

# M22 Hex Bolts Dimensions

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[Fasteners/Bolts/Hex Bolts](#) / M22 Hex Bolts Dimensions

Bolts · ISO 4014 / ISO 4017

Controlling dimensions to ISO 4014 / ISO 4017, with clearance hole and tapping drill, spanner or drive size and tightening torque

M22 Hex Bolts dimensions to ISO 4014 / ISO 4017: width across flats (spanner size) 32 mm, head height 14 mm.

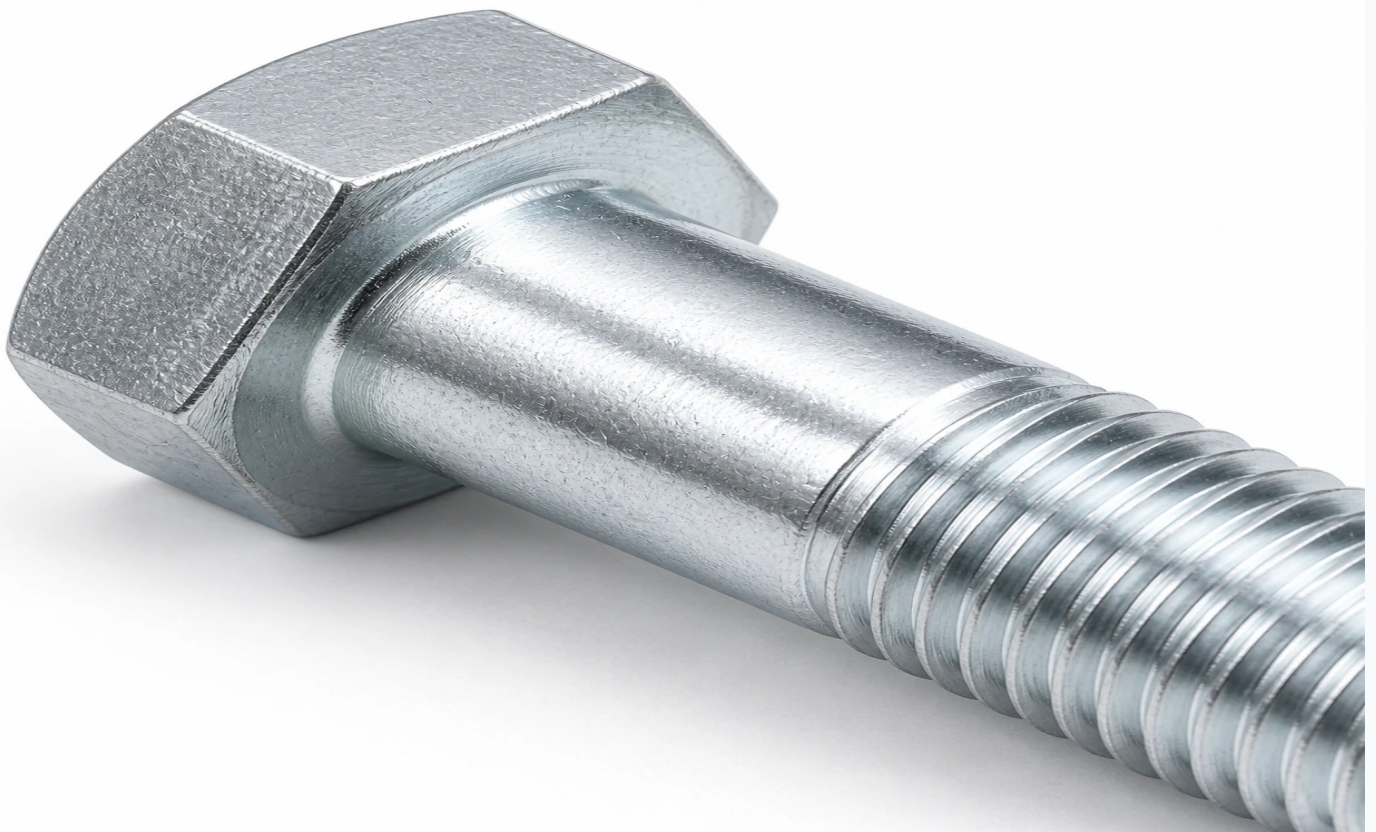
Width across flats (spanner size)

32 mm

Head height

14 mm

Figures are nominal values from the governing standard. Confirm against the tolerance class for your application before machining or ordering.



