

What Are Insulating Shoulder Washers Used For?

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

Insulating Shoulder Washers are used for load distribution and anti-loosening under a bolt or nut. They are manufactured to Industry standard, and selection is driven by the nominal bolt size, the fit and tolerance the assembly requires, and the service environment.

Primary duty

Load distribution and anti-loosening under a bolt or nut

Governing standard

Industry standard

Nominal bolt size range

M2.5 to M6

Category

Washers

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



Insulating Shoulder Washers are selected when an assembly calls for load distribution and anti-loosening under a bolt or nut. This application guide to the Industry standard type covers concrete end-uses, the specification checklist, correct installation, and where an alternative fastener performs better. Stocked across roughly M2.5 to M6, they cover light-duty and instrument-scale work.

Typical Applications for Insulating Shoulder Washers

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.
- **Bolted structural joints:** spreading load over soft or oversized holes and protecting the surface.
- **Vibration applications:** spring and serrated types that maintain tension under cyclic load.
- **Timber & soft materials:** large-OD types that prevent pull-through.

How to Specify Insulating Shoulder Washers for Your Application

- **Size:** Match the nominal size to the mating thread or hole. This product spans M2.5–M6; check the full table below for the exact dimensions of each size.
- **Type & OD:** Select flat for load spreading, spring/serrated for anti-loosening, or fender/large-OD for soft or oversized holes.

- **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 Industry standard. Quoting the standard on your order guarantees interchangeable dimensions between suppliers.

Installation & Assembly Practice

- Place the washer under the rotating element (usually the nut) so tightening does not score the surface.
- Chamfered-hole side of a hardened washer faces the bolt head fillet.
- On serrated-flange hardware, do not add a plain washer — it defeats the serrations.

Common Selection Mistakes with Insulating Shoulder Washers

- Relying on a spring washer for locking on class 8.8+ joints — at high preload it flattens and adds nothing.
- Choosing an OD too small for soft material, so the head pulls through or embeds.

Where Insulating Shoulder Washers Are Not the Right Choice

A washer does not replace a locking feature on its own in severe vibration, and a spring washer adds little clamp on high-strength joints.

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 (Industry standard)

Screw size	Bore d1 (mm)	Shoulder outer diameter (mm)	Flange outer diameter d2 (mm)	Shoulder length (mm)	Flange thickness (mm)	Material	Reference standard
M2.5	2.7	3.6	6.0	1.5	0.8	Nylon 6/6	Industry standard
M3	3.2	4.2	7.0	1.5	0.8	Nylon 6/6	Industry standard
M3	3.2	4.2	7.0	3.0	0.8	Nylon 6/6	Industry standard
M4	4.3	5.4	9.0	2.0	1.0	Nylon 6/6	Industry standard
M4	4.3	5.4	9.0	3.5	1.0	Nylon 6/6	Industry standard
M5	5.3	6.6	11.0	2.5	1.0	Nylon 6/6	Industry standard
M6	6.4	7.8	13.0	3.0	1.2	Nylon 6/6	Industry standard

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

Which industries use Insulating Shoulder Washers?

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

How do I choose the right size of Insulating Shoulder Washers?

Match the nominal size to the mating thread or hole. This product is available from M2.5 to M6; the full dimension table on this page lists each size.

Do Insulating Shoulder Washers actually stop bolts loosening?

Spring and serrated washers help maintain tension under light vibration, but for critical joints a prevailing-torque locking nut or adhesive is more reliable. Flat washers mainly spread load and protect the surface.

What material should Insulating Shoulder Washers 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.

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

Insulating Shoulder Washers Specification Guides

- [M2.5 Insulating Shoulder Washers size guide](#)
- [A4 stainless Insulating Shoulder Washers](#)

Related Fastener Applications

- [Bearing Lock Washers \(MB Series\) applications](#)
- [Bonded Sealing Washers applications](#)
- [Conical Spring Washers \(HV\) applications](#)
- [Cup Washers applications](#)
- [Disc Springs \(Belleville Washers\) applications](#)
- [EPDM Sealing Washers applications](#)