

CUSTOM ENGINEERED PRODUCTS

PERFORMANCE . QUALITY . SAFETY

FRICTION FLOW LOOP SYSTEMS

FRICTION FLOW LOOPS are fully automated systems which accurately determine the effectiveness of friction reducer polymers for optimizing slick water fluid designs. Fluid is circulated through two test sections and provides data including the Reynolds number and Percentage of Friction Reduction. The 6700 full-size loop is available in a range of pressure and temperature configurations, with customizable options to suit specific lab testing and space requirements. Each system includes comprehensive Data Acquisition and Control Software for seamless operation and analysis.



The 6700-M Mini-Loop™ is a benchtop unit designed for quick turnaround and lower sample volume testing making it ideal for QC/QA or field use. It circulates fluid through a single test section and uses custom Chandler Engineering software to record and analyze the test data. This enables reliable testing in a simple to operate compact system. The unit is ideal for quality control testing of slick water fracturing fluids.



FOAM RHEOMETERS

FOAM RHEOMETERS measure the rheological properties of foamed fluids under high pressure (up to 5800 psi/400 bar) and high temperature conditions (from ambient up to 350°F/177°C). The automated software includes features that allow the operator control over foam quality, shear rate (from 50 to 1300 1/sec), shear stress (0 to 1300 dyne/cm²), test time and operating temperature. High pressure viewing cell and imaging software provide a visual analysis of the foam. Custom-engineered design specifications are available upon request.

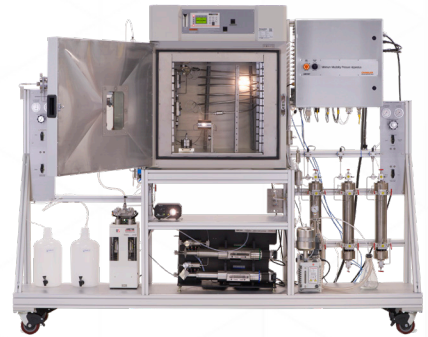


HISTORY

Since 1949, Chandler Engineering has been a trusted leader in delivering high quality measurement instruments for the Oil & Gas Industry. As the industry's largest instrument supplier, Chandler Engineering continues to drive innovation, helping customers enhance the efficiency and productivity of their drilling and production operations.

MINIMUM MISCIBILITY PRESSURE APPARATUS

MINIMUM MISCIBILITY PRESSURE APPARATUS (MMPA) determines when gas is miscible in the reservoir which is key to gas injection. The gas injection pressure has a significant cost implication to the operation of the well. Included are Quizix precision syringe pumps that offer exceptional pressure and volume control as well as an innovative gasometer with infinite volume. The MMPA provides extremely accurate data along with significant savings and value over conventional instrumentation.



CURING CHAMBER FOR CO₂

THE LONG-TERM CURING CHAMBER evaluates cement exposed to water and CO₂ for long term testing under elevated temperature and pressures. Gas accumulators are pressurized via gas booster for pressure control. The Curing Chamber offers a pressure up to 5000 psi (345 bar) and a temperature of 400°F (204°C). The max heating rate is 3°C/min (37°F).



FRACTURE CONDUCTIVITY APPARATUS

THE FRACTURE CONDUCTIVITY APPARATUS is designed to perform testing per API and ISO procedures. The tester can create closure stress on proppant between cells. A load frame allows up to 4 cells to be loaded vertically. The frame is used to perform proppant and sand crush tests per API 56, 58, 60 and ISO 13503. The load frame is capable of creating 15,000 psi of closure stress and offers a maximum temperature of 450°F (232°C) including heated rams.



CUSTOM CORE FLOW

FORMATION DAMAGE RESPONSE TESTER is an automated system used to study the effect of chemical and fluid treatments on the permeability of core samples. The 6100 offers forward, reverse and across-the-face core flow paths for up to five separate fluids. It is capable of simulating multiple stimulation treatments and can be operated as a Dynamic Fluid Loss Tester measuring filter cake buildup. Offered are 316 SST or Hastelloy wetted components and a flow rate from 0.001 to 50 ml/min. Variable Pressures are available up to 10,000 psi (690 bar) and temperatures up to 400°F (205°C). Also available is an optional Dynamic Slurry Cart.