This page covers M22 Hex Bolts to ISO 4014 / ISO 4017: the full dimensional row, hole and tool sizes, proof-load data and typical applications. All values are taken from the governing standards (ISO 4014 / ISO 4017 together with ISO 273, ISO 724 and ISO 898-1

where applicable).

## M22 Dimensional Row (ISO 4014 / ISO 4017)

| Size | Pitch coarse (mm) | Width across flats s (mm) | Width across corners e min (mm) | Head height k nom (mm) | Nominal diameter d (mm) | Reference standard | Notes                    |
|------|-------------------|---------------------------|---------------------------------|------------------------|-------------------------|--------------------|--------------------------|
| M22  | 2.5               | 32.0                      | 35.72                           | 14.0                   | 22.0                    | ISO 4014/4017      | Partial / fully threaded |

## Spanner & Drive for M22 Hex Bolts

M22 Hex Bolts have a width across flats of 32.0 mm — fit a 32.0 mm open-ended spanner or socket. Use a 6-point socket for tight clearances and to reduce rounding; for repeated assembly choose a torque wrench so the joint preload is repeatable.

## Common Applications for M22 Hex Bolts

M22 Hex Bolts are commonly specified for structural steelwork, heavy machinery foundations and large flange joints.

## Installation Tips for M22 Hex Bolts

- Use a 6-point socket where access allows — 12-point sockets are more prone to rounding the corners on smaller sizes.
- On flanged or serrated variants, do NOT add a separate flat washer — the flange already spreads the load and the washer can defeat the locking serrations.
- At M22 the stretch in the bolt becomes the controlling factor — for critical joints, use angle-controlled or stretch-controlled tightening instead of pure torque.

## Mating Parts for M22

For M22, pair with a M22 hex nut (ISO 4032 / DIN 934) and, where used, a M22 flat washer (ISO 7089 / DIN 125A) under the head and under the nut.

## Technical Drawing

Customize the parameters below — every spec field is editable, and the drawing redraws to match the values you choose. Changing the size will snap the other fields to that size's standard values; you can then override any individual value.

Sends the selected values to the quote form below.

## Request a Quote

The form below follows the current technical drawing configuration. Change the drawing values above and the request details update automatically.

## Dimensions & Specifications (ISO 4014 / ISO 4017)

| Size | Pitch coarse (mm) | Width across flats s (mm) | Width across corners e min (mm) | Head height k nom (mm) | Nominal diameter d (mm) | Reference standard | Notes                    |
|------|-------------------|---------------------------|---------------------------------|------------------------|-------------------------|--------------------|--------------------------|
| M1   | 0.25              | 2.5                       | 2.71                            | 0.7                    | 1.0                     | ISO 4017           | Fully threaded           |
| M1.2 | 0.25              | 3.0                       | 3.28                            | 0.8                    | 1.2                     | ISO 4017           | Fully threaded           |
| M1.4 | 0.3               | 3.0                       | 3.28                            | 0.9                    | 1.4                     | ISO 4017           | Fully threaded           |
| M1.6 | 0.35              | 3.2                       | 3.48                            | 1.1                    | 1.6                     | ISO 4014/4017      | Fully threaded           |
| M2   | 0.4               | 4.0                       | 4.32                            | 1.4                    | 2.0                     | ISO 4014/4017      | Fully threaded           |
| M2.5 | 0.45              | 5.0                       | 5.45                            | 1.7                    | 2.5                     | ISO 4014/4017      | Fully threaded           |
| M3   | 0.5               | 5.5                       | 6.01                            | 2.0                    | 3.0                     | ISO 4014/4017      | Fully threaded           |
| M4   | 0.7               | 7.0                       | 7.66                            | 2.8                    | 4.0                     | ISO 4014/4017      | Fully threaded           |
| M5   | 0.8               | 8.0                       | 8.79                            | 3.5                    | 5.0                     | ISO 4014/4017      | Fully threaded           |
| M6   | 1.0               | 10.0                      | 11.05                           | 4.0                    | 6.0                     | ISO 4014/4017      | Fully threaded           |
| M8   | 1.25              | 13.0                      | 14.38                           | 5.3                    | 8.0                     | ISO 4014/4017      | Fully threaded           |
| M10  | 1.5               | 16.0                      | 17.77                           | 6.4                    | 10.0                    | ISO 4014/4017      | Fully threaded           |
| M12  | 1.75              | 18.0                      | 20.03                           | 7.5                    | 12.0                    | ISO 4014/4017      | Partial / fully threaded |
| M14  | 2.0               | 21.0                      | 23.36                           | 8.8                    | 14.0                    | ISO 4014/4017      | Partial / fully threaded |

