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Core Lab

Proppant Conductivity Evaluation System PCES-100 Datasheet

Drilling & Stimulation Properties

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Proppant Conductivity Evaluation System, PCES-100

PROPPANT CONDUCTIVITY EVALUATION SYSTEM is designed, through the cooperation of various Business Units of Core Laboratories, to produce data, which allows the engineer to evaluate and model the performance of proppants used in fracture enhancement projects. Using the system; proppants can be evaluated at various closure pressures and temperatures and the resultant conductivity determined at various flow rates and pressure differentials.



The standard system uses a 100 short ton press to apply up to 20,000-psi closure pressure on one custom designed cell that can be heated up to 350 °F (177 °C). All of the wetted parts are constructed in 316 stainless steel, with optional materials available on request.

Conductivity Cell: 316 stainless steel API configured cell for the testing proppant conductivities at closure pressures of up to 20,000 psi, flowing fluid pressures up to 1,000 psi standard. The cell contains standard, shaped, Ohio sandstone slabs and proppant during the conductivity test with three side ports allowing high accuracy differential pressure transducers to monitor the pressure drop across the proppant during fluid flow. The cell is supplied complete with width slats, o-rings, stainless steel platens and Ohio sandstone slabs. Fracture width determined using PC linked Laser LVDT's (2 per cell) with an accuracy of +/- 0.001 inches.

Laboratory Press: custom 4-post design, allows an even and constant force to be applied to the conductivity cell. A 100 short ton model press capable of delivering up to 20,000 psi closure pressure controlled by a precision syringe pump is integrated with PC based control software to allow automated



ramping and constant pressure cycles. The press provides the capability to perform crush tests as described in API RP 56 and 58, in addition to long-term conductivity tests on proppants. A load cell, of compatible range for the press, is supplied to enable the precise calibration of the applied pressure.

Fluid System: Provides for the constant pressure, or constant rate flow of de-gassed brine through the proppant system. The upstream component consists of a nitrogen blanketed sparging system to remove dissolved air from brines and two 1 liter accumulators for fluid storage. Oxygen removal is essential to avoid the formation of metal oxides during long-term tests. The accumulators are pressurized, up to 1,000 psi, using an Isco or Quizix pump at either constant pressure or constant rate to flow brine through the Conductivity Cell. The brine passes through a pre-heater and then through a silica-saturating column. The column is packed with 100-mesh sand and proppant to avoid leaching the Ohio sandstone and the proppant under the test. Downstream a back pressure regulator controls the Conductivity Cell pressure and the effluent brine is collected in a receiving vessel mounted on a PC linked digital balance.