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ENGLISCHE KURZFASSUNG

The joint research project EWS-tech II aims at quality improvements of borehole heat exchanger groutings. In the light of the damages which occurred in Baden-Württemberg in the last years caused by borehole heat exchangers the project focuses on the influence of groundwater flow on the grouting quality. For an extensive evaluation of this influence small-scale experiments (6 m) are performed to visualize the grouting and hydration process of borehole heat exchangers. Furthermore real-scale grouting experiments (30 m) with real size short-circuits of groundwater aquifers are done. Additional experiments are performed in a borehole simulator (5 m) with different borehole wall topographies, in order to quantify the effect of groundwater flow on system tightness of borehole heat exchangers.

Another focuses lie on extensive studies on the magnetic doping and the magnetic susceptibility of borehole heat exchanger grouting materials. Requirements for the magnetic doping and for susceptibility measuring probes are derived from these studies.

In addition, basic knowledge is gained in the project on the long-term integrity of borehole heat exchangers in areas with swelling rock and on the impact of drilling methods using compressed air (e.g. down the hole hammer) on the grouting quality of borehole heat exchangers.

Based on the aspects of the analyses described above requirement criteria for borehole heat exchanger grouting materials are derived, which can e.g. be used in technical or official regulations.