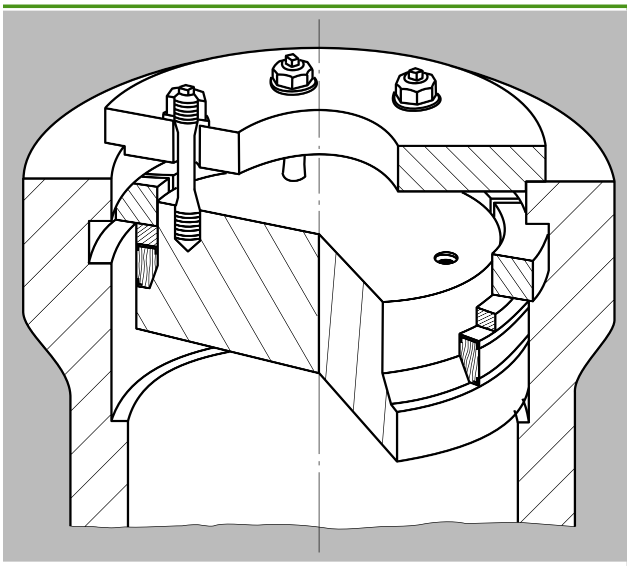
Cover plate gaskets

Cover plate gaskets are used as self-sealing gaskets, meaning that the sealing force does not come from bolts but from the internal pressure. Therefore bolts with a smaller cross-section can be selected. The entire connection is more compact. The following illustration shows the design principle.

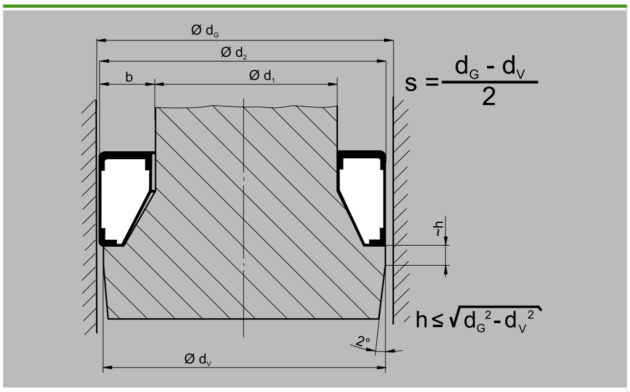


At high pressures or with reworked covers, caps should be provided, so that the graphite does not extrude into the gap between the housing and the cover plate. Compressed caps are made of 0.4 mm thick stainless steel sheet metal 1.4541. At very high pressures solid, lathed caps are usual.

Indicative values for maximum bridgeable gaps:

b [mm]	5	10	15	20	30	40
s [mm]	0,4	0,6	0,8	1,0	1,2	1,3

Gap width s is the average gap as shown in the illustration.



When new, the gap should be as narrow as possible. The specified fit tolerance can be used as an indicator. The selection and model is left to the equipment manufacturer.

Diameter d_2	Fit tolerance d_G/d_V
d_2 < 500 mm	D9/h8
d_2 > 500 mm	E8/h8

The cover plate can be tilted by 1° or 2° as shown in the illustration, for ease of fitting.

Cover plate gaskets have a rectangular or an internally (less often, externally) sloped cross-section. There is a range of profiles in seven different shapes available, with which all sealing problems can be solved. The necessary deformation to conform to the sealing surfaces is achieved with the cover tensioning bolts.

When laying out the bolts, attention should also be paid to the weight of the cover and where it is to be installed. Depending on the type of profile and the geometry of the gasket, achieving sufficient deformation will require the correct level of surface pressure and/or the correct internal pressure.

The minimum pressure required for a self-sealing connection is given as p_{krit}. Where d_1=internal diameter and d_2 = external diameter of the gasket, and the sealing factor is K, the following is true:

$$p_{krit} = K \cdot \left(1 - \frac{d_1}{d_2} \right) \ [\text{N/mm}^2]$$

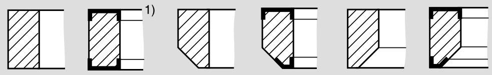
The sealing factor K was established in tests and can be taken from the table on the following page.

The maximum permitted operating or test pressure can also be estimated from the critical pressure. The selected tolerances and the presence or absence of metal caps or lathed protective caps is of critical importance.

The following gives an indication:

Pressure		Model
	$p_{max} < 3 \cdot p_{krit}$	without caps
$3 \cdot p_{krit} <$	$p_{max} < 6 \cdot p_{krit}$	with metal caps
$6 \cdot p_{krit} <$	$p_{max} < 12 \cdot p_{krit}$	with lathed steel cap

Cover plate gaskets

Construction and material of the gasket	 [1)]						R_z* [µm]
Graphite ring, **Profile series P70** made from chemically pure graphite, "RivaTherm"	P71	P71K	P74	P74K	P75	P75K	12,5 to 25
Factor K (N/mm²)	100	110	70	80	70	80	

Material for the caps: Stainless steel sheet metal 1.4541 and/or by arrangement

* Recommended maximum roughness depth of the flange surfaces

1) In packing sets of two or more rings, the intermediate caps can be done away with, please specify when ordering.

Application temperatures up to 650 °C (media temperature) are possible when using caps. In these cases, it must be ensured that the caps remain undamaged during installation. Only completely encapsulated cover seals are protected against oxidation to the greatest possible extent.

The pretensioning force F_{SV}, which produces sufficient sealing surface pressure, can generally be represented as:

$$F_{SV} = \frac{d_2^2 \pi}{4} \cdot \frac{p_{krit}}{2}$$

Depending on the mode of operation, smaller or greater pretensioning forces can be indicated.

The advantage is that all sealing gaps required by the design, into which the graphite could be extruded, are closed off by the caps.

Equipment with d_2 = 720 mm diameter and 770 bar test pressure will run perfectly satisfactorily. Larger diameters of more than 1000 mm are used at approx. 500 bar and are just one further example of thousands of safely installed cover gaskets. To achieve an optimal seal h_G should be = 2 • b_G.

All rings are compressed in moulds. Our extensive range includes tools from a few millimetres to more than 1000 mm in diameter. As the moulds and tools are constantly being updated, an up-to-date list cannot be given here. We would be happy to advise whether a tool is available for the required measurement or whether it would cost extra.