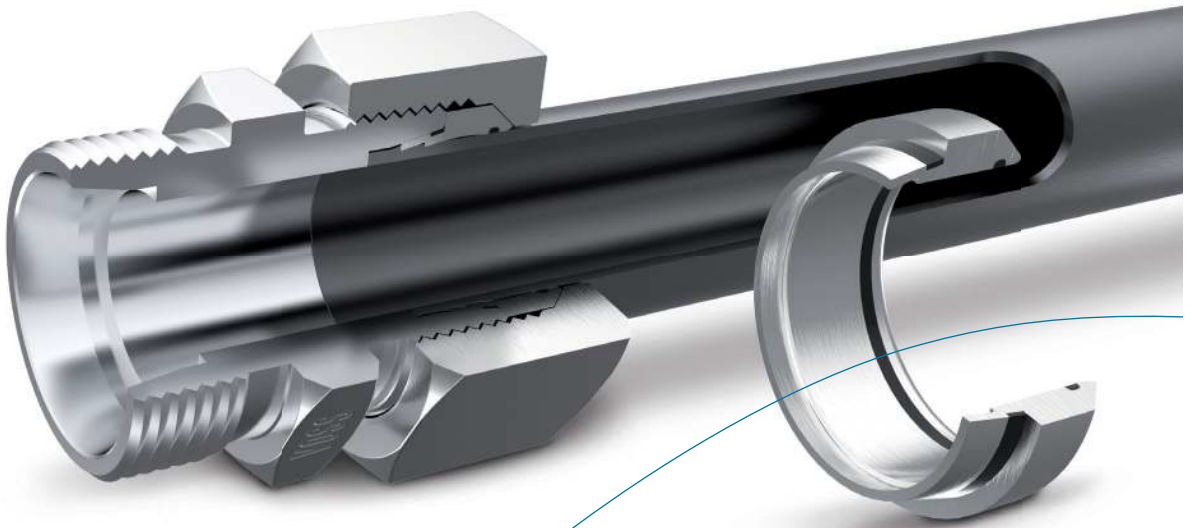


ES-4 cutting ring couplings

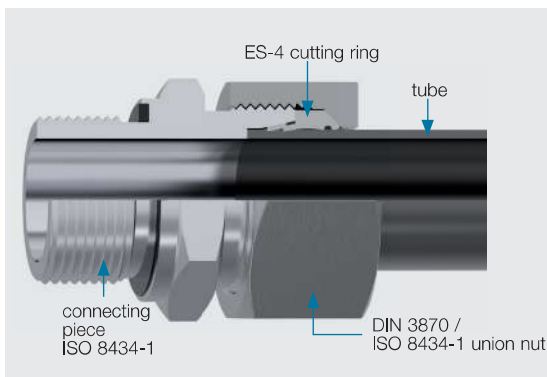
The soft-seal connection with 4-fold benefits



Product information, ES-4 tube couplings

VOSS ES-4: soft seal couplings in accordance with DIN / ISO and with 4-fold benefits:

1. Design based on the tried and tested VOSS 2S cutting ring.
2. Additional precision sealing using soft sealing elements made of FPM/FKM.
3. Reliable leak-tightness thanks to gap-free chamfering of the soft seals.
4. Guided assembly up to the tightening torque limit.



With “ES-4”, VOSS engineers have developed a soft-seal coupling that not only offers additional reliability, but is also much more economical.

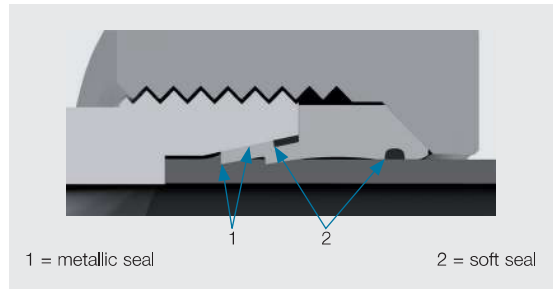
As regards the tube connection side, ES-4 couplings cover the application range between the proven 2S cutting ring coupling for standard applications and 10° flared couplings for heavy loads and high stresses.

Leak prevention

The special moulded seal in the groove on the cutting ring taper and the additional O-ring between the cutting ring and the tube eliminate leaks which might otherwise occur due to slackening of the metallic seal, e. g. due to creep characteristics.

