What Are Conical Spring Washers (HV) Used For?

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Fasteners/Washers/Conical Spring Washers (HV)/Applications

Washers · DIN 6796 · Application guide

Typical applications, the industries that specify conical spring washers (hv), and how to choose the right size, material and finish for the joint.

Conical Spring Washers (HV) are used for maintaining bolt load in a joint that settles or relaxes, and compensating for small amounts of embedment. They are manufactured to DIN 6796, and selection is driven by the nominal bolt size, the fit and tolerance the assembly requires, and the service environment.

Primary duty
: Maintaining bolt load in a joint that settles or relaxes, and compensating for small amounts of embedment

Governing standard
: DIN 6796

Nominal bolt size range
: M2 to M30

Category
: Washers

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

Application guide for Conical Spring Washers (HV) to DIN 6796. The core duty of the type is maintaining bolt load in a joint that settles or relaxes, and compensating for small amounts of embedment. The typical industries, the how-to-specify checklist, assembly practice and the exclusion cases are set out below. Stocked across roughly M2 to M30, they cover general to heavy-duty work.

Typical Applications for Conical Spring Washers (HV)

The most common settings where these are specified:

- **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.
- **General machine building:** fastening covers, brackets, motors and sub-assemblies on production equipment.

How to Specify Conical Spring Washers (HV) for Your Application

- **Size:** Match the nominal size to the mating thread or hole. This product spans M2–M30; 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 DIN 6796. 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 Conical Spring Washers (HV)

- 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 Conical Spring Washers (HV) 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 (DIN 6796)

Size	Inner diameter d1 (mm)	Outer diameter d2 (mm)	Thickness s (mm)	Height h max (mm)	Height h min (mm)	Reference standard
M2	2.2	5	0.4	0.6	0.5	DIN 6796
M2.5	2.7	6	0.5	0.72	0.61	DIN 6796
M3	3.2	7	0.6	0.85	0.72	DIN 6796
M3.5	3.7	8	0.8	1.06	0.92	DIN 6796
M4	4.3	9	1	1.3	1.12	DIN 6796
M5	5.3	11	1.2	1.55	1.35	DIN 6796
M6	6.4	14	1.5	2	1.7	DIN 6796
M7	7.4	17	1.75	2.3	2	DIN 6796
M8	8.4	18	2	2.6	2.4	DIN 6796
M10	10.5	23	2.5	3.2	2.8	DIN 6796
M12	13	29	3	3.95	3.43	DIN 6796
M14	15	35	3.5	4.65	4.04	DIN 6796
M16	17	39	4	5.25	4.58	DIN 6796
M18	19	42	4.5	5.6	5.08	DIN 6796
M20	21	45	5	6.4	5.6	DIN 6796
M22	23	49	5.5	7.05	6.15	DIN 6796
M24	25	56	6	7.75	6.77	DIN 6796
M27	28	60	6.5	8.35	7.3	DIN 6796
M30	31	70	7	9.2	8	DIN 6796

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

How do I choose the right size of Conical Spring Washers (HV)?
Match the nominal size to the mating thread or hole. This product is available from M2 to M30; the full dimension table on this page lists each size.

Do Conical Spring Washers (HV) 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 Conical Spring Washers (HV) 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 Conical Spring Washers (HV) made to a recognized standard?

Yes — they are manufactured to DIN 6796, so dimensions are interchangeable between suppliers when you quote the standard on your order.

Can I get a quote for Conical Spring Washers (HV) 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: Conical Spring Washers (HV) — specifications & sizes

Conical Spring Washers (HV) Specification Guides

- M2 Conical Spring Washers (HV) size guide
- A4 stainless Conical Spring Washers (HV)

Related Fastener Applications

- Bearing Lock Washers (MB Series) applications
- Bonded Sealing Washers applications
- Cup Washers applications
- Disc Springs (Belleville Washers) applications
- EPDM Sealing Washers applications
- External Tooth Lock Washers applications