

On Hydraulic Conductivity Test Methods in Rocks

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One-dimensional flow of a compressible fluid through a saturated porous media can be described by combining the principle of conservation of fluid mass and Darcy's law. There are 5 types of laboratory techniques (Constant Head, Falling Head, Transient Pulse, Flow Pump, Oscillation) for measuring the low hydraulic conductivity of rocks. The Constant Head and Falling Head test are conventional methods and are applied to relatively low permeable materials. These tests are measuring the induced flux or flow rates under a constant or changing every moment head. The Transient Pulse and Flow Pump test method are measuring the time-dependent variations of differential hydraulic head across the entire length of the specimen. The Oscillation test is measuring the phase lag and attenuation of the injected sin wave pore pressure at the opposite end of the specimen. The later three test methods are most suitable for measuring a very low permeable specimen. We can obtain some information through these about the latest trend of the research.