Dynamic loads

If the medium succeeds in passing the metallic sealing zone when there is an alternating pressure load, it is stopped by the soft seals located behind the metal seal. The arrangement of the elastomer seals behind the metallic sealing zone means that the alternating pressures can only act on the soft seal after being considerably damped. This quasi-static load, which is lower than the operating pressure, ensures excellent long-term stability of the elastomers.



Static loads

Assuming that a leak develops in the metallic sealing zone while the assembly is exposed to static pressure loads, the full operating pressure would build up and act on the front of the soft seal – however with a considerable time delay. In such cases, complete enclosure of the soft-seal elements without any gaps ensures reliable sealing.

VOSS 2S ring as the basis

The basis for the soft seal coupling is the proven VOSS tube couplings conforming to DIN 2353 / ISO 8434-1. In this design, the 2S cutting ring is supplemented by soft seals fitted on the secondary side.

The reliable functional properties of 2S cutting rings remain totally unaffected:

- In the final assembled state, loading by bending moments is counteracted adequately by support from the broad contact area and by the uninterrupted force transfer.
- In addition, the first, strong cutting edge and the additional second cutting edge ensure a secure hold i. e. for tear-out protection in the case of sudden pressure increases.

Additional precision seal with defined seal chambers.

The precision seals prevent the familiar sweating effects of purely metallic seals:

- The special moulded seal of the ES-4 cutting ring, which is set into a groove in the cutting ring taper, seals off any possible leakage path between the cutting ring and the connecting piece.
- An additional O-ring prevents leakage between the cutting ring and the tube.

As a result, both soft seals are located behind the tried and tested metallic seal. With this arrangement, dynamic and static loads are intercepted in the primary zones, i. e. at the metallic sealing points, and only act on the soft seals in a virtually static manner.

Another advantage is that the soft seals are contained in stable, gap-free retention spaces once the cutting rings have been fitted. This prevents extrusion of the soft seals even when exposed to full system pressure.

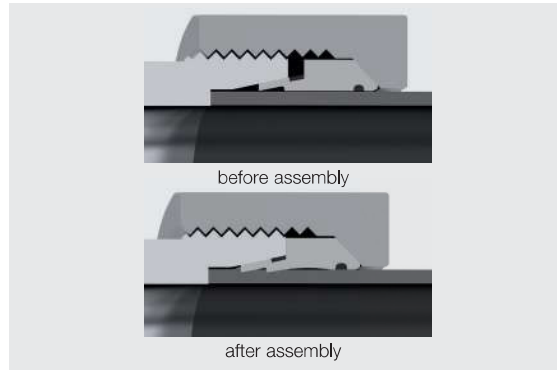
Safety through block installation

The strong, gap-free enclosure of the fine seal is obtained by a block installation of the ES-4 cutting ring. This is achieved by pressing the moulded seal more strongly onto the coupling taper and by the gap-free radial contact of the cutting ring to the outside tube surface in the area around the O-ring seal. For this purpose, the cutting ring geometry is designed in such a way that maximum possible elasticity is achieved despite the block effect.

Block installation also ensures that the depth of incision is limited, thus counteracting tube constriction when joining thin-walled tubes

It also makes over-tightening of the connection much more difficult.

The same assembly forces are required for block installation as for 2S cutting rings. Also, the same procedure for checking correct cutting ring incision, as required by the standard, can be applied here, and the fitter can use the same working methods and tools.



The economic advantages:

ES-4 couplings offer not only a high degree of security against leaks, but additional economic benefits as well:

- Cost and time-intensive corrective measures are no longer required. Production failures are avoided.
- Dry connections help improve the image of the final product, giving final customers advantages over their competitors.
- With the introduction of the ES-4 couplings, VOSS offers a consistent soft seal system. The user can reduce the number of suppliers considerably and thus minimize the number of orders required.
- As ES-4 couplings consist of DIN/ISO connecting pieces and DIN/ISO nuts, the user does not need to establish and maintain a stock of special parts.
- As the user needs to change neither assembly procedures nor tools, additional costs for training and tools are avoided.

Conclusion: In view of the advantages offered by ES-4 couplings regarding greatest possible leak protection, they are an interesting economical alternative from the cost-benefit aspect.