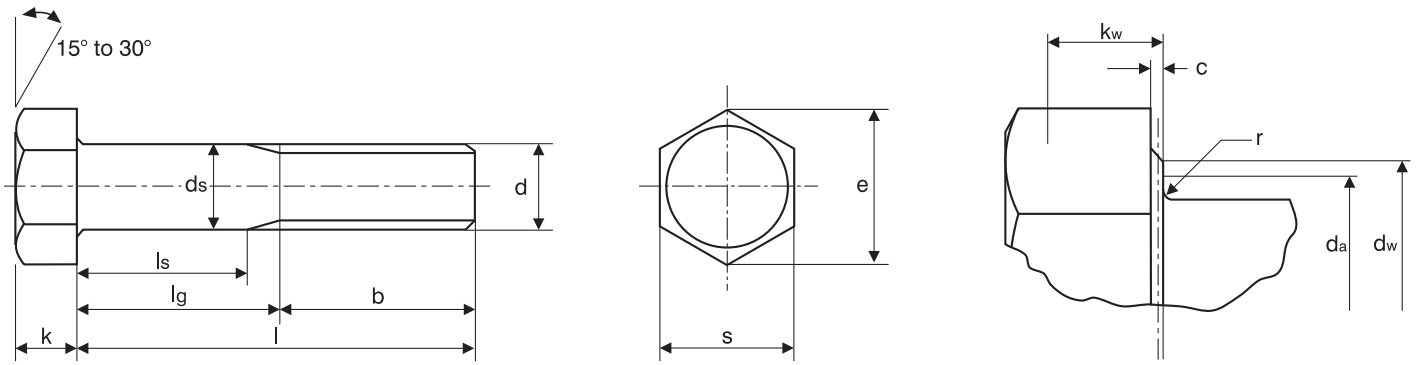


Hexagon Head Bolts Fine Pitch

EN ISO 8765 (DIN 960) High Tensile



EN ISO 8765 (DIN960) Dimensions of bolts

Nominal size and thread diameter d	Pitch of thread P	Thread Length b			Depth of washer face c		Transition Diameter da	Diameter of unthreaded shank ds		Dia. of washer face dw	Width across corners e	Thickness of head k	Radius under head r	Width across flats s	
		Bolt ≤ 125	Bolt 125-200	Bolt ≥ 200	min.	max.		max.	min.					max.	min.
M10	1.00	26	32	45	0.15	0.6	11.20	9.64	10.0	14.47	17.59	6.40	0.4	15.57	16.00
M12	1.50	30	36	49	0.15	0.6	13.70	11.57	12.00	16.47	19.85	7.50	0.6	17.57	18.00
M14	1.50	34	40	53	0.15	0.6	15.70	13.57	14.00	19.15	22.78	8.80	0.6	20.16	21.00
M16	1.50	38	44	57	0.2	0.8	17.70	15.57	16.00	22.00	26.17	10.00	0.6	23.15	24.00
M18	1.50	42	48	61	0.2	0.8	20.20	17.57	18.00	24.85	29.56	11.50	0.6	26.16	27.00
M20	1.50	46	52	65	0.2	0.8	22.40	19.48	20.00	27.70	32.95	12.50	0.8	29.16	30.00
M22	1.50	50	56	69	0.2	0.8	24.40	21.48	22.00	31.35	37.29	14.00	0.8	33.00	34.00
M24	2.00	54	60	73	0.2	0.8	26.40	23.48	24.00	33.25	39.55	15.00	0.8	35.00	36.00
M27	2.00	60	66	79	0.2	0.8	30.40	26.48	27.00	38.00	45.20	17.00	1.0	40.00	41.00
M30	2.00	66	72	85	0.2	0.8	33.40	29.48	30.00	42.75	50.85	18.70	1.0	45.00	46.00
M33	2.00	-	78	91	0.2	0.8	36.40	32.38	33.00	46.55	55.37	21.00	1.0	49.00	50.00
M36	3.00	-	84	97	0.2	0.8	39.40	35.38	36.00	51.11	60.79	22.50	1.0	53.80	55.00
M39	3.00	-	90	103	0.3	1.0	42.40	38.38	39.00	55.86	66.44	25.00	1.0	58.80	60.00
M42	3.00	-	95	109	0.3	1.0	45.60	41.38	42.00	59.95	71.30	26.00	1.2	63.10	65.00
M45	3.00	-	102	115	0.3	1.0	48.6	44.38	45.00	64.70	76.95	28.00	1.2	68.10	70.00
M48	3.00	-	108	121	0.3	1.0	52.60	47.38	48.00	69.45	82.60	30.00	1.6	73.10	75.00
M52	4.00	-	116	129	0.3	1.0	56.60	51.26	52.00	74.20	88.25	33.00	1.6	78.10	80.00
M56	4.00	-	-	137	0.3	1.0	63.00	55.26	56.00	78.66	93.56	35.00	2.0	82.80	85.00
M60	4.00	-	-	145	0.3	1.0	67.00	59.26	60.00	83.41	99.21	38.00	2.00	87.0	90.00
M64	4.00	-	-	153	0.3	1.0	71.00	63.26	64.00	88.16	104.86	40.00	2.0	92.80	96.00

