

2023

Product Catalog



EOR / IOR
TESTING

CORE ANALYSIS &
CORE TESTING

OIL WELL
CEMENTING TESTING

VISCOSITY AND
STIMULATION TESTING

DRILLING FLUIDS
TESTING

2023 PRODUCT CATALOG

A comprehensive listing of our current products.



We work hard to ensure testing reliability so you can focus on the more important things, like getting back to business.

UNMATCHED QUALITY INSTRUMENTATION

At Grace Instrument, we know that testing plays a vital role before drilling operations can even begin. That's why we are dedicated to providing unmatched, high-quality testing solutions that save you time and money.

With over 20 years of experience in the oil and gas testing equipment industry, Grace Instrument sells and services over 50 different models worldwide. Our instruments feature innovative, patented technology, easy maintenance, and advanced engineering solutions. Our proven track record includes on-site training, a 1-year limited warranty, and replaceable spare parts with a lifetime of support and service via phone, email, video-conferencing, and/or on-site. Our experienced technicians can travel the globe to train and service any instrument within 3 weeks (or 3 days for emergencies).

Grace Instrument is based in the USA, where we proudly design and manufacture all products in-house to reduce end-costs, control quality, and decrease lead times. Our products include viscometers, rheometers, core analysis and stimulation testers, drilling fluid testers, oil well cementing testers, and much more.

We are committed to delivering outstanding service to our valued customers across the globe. As a leader of instrumentation devices, our products can be found in laboratories worldwide.

OUR MOST POPULAR PRODUCTS

SCIENTIFIC INNOVATIONS. INDUSTRIAL SOLUTIONS.

RIDE THE WAVE. SEE WHAT EVERYONE'S TALKING ABOUT



For more information or a free product evaluation, simply email us at info@graceinstrument.com or call us at 713-783-1560.

M5600

HP/HT RHEOMETER

TRUE RHEOLOGY MEASUREMENT UNDER HIGH PRESSURE



U.S. Pat. 6,938,464
U.S. Pat. 6,951,127
U.S. Pat. 9,157,846

-
- ✓ **No magnetic coupling** under high temperature and high pressure conditions.
 - ✓ **Direct measurement** torque transducer and a separately controlled strain mechanism eliminates moment of inertia errors.
 - ✓ **Capable of obtaining values for G' and G'' , N' and K'** , all with the same API geometry.
 - ✓ **Hastelloy C construction** on wetted parts and **multiple patented technologies** enable testing of the most corrosive samples, including acids.
 - ✓ M5600 PC software allows both single- and **multi-step real-time testing**.

M2200

HP/HT LUBRICITY, DYNAMIC FILTRATION AND DRILLING SIMULATION TESTER

THE 3-IN-1 MULTIFUNCTION TESTER WITH REAL DRILL BIT SIMULATION



- ✓ **Multifunction Tester in one compact unit** featuring HPHT Lubricity, Dynamic Filtration, and Drilling Simulation functionality.
- ✓ **Only HP/HT lubricity tester currently available in the USA** specifically designed for evaluating dynamic lubricity performance of drilling fluids under user-controlled conditions.
- ✓ **Dynamic filtration testing** conducted within a pressurized, temperature-controlled environment that contains a filtrate medium to simulate reservoir formations where **particle plugging tests** and **differential sticking tests** can be performed.
- ✓ Includes ultra-realistic well-bore simulation chamber, which allows the user to **test the penetration rate on actual core samples using a real drill bit** provided with each unit.

M7500

ULTRA HP/HT RHEOMETER

THE LAB IN-A-BOX



U.S. Pat. 7,287,416
U.S. Pat. 7,412,877

- ✓ **Optional components add multiple test functions** while saving money, time, and laboratory space to provide you with an excellent ROI.
- ✓ **Quick and easy test turn around** with no need for re-calibration before every test.
- ✓ **Prevents sample contamination** by removing contact between the sample fluid within the main test chamber and the pressurization fluid. **No other rheometer on the market today can make this claim.**
- ✓ **Patented design eliminates the use of expensive jewel bearings**, which are difficult to install and break easily.
- ✓ **State-of-the-art PC software** with database management and real-time charting.

M9100

AUTOMATIC CORE FLOW TESTER

CORE FLOW TESTING CUSTOMIZED TO FIT YOUR NEEDS



-
- ✓ **Streamlined workflow allows for multiple test operations** without draining confining fluid between tests enabling the researcher to conduct multiple tests without multiple set-up.
 - ✓ **Completely automatic controls** including digital control of valves, fluid injection, and many other test parameters.
 - ✓ Designed to **accurately measure permeability changes** to a formation core sample in a high temperature and high pressure environment, while exposing it to a variety of test fluids
 - ✓ The 9000 series products are all **completely customizable** and made specifically to the clients requested specifications.

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We're eroding away the competition

An acid-resistant viscometer equipped with nickel chromium-molybdenum alloy (Hastelloy C-276), all-sheet material, and a special HCL acid fume coating that is suitable for corrosion testing. The unit provides an excellent resistance to strong oxidizers and a variety of chemical compounds, which sets it apart from the competition and makes it an excellent choice for acidizing testing.



M3600 Acid Viscometer

OTHER ITEMS FROM OUR VISCOMETER SERIES



M3400 Dial-Reading Viscometer

M3600 Automatic Viscometer

Another innovation brought to you by

Grace
INSTRUMENT
GfYVbfjZWebbcj Ufjcbg' i' bXi ghjU' Gc' i Hfcbg

DRILLING FLUIDS TESTING INSTRUMENTS

SHOP FOR SIMPLIFIED SOLUTIONS



Choose instruments that **provide quality craftsmanship.**

Designed to test the various characteristics and performance of a drilling fluid, Grace Instrument Drilling Fluid Testing Instruments are triple-tested for durability, quality, and optimization.

