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Circlip

A locking ring, grooved ring or, according to Seeger-Orbis, one of the manufacturers, known as a Seeger ring^{[1][2][3][4]}, is a machine element (standard part) for securing the axial position of bolts in bores or of components, such as rolling bearings, on a shaft or axis.

Circlips require a groove for positioning. This is pierced into a shaft from the outside on the lathe. The groove is also inserted or milled into a hole from the inside.

An external locking ring according to DIN 471 has outward-pointing ends and is used for mounting in the outer groove of a shaft.

An internal locking ring according to DIN 472 has inward-pointing ends and is inserted into the inside of a hole.

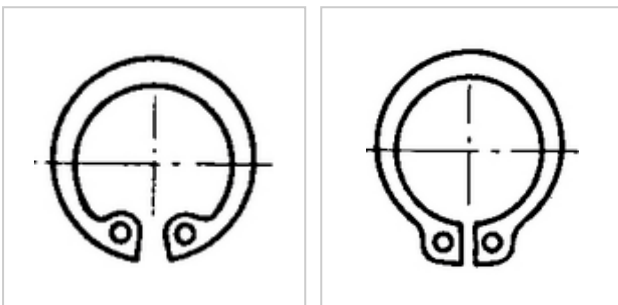
The flat rings are punched from sheet metal, ground and have two holes for assembly and disassembly with special circlip pliers. As an alternative to perforation, the end pieces can also be semicircular in shape to accommodate the tips of the circlip pliers.



Machine part with four external locking rings. The brass-colored, clip-on locking washers are often referred to in the trade as E-rings. The large circlip ("Seeger ring") can be opened with circlip pliers.

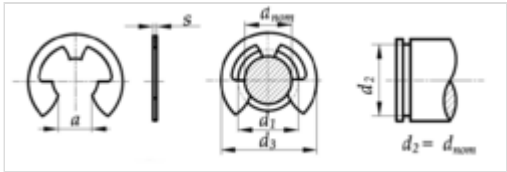


Circlip pliers with pointed ends for installing internal circlips



Inner circlip outer circlip

Snap rings are similar in function to the Seeger ring and are less complex to manufacture. They consist of a ring-shaped and hardened round wire and cannot be installed with ordinary circlip pliers. For mounting in a hole, a version with angled ends is available, which is compressed with needle-nose pliers, pushed into the hole and inserted into the internal groove.



Lock washers according to DIN 6799 can be used as an alternative to external lock rings

Lamellar rings are similar to flat snap rings. Several lamellar rings, which alternately fit on the inside and outside, can be used next to each other in order to achieve a seal between the shaft and the housing against the escape of grease or other viscous liquids.

Axle holders are metal sheets that are inserted into a shaft groove and then screwed onto the housing. They are usually used to secure the position of axles or bolt connections with diameters of over 18 mm.

Lock washer, fuel ring



Lock washer according to DIN 6799 from Hugo Benzing

Lock washers, like shaft lock rings, are placed on shafts. They are standardized according to DIN 6799 and are intended for smaller shafts and axles (diameters from 0.8 mm to 30 mm are common). The disks have three areas on the inside diameter in which they rest on the bottom of the groove.

The also common name Benzingring or



Lock washer according to DIN 6799, which is also referred to as an "E-ring" due to a certain similarity to the letter "E" or "e".

Fuel washer off.^[5]

Seeger rings and gasoline rings differ in their design. Seeger rings according to DIN 471 or DIN 472 have holes to accommodate the tips of the circlip pliers. They are expanded by tightening the pliers, pushed axially onto the shaft and inserted into the shaft groove by relaxing the pliers.

In contrast, petrol rings do not have any holes. They are pushed radially onto the shaft groove. This is also possible if the end of the shaft is not accessible and can be done without tools for smaller rings. To install larger or tight-fitting fuel rings, e.g. B. used water pump pliers to help



E-ring on the axle of an action cam housing

[6] To loosen the fuel ring, slide the flat blade of an appropriately sized screwdriver or a tapered pick under one of the arms of the ring to pry it out of the groove.

One application for lock washers is captive screws.

See also

- snap ring

Web links

- Data sheet retaining rings for shafts A3-A1000 / DIN 471 (https://www.seeger-orbis.de/fileadmin/assets/pdf_datenblaetter/datenblatt_seeger-ringe_471.pdf) Data sheet retaining
 - rings for reinforced shafts AS12-AS100 / DIN 471 (https://www.seeger-orbis.de/fileadmin/assets/pdf_datenblaetter/datenblatt_seeger-ringe_versta%CC%88rkte_Ausfu%CC%88hrung_471.pdf) Data sheet circlips for bores J8-J1000 / DIN 472
 - (https://www.seeger-orbis.de/fileadmin/assets/pdf_datenblaetter/datenblatt_seeger-ringe_472.pdf) Data sheet circlips for reinforced holes JS20-JS100 / DIN 472
 - (https://www.seeger-orbis.de/fileadmin/assets/pdf_datenblaetter/datenblatt_seeger-ringe_versta%CC%88rkte_Ausfu%CC%88hrung_472.pdf) Data sheet lock washer for shafts RA1,2-RA24 / DIN 6799 (https://www.seeger-orbis.de/fileadmin/assets/pdf_datenblaetter/datenblatt_seeger-rings_Securing_washers.pdf)
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Individual evidence

1. German Patent and Trademark Office, registration number 601140 (<https://register.dpma.de/DPMAregister/marke/register/601140/DE>) Website of the German Patent and Trademark Office. Accessed on April 12, 2016.
2. German Patent and Trademark Office, registration number 379225 (<https://register.dpma.de/DPMAregister/marke/registerIR?AKZ=379225&CURSOR=1>) Website of the German Patent and Trademark Office. Accessed on April 12, 2016.
3. WIPO/ROMARIN WIPO international registration number 379225 (<https://www.wipo.int/romarin>) Website of the World Intellectual Property Organization WIPO, International Registration Number 379225, accessed on April 12, 2016.
4. Seeger-Orbis, overview (<http://www.seeger-orbis.de/produkte/seeger-ringe-grundtypen-uebersicht/>) Website of the manufacturer and trademark holder Seeger-Orbis. Accessed on April 12, 2016.
5. Hugo Benzing company history. (<https://www.hugobenzling.de/unternehmen/historie>) Accessed on October 17, 2024.
6. Christian Spura, Bernhard Fleischer, Herbert Wittel, Dieter Jannasch: Roloff/Matek machine elements. 24th edition. Springer Vieweg, Berlin 2021, ISBN 978-3-658-46491-2, pp. 503–505.