

What Are Retaining Rings (Circlips) Used For?

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Fasteners Retaining Rings Retaining Rings (Circlips) Applications

Retaining Rings · DIN 471 / DIN 472 · Application guide

Typical applications, the industries that specify retaining rings (circlips), and how to choose the right size, material and finish for the joint.

Retaining Rings (Circlips) are used for axial retention of components on shafts and in bores. They are manufactured to DIN 471 / DIN 472, and selection is driven by the shaft / bore diameter, the fit and tolerance the assembly requires, and the service environment.

Primary duty

Axial retention of components on shafts and in bores

Governing standard

DIN 471 / DIN 472

Shaft / bore diameter range

3 mm to 100 mm

Category

Retaining Rings

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



The primary duty of Retaining Rings (Circlips) is axial retention of components on shafts and in bores. Below: the sectors that specify them in volume, the checklist used to select the right size and material for the application, installation notes, and the known limits of the type. Stocked across roughly 3 mm to 100 mm, they cover general to heavy-duty work.

Typical Applications for Retaining Rings (Circlips)

The most common settings where these are specified:

- **Shafts & gearboxes:** retaining bearings, gears and pulleys against axial movement.
- **Hydraulic & pneumatic:** holding pistons and seals in bores.
- **Automotive driveline:** axial location on rotating shafts.
- **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 Retaining Rings (Circlips) for Your Application

- **Size:** Select on nominal diameter, then on the hole tolerance and fit class — the fit, not the diameter alone, determines whether the part locates or slips. This product spans 3 mm–100 mm; check the full table below for the exact dimensions of each size.
- **Groove fit:** Specify to the shaft or bore groove diameter; the ring must seat fully in the groove to carry the thrust load.

- **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 471 / DIN 472. Quoting the standard on your order guarantees interchangeable dimensions between suppliers.

Installation & Assembly Practice

- Use the correct circlip pliers for the ring size; over-spreading a ring permanently reduces its retention.
- Check the ring is fully seated in the groove around its whole circumference before loading the assembly.

Common Selection Mistakes with Retaining Rings (Circlips)

- Machining the groove to the shaft tolerance instead of the groove dimensions in the ring standard.
- Loading a standard ring axially beyond the groove rating instead of moving to a heavy-duty section ring.

Where Retaining Rings (Circlips) Are Not the Right Choice

Not for heavy axial thrust beyond the groove rating, and not where the groove cannot be machined to spec.

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 471 / DIN 472)

Nominal diameter (mm)	Ring diameter d1 (mm)	Groove diameter d2 (mm)	Thickness s (mm)	Groove depth ref (mm)	Type / standard
3	2.7	2.5	0.4	3.5	DIN 471 external
4	3.7	3.4	0.4	4.5	DIN 471 external
5	4.7	4.4	0.6	5.5	DIN 471 external
6	5.6	5.3	0.7	6.5	DIN 471 external
7	6.5	6.2	0.8	7.5	DIN 471 external
8	7.4	7.1	0.8	8.5	DIN 471 external
9	8.4	8.1	1.0	9.5	DIN 471 external
10	9.3	9.0	1.0	10.5	DIN 471 external
11	10.2	9.9	1.0	11.5	DIN 471 external
12	11.1	10.8	1.0	12.5	DIN 471 external
14	13.0	12.7	1.0	14.5	DIN 471 external
15	14.0	13.7	1.0	15.5	DIN 471 external
16	15.0	14.7	1.0	16.5	DIN 471 external
17	16.0	15.7	1.0	17.5	DIN 471 external

