Handout GEMÜ Code 71

EN

Validation Guide

General Information Document

1 Background

Launch of the code 71 diaphragm as the first three-piece GEMÜ diaphragm.

2 Details of code 71 diaphragms

1. Code 71 diaphragms are made up of a PTFE face, a PVDF intermediate layer and an EPDM backing
2. The design and dimensions of the PTFE face are the same as the tried and tested code 5M diaphragm
3. The code 71 diaphragm shows excellent permeation properties, as tested and certified by TÜV SÜD as part of a permeation test based on DIN EN 1779
4. Excellent resistance to wet chlorine is tested and certified by TÜV SÜD as part of a resistance test based on ISO 1817

3 Advantages/innovations of code 71 diaphragms

1. Excellent permeation properties towards gases, especially with regard to wet chlorine, achieved thanks to a PVDF intermediate layer
2. Permeation of gases six times lower in comparison with a three-piece diaphragm from a competitor
3. Endurance tests under the influence of vacuum show much better service life and sealing capability results in comparison with a three-piece diaphragm from a competitor
4. The diaphragm has no leakage holes in the EPDM backing in order to improve the permeation properties
5. Use of a mounting pin made of grade 7 titanium, which is particularly resistant to highly corrosive media, especially to wet chlorine
6. Mechanical stop integrated into the diaphragm face mounting pin in order to ensure correct installation
7. High wear resistance and optimized setting behaviour
8. Long service lives are possible

4 Endurance tests for code 71 diaphragms

The service life of code 71 diaphragms is validated via endurance and resistance tests. The code 71 diaphragms that are to undergo validation are assembled on test valves by trained personnel. Leak measurements are carried out as intermediate tests in accordance with DIN EN 12266-1 before, in between or after endurance tests. These leak measurements are used to determine whether and to what extent the leak-tightness characteristics of the diaphragms are adversely affected by the stresses of the endurance test. During endurance tests, diaphragms are clocked under corrosive ambient conditions. This results in artificial ageing via the effects of mechanical and thermal stress as well as direct contact with corrosive media. Once the test valve has completed the specified test programme, it is removed and a final leak test is carried out. Afterwards the test valve is disassembled, and the diaphragm is analyzed for faults and evaluated in accordance with GEMÜ guidelines.

During the vacuum endurance test, the diaphragm valve is switched at a continuous clock frequency (open/closed) under the influence of a vacuum within the valve body, which is transmitted to the diaphragm. From our analysis of the results of our testing, GEMÜ can state that the performance of the code 71 diaphragm achieves the usual GEMÜ diaphragm quality standard.

Additional tests passed successfully

- Permeation measurement
- Resistance test on wet chlorine
- Pin pull-out force
- Pin overtorque

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