| Size | Pitch<br>coarse<br>(mm) | Width across<br>flats s (mm) | Width across<br>corners e min<br>(mm) | Head height<br>k nom (mm) | Nominal<br>diameter d<br>(mm) | Reference<br>standard | Notes                    |
|------|-------------------------|------------------------------|---------------------------------------|---------------------------|-------------------------------|-----------------------|--------------------------|
| M16  | 2.0                     | 24.0                         | 26.75                                 | 10.0                      | 16.0                          | ISO 4014/4017         | Partial / fully threaded |
| M18  | 2.5                     | 27.0                         | 30.14                                 | 11.5                      | 18.0                          | ISO 4014/4017         | Partial / fully threaded |
| M20  | 2.5                     | 30.0                         | 33.53                                 | 12.5                      | 20.0                          | ISO 4014/4017         | Partial / fully threaded |
| M22  | 2.5                     | 32.0                         | 35.72                                 | 14.0                      | 22.0                          | ISO 4014/4017         | Partial / fully threaded |
| M24  | 3.0                     | 36.0                         | 39.98                                 | 15.0                      | 24.0                          | ISO 4014/4017         | Partial / fully threaded |
| M27  | 3.0                     | 41.0                         | 45.2                                  | 17.0                      | 27.0                          | ISO 4014/4017         | Partial / fully threaded |
| M30  | 3.5                     | 46.0                         | 50.85                                 | 18.7                      | 30.0                          | ISO 4014/4017         | Partial / fully threaded |
| M33  | 3.5                     | 50.0                         | 55.37                                 | 21.0                      | 33.0                          | ISO 4014/4017         | Partial / fully threaded |
| M36  | 4.0                     | 55.0                         | 60.79                                 | 22.5                      | 36.0                          | ISO 4014/4017         | Partial / fully threaded |
| M39  | 4.0                     | 60.0                         | 66.44                                 | 25.0                      | 39.0                          | ISO 4014/4017         | Partial / fully threaded |
| M42  | 4.5                     | 65.0                         | 71.3                                  | 26.0                      | 42.0                          | ISO 4014/4017         | Partial / fully threaded |
| M45  | 4.5                     | 70.0                         | 76.95                                 | 28.0                      | 45.0                          | ISO 4014/4017         | Partial / fully threaded |
| M48  | 5.0                     | 75.0                         | 82.6                                  | 30.0                      | 48.0                          | ISO 4014/4017         | Partial / fully threaded |
| M52  | 5.0                     | 80.0                         | 88.25                                 | 33.0                      | 52.0                          | ISO 4014/4017         | Partial / fully threaded |
| M56  | 5.5                     | 85.0                         | 93.56                                 | 35.0                      | 56.0                          | ISO 4014              | Partial / fully threaded |

| Size | Pitch<br>coarse<br>(mm) | Width across<br>flats s (mm) | Width across<br>corners e min<br>(mm) | Head height<br>k nom (mm) | Nominal<br>diameter d<br>(mm) | Reference<br>standard | Notes                    |
|------|-------------------------|------------------------------|---------------------------------------|---------------------------|-------------------------------|-----------------------|--------------------------|
| M60  | 5.5                     | 90.0                         | 99.21                                 | 38.0                      | 60.0                          | ISO 4014              | Partial / fully threaded |
| M64  | 6.0                     | 95.0                         | 104.86                                | 40.0                      | 64.0                          | ISO 4014              | Partial / fully threaded |

## Materials & Grades

Select a material class to see the grades we supply it in. Each designation is listed with its ISO/EN, AISI/SAE, JIS and GB equivalents.

