

عنوان مقاله:

Study of the Early Development Factors of Failure in Valves of Reciprocating Compressors by Experimental and Numerical Simulation

محل انتشار:

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خلاصه مقاله:

Nowadays most of reciprocating compressors have one - way valves that act by difference pressure between behind and front of valves. In this article, experimental and numerical studying of one - way valves in reciprocating compressors was done. In this experimental tests, one – way valve with two different materials for rings; stainless steel with the material number 1.5022 and sign 38si6, and carbon-peek composite, were used. Numerical simulation for one-way valves with identical characteristics of experimental tests was done by CFX 5.7.1 and Ansys workbench 9.1. Experimental tests showed that life of carbon-peek composite ring was more than stainless steel. The most important cause of failure in the stainless steel ring was inappropriate distribution of forces due to the springs below the ring. Another common cause of failure in these valves was the stresses on walls in the location of springs that approved by numerical simulation. Difference in reaction of one - way valves in opening and closeing was another cause of failure because they were different in thermal expansion coefficient, thickness and diameter of carbon-peek composite and stainless steel rings. Appropriate thickness of rings determined by flow equation. The results obtained from numerical simulations have a good agreement with experimental tests.

کلمات کلیدی:

Experimental Test, Failure, numerical simulation, One-Way Valve, Reciprocating Compressor

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