Aging Cell and Roller Oven

Aging cells are used with roller ovens in the aging and testing of drilling fluids or muds. Samples are placed in the aging cell, then agitated and rotated in the roller oven at high temperatures.



M1741 AGING CELL

Features

- Available in 3 premium metals: stainless steel 303 or 316, or hastelloy C-276
- Enclosure and rollers are stainless steel
- High temperature testing, even through prolonged salinity
- Designed for pressurizing fluid samples
- Meets API Recommended Practice 13 B-1/13B-2

Specifications

Capacity: 260 mL or 500 mL
 Max Temperature: 500°F (260°C)
 Max Pressure: 2,500 psi (17.23 MPa)
 Material Options:
 • 303 Stainless Steel
 • 316 Stainless Steel
 • C-276 Hastelloy
 260 mL Dimensions:
 Outside cell 3.75"OD, 4.85"L.
 Inside cell 2.5"ID and 3.2"L
 500 mL Dimensions:
 Outside cell 3.75"OD, 7.75"L.
 Inside cell 2.5"ID and 6.1"L



M1750 ROLLER OVEN

Features

- Stainless-steel enclosure and rollers.
- Digital oven temperature controller and overtemperature safety controller (preset settings).
- Overtemperature safety mechanism for operator protection.
- K-type thermocouple connection installed on front panel for data log.
- Evenly distributes heat by inside air circulation.
- Accurate and stable temperature measurements.
- Very precise, accurate simulation of pressure/temperature conditions.
- Compatible with laboratory use or in-field operation.
- Temperature data log output for data collection.

Specifications

Temperature Range: Ambient to 500°F (260°C)
 Outer Dimensions: 26"W x 31"D x 26"H
 Inner Dimensions: 22¼" W x 24¾" D x 14" H
 Weight: 170 lbs. (~77 kg.)
 Frequency: 50-60 Hz
 Voltage: 115V AC or 230V AC (Integrated voltage switch on back of unit allows for selection between these two options. Always ensure selected voltage is compatible with your power supply.)

Aging Cell Capacity			
Model	Roller No.	260 ml Cell	500 ml Cell
M1750	5	12	8

Lubricity

Lubricity testers measure the lubricating value of a drilling fluid and are typically useful in drilling operations that require a mud additive to reduce torque and drag in the wellbore.



U.S. Pat. 9,194,784 and 10,215,001

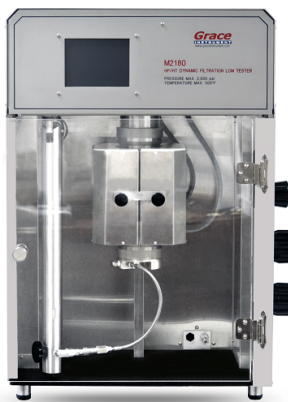
M2170 HPHT LUBRICITY TESTER

Features

- Fully customizable test parameters
- Automatic pressure & temperature control
- Automatic data collection
- Paddle assembly is durable for extensive testing
- Measures fluid resistivity of various lubricants
- In accordance with API Recommended Practice 10B-2
- Maximum speed up to 600 rpm
- Design of cooling jacket allows rapid cooling of test cells, lessening setup time between finishing one test & beginning a new one

Specifications

Dimensions: 27.5" H x 18" W x 21" D
 Temperature Range: Amb. to 500 °F (260 °C)
 Working Pressure: 2,000 psi
 Max Torque: 42.5 pound/inch (4.8 N.m)
 Max Power Requirement: 1,800 watts
 Heater Power: 1,200 watts
 Power Supply: 120/240 V, 50/60 Hz
 Sample Volume: 400 mL
 Filtrate Volume: 50 mL
 Shear Bob Speed: 0 to 600 rpm



U.S. Pat. 9,194,784 and 10,215,001

M2180 HPHT DYNAMIC FILTRATION LCM TESTER

Features

- Powerful, dynamic HP/HT filtration testing.
- Pressurized, temperature-controlled environment realistically simulates downhole wellbores.
- Filtrate medium available in a variety of porosities and permeabilities.
- Simulates different reservoir formation types.
- Robust back pressure control design minimizes downtime and repair costs.
- Particle plugging test feature—specialized filtrate medium with artificial fissure.
- Free, easy-to-use software included with each unit. Compact benchtop size easily moved from lab to lab.
- Custom pressure, temperature, and automation solutions available. (Contact Grace Instrument for details.)
- Fully compliant with API Recommended Practice 13B (RP 13B).

Specifications

Dimensions: 27.5" H x 18" W x 21" D
 Temperature Range: Ambient to 500°F (260°C)
 Maximum Working Pressure: 2,000 psi
 Maximum Differential Pressure: 500+ psi (Or Determined By Core Strength)
 Sample Volume: 350 ml
 Maximum Filtrate Volume: 45 ml
 Shear Bob Speed: 0 to 600 rpm
 Voltage: 220-240V AC
 Frequency: 50-60 Hz
 Power: 1,200 W
 Compliance/Standards: Fully Compliant with API Recommended Practice 13B (RP 13B)



U.S. Pat. 9,194,784 and 10,215,001

M2200 HPHT LUBRICITY, DYNAMIC FILTRATION, & DRILLING SIMULATOR

Features

- The M2200's very repetitive COF (coefficient of friction) measurement of ± 0.01 is due to its unique, patented design.
- Innovative designed cooling jacket rapidly cools testing cell to quickly start next test.
- Newly designed cell cap is interchangeable with older cells.
- Innovative designed paddle assembly is durable for extensive testing and easy to maintain.
- Heating jacket can be locked at 30° inclined angle for the easy installation and extraction of test cell.
- Programmable temperature controller increases the cell temperature at desired rate.
- Apparatus is in accordance with API Recommended Practice 10B-2.
- Fully compliant with API 13B.
- No need to transfer hot slurry.
- Includes custom M2200 PC software.

