



Automatic Strength Calculation of Pistons for Reciprocating Compressors

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Abstract:

The individuality of process gas compressors requires flexibility regarding piston geometry. Therefore, usually each piston has to be evaluated as to its strength. With the help of a piston standard that leaves only a few individual parameters such as piston height and diameter, a finite element simulation (FEA) and a fatigue strength calculation can be performed in an almost fully automatic way. The result of this simulation is a piston design that meets the special requirements of the respective application. The output of the calculation is input for a parametric CAD model. In this way the design time for a process gas piston can be significantly reduced and the reliability concerning strength is always proved.

This report describes the newly introduced design sequence, a computer program that was developed especially for automatic strength calculations, the piston standard and its implementation in the computer program, the evaluation of critical piston locations and the use of a parametric CAD model.