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## **Design of Horizontal Opposed Reciprocating Compressor for Hydrogen Provided by Stepless Capacity Control (HydroCom by Hoerbiger)**

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### **Abstract:**

This paper presents a description of design of horizontal-opposed two-stage oil-free four-cylinder piston compressor ČKD model 4 DBK 430B for hydrogen. It particularly deals with a design of compressor cylinders including FEM analysis, a capacity control of compressor and with a torsional vibration analysis of compressor unit.

Cylinders are modeled using parametric CAD system and resulting 3D model is analyzed by FEM for a stress.

The system of capacity control used in this unit is HydroCom by Hoerbiger. The system consists of actuators that are installed on each suction valve of individual cylinders providing stepless capacity control from 0 to 100%, HydroCom – Compressor Interface Unit and HydroCom – Hydraulic unit.

The torsional vibrations of system consisting of reciprocating compressor and electric motor are simulated in a process of compressor unit design. The results of TVA are practically verified after manufacturing of the unit during a test operation.