

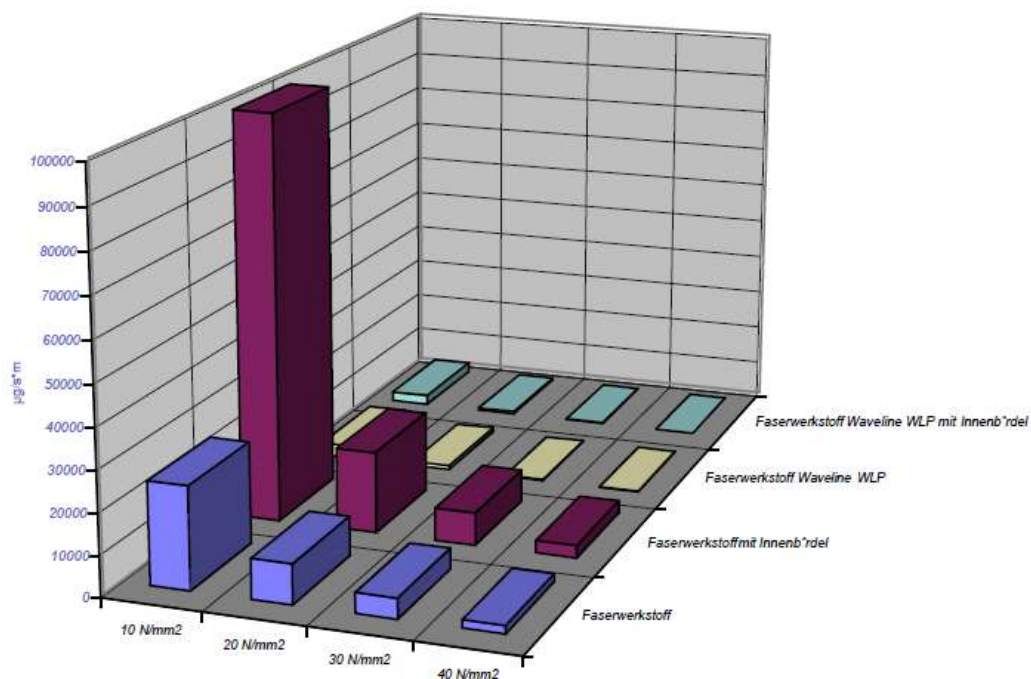
Influence of a Metallic Inside Flange on the Leakage Behaviour of a Gasket

Soft material gaskets are often provided with a metallic flange, with the focus being on the following objectives, depending on the application:

- Increased blow-out safety
- Protection of the medium and the gasket against contamination
- Reduction of the cross-section leakage
- Increase in the buckling resistance and improved handling

There was also a widespread assumption that a gasket with an inside flange always provided better leak tightness than a gasket without a flange.

Extensive measurements at the Materials Testing Institute (MPA) in Stuttgart have confirmed that in beaded gaskets there is usually a significant deterioration in the leakage behaviour, as the following diagram shows with the example of a fibre gasket.

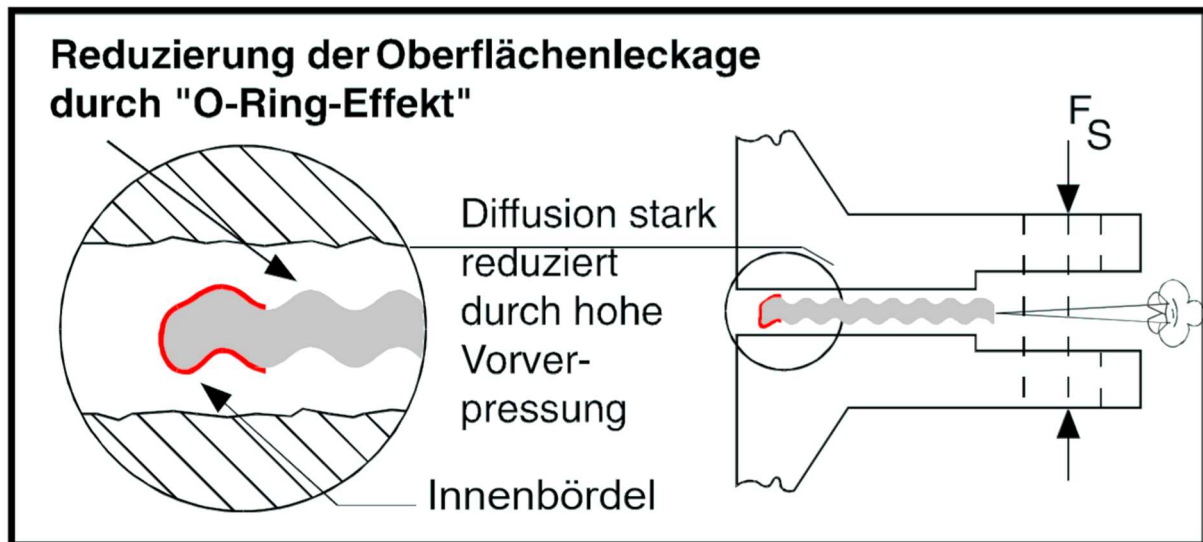


Example of a fibre material and its leakage behaviour

In practice there is often only small potential available with respect to surface pressure for the sealing connection, limited by the flange and screw properties.

However, in order to crimp the metal flange, part of the surface pressure available is absorbed. The consequence is greater leakage through the gasket surface. With gaseous media in particular, this amount of leakage is often considerable.

In the case of a flanged gasket of a Waveline WLP® design, however, the flange is already pre-crimped and an O-ring effect is created, so that hardly any flange force is lost for further crimping (Fig. 2)



The Waveline WLP® version of the flanged gasket

The functional properties of the flange, such as blow-out safety, media purity or the non-contamination of the gasket with toxic media are retained.

In the measurements at the MPA in Stuttgart, various versions of the flange were also studied in the normal version with respect to their leakage. The flange material thickness, flange width and geometry of the flange were found to be dominant influencing factors.

For the increase in blow-out safety and in order to guarantee the fixed tension of the raised edge in the flange, the raised edge should not be too narrow. Good calibration of the raised edge in the gasket material should also be ensured.

To reduce the notching effect on the ends of the raised edges, it makes sense not to allow these to end exactly one above the other.

Furthermore, the gasket material exerts a decisive influence on the leakage. Good deformability of the material contained within the gasket has a positive effect on the compression.

Through the Waveline WLP® method it is possible to achieve significant leakage reductions in the case of gaskets with an inside flange.

The method can be applied to almost all standard soft gasket materials and offers the operator a much better sealing effect with the tried and tested gasket material.