Specifications

Dimensions: 27.5" H x 18" W x 21" D
 Temperature Range: Amb. to 500 °F (260 °C)
 Working Pressure: 2,000 psi
 Max Load (Normal) Force: 600 lb
 Sample Volume: 350 ml
 Max Filtrate Volume: 45 ml
 Shear Bob Speed: 0 to 600 rpm
 Compliance: Fully Compliant with API 13B
 Max Torque: 120 lb./in. (14 N.m)
 Coefficient of Friction (COF) Accuracy: ± 0.01
 (Particle fluids may experience high errors.)

Static Filtration

Static filtration instruments evaluate the static filtration properties of a drilling fluid without the occurrence of cake erosion.



M4050 FILTER PRESS

Features

- Threaded cell and set screw cell available.
- Single and double opening cells available.
- Pressurization method includes CO2 Cartridges, bottled Nitrogen, or an in-house (user provided) source.
- Easy and safe to operate.
- Filter media includes the API standard Filter Paper, Ceramic Discs of several calculated porosities, and various mesh-sized screens.

Specifications

Dimensions: 15.5" height x 6" width x 6" depth
 Weight: 14 lbs
 Max Temperature: 350°F
 Max Pressure: 1,800 psi
 Heater Power: 400 W
 Power Supply: 110/220 VAC, 50Hz or 60 Hz
 Filtering Area: 3.5 in²
 Sample Volume: 175 ml
 Back Pressure Receiver Volume: 15 ml



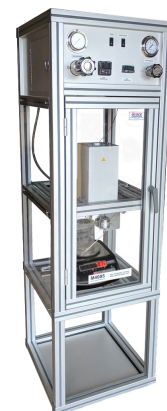
M4090 HPHT FILTER PRESS

Features

- Compatible with the Grace Instrument M4095 Filter Press Threaded Cell.
- Adjustable height – you can lower the heat jacket for easy cell loading and removal.
- It can use a threaded or set screw cell that is single or double-ended. Cell sold separately.
- Safety mechanism enabled for pressurized cells.
- Double opening cells accept various filter media.
- Temperature controller for easy temperature control.
- Regulators and gauges are easy to replace.
- Easy to pressurize by avoiding heavy regulator manifold.
- Able to combine multiple units.

Specifications

Dimensions: 34" height x 15" width x 19" depth
 Weight: 50 lbs
 Cell Size Volume: 175 ml
 Maximum Temperature: 500°F (260°C)
 Maximum Pressure: 1,800 psi
 Maximum Back Pressure: 250 psi (standard) or 750 psi (high pressure option)
 Back Pressure Receiver Volume: 100 ml
 Filtering Area: 3.5 in²
 Pressure Source: Nitrogen
 Power Requirement: 115V / 230 V
 Heater: 800 W



M4085 AUTOMATIC FLUID LOSS APPARATUS

Features

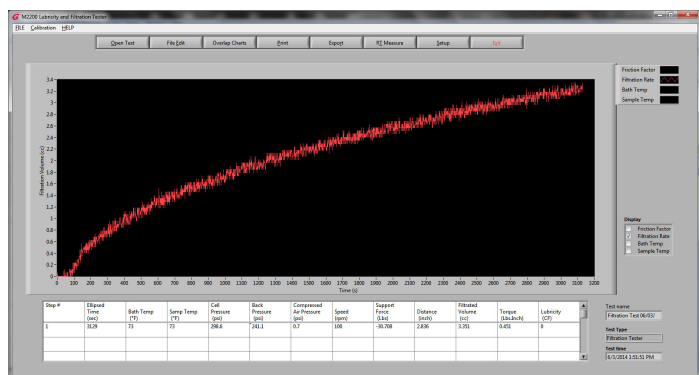
- Automatic Fluid Collection and Filtration
- Digital measurement—digital screen displays cell temperature for easy reference.
- Cell, back pressure regulator, and air actuated valve are made of high-quality Hastelloy wetted parts.
- Nitrogen Pressurization Method / Source
- Filter media is 1" in diameter with a core 1" in length.
- Safe operation—a second thermocouple controls the heating jacket temperature and acts as a safety feature. It shuts off the unit at temperatures above 350°F.
- Pressure regulator and gauge are conveniently located on panel for easy operation.
- Pressure regulator, gauge, and filter are easy to access and replace.
- Cell is easy to load into the unit.
- Transparent glass door allows for a quick and clear view of testing and doubles as safety feature by acting as a splash guard.
- Free M4085 software can perform automatic data recording, configure test sequences to control variables, graph and export results, and automatically open the filtrate valve (also opens manually without software)
- Able to combine multiple units

Specifications

Dimensions: 48" Height x 20" Width x 22" Depth
 Max Temperature: 350°F
 Max Cell Pressure: 2,500 psi
 Max Back Pressure Regulator Pressure: 300 psi
 Cell Volume: 280 ml Maximum
 Pressure Method / Source: Nitrogen
 Band Heater: 1,250W

Dynamic Filtration

Dynamic filtration is a process by which filtered drilling fluid is circulated over the filter cake to simulate build-up of filter cake on a formation.



U.S. Pat. 9,194,784 and 10,215,001

M2200 HPHT LUBRICITY, DYNAMIC FILTRATION, & DRILLING SIMULATOR

Features

- The M2200's very repetitive COF (coefficient of friction) measurement of ± 0.01 is due to its unique, patented design.
- Innovative designed cooling jacket rapidly cools testing cell to quickly start next test.
- Newly designed cell cap is interchangeable with older cells.
- Innovative designed paddle assembly is durable for extensive testing and easy to maintain.
- Heating jacket can be locked at 30° inclined angle for the easy installation and extraction of test cell.
- Programmable temperature controller increases the cell temperature at desired rate.
- Apparatus is in accordance with API Recommended Practice 10B-2.
- Fully compliant with API 13B.
- No need to transfer hot slurry.
- Includes custom M2200 PC software.

