

What Are Hex Bolts, Grade C Used For?

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Typical applications, the industries that specify hex bolts, grade c, and how to choose the right size, material and finish for the joint.

Hex Bolts, Grade C are used for structural and machine joints that must be tightened to a controlled preload. They are manufactured to ISO 4016, and the choice of size, property class and finish is driven by the load in the joint and the environment it sits in.

Primary duty

Structural and machine joints that must be tightened to a controlled preload

Governing standard

ISO 4016

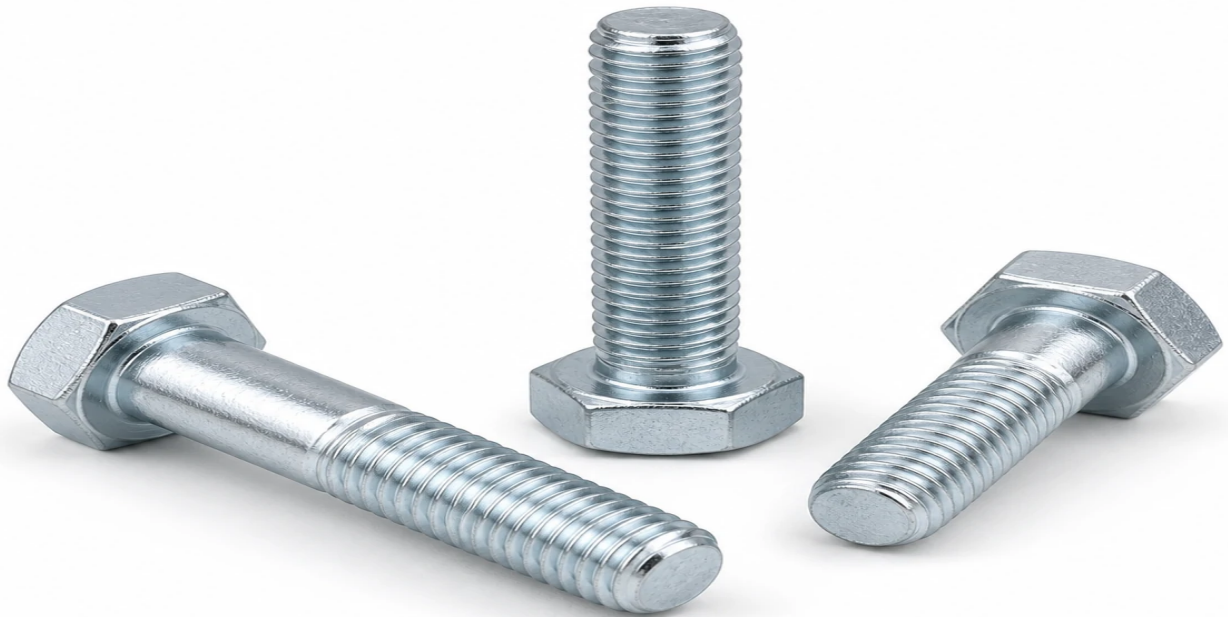
Thread size range

M5 to M48

Category

Bolts

Application notes are general engineering guidance. Verify the property class and any approval requirement against your own design calculation.



Hex Bolts, Grade C are used primarily for structural and machine joints that must be tightened to a controlled preload. This page lists the industries and assemblies where they are specified, the selection criteria that matter for each application, installation practice, and the cases where a different fastener type is the correct choice. Parts are supplied to ISO 4016. Stocked across roughly M5 to M48, they cover general to heavy-duty work.

Typical Applications for Hex Bolts, Grade C

The most common settings where these are specified:

- **Maintenance & repair (MRO):** a stocked size for servicing existing plant where the original fastener spec must be matched.
- **Fabrication & metalwork:** bench and on-site assembly of steel frames, enclosures and weldments.
- **Structural steel:** bolting beams, base plates and bracing where a defined preload and property class are required.
- **Automotive & transport:** chassis, suspension and powertrain mounting points subject to vibration.
- **Heavy machinery:** securing gearboxes, frames and guarding on plant that sees shock loads.

How to Specify Hex Bolts, Grade C for Your Application

- **Size:** Match the nominal size to the mating thread or hole. This product spans M5–M48; check the full table below for the exact dimensions of each size.

- **Strength class:** Choose the property class (e.g. 8.8, 10.9, 12.9 or A2/A4 stainless) for the load and environment, and tighten to the matching torque so the joint relies on preload, not friction.
- **Environment:** For damp, coastal or chemical exposure prefer A4/316 stainless or a suitable coating; indoors, plated steel or A2 is usually sufficient.
- **Standard:** This product is supplied to ISO 4016. Quoting the standard on your order guarantees interchangeable dimensions between suppliers.

Installation & Assembly Practice

- Tighten to the torque for the size and property class with a calibrated wrench — the joint is held by preload, not by the thread friction alone.
- Ensure at least one full thread projects beyond the nut after tightening, and never re-use a bolt that has been tightened into yield.
- Under slotted or oversized holes, fit a hardened washer so the preload does not relax into the hole edge.

Common Selection Mistakes with Hex Bolts, Grade C

- Specifying class 12.9 "to be safe" in a corrosive environment — high classes are more sensitive to hydrogen embrittlement and stress corrosion; 8.8 hot-dip galvanized often outlasts them outdoors.
- Choosing a length that puts the shear plane through the threaded portion when a plain shank (partially threaded bolt) was available.
- Mixing stainless bolts with plated-steel nuts: the joint loses its corrosion logic and can gall or seize.

Where Hex Bolts, Grade C Are Not the Right Choice

Not for permanent joints that will never be opened (a rivet or weld is cheaper), and not where the head must sit flush — use a countersunk screw instead.

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

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.



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

How tight should Hex Bolts, Grade C be torqued?

Tighten to the torque for the size and property class so the joint is held by bolt preload. The size pages and torque reference table give recommended values; use a calibrated torque wrench for anything structural.

What material should Hex Bolts, Grade C be for outdoor use?

For damp, coastal or chemical environments specify A4 (316) stainless or a suitably coated steel. For indoor or dry use, A2 (304) stainless or zinc-plated steel is normally adequate.

Are Hex Bolts, Grade C made to a recognized standard?

Yes — they are manufactured to ISO 4016, so dimensions are interchangeable between suppliers when you quote the standard on your order.

What are Hex Bolts, Grade C used for?

Structural and machine joints that must be tightened to a controlled preload. They are supplied to ISO 4016.

Can I get a quote for Hex Bolts, Grade C in the size and material I need?

Yes. Use the technical drawing and quote form on this page to set the size and options, then send the exact configuration to our team for pricing and lead time.

Related Pages

Product page: [Hex Bolts, Grade C — specifications & sizes](#)

Hex Bolts, Grade C Specification Guides

- [M5 Hex Bolts, Grade C size guide](#)
- [A4 stainless Hex Bolts, Grade C](#)

Related Fastener Applications

- [Carriage Bolts applications](#)
- [Clamping Handle Screw \(Long\) — DIN 6336 / GN 313 \(Series 044\) applications](#)
- [Clamping Handle Screw \(Medium\) — DIN 6336 / GN 313 \(Series 043\) applications](#)
- [Clamping Handle Screw \(Short\) — DIN 6336 / GN 313 \(Series 042\) applications](#)
- [Equal-End Stud Bolt — GB/T 901 / DIN 939 \(Series 093\) applications](#)
- [Eye Bolts applications](#)