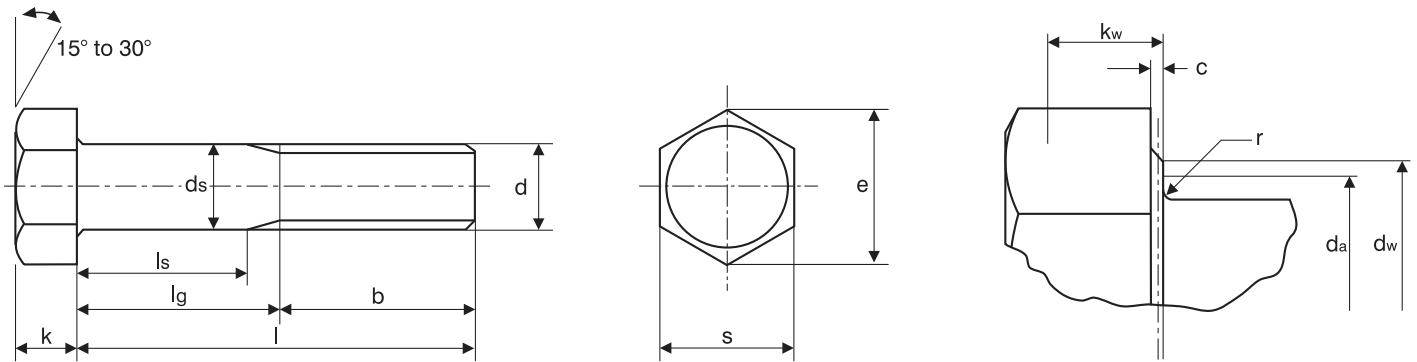


Hexagon Head Bolts

EN ISO 4014 (DIN 931)

High Tensile



EN ISO 4014 (DIN931) Dimensions of bolts

| Nominal size and thread diameter d | Pitch of thread P | Thread Length b | | | Depth of washer face c | | Transition Diameter d_a | Diameter of unthreaded shank d_s | | Dia. of washer face d_w | 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 | 1.50 | 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 | 1.75 | 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 | 2.00 | 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 | 2.00 | 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 | 2.50 | 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 | 2.50 | 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 | 2.50 | 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 | 3.00 | 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 | 3.00 | 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 | 3.50 | 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 | 3.50 | - | 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 | 4.00 | - | 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 | 4.00 | - | 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 | 4.50 | - | 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 | 4.50 | - | 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 | 5.00 | - | 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 | 5.00 | - | 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 | 5.50 | - | - | 137 | 0.3 | 1.0 | 63.00 | 55.26 | 56.00 | 78.66 | 93.56 | 35.00 | 2.0 | 82.80 | 85.00 |
| M60 | 5.50 | - | - | 145 | 0.3 | 1.0 | 67.00 | 59.26 | 60.00 | 83.41 | 99.21 | 38.00 | 2.00 | 87.0 | 90.00 |
| M64 | 6.00 | - | - | 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

EN ISO 4014 (DIN 931)

High Tensile

EN ISO 4014 (DIN931) 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

EN ISO 4014 (DIN 931)

High Tensile

Specification for bolts and reference standards

Mechanical and physical properties

| Characteristic | | Standard |
|--|---|--|
| Material | | Steel |
| General Requirements | International Standards | ISO 8992 |
| Thread | Tolerance | 6g |
| | International Standard | ISO 724, ISO 965-1 |
| Mechanical Properties | Property Class ^a | d < 3mm: as agreed 3mm ≤ d ≤ 39mm: 8.8, 10.9 d > 39mm: as agreed |
| | International Standards | 3mm ≤ d ≤ 39mm: ISO 898-1 d < 3mm and d > 39mm |
| Tolerances | International Standard | 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) | | | | | |