

M12 Hex Bolts, Grade C Dimensions

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Fasteners Bolts Hex Bolts, Grade C M12 Hex Bolts, Grade C Dimensions

Bolts - ISO 4016

Controlling dimensions to ISO 4016, with clearance hole and tapping drill - spanner or drive size and tightening torque.

M12 Hex Bolts, Grade C dimensions to ISO 4016: width across flats (spanner size) 19 mm, head height 7.68 mm, coarse thread pitch 1.75 mm, clearance hole (ISO 273 medium) 13.5 mm. Tighten to approximately 85 Nm at property class 8.8 in a dry, as-supplied condition.

Width across flats (spanner size)

19 mm

Head height

7.68 mm

Coarse thread pitch

1.75 mm

Clearance hole (ISO 273 medium)

13.5 mm

Tightening torque (class 8.8)

85 Nm

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



This page covers M12 Hex Bolts, Grade C to ISO 4016: the full dimensional row, hole and tool sizes, proof-load data and typical applications. All values are taken from the governing standards (ISO 4016 together with ISO 273, ISO 724 and ISO 898-1 where applicable).

M12 Dimensional Row (ISO 4016)

Size	Pitch (mm)	Width across flats s (mm)	Width across corners e min (mm)	Head height k (mm)	Product grade	Reference standard
M12	1.75	19.0	20.88	7.68	Grade C	ISO 4016 / DIN 601

Spanner & Drive for M12 Hex Bolts, Grade C

M12 Hex Bolts, Grade C have a width across flats of 19.0 mm — fit a 19.0 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.

Hole Sizes for M12

Coarse-thread pitch (ISO 724)	1.75 mm
Through-hole / clearance (ISO 273 medium)	13.5 mm
Tapping drill, coarse thread	10.2 mm

Tightening Torque for M12

Class 8.8 (dry, $\sim\mu$ 0.125)	$\approx$ 85 Nm
Class 10.9 (dry, $\sim\mu$ 0.125)	$\approx$ 120 Nm
Class 12.9 (dry, $\sim\mu$ 0.125)	$\approx$ 145 Nm

Indicative dry-joint values. Lubrication can lower the required torque by 15–25%. Always confirm against the joint design, especially when going up a strength class.

Proof Load & Strength for M12

Tensile stress area A_s (ISO 898-1)	84.3 mm ²
Proof load, class 8.8	49 kN
Proof load, class 10.9	70 kN
Proof load, class 12.9	82 kN
Min. ultimate tensile, class 8.8	67 kN

Proof load = stress area $\times$ proof stress per ISO 898-1. Design joints so the working preload stays below the proof load of the selected class.

Common Applications for M12 Hex Bolts, Grade C

M12 Hex Bolts, Grade C are commonly specified for medium-duty structural connections, automotive sub-frames and equipment chassis.

Installation Tips for M12 Hex Bolts, Grade C

- 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.

Mating Parts for M12

For M12, pair with a M12 hex nut (ISO 4032 / DIN 934) and, where used, a M12 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 4016)

Size	Pitch (mm)	Width across flats s (mm)	Width across corners e min (mm)	Head height k (mm)	Product grade	Reference standard
M5	0.8	8.0	8.63	3.35	Grade C	ISO 4016 / DIN 601
M6	1.0	10.0	10.89	4.15	Grade C	ISO 4016 / DIN 601
M8	1.25	13.0	14.2	5.45	Grade C	ISO 4016 / DIN 601
M10	1.5	17.0	18.72	6.58	Grade C	ISO 4016 / DIN 601
M12	1.75	19.0	20.88	7.68	Grade C	ISO 4016 / DIN 601
M14	2.0	22.0	24.49	9.25	Grade C	ISO 4016 / DIN 601
M16	2.0	24.0	26.75	10.18	Grade C	ISO 4016 / DIN 601
M18	2.5	27.0	29.56	11.72	Grade C	ISO 4016 / DIN 601
M20	2.5	30.0	33.53	12.72	Grade C	ISO 4016 / DIN 601
M22	2.5	32.0	35.72	14.5	Grade C	ISO 4016 / DIN 601
M24	3.0	36.0	39.55	15.35	Grade C	ISO 4016 / DIN 601
M27	3.0	41.0	45.2	17.92	Grade C	ISO 4016 / DIN 601
M30	3.5	46.0	50.85	19.75	Grade C	ISO 4016 / DIN 601
M36	4.0	55.0	60.79	23.35	Grade C	ISO 4016 / DIN 601

Size	Pitch (mm)	Width across flats s (mm)	Width across corners e min (mm)	Head height k (mm)	Product grade	Reference standard
M42	4.5	65.0	71.3	27.05	Grade C	ISO 4016 / DIN 601
M48	5.0	75.0	82.6	31.07	Grade C	ISO 4016 / DIN 601

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.

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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
- ML08Al
- 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

Video: M12 Hex Bolts, Grade C Dimensions

Gauge (#)	Dec	Thread (UNC)
0		UNF only
1		1-64
2		2-56
3		3-48
4		4-40
5		5-40
6		6-32
8		8-32
10		10-24

Gauge (#)	Decimal Inches	Millimeters	Common Thread (UNC)
0	0.060	1.52mm	0-80 UNF only
1	0.073	1.85mm	1-64
2	0.086	2.18mm	2-56
3	0.099	2.51mm	3-48
4	0.112	2.83mm	4-40
5	0.125	3.18mm	5-40
6	0.138	3.51mm	6-32
8	0.164	4.17mm	8-32
10	0.190	4.83mm	10-24
12	0.216	5.49mm	12-24

► Watch video: https://www.youtube.com/watch?v=E_KbZxHRi8

Third-party video, selected automatically for this topic. It is not produced by Engineering Hardware and is not a specification source — use the tables on this page for dimensional data.

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 spanner size fits M12 Hex Bolts, Grade C?

The width across flats for M12 Hex Bolts, Grade C is 19.0 mm, so a 19.0 mm spanner or 6-point socket fits.

What is the coarse-thread pitch of M12 for Hex Bolts, Grade C?

For M12 the standard coarse pitch is 1.75 mm — this is the value used for Hex Bolts, Grade C.

What torque do M12 class 8.8 Hex Bolts, Grade C take?

A dry M12 class 8.8 joint takes about 85 Nm ($\approx$ 120 Nm for 10.9, $\approx$ 145 Nm for 12.9). Confirm against your joint design; lubrication reduces these values.

What clearance and tapping drill suit M12?

Use a 13.5 mm clearance hole (ISO 273 medium) for through-fixing, or a 10.2 mm tapping drill for a coarse M12 thread.

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, Grade C page](#)

More Hex Bolts, Grade C Guides

- [M5 Hex Bolts, Grade C](#)
- [M6 Hex Bolts, Grade C](#)
- [M8 Hex Bolts, Grade C](#)
- [M10 Hex Bolts, Grade C](#)
- [M14 Hex Bolts, Grade C](#)
- [M16 Hex Bolts, Grade C](#)
- [M18 Hex Bolts, Grade C](#)
- [M20 Hex Bolts, Grade C](#)