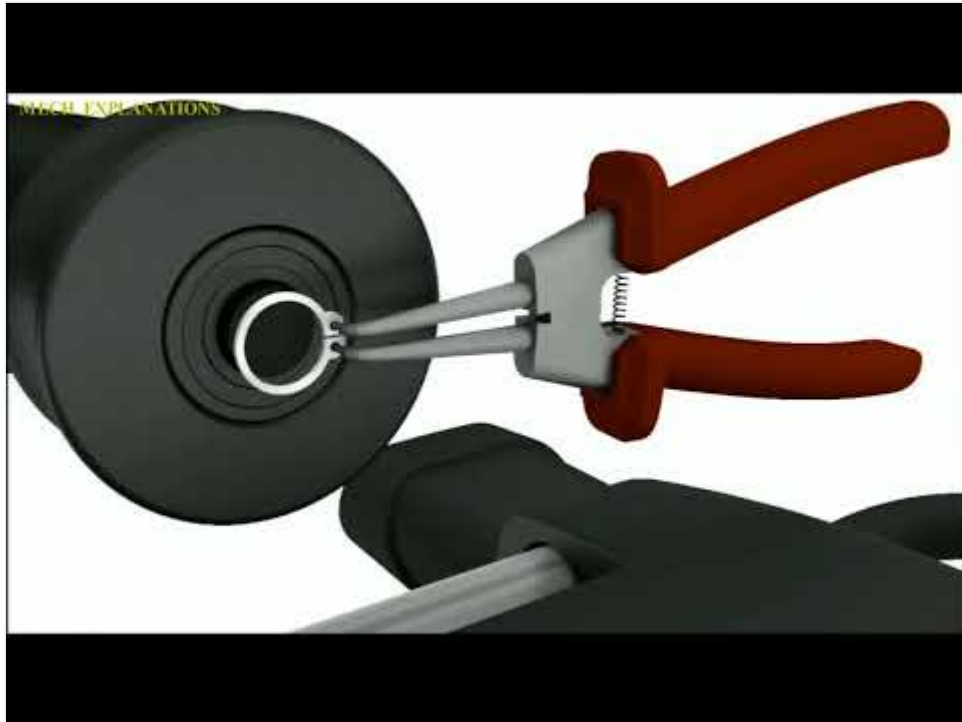
Nominal diameter (mm)	Ring diameter d1 (mm)	Groove diameter d2 (mm)	Thickness s (mm)	Groove depth ref (mm)	Type / standard
18	17.0	16.7	1.2	18.5	DIN 471 external
19	18.0	17.7	1.2	19.5	DIN 471 external
20	19.0	18.7	1.2	20.5	DIN 471 external
22	21.0	20.7	1.2	22.5	DIN 471 external
24	22.9	22.6	1.2	24.5	DIN 471 external
25	23.9	23.6	1.2	25.5	DIN 471 external
28	26.9	26.6	1.5	29.0	DIN 471 external
30	28.9	28.6	1.5	31.0	DIN 471 external
32	30.9	30.6	1.5	33.0	DIN 471 external
35	33.8	33.5	1.5	36.0	DIN 471 external
40	38.5	38.2	1.75	41.0	DIN 471 external
45	43.5	43.2	1.75	46.0	DIN 471 external
50	48.5	48.2	2.0	51.0	DIN 471 external
55	53.3	53.0	2.0	56.5	DIN 471 external
60	58.3	58.0	2.0	61.5	DIN 471 external
65	63.3	63.0	2.5	67.0	DIN 471 external

Nominal diameter (mm)	Ring diameter d1 (mm)	Groove diameter d2 (mm)	Thickness s (mm)	Groove depth ref (mm)	Type / standard
70	68.3	68.0	2.5	72.0	DIN 471 external
75	73.3	73.0	2.5	77.0	DIN 471 external
80	78.0	77.7	2.5	82.0	DIN 471 external
85	83.0	82.7	3.0	87.0	DIN 471 external
90	88.0	87.7	3.0	92.0	DIN 471 external
95	93.0	92.7	3.0	97.0	DIN 471 external
100	98.0	97.7	3.0	102.0	DIN 471 external
8	8.4	8.7	0.8	7.5	DIN 472 internal
9	9.4	9.7	1.0	8.5	DIN 472 internal
10	10.4	10.7	1.0	9.5	DIN 472 internal
11	11.4	11.7	1.0	10.4	DIN 472 internal
12	12.5	12.8	1.0	11.4	DIN 472 internal
13	13.5	13.8	1.0	12.4	DIN 472 internal
14	14.5	14.8	1.0	13.4	DIN 472 internal
15	15.5	15.8	1.0	14.3	DIN 472 internal
16	16.5	16.8	1.0	15.3	DIN 472 internal