Hexagon Head Bolts Fine Pitch

EN ISO 8765 (DIN 960) High Tensile

EN ISO 8765 (DIN960) Dimensions of bolts (concluded)

d	M10		M12		M14		M16		M18		M20		M22		M24		M27		M30	
	ls min.	lg max.	ls min.	lg max.	ls min.	lg max.	ls min.	lg max.	ls min.	lg max.	ls min.	lg max.	ls min.	lg max.	ls min.	lg max.	ls min.	lg max.	ls min.	lg max.
50	16.50	24.00	11.25	20.00																
55	21.50	29.00	16.25	25.00																
60	26.50	34.00	21.25	30.00	16.00	26.00														
65	31.50	39.00	26.25	35.00	21.00	31.00	17.00	27.00												
70	36.50	44.00	31.25	40.00	26.00	36.00	22.00	32.00	15.50	28.00										
80	46.50	54.00	41.25	50.00	36.00	46.00	32.00	42.00	25.50	38.00	21.50	34.00								
90	56.50	64.00	51.25	60.00	46.00	56.00	42.00	52.00	35.50	48.00	31.50	44.00	27.50	40.00	21.00	36.00				
100	66.50	74.00	61.25	70.00	56.00	66.00	52.00	62.00	45.50	58.00	41.50	54.00	37.50	50.00	31.00	46.00	25.00	40.00		
110			71.25	80.00	66.00	76.00	62.00	72.00	55.50	68.00	51.50	64.00	47.50	60.00	41.00	56.00	35.00	50.00	26.50	44.00
120			81.25	90.00	76.00	86.00	72.00	82.00	65.50	78.00	61.50	74.00	57.50	70.00	51.00	66.00	45.00	60.00	36.50	54.00
130					80.00	90.00	76.00	86.00	69.50	82.00	65.50	78.00	61.50	74.00	55.00	70.00	49.00	64.00	40.50	58.00
140					90.00	100.00	86.00	96.00	79.50	92.00	75.50	88.00	71.50	84.00	65.00	80.00	59.00	74.00	50.50	68.00
150							96.00	106.00	89.50	102.00	85.50	98.00	81.50	94.00	75.00	90.00	69.00	84.00	60.50	78.00
160							106.00	116.00	99.50	112.00	95.50	108.00	91.50	104.00	85.00	100.00	79.00	94.00	70.50	88.00
180									119.50	132.00	115.50	128.00	111.50	124.00	105.00	120.00	99.00	114.00	90.50	108.00
200											135.50	148.00	131.50	144.00	125.00	140.00	119.00	134.00	110.50	128.00
220													138.50	151.00	132.00	147.00	126.00	141.00	117.50	135.00
240															152.00	157.00	146.00	161.00	137.50	155.00
260																	166.00	181.00	157.50	175.00
280																			177.50	195.00
300																			197.50	215.00