[Stainless Steel](#)
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### Stainless Steel

#### Austenitic Stainless Steel

- A1 AISI 303 · SAE 303 · SUS303 · EN 1.4305 · X8CrNiS18-9
- A2 AISI 304 · SAE 304 · SUS304 · EN 1.4301 · X5CrNi18-10 · 06Cr19Ni10
- 304L AISI 304L · SUS304L · EN 1.4307 · X2CrNi18-9 · 022Cr19Ni10
- 302 AISI 302 · SUS302 · EN 1.4310
- 305 AISI 305 · SUS305 · EN 1.4303
- A4 AISI 316 · SAE 316 · SUS316 · EN 1.4401 · X5CrNiMo17-12-2 · 06Cr17Ni12Mo2
- 316L AISI 316L · SUS316L · EN 1.4404 · X2CrNiMo17-12-2 · 022Cr17Ni12Mo2
- 321 AISI 321 · SUS321 · EN 1.4541 · X6CrNiTi18-10
- 310 / 310S AISI 310 · AISI 310S · SUS310S · EN 1.4845
- 302HQ AISI 302HQ
- A3
- A5
- 347 AISI 347 · SUS347 · EN 1.4550 · X6CrNiNb18-10
- 309 / 309S AISI 309 · AISI 309S · SUS309S

#### Martensitic Stainless Steel

- AISI 410 SUS410 · EN 1.4006 · X12Cr13 · 12Cr13
- AISI 420 SUS420J1 · SUS420J2 · EN 1.4021 · EN 1.4028 · 20Cr13 · 30Cr13

- AISI 431 SUS431 · EN 1.4057 · X17CrNi16-2
- C1
- C3
- C4
- AISI 440A
- AISI 440B
- AISI 440C SUS440C · EN 1.4125

### **Ferritic Stainless Steel**

- AISI 430 SUS430 · EN 1.4016 · X6Cr17 · 10Cr17
- F1
- AISI 434
- AISI 444

### **Precipitation-Hardening Stainless Steel**

- 17-4 PH AISI 630 · UNS S17400 · SUS630 · EN 1.4542 · X5CrNiCuNb16-4
- 15-5 PH UNS S15500
- 17-7 PH UNS S17700

### **Duplex and Super Duplex Stainless Steel**

- Duplex 2205 UNS S31803 · UNS S32205 · EN 1.4462
- Super Duplex 2507 UNS S32750 · EN 1.4410
- D2
- D4
- D6
- D8
- Lean Duplex 2101 UNS S32101
- Super Duplex S32760 UNS S32760 · EN 1.4501

### **Carbon Steel**

#### **Low-Carbon Steel**

- SAE 1006
- SAE 1008
- SAE 1010
- SAE 1018

- SAE 1020
- Q195
- Q235
- SAE 1012
- SAE 1015
- Q215
- ML08
- ML08AI
- ML10
- ML15
- ML20
- SWRCH6A
- SWRCH8A
- SWRCH10A
- SWRCH12A
- SWRCH15A
- SWRCH18A

### **Medium-Carbon Steel**

- SAE 1035
- SAE 1045
- S45C
- C45
- SAE 1030
- SAE 1040
- SAE 1050
- 30
- 35
- 40
- 45
- 50
- S35C
- S40C
- S50C
- C35
- C40



## High-Carbon Steel

- SAE 1060
- SAE 1070
- 65Mn
- SAE 1065
- SAE 1075
- SAE 1080
- SAE 1085
- SAE 1090
- SAE 1095
- 60
- 65
- 70
- 75
- 80
- 85

