

Optimization of gasket geometry

Circular and rectangular geometry

Full face gaskets with bolt holes are destined after all for use in devices of older models, but can also be found in some current standards for flange gaskets (e.g. DIN 86072). In these designs the given and therefore limited bolt forces face a very large sealing surface. This fact leads to a low surface pressure. After all when increasing the test pressure level formerly well performing sealing connections now fail. Main reasons are too low surface pressure and/or overstrained bolts.

In order to avoid this failure of the gaskets, we suggest following two corrective measures:

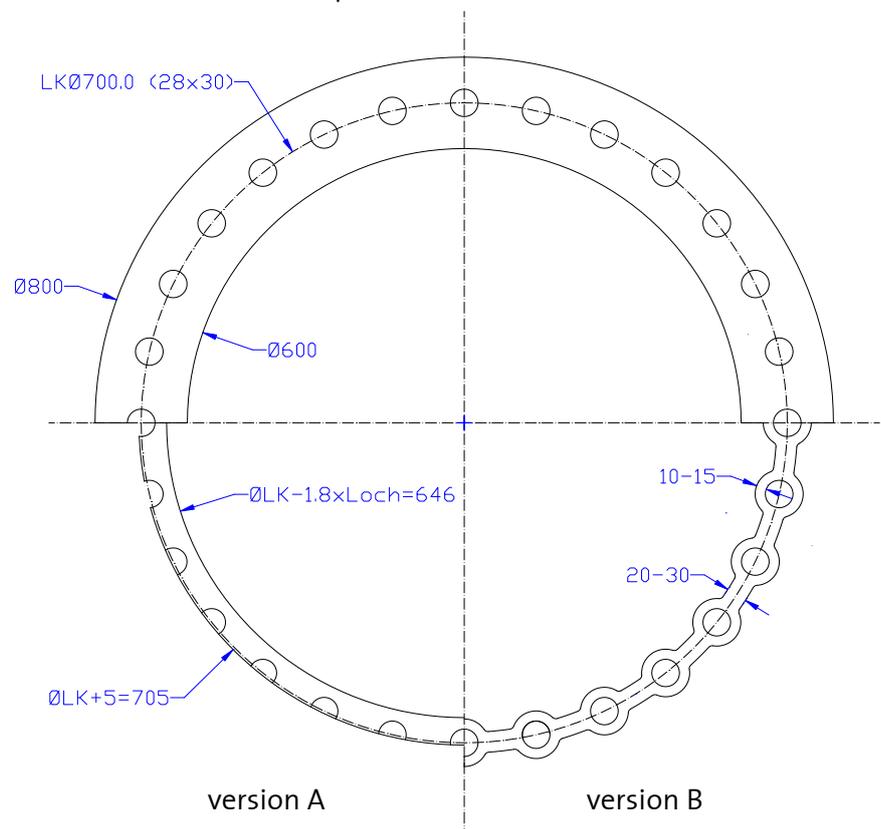
1. Use bolt material of a higher tensile strength in order to increase the pre-load forces.
2. Optimize the gasket geometry in order to minimize the compressed surface.

sample drawing:

original geometry

optimized geometry

in two versions



version A: especially for gaskets with inner eyelet diameter + 5 mm
diameter – 1.8 x diameter of bolt hole

version B: see drawing, the given values are only an indication

outer diameter = pitch circle
inner diameter = pitch circle

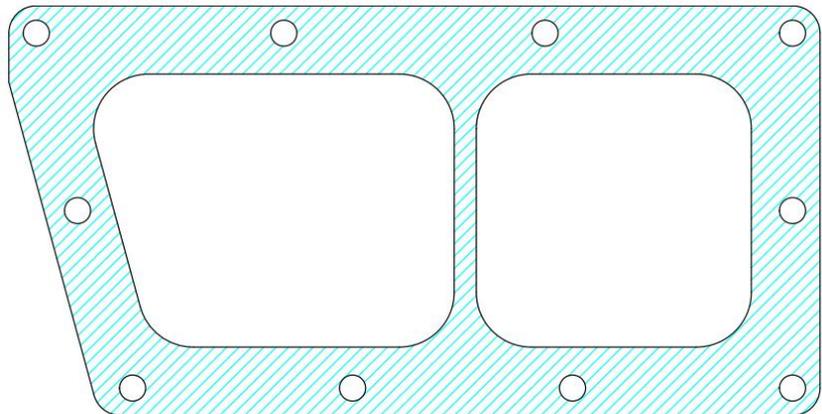
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Complex geometry

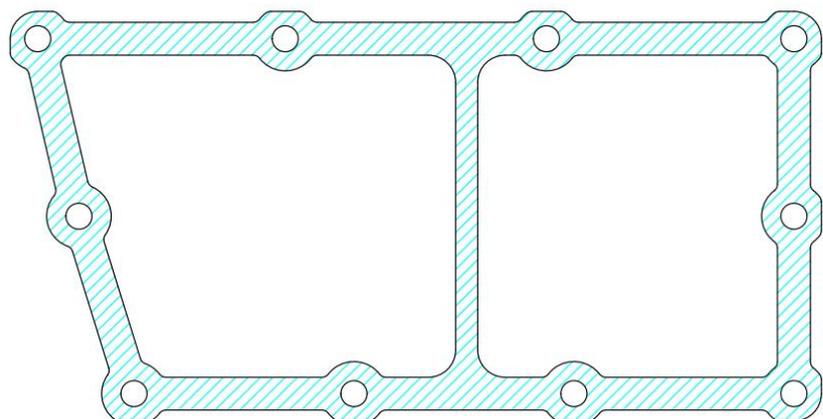
Of course, the underlying considerations apply not only to traditional flange gaskets, but also to all flat gasket applications in gearboxes, pumps, compressors and other apparatus. Please keep always in mind: any sealing requires surface pressure instead of surface.

The following example is representative of any complex sealing geometry, which has unnecessarily large areas to be pressed, so that the existing bolt force can only produce an insufficient surface pressure.

original geometry



optimized geometry



- = 44 % less compressed area
- = 44 % more surface pressure

Application engineering questions?

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Status: April 2018