

What Are Shoulder Bolts Used For?

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

Shoulder Bolts are used for structural and machine joints that must be tightened to a controlled preload. They are manufactured to ISO 7379, 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 7379

Nominal diameter range

4 mm to 30 mm

Category

Bolts

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



Shoulder Bolts (ISO 7379) are specified where the joint requires structural and machine joints that must be tightened to a controlled preload. The sections below cover the typical end-uses by industry, the size and material decisions for each, assembly practice, and the applications this fastener type is not suited to. Stocked across roughly 4 mm to 30 mm, they cover general to heavy-duty work.

Typical Applications for Shoulder Bolts

The most common settings where these are specified:

- **Automotive & transport:** chassis, suspension and powertrain mounting points subject to vibration.
- **Heavy machinery:** securing gearboxes, frames and guarding on plant that sees shock loads.
- **Energy & infrastructure:** tower, pylon and pipework supports exposed to weather and long service life.
- **General machine building:** fastening covers, brackets, motors and sub-assemblies on production equipment.
- **Maintenance & repair (MRO):** a stocked size for servicing existing plant where the original fastener spec must be matched.

How to Specify Shoulder Bolts for Your Application

- **Size:** Match the nominal size to the mating thread or hole. This product spans 4 mm–30 mm; 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 7379. 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 Shoulder 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 Shoulder 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 (ISO 7379)

Shoulder diameter (mm)	Thread size	Pitch (mm)	Shoulder length range (mm)	Head diameter dk (mm)	Head height k (mm)	Reference standard
4.0	M3	0.5	8~50	8.0	4.3	ISO 7379 / DIN 9841
5.0	M4	0.7	8~63	9.5	5.3	ISO 7379 / DIN 9841
6.0	M5	0.8	10~63	11.0	6.5	ISO 7379 / DIN 9841
8.0	M6	1.0	10~80	13.0	8.0	ISO 7379 / DIN 9841
10.0	M8	1.25	12~100	16.0	10.0	ISO 7379 / DIN 9841
12.0	M10	1.5	16~100	18.0	12.0	ISO 7379 / DIN 9841
16.0	M12	1.75	20~125	24.0	16.0	ISO 7379 / DIN 9841
20.0	M16	2.0	25~160	30.0	20.0	ISO 7379 / DIN 9841
25.0	M20	2.5	32~200	36.0	25.0	ISO 7379 / DIN 9841
30.0	M24	3.0	40~200	45.0	30.0	ISO 7379 / DIN 9841

Video: What Are Shoulder Bolts Used For? in use



► Watch video: <https://www.youtube.com/watch?v=o18gs0ZCWQA>

Shoulder Screw vs. Carriage Bolt

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

Are Shoulder Bolts made to a recognized standard?

Yes — they are manufactured to ISO 7379, so dimensions are interchangeable between suppliers when you quote the standard on your order.

What are Shoulder Bolts used for?

Structural and machine joints that must be tightened to a controlled preload. They are supplied to ISO 7379.

Which industries use Shoulder Bolts?

They are commonly specified in general machine building, maintenance & repair (mro) and fabrication & metalwork, among other sectors.

How do I choose the right size of Shoulder Bolts?

Match the nominal size to the mating thread or hole. This product is available from 4 mm to 30 mm; the full dimension table on this page lists each size.

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

Shoulder Bolts Specification Guides

- [A4 stainless Shoulder Bolts](#)

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](#)