## Cold-Heading Steel

- SWRCH22A
- 10B21
- SWRCH22K
- SWRCH25K
- SWRCH30K
- SWRCH35K
- SWRCH40K
- ML20Mn
- ML25
- ML30
- ML35
- ML40
- 15B25

## **Alloy Steel**

### **Chromium Steel**

- 40Cr
- 45Cr
- AISI 5140
- SAE 5140
- AISI 5120
- SAE 5120
- SCr420
- SCr440

### **Chromium-Molybdenum Steel**

- 35CrMo
- 42CrMo
- AISI 4140
- SCM435
- SCM440
- 42CrMo4
- 30CrMo
- AISI 4130
- SAE 4130
- SAE 4140
- AISI 4142
- AISI 4145
- SCM415
- SCM420
- SCM445
- EN 1.7220
- EN 1.7225
- 25CrMo4
- 34CrMo4

### **Nickel-Chromium-Molybdenum Steel**

- AISI 4340

- SAE 4340
- 40CrNiMo
- SNCM439
- EN 1.6511
- 36CrNiMo4

### **Boron Alloy Steel**

- 10B22
- 10B21
- 15B21
- 15B25
- 20MnTiB
- 20Mn2B
- 35VB
- 40MnB

### **Bearing Steel**

#### **Bearing Steel**

- GCr15
- AISI 52100 SAE 52100 · UNS G52986
- SUJ2
- 100Cr6 EN 1.3505
- GCr15SiMn

### **Spring Steel**

#### **Carbon Spring Steel**

- SAE 1065
- SAE 1070
- SAE 1075
- SAE 1080
- SAE 1095
- 65
- 70
- 75

- 80
- 65Mn

### **Silicon-Manganese Spring Steel**

- 60Si2Mn
- 60Si2MnA
- SUP6
- SUP7

### **Chromium-Vanadium Spring Steel**

- 50CrVA
- SAE 6150
- AISI 6150
- SUP10

### **Stainless Spring Steel**

- AISI 301
- SUS301
- EN 1.4310
- AISI 302
- AISI 304
- AISI 316
- 17-7 PH

## **Aluminum and Aluminum Alloys**

### **Commercially Pure Aluminum**

- 1050
- 1060
- 1070
- 1100

### **2xxx Series Aluminum**

- 2024
- 2011
- 2014

- 2017

### **5xxx Series Aluminum**

- 5052
- 5083
- 5754

### **6xxx Series Aluminum**

- 6061
- 6061-T6
- 6063
- 6082
- 6082-T6

### **7xxx Series Aluminum**

- 7075
- 7075-T6
- 7005
- 7050
- 7075-T73

## **Brass**

### **Free-Cutting Brass**

- C36000
- H62
- HPb59-1
- C3601
- C3602
- C3604
- CuZn36Pb3
- CuZn39Pb3
- EN CW614N
- EN CW617N
- H65

### **Lead-Free Brass**

- C69300
- C27450
- CW510L
- CW511L

### **Naval Brass**

- C46400
- CuZn39Sn1

### **Bronze**

#### **Silicon Bronze**

- C65500
- C65100
- C65600

#### **Phosphor Bronze**

- C51000
- C52100
- CuSn6
- CuSn8

#### **Aluminum Bronze**

- C95400
- C95500
- C63000
- CuAl10Ni5Fe4

### **Copper**

#### **Copper**

- C11000
- T2
- C10100

- C10200
- C12200
- T1
- TU1
- TU2

## **Titanium and Titanium Alloys**

### **Commercially Pure Titanium**

- Grade 2
- Grade 1
- Grade 3
- Grade 4
- TA1
- TA2
- TA3

### **Alpha-Beta Titanium Alloys**

- Grade 5
- Ti-6Al-4V
- TC4
- UNS R56400

### **Low-Interstitial Grade**

- Grade 23
- Ti-6Al-4V ELI
- UNS R56407

### **Other Titanium Fastener Alloys**

- Ti-6Al-6V-2Sn
- Ti-6Al-2Sn-4Zr-2Mo
- Beta-C titanium
- Ti-10V-2Fe-3Al

## Nickel and Nickel Alloys

### Commercially Pure Nickel

- Nickel 200
- UNS N02200
- Nickel 201
- UNS N02201

### Inconel Alloys

- Inconel 625 UNS N06625
- Inconel 718 UNS N07718
- Inconel 600 UNS N06600
- Inconel 601 UNS N06601
- Inconel 686 UNS N06686
- Inconel X-750 UNS N07750