d	M33		M36		M39		M42		M45		M48		M52		M56		M60		M64	
	ls min.	lg max.	ls min.	lg max.	ls min.	lg max.	ls min.	lg max.	ls min.	lg max.	ls min.	lg max.	ls min.	lg max.	ls min.	lg max.	ls min.	lg max.	ls min.	lg max.
130	34.50	52.00																		
140	44.50	62.00	36.00	56.00																
150	54.50	72.00	46.00	66.00	40.00	60.00														
160	64.50	82.00	56.00	76.00	50.00	70.00	41.50	64.00												
180	84.50	102.00	76.00	96.00	70.00	90.00	61.50	84.00	55.50	78.00	47.00	72.00								
200	104.50	122.00	96.00	116.00	90.00	110.00	81.50	104.00	75.50	98.00	57.00	92.00	59.00	84.00						
220	111.50	129.00	103.00	123.00	97.00	117.00	88.50	111.00	82.50	105.00	74.00	99.00	66.00	91.00	55.50	83.00				
240	131.50	149.00	123.00	143.00	117.00	137.00	108.50	131.00	102.50	125.00	94.00	119.00	86.00	111.00	75.50	103.00	67.50	95.00		
260	151.50	169.00	143.00	163.00	137.00	157.00	128.50	151.00	122.50	145.00	114.00	139.00	106.00	131.00	95.50	123.00	87.50	115.00	77.00	107.00
280	171.50	189.00	163.00	183.00	157.00	177.00	148.50	171.00	142.50	165.00	134.00	159.00	126.00	151.00	115.50	143.00	107.50	135.00	97.00	127.00
300	191.50	209.00	183.00	203.00	177.00	197.00	168.50	191.00	162.50	185.00	154.00	179.00	146.00	171.00	135.50	163.00	127.50	155.00	117.00	147.00
320	211.50	229.00	203.00	223.00	197.00	217.00	188.50	211.00	182.50	205.00	174.00	199.00	166.00	191.00	155.50	183.00	147.50	175.00	137.00	167.00
340			223.00	243.00	217.00	237.00	208.50	231.00	202.50	225.00	194.00	219.00	186.00	211.00	175.50	203.00	167.50	195.00	157.00	187.00
360			243.00	263.00	237.00	257.00	228.50	251.00	222.50	245.00	214.00	239.00	206.00	231.00	195.50	223.00	187.50	215.00	177.00	207.00
380					257.00	277.00	248.50	271.00	242.50	265.00	234.00	259.00	226.00	251.00	215.50	243.00	207.50	235.00	197.00	227.00
400							288.50	291.00	262.50	285.00	254.00	279.00	246.00	271.00	235.50	263.00	227.50	255.00	217.00	247.00
420							298.50	311.00	282.50	305.00	274.00	299.00	266.00	291.00	255.50	283.00	247.50	275.00	237.00	267.00
440							308.50	331.00	302.50	325.00	294.00	319.00	286.00	311.00	275.50	303.00	267.50	295.00	257.00	287.00
460											314.00	339.00	306.00	331.00	295.50	323.00	287.50	315.00	277.00	307.00
480											334.00	359.00	326.00	351.00	315.50	343.00	307.50	335.00	297.00	327.00
500															335.50	363.00	327.50	355.00	317.00	347.00

Hexagon Head Bolts Fine Pitch

EN ISO 8765 (DIN 960) High Tensile

Specification for bolts and reference standards

Mechanical and physical properties

Characteristic		Standard
Material		Steel
General Requirements	International Standards	ISO 8992
	Tolerance	6g
Thread	International Standard	ISO 724, ISO 965-1
	Property Class ^a	d < 3mm: as agreed 3mm ≤ d ≤ 39mm: 8.8, 10.9 d > 39mm: as agreed
Mechanical Properties	International Standards	3mm ≤ d ≤ 39mm: ISO 898-1 d < 3mm and d > 39mm
	Tolerances	ISO 4759-1
Finish and/or coating	As processed	
	Requirements for electroplating are covered in ISO 4042	
	Requirements for non-electrolytically applied zinc flake coatings are covered in ISO 10683	
	If different electroplating requirements are desired or if requirements are needed for other finishes, they should be agreed between customer and supplier.	
	Limits for surface discontinuities are covered in ISO 6157-1	
Acceptability	For acceptance procedure, see ISO 3269.	
a For other property classes see ISO 898-1.		

Mechanical or physical property	Property Class				
	8.8		10.9	12.9	
	≤ M16	> M16			
Tensile Strength	nom.	800		1000	1200
	min.	800	830	1040	1220
Yield Strength 0.2% offset non-proportional elongation	nom.	640	640	900	1080
	min.	640	660	940	1100
Percentage elongation after fracture for machined test piece	min.	12	12	9	8
Stress Under Proof Load	nom.	580	600	830	970
Rockwell Hardness, HRC	min.	22	23	32	39
	max.	32	34	39	44
All units are displayed as newton per square millimeter (N/mm ²)					