

What Are Carriage Bolts Used For?

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

Carriage Bolts are used for clamping round or irregular sections to a structure where a conventional headed bolt has nothing to bear against. They are manufactured to DIN 603, 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

Clamping round or irregular sections to a structure where a conventional headed bolt has nothing to bear against

Governing standard

DIN 603

Thread size range

M5 to M20

Category

Bolts

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



Carriage Bolts are used primarily for clamping round or irregular sections to a structure where a conventional headed bolt has nothing to bear against. 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 DIN 603. Stocked across roughly M5 to M20, they cover general to heavy-duty work.

Typical Applications for Carriage Bolts

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 Carriage Bolts for Your Application

- **Size:** Match the nominal size to the mating thread or hole. This product spans M5–M20; 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 DIN 603. 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 Carriage Bolts

- 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 Carriage Bolts 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 (DIN 603)

Size	Pitch (mm)	Head diameter dk (mm)	Head height k (mm)	Square neck width (mm)	Square neck depth (mm)	Common length range (mm)	Reference standard
M5	0.8	13.0	3.0	5.0	2.5	16~80	DIN 603 / ISO 8677
M6	1.0	16.0	3.5	6.0	3.0	16~120	DIN 603 / ISO 8677
M8	1.25	20.0	4.5	8.0	4.0	20~160	DIN 603 / ISO 8677
M10	1.5	25.0	5.5	10.0	5.0	25~200	DIN 603 / ISO 8677
M12	1.75	30.0	7.0	12.0	6.0	30~240	DIN 603 / ISO 8677
M14	2.0	35.0	8.0	14.0	7.0	40~260	DIN 603 / ISO 8677
M16	2.0	40.0	9.0	16.0	8.0	40~300	DIN 603 / ISO 8677
M20	2.5	50.0	11.0	20.0	10.0	50~300	DIN 603 / ISO 8677

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 are Carriage Bolts used for?

Clamping round or irregular sections to a structure where a conventional headed bolt has nothing to bear against. They are supplied to DIN 603.

Which industries use Carriage Bolts?

They are commonly specified in structural steel, automotive & transport and heavy machinery, among other sectors.

How do I choose the right size of Carriage Bolts?

Match the nominal size to the mating thread or hole. This product is available from M5 to M20; the full dimension table on this page lists each size.

How tight should Carriage Bolts 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.

Can I get a quote for Carriage Bolts 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: [Carriage Bolts — specifications & sizes](#)

Carriage Bolts Specification Guides

- [M5 Carriage Bolts size guide](#)
- [A4 stainless Carriage Bolts](#)

Related Fastener 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](#)
- [Hex Bolt — GB/T 5782 / ISO 4014 \(Series 006\) applications](#)