Specifications

Dimensions: 27.5" H x 18" W x 21" D
 Temperature Range: Amb. to 500 °F (260 °C)
 Working Pressure: 2,000 psi
 Max Load (Normal) Force: 600 lb
 Sample Volume: 350 ml
 Max Filtrate Volume: 45 ml
 Shear Bob Speed: 0 to 600 rpm
 Compliance: Fully Compliant with API 13B
 Max Differential Pressure: Determined by Core Strength
 Max Penetration Depth: 0.8 in.

Linear Swell Meters

Linear swell meters (LSM) measure the volume or rate of expansion and contraction of a solid core sample and it helps to evaluate issues of shale hydration during oil well drilling operations.



U.S. Pat. 8,434,355 and 8,443,661



Dual Core/Wafer Compactor

M4600 HPHT LINEAR SWELL METER

Features

- Allows core samples to expand in only one direction, making test results extremely repeatable.
- High temperature testing, even through prolonged salinity.
- Supplementary Dual Core/Wafer Compactor available for purchase.
- Quick sample loading and simple test setup.
- Customizable charts and real-time data are displayed during tests.

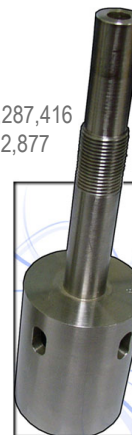
Specifications

Dimensions: 21" height x 20" width x 14" depth
 Weight: 55 lbs.
 Temperature Range: Ambient to 500°F (260°C)
 Pressure Range: Atm. to 2,000 psi
 Pressure Supply: Nitrogen Atm. to 2,000 psi
 Core/Wafer diameter: 1.00 inch
 Core/Wafer length: 0.4 to 1.00 inch
 Maximum linear displacement: ± 0.6 inches
 Linear resolution: 0.1% of full scale range
 Power Supply: 110-120V AC (220-240V AC with Step-Down Transformer, Supplied if Required)
 Frequency: 50-60 Hz
 Power: 600 W
 Computer Requirements: PC with MS Windows 9X/2000/XP/Vista/7/8/10/11

(Supplementary) Dual Core/Wafer Compactor Specifications

Pellet Compacting Force: 10,623 lbs. at 2,000 psi Source Pressure
 Pellet size is 1.0" OD.
 To compact at 10,000 psi on pellet, set compactor gauge pressure to 1,478 psi.
 Included: Complimentary 2,850 psi Hand Pump

U.S. Pat. 7,287,416
 and 7,412,877



M7500 Ultra HPHT Rheometer

M7500 LSM ULTRA HPHT LINEAR SWELL METER

Features

- M7500LSM is an add-on module for M7500 Ultra HPHT Rheometer
- Patented M7500 Ultra HPHT Rheometer is capable of testing fluid viscosity under conditions of temperature and pressure ranging from atmospheric to 30,000 psi and from 20°F (with chiller) to 600°F.
- M7500 add-on modules provide powerful new functionality at a lower cost than competing, stand-alone instruments, while maintaining a single instrument footprint and merging seamlessly with your existing software training.
- More specifications and other information can be found on our M7500 Ultra HPHT Rheometer page.

Specifications

Dimensions: 6 inches tall x 4 inches wide x 2 inches deep
 Temperature Range: Ambient (20°F with chiller) to 600°F (315°C)
 Pressure Range: Atmospheric to 30,000 psi
 Core/Wafer Diameter: 1.00 inch
 Core/Wafer Length: 0.4 to 1.00 inch
 Linear Resolution: 0.1% of full scale range
 Maximum Linear Displacement: ± 0.6 inches

Density (PVT) & Sag Tester

A density (PVT) tester is designed to test liquid or mud density of a drilling fluid under simulated downhole conditions. A sag tester evaluates barite sagging and the settling of particles between the wellbore and casing.



M8500 DYNAMICSAGGING TESTER

Features

- Fully customizable test parameters.
- Automatic pressure & temperature control.
- Automatic data collection.
- Measures fluid resistivity of various lubricants.
- Paddle assembly is durable for extensive testing.
- In accordance with API Recommended Practice 10B-2
- Maximum Speed up to 2,000 rpm.
- Design of cooling jacket allows rapid cooling of test cells, lessening setup time between tests.

Specifications

Max Temperature:	600° F
Max Pressure :	20,000 psi
Speed Range:	0.01 - 600 rpm continuous
Shear Rate:	0.004 to 202 S-1
Borehole Angle:	0 to 80°
Voltage:	120/240 VAC (with transformer)
Frequency:	50 Hz or 60 Hz
Construction:	Stainless Steel
Coolant Supply:	Tap water or chiller
Compressed Air:	120 psi
Dimensions:	30" H x 12.5" W x 25" D
Weight:	278 lbs.



M7500PVT ULTRA HP/HT PYCNOMETER

Features

- Add-on module for M7500 Ultra HPHT Rheometer.
- Tests liquid density changes under simulated downhole conditions, such as those found in deep oil or geothermal wells.
- Also designed to test solid samples such as cements and core samples.
- Able to test within environments up to 30,000 psi and 600° F.
- Module includes two pistons- one large and one small.
- More specifications and other information can be found on our M7500 Ultra HPHT Rheometer page.

Specifications

Max Temperature:	500° F
Max Pressure:	30,000 psi
Sample Size:	Small piston: 185 to 193 ml Large piston: 120 to 170 ml
Resolution:	0.5% of initial density
Density Range:	71% to 142%
Compressibility Range:	150 rpm
Compliance:	API Spec 10A/ISO 10426-1

Formation Damage

Formation damage instruments evaluate damage to a formation resulting from exposure to drilling fluids and provide quantifiable solutions for remediation.