ENHANCED OIL RECOVERY (EOR) single and multi-phase core flood systems are available for Water Alternating Gas (WAG), Steam Alternating Gas (SAG) and chemical and polymer injections. Systems are customized based on user-application and use Quizix precision pumps to displace fluids in open or closed loop recirculated flows. Many options are available for core holders, accumulators, dP transducers and types of oven enclosures. Pressure options are offered to 10,000 psi (690 bar) and temperature up to 350°F (177°C). Other features include CO₂/liquid separation and measurement, sequential flow of multiple fluids as well as 2 and 3-phase flow options and flow rates to 200 ml/min.



STEADY-STATE AND UNSTEADY STATE RELATIVE PERMEABILITY SYSTEMS are automated, closed loop recirculating core flow systems that measure 2 or 3-phase flows for long term testing of core samples at reservoir conditions. Fluids and gases are injected using Quizix precision pump products. These highly specialized systems are designed around specific application requirements and experiments. They offer pressure up to 20,000 psi (1379 bar) and temperature up to 400°F (204°C). Flow rates are up to 200 ml/min. Available are options for oven enclosures, core holders and phase separators. The system is ready for connections to CT / X-Ray / NMR instruments.



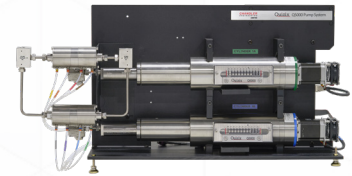
QUIZIX PRECISION PUMP SYSTEMS

Quizix precision pumps are the industry standard for core flow studies by operators, service companies and research laboratories. These positive displacement pumps provide pulse-free continuous flow at extremely accurate flow rates and pressures.

Operating from the proprietary PumpWorks software, there are 14 standard modes of operation and a sequencer function for automated response to internal or external system functions. PumpWorks easily interfaces to other Data Acquisition and Control programs via an embedded Open Platform Communications (OPC) server. Also included are ramping procedures by time, pressure, flow and volume.

Engineered for versatility, Quizix precision pumps can be seamlessly integrated into any system requiring highly accurate, pulse-free flow control at precise pressures and rates.

Q5000 SERIES provides ultimate precision for special core analysis, EOR, and other core flood applications. Flow rates are from sub-nanoliter to 60 ml/min and pressures to 20,000 psi (1379 bar). Multiple configurations for temperature ratings and wetted components are available.



Q6000 SERIES is ideal for high flow, large volumes and gas flows and offers flow rates from sub-microliter to 400 ml/min and pressures to 30,000 psi (2068 bar).



QX SERIES are compact dual cylinders for general and routine core analysis applications with flow rates from sub-microliter to 500 ml/min and pressures to 20,000 psi (1379 bar).



LOST CIRCULATION TESTER


LOST CIRCULATION TESTER evaluates the performance of lost circulation materials under HPHT conditions. Variable slot widths are used to determine bridging characteristics under pre-defined differential pressures. The slurry is stirred and conditioned at 150 rpm during heating and pressurization. At steady-state conditions, differential pressure is created across the slot, and a piston accumulator is used to measure the liquid volume passing through the slot. The tester offers pressures up to 400°F (204°C) and pressure to 2000 psi (138 bar) and has variable width slots for determining bridging characteristics at predefined differential pressures. Data acquisition is provided via an Ethernet interface to the Model 5270 software.



At Chandler Engineering, we are united by our commitment to each other and the shared values that define our work. We promote unity, honor, and belonging within our company and extend that care to the communities we serve. Our dedication to innovation and excellence in energy solutions is driven by our desire to leave the world a better place for our families and future generations.



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