Nominal diameter (mm)	Ring diameter d1 (mm)	Groove diameter d2 (mm)	Thickness s (mm)	Groove depth ref (mm)	Type / standard
17	17.5	17.8	1.0	16.3	DIN 472 internal
18	18.5	18.8	1.2	17.2	DIN 472 internal
19	19.5	19.8	1.2	18.2	DIN 472 internal
20	20.5	20.8	1.2	19.2	DIN 472 internal
22	22.5	22.9	1.2	21.2	DIN 472 internal
24	24.5	24.9	1.2	23.2	DIN 472 internal
25	25.5	25.9	1.2	24.2	DIN 472 internal
28	28.6	29.0	1.5	27.0	DIN 472 internal
30	30.6	31.0	1.5	29.0	DIN 472 internal
32	32.6	33.0	1.5	31.0	DIN 472 internal
35	35.7	36.1	1.5	34.0	DIN 472 internal
40	40.8	41.3	1.75	39.0	DIN 472 internal
45	45.8	46.3	1.75	44.0	DIN 472 internal
50	51.0	51.5	2.0	49.0	DIN 472 internal
55	56.0	56.5	2.0	54.0	DIN 472 internal
60	61.0	61.5	2.0	59.0	DIN 472 internal

Nominal diameter (mm)	Ring diameter d1 (mm)	Groove diameter d2 (mm)	Thickness s (mm)	Groove depth ref (mm)	Type / standard
65	66.2	66.8	2.5	64.0	DIN 472 internal
70	71.2	71.8	2.5	69.0	DIN 472 internal
75	76.2	76.8	2.5	74.0	DIN 472 internal
80	81.2	81.8	2.5	79.0	DIN 472 internal
85	86.5	87.1	3.0	84.0	DIN 472 internal
90	91.5	92.1	3.0	89.0	DIN 472 internal
95	96.5	97.1	3.0	94.0	DIN 472 internal
100	101.5	102.1	3.0	99.0	DIN 472 internal

Video: What Are Retaining Rings (Circlips) Used For? in use



► Watch video: <https://www.youtube.com/watch?v=OL5zXXIN6Uk>

Retaining Ring ✓

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

How much axial load can Retaining Rings (Circlips) hold?

Retention depends on the groove dimensions and ring thickness. Stay within the rated thrust load and make sure the groove is machined to the specified diameter and width.

What material should Retaining Rings (Circlips) 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 Retaining Rings (Circlips) made to a recognized standard?

Yes — they are manufactured to DIN 471 / DIN 472, so dimensions are interchangeable between suppliers when you quote the standard on your order.

What are Retaining Rings (Circlips) used for?

Axial retention of components on shafts and in bores. They are supplied to DIN 471 / DIN 472.

Can I get a quote for Retaining Rings (Circlips) 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: [Retaining Rings \(Circlips\) — specifications & sizes](#)

Retaining Rings (Circlips) Specification Guides

- [A4 stainless Retaining Rings \(Circlips\)](#)

Related Fastener Applications

- [E-Clips \(External Snap Rings\) applications](#)
- [Retaining Ring \(Circlip\) — ISO / DIN \(Series 147\) applications](#)
- [Retaining Ring \(Circlip\) — ISO / DIN \(Series 148\) applications](#)
- [Retaining Ring \(Circlip\) — ISO / DIN \(Series 149\) applications](#)
- [Retaining Ring \(Circlip\) — ISO / DIN \(Series 151\) applications](#)