M9100 HPHT AUTOMATIC CORE FLOW TESTER

Features

- Optional automatic gas porosity and permeability measurement
- Optional automatic core loading
- Optional heating band or convection oven temperature control
- Optional fluid pre-heating prior to contact with the core sample
- Optional slim tube system
- Optional resistivity & ultrasonic measurement
- Includes pressure relief devices such as rupture discs and pressure relief valves
- PC software prevents user from setting temperature above 410°F
- Oven itself has heater cut off safety

Specifications

Dimensions: Customizable (depending on client's desired specifications)
 Weight: Customizable (depending on client's desired specifications)
 Core Dimensions: 1-1.5" diameter by 6-24" length
 Operating Temperature: Amb. to 350°F (or 392°F)
 Confining Pressure: Atm to 15,000 psi
 Working Pressure: Atm to 10,000 psi
 Back Pressure: Atm to 10,000 psi
 Accumulator: 1L sample capacity
 Fluid Injection Rate: 0 to 80 ml/min (depending on pump type)
 Voltage: 220 VAC±10% or three-phase AC 380 VAC±10%, 50Hz



M9200 HPHT FOAM LOOP RHEOMETER

Features

- Single or dual gas (CO2 and/or N2) foam testing capability.
- Continuous foam circulation ensures uniform foam properties.
- Constant foam circulation and shear.
- HPHT viewing cell allows testing of acid samples and ensures safe operation.
- Visual determination of foam half life and digital measurement of bubble size and distribution.
- Integrated heating trace ensures that all lines are subjected to a uniform temperature.
- Accumulator for testing high viscosity and/or corrosive samples.
- Viewing cell images can be digitized and processed digitally.
- Designed to handle fluids and gases at temperatures up to 350°F, under a working pressure up to 5,000 psi.

Specifications

Dimensions: Custom (depending on client's desired specifications)
 Weight: Custom (depending on client's desired specifications)
 Operating Temperature: Amb. to 350°F (or 392°F)
 Working Pressure: Atm to 5,000 psi
 Shear Rate: 0 to 1,500 S⁻¹
 Sample Volume: 115 ml
 Accumulator: 500 ml capacity, 6,000 psi
 Viewing Cell: Stereo microscope; Sapphire window
 Dual Gas: CO2 or N2 gas injection for foam creation
 PC (Included): Desktop PC with MS Windows 11, M9200 PC software preinstalled.



M9300 HPHT FOAM LOOP & CORE FLOW TESTER

Features

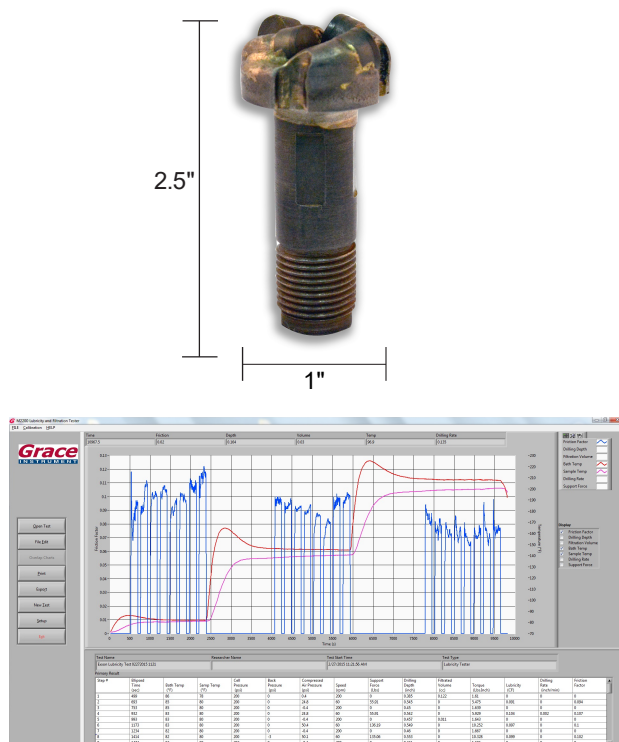
- Combines operation of a foam loop system with a formation damage evaluation system.
- Foam generation & foam loop system can be used for foam creation, rheology and quality evaluation.
- Formation damage (core flow) system can be used for core fluid treatments and permeability analysis.
- Can be built to custom specifications.

Specifications

Temperature Range: Amb. to 350°F (or 392°F)
 Operating Pressure: Atm. to 5,000 psi
 Flow Rate Range: 0 to 375 ml/min
 Shear Rate: 0 to 1,500 S⁻¹
 Microscope Magnification: 11x to 144x
 Viewing Window: Quartz
 Rheology Characterization: API Standard Rheological and Shear History
 Foam Density: 0.3 to 1.0 g/cm³ controllable
 Half-life of Foam: 0 to 72 hr
 Diameter of Visible Foam Bubble: ≥ 1 µm

Drilling Simulator

To help improve, optimize, and offset the cost of expensive drilling well operations, our drilling simulator uses a realistic wellbore chamber to test the penetration rate of actual core samples.



M2200 HPHT LUBRICITY, DYNAMIC FILTRATION, & DRILLING SIMULATOR

Features

- The M2200's very repetitive COF (coefficient of friction) measurement of ± 0.01 is due to its unique, patented design.
- Innovative designed cooling jacket rapidly cools testing cell to quickly start next test.
- Newly designed cell cap is interchangeable with older cells.
- Innovative designed paddle assembly is durable for extensive testing and easy to maintain.
- Heating jacket can be locked at 30° inclined angle for the easy installation and extraction of test cell.
- Programmable temperature controller increases the cell temperature at desired rate.
- Apparatus is in accordance with API Recommended Practice 10B-2.
- Fully compliant with API 13B.
- No need to transfer hot slurry.
- Includes custom M2200 PC software.

