

Fire Safe Test of Valves

Key words

EN ISO 10497, fire safe test

Fields of application

Type test of safety relevant valves for fire safety. This test examines the resistance of fire-safe-valves to fire under reproducible conditions as defined in the standard. The evaluation relates to the internal leakage of the valve seat and the external leakage. The requirements are fulfilled if the internal and the external leakage during several test steps under hot and cold conditions do not exceed the limiting values defined in the standard. Fire-safe-valves are used in petrochemical plants and in liquefied petroleum gas storage vessels. Type testing of the valves is initiated by the manufacturer.

Methodology and instrumentation

The test assembly consists of a water supply with a pump to generate the test pressure, a combustion chamber with propane burners and a collecting vessel for the leakage. The test is carried out according to the requirements of EN ISO 10497. The test pressure, the flame temperature and the number of test steps are specified in the standards.

Items tested

Valves with a nominal diameter up to DN 150 and a nominal pressure up to PN 100 depending on the test standard applied. Flanges with specified screw-hole circles are to be provided as connection between the test valve and the test equipment.

Quantities / characteristics tested

The leakage quantity during the individual test steps is measured in accordance with the requirements of the test standard.

Uncertainty / reliability of results

For the internal leakage of the valve seat the measurement range and uncertainty are from 10 ml \pm 5 ml to 50 ml \pm 25 ml depending on the selected collecting vessel. The external leakage is determined by the difference between the filling level of the water supply and the collecting vessel for the internal leakage. This results in a range for the external leakage from 60 ml \pm 30 ml to 100 ml \pm 50 ml.

Qualification and quality assurance

BAM Federal Institute for Materials Research and Testing has participated in the development of test standard EN ISO 10497. The test assembly is the only one available in Germany.

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Further information

The following close-up of the test assembly shows the combustion chamber with the test valve fitted



Literature

Additional information on the fire-safe test are available in the (German language) publication:

W. Steppuhn, Th. Grunewald, B. Schalau

Fire-safe-Prüfung für Absperrarmaturen

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