

CASE STUDY

A German refinery was facing corrosion problems on the recycle compressors of its hydrodesulphurisation unit.

Reliability optimization through adaptation of the compressor to the corrosive gas

Compressor manufacturer: MB HALBERSTADT			
Type	1HB2KT-400/180	Gas	H ₂
Power	600 kW (816 hp)	Suction pressure	40 bar (580 psi)
Speed	270 rpm	Discharge pressure	60 bar (870 psi)
Lubrication	no		



Compressor with old cylinder design

Customer requirements

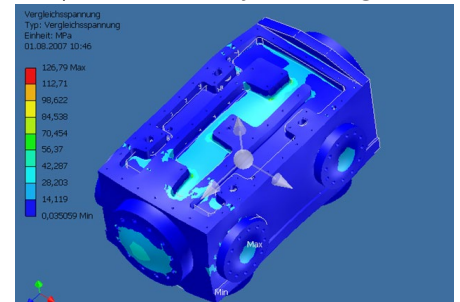
- Replacement of old corroded cylinders with two new cylinders for each of the two identical compressors
- Design engineering from existing cylinders and liners
- Strength calculation
- Pressure and leakage tests

Solution applied

- Measurement of the original cylinder on site
- Material selection (CK35) to avoid corrosion problems
- Finite element stress calculation for new cylinders
- Construction and production of the cylinders, and design of the cylinder liners
- Pressure and leakage tests
- Assembly and installation of all new parts on site
- Project management and documentation

Results

- The rebuilt compressors have been running since 2008 with no corrosion problems
- The liners effectively protect the cylinders from wear by the piston rings



3D design and finite element calculation



Production of new forged cylinder



One of four new cylinders installed and tested