Specifications

Dimensions: 27.5" H x 18" W x 21" D
 Temperature Range: Amb. to 500 °F (260 °C)
 Working Pressure: 2,000 psi
 Max Load (Normal) Force: 600 lb
 Sample Volume: 350 ml
 Max Filtrate Volume: 45 ml
 Shear Bob Speed: 0 to 600 rpm
 Compliance: Fully Compliant with API 13B
 Max Differential Pressure: 500+ psi (Or Determined by Core Strength)
 Max Torque: 120 lb./in. (14 N.m)
 True measurement of rate of penetration (ROP).

Rheology & Viscosity

Rheology is a specific study of fluids that helps determine the flow properties of a fluid and deformation of matter. Viscometers and rheometers measure viscosity and/or the rheological properties of fluids.



M3400 DIAL-READING VISCOMETER

Features

- The unit features a control pad, dial reading, and can shift speeds with one button press.
- Able to perform automatic 10-minute or 10-second gel strength measurement of drilling muds, oil well cements, and fracturing fluids with alarm sound.
- Includes B1 bob, R1 rotor sleeve, and F1 torsion spring.
- Complies with API 10 and 13 standards.
- The unit is dual voltage.

Specifications

Sample Size: 35-220 mL (Depending on bob size, cup, and sleeve type.)
 Testing Sample Temperature Range: 32°F to 200°F (93°C) (With Optional Heater Cup)
 Pressure Range: Atmospheric
 Viscosity Range: 0.5 to 10,000,000 cP
 Shear Stress Range: 1.02 to 61,200 dyne/cm² (Up to 3,500 dyne/cm² with standard R1B1 bob configuration. Up to 61,200 dyne/cm² with other optional bob options.)
 Resolution: 1 dyne/cm² to 10 dyne/cm² (Based on spring selection. Standard spring is 5 dyne/cm². 2 spring is 1 dyne/cm².)
 Available Springs: F0.2, F0.5, F1, F2, and/or F5
 Speed Range: 600, 300, 200, 100, 60, 30, 6, 3, 0.1 rpm
 Shear Rate Range: 0.17 - 1020 sec⁻¹ (With Standard R1B1 Geometries)
 Accuracy: ±0.5% of Torque Span
 Standards: API 10 & API 13 Compliant
 Sounds: Auto Beep for 10 Sec Gel and 10 Min Gel
 Dimensions: 16.5" H x 5" W x 8" D
 Weight: 10 lbs. (Standard)



U.S. Pat. 6,571,609

M3600 AUTOMATIC RHEOMETER

Features

- Sturdy, portable, and compact.
- Can create test sequences and record test data without use of external equipment.
- Exports test data in a spreadsheet format.
- Includes LCD display with automatic keypad control.
- Allows test flexibility.
- Stores test data.
- Low maintenance with repeatable results.
- All wetted materials are Hastelloy C276 construction.
- Chiller cup is made from stainless steel and can be purchased separately.
- Carrying case can hold the M3600 Rheometer with an attached rotor sleeve. It also has slots for a dust shield, three bobs (B1, B2, and B5), a heater cup, and other items can fit in an extra slot or between the M3600's legs.

Specifications

Sample Size: 35-500 mL (Depending on Bob/Cup/Sleeve Size and Type)
 Temperature Range: Ambient (20°F with Chiller) to 212°F (100°C)
 Pressure Range: Atmospheric
 Viscosity Range: 0.1 to 100,000,000 cP
 Shear Stress Range: .02 to 3,500 dyne/cm²
 Resolution: 1 dyne/cm²
 Speed Range: 0.01 to 600 rpm Continuous
 Shear Rate Range: 0.0038 to 1021 sec⁻¹
 Accuracy: ±0.5% Torque Span or Better
 Standards: API 10 & API 13 Compliant
 Torque: 7 µN.m to 14 mN.m
 Dimensions: 16" Height x 5" Width x 8" Depth
 Weight: 13 lbs. (Standard) or 13 lbs. (Acid Option) (rheometer with standard setup and heater cup)



U.S. Pat. 6,571,609

M3600 ACID RHEOMETER

Features

- Allows the user to test samples with high acid concentrations, including fluids with 30% HCl.
- Sturdy, portable, and compact.
- Can create test sequences and record test data without use of external equipment.
- Exports test data in a spreadsheet format.
- Includes LCD display with automatic keypad control.
- Allows test flexibility.
- Stores test data.
- Low maintenance with repeatable results.
- All wetted materials are Hastelloy C276 construction.
- Chiller cup is made from stainless steel and can be purchased separately.
- Carrying case can hold the M3600 Rheometer with an attached rotor sleeve. It also has slots for a dust shield, three bobs (B1, B2, and B5), a heater cup, and other items can fit in an extra slot or between the M3600's legs.

Specifications

Same specifications as the M3600.



U.S. Pat. 8,850,874

M3900 IN-LINE VISCOMETER

Features

- Compliant with API 13 and API 39.
- Viscosity measurement unaffected by fluid flow.
- Computer-controlled speed, viscosity measurement, and calibration.
- Multiple data export formats.
- Easy to operate and calibrate.
- Unique and durable design with fast cleaning and simple maintenance.