### Monel Alloys

- Monel 400 UNS N04400
- Monel K-500 UNS N05500

### Hastelloy Alloys

- Hastelloy C-276 UNS N10276
- Hastelloy C-22 UNS N06022
- Hastelloy B-2 UNS N10665
- Hastelloy B-3 UNS N10675
- Hastelloy X UNS N06002

### Other Nickel Alloys

- Alloy 20 UNS N08020
- Alloy 625
- Alloy 718
- Alloy 825 UNS N08825
- Alloy 925 UNS N09925



## Iron-Nickel and High-Temperature Alloys

### A286

- A-286
- UNS S66286
- EN 1.4980

### Invar

- Invar 36
- Alloy 36
- UNS K93600
- FeNi36

### Alloy 42

- Alloy 42
- UNS K94100
- FeNi42

## Tool Steel and Specialty Hardened Steel

### Tool Steel and Specialty Hardened Steel

- AISI D2
- AISI H13
- SKD11
- Cr12MoV
- AISI O1
- AISI A2
- AISI S7
- SKD61
- 9CrSi

## Structural and Construction Steel

### Structural and Construction Steel

- ASTM A36

- Q235B
- Q355B
- S355JR
- Q235C
- Q355C
- S235JR
- S275JR
- S355J2

Inside the plant

## Manufactured in our own plant

This part is cold-formed, threaded, heat-treated and finished in-house. The stages below are where its class and finish are actually decided.



1.

01

## Cold heading

Wire rod is drawn to size and cold-formed into blanks. Forming rather than cutting keeps the grain flow continuous around the head, which is where a bolt is most likely to fail.

Head dimensions and under-head radius checked at set-up and per shift.



2.

02

## Thread rolling

Threads are rolled between hardened dies rather than cut. Rolled threads are stronger in fatigue than cut threads and hold pitch and flank angle far more consistently across a batch.

Go / no-go ring gauges to ISO 965 tolerance class 6g.

3.



03

## Heat treatment

Quench-and-temper brings carbon and alloy steel to the property class ordered — 8.8, 10.9 or 12.9 — with the furnace charge tracked so a finished lot can be traced back to it.

Core hardness and tensile tested per lot to ISO 898-1.



4.



04

## Surface treatment

Zinc, zinc-nickel, hot-dip galvanizing, black oxide, phosphate and Dacromet, selected against the service environment rather than against the price list.

Coating thickness and neutral salt spray hours to ISO 9227.

## Frequently Asked Questions

What grip range is typical for M22 structural bolts?

Grip ranges are highly application-dependent at M22. As a guide, choose a length that gives at least 1× the thread diameter engagement in the nut plus 2-3 thread pitches projecting.

What's the difference between M22 ISO 4014 and ISO 4017?

Both specify the same head geometry. ISO 4014 is partially threaded — a plain shank for clamping with threads only near the nut; ISO 4017 is fully threaded for shorter grip-lengths or when the shear plane runs through threads.

What spanner size fits M22 Hex Bolts?

The width across flats for M22 Hex Bolts is 32.0 mm, so a 32.0 mm spanner or 6-point socket fits.

Should M22 Hex Bolts be tightened by torque or by angle?

For critical structural joints at M22, angle-controlled or stretch-controlled tightening is more repeatable than pure torque — the friction scatter at large diameters can dominate the torque signal.

How do I request a quotation?

Use the technical drawing on this page to pick the exact configuration, then submit it with the quote form. We respond within one business day.

## Related Pages

[View the full Hex Bolts page](#)

### More Hex Bolts Guides

- [M1.6 Hex Bolts](#)
- [M2 Hex Bolts](#)
- [M2.5 Hex Bolts](#)
- [M3 Hex Bolts](#)
- [M4 Hex Bolts](#)
- [M5 Hex Bolts](#)
- [M6 Hex Bolts](#)
- [M8 Hex Bolts](#)