

Pneumatic Frac Tests in Cavern wells for determining the gas compressive capacity as a basic for fixing the maximum storage Pressure

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Abstract

In the field of underground storage of gas under high pressure and in large-volume caverns which have been leached in salt rock, the Information about the gas compressive capacity of the encircled salt rock is vitally important.

It is basically known, that salt rock is gas tight up to the amount of formation pressure restraint. It is assumed, that the amount of the effective formation pressure restraint equals to the weight of the salt rock above the cavern and the cap rock. Furthermore it is assumed, that in the salt rock isotropic rock stress conditions dominate. Therefore the lithostatic pressure is calculated by the summation of the known densities of the single cap rock levels and their thicknesses as well as the results of the density logs of the cavern wells.

All of these mentioned facts affect the determination and definition of the maximum allowable storage pressure and demand the consideration of a wide certainty range.

In order to increase the accuracy of the determination of the maximum storage pressure the method of *In Situ Pneumatic Frac Test* has been deployed. The present technical paper explains the method of *In Situ Pneumatic Frac Test* with the aim of determining the maximum allowable storage pressure in cavern wells by means of conducted examples in the cavern field *Bad Lauchstädt*/Germany.

Key words: Caverns for Gas Storage, Cavern Testing, Computer Modeling, Germany, Instrumentation and Monitoring, Rock Mechanics, Well logging

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