Specifications

Viscosity Range: 5 cP to 1,000 cP
 Pressure Range: Atmospheric to 1,000 psi
 Speed Range: 3 to 600 rpm (Continuous)
 Output: RS-232 or RS-485 Modbus (0 to 10V DC Analog Optional)
 Voltage: Varies per unit. Either 110-120V AC or 220V-240V AC (not both).
 Frequency: 50-60 Hz
 Power: 500 W



U.S. Pat. 6,938,464; 6,951,127; and 9,157,846

M5600 HPHT RHEOMETER

Features

- Allows the user to test samples with high acid concentrations, including fluids with 30% HCl
- Oil or dry heat option (oil bath shown, above)
- Fast test cycle: Setup-load-test-clean
- Safety feature of temperature controller will stop heating if it sees temperature is above 520°F.
- Over pressure relief valve
- Repeatable results with Test flexibility
- Includes M5600 PC™ software, which connects the M5600 with a Windows®-based PC
- Tests are simple to set up and run
- Customizable charts and real-time data are displayed during tests
- Saved tests can be searched by any specified test parameter: test name, fluid ID, additive, researcher name, or more
- Also Available: M5600 HPHT Rheometer Carrying Case; case includes an extendable handle and wheels for easy transportation
- Each M5600 unit has multiple thermocouples, dedicated thermostat for overheating shutoff, special relief valves, integrated N2 regulator, all internal tubing rating for 10ksi, and pre-programmed shutoff points within M5600 software.
- The new carbon bath is much cleaner than older oil bath and allows for heating at 2x rate.

Specifications

Pressure Range: Atm to 2,000 psi
 Sample Size: 32 to 78 ml
 Resolution: 0.01% of full scale range or better
 Temperature Range: Ambient (20 °F with Chilling Device) to 500 °F
 Speed Range: 0.0001 to 1,100 rpm continuous
 Frequency Range: 0.01 to 5 Hz (Optimized at 0.2 to 3 Hz)
 Amplitude Range: 0.1% to 500 % (Optimized at 0.2% to 500%)
 Shear Rate Range: 0.00004 to 1870 sec-1
 Shear Stress Range: 1 to 15,000 dyn/cm2
 Viscosity Range: 0.5 to 5,000,000 Centipoise
 Torque: 14 µN.m to 100 mN.m
 Repeatability: ±0.05% of full scale range or better
 Construction: Hastelloy C Wetted Material



U.S. Pat. 7,287,416
 and 7,412,877

M7500 ULTRA HPHT RHEOMETER

Features

- The M7500 is built with a thick-walled steel pressure cell, which is surrounded by a fail-safe steel containment vessel to ensure operator safety.
- It is designed for easy test set up, sample loading and post-test cleaning.
- Cool-down after tests can be accomplished more quickly by connecting a tap water supply or a chiller into the M7500 cooling fluid loop.
- Innovative patented design prevents contamination of test sample with pressurization fluid.
- Recently patented design eliminates the need for fragile and expensive "V" jewel bearings.
- A computer-controlled, magnetically-coupled stirrer agitates the sample during testing
- Provides users with sturdy unit, safe operation, and low maintenance
- Engineered for safe testing with extreme pressure and temperature settings
- Offers repeatable results and test flexibility
- Unit includes an LCD screen and PC interface
- Instrument does not compromise sample integrity
- Fully digital and automatic

Specifications

Dimensions: 22" height x 12" width x 24" depth (Tower)
 12" height x 25" width x 15.5" depth (Cab)
 Weight: 250 lbs.
 Construction: Stainless Steel
 Sample Size: 132 ml
 Temperature Range: Ambient (32°F w/ standard chiller) to 600°F (lower temperatures available).
 Speed Range: 0.01 to 600 rpm continuous
 Viscosity: 0.5 to 5,000,000 Centipoise
 Torque: 7µN.m to 10 mN.m
 Pressure Range: Atm. to 30,000 psi
 Shear Rate: 0.0082 to 1020 S-1
 Shear Stress: 2 to 10,000 dyn/cm2
 Repeatability: ±1% of full scale range or better
 Resolution: 0.3% of full scale range or better
 Voltage: 120 VAC or 240 VAC (with transformer)
 Coolant Supply: Tap water or chiller
 Compressed Air: 120 psi
 Compliance Standards: Fully compliant with API 10B and API 13B

OIL WELL CEMENT TESTING INSTRUMENTS

SHOP FOR TIME-SAVING SOLUTIONS

Choose instruments that **value your time**

Cementing instruments play an important role before drilling operations even begin. By determining the physical properties of cement slurries, cementing crews can use better techniques to pump cement and remediate wells for repair.

Cement Prep & Fluid Loss Testing

Mixers or blenders are used to prepare cement slurries and/or gels for stimulation testing. Fluid loss testers determine the fluid loss characteristics of oil well cement.



M3080 VARIABLE SPEED MIXER

Features

- Durable stainless steel mixing blades
- 1 L stainless steel mixing container that can withstand abrasive action
- 2 preset (and customizable) mixing speeds
- Variable speeds
- Complies with all API standards
- Microprocessor controlled speeds allow operator to set customized speed acceleration rate
- User-friendly LCD display of rpm and time
- Rotational speed is maintained at set point with microprocessor
- Timing relays automatically control mixing at the required rpm
- No variation in thickening time tests due to changes in shear rate
- Operator can quickly select API speeds while adding cement to mixer

Specifications

Dimensions: 26"H x 16"W x 11"D
 Weight: 35 lbs
 Container Material: Stainless Steel
 2 Constant Speed Ranges: Preset to 4,000 rpm & 12,000 rpm (can be modified by user)
 RPM Range: 1,000 rpm (Minimum) to 25,000 rpm (Maximum)
 Sample Volume: 750 mL
 Voltage: 115VAC or 220VAC (can be operated with 1.25 KVA power supply)
 Frequency: 50 Hz or 60 Hz
 Power: 800 W



M7150 STIRRED FLUID LOSS TESTER

Features

- Innovative designed cooling jacket rapidly cools testing cell to quickly start next test.
- New designed cell cap is interchangeable with older cells.
- Innovative designed paddle assembly is durable for extensive testing and easy to maintain.
- Heating jacket can be locked at 30° inclined angle for the easy installation and extraction of test cell.
- Programmable temperature controller increases the cell temperature at desired rate.
- Apparatus is in accordance with API Recommended Practice 10B-2.
- No need to transfer hot slurry.

Specifications

Dimensions: 27" Height x 22" Width x 18" Depth
 Max Temperature: 400 °F (204°C)
 Max Pressure: 2,000 psi (13.8 Mpa)
 Heater Power: 800 W
 Power Supply: Available with 120V or 240 V, 50Hz or 60 Hz
 Nitrogen Supply: 2000 psi - 2500 psi (13.8 Mpa - 17.2 Mpa)
 Cooling Water Supply: 40 psi
 Slurry Cup Volume: 500 ml
 Includes: Digital Temperature Controller with 1.0° resolution
 Specification Standards: Conforms to API Recommended Practice 10B-2

Ultrasonic Cement Analyzer (UCA)

An Ultrasonic Cement Analyzer (UCA) uses ultrasonic measurements to perform compressive, non-destructive strength tests on cement slurry under controlled conditions of temperature and pressure.



M7350 UCA

Features

- Continuous measurement of cement sample under temperature and pressure conditions.
- Pressure and temperature automatically monitored and regulated.
- Easy-to-use, compact, and lightweight pressure vessel withstands up to 10,000 psi.
- No sample contamination by pressurization media.
- FREE advanced software is Windows-compatible.
- Touchscreen controls enhance ease-of-use.
- Test sequences amendable during tests.
- Comprehensive data searches and management.
- Control up to 8 units from 1 PC.
- Reliable overtemperature, overpressure, consistency, and time protection.
- Easy to clean and maintain.
- Compatible with the M7355 Volumetric Cement Expansion / Shrinkage Device.

Specifications

Temperature Range: Ambient to 400°F (204°C)
 Pressure Range: Atmospheric to 10,000 psi
 Operating Temperature: 32-105°F (0 to ~41°C)
 Compressed Air Pressure Range: 50-100 psi
 Chiller/Cooling Water Pressure Range: 5-80 psi
 Utility Inlets: 1/4-Inch Female NPT



M7355 Volumetric Cement Expansion / Shrinkage Device



M7360 HPHT UCA

Features

- Continuous measurement of cement sample under conditions of temperature and pressure.
- No sample contamination by pressurization media.
- Test sequences can be amended during tests.
- Pressure and temperature are monitored and regulated automatically.
- Easy-to-use, lightweight pressure vessel capable of up to 20,000 psi.
- Compatible with the M7355 Volumetric Cement Expansion / Shrinkage Device.

Specifications

Temperature Range: Amb. to 400°F (204°C)
 Pressure Range: Atmospheric to 20,000 psi
 Compressed Air: 50-100 psi
 Chiller/Cooling Water: 5-80 psi
 Utility Inlets: 1/4-Inch Female NPT

Features

- Attaches to M7350 UCA or M7360 HPHT UCA units during testing to measure volumetric expansion and shrinkage and compressive strength of cement samples.
- Accessory device can connect to multiple UCA units.
- Reports real-time testing data that can be exported to Microsoft Excel®.
- Capable of continuous measurement under HPHT conditions.
- FREE advanced Grace Instrument M7355 Software can set pressure and temperature sequences.



M7370 TWIN CELL UCA

Features

- Twin cell design that can run independent tests.
- Pressure and temperature are monitored and regulated automatically.
- Completely automatic pressure control-regulator adjustment not required.
- User-friendly, touchscreen display.
- Continuous measurement of cement sample under conditions of temperature and pressure.
- No sample contamination by pressurization media.
- Test sequences can be amended during tests.
- Easy-to-use, lightweight pressure vessel capable of up to 10,000 psi.
- Unit and chambers are easy to clean up and maintain.
- Analysis software runs on Microsoft Windows.

Specifications

Temperature Range: Ambient to 400°F (204°C)
 Pressure Range: Atmospheric to 10,000 psi
 Coolant Supply: Tap Water or Chiller
 Chiller/Cooling Water Pressure: 5-80 psi
 Compressed Air Pressure: 60-100 psi
 Utility Inlets: 1/4-Inch Female NPT

Specifications

Maximum Pressure: 20,000 psi
 Maximum Measurement: ± 30 ml
 Pressure Control: ± 25 psi
 Water Supply: Tap Water
 Power Supply: 120V, 50/60 Hz
 Dimensions: 19" W x 24" D x 47" H
 Weight: 95 lb

SGS / Consistometer

Static gel strength (SGS) consistometers test cement slurry under elevated temperatures and pressures to determine the static gel strength of an oil well cement.



U.S. Pat. 7,412,877

M7540 HPHT CONSISTOMETER/SGS TESTER

Features

- Measures slurry consistency, thickening time, and static gel strength all in one test while the slurry is subjected to simulated downhole conditions.
- Unique patented design that prevents mixing of pressurization fluid with test sample. Ball bearings support the inside of the rotating paddle, substantially reducing friction measurement errors and maximizing the accuracy and sensitivity of the instrument.
- Prevents pressurization fluid/hydraulic fluid from contaminating cement after stirring.
- Paddle dimensions and cell comply with API 10B.
- Included software is compatible with Windows and can control up to 8 units.
- Computer-controlled, automatic 6-channel data logging with easy export.
- Compares current test data with historical data.
- Designed for maximum accuracy and safety.
- Constant temperature control system. Automatic PC-controlled temperature and pressure.

Specifications

Temperature Range: Up to 400°F (optional 450°F)
 Pressure Range: Up to 20,000 psi
 Max Rated Torque: 0.637 N•m = 5.63 lb/in
 Torque Resolution: 9.72e-6 N•m = 8.6e-5 lb/in
 SGS Measurement Range: 10 lb/100ft² to 1800 lb/100ft² (standard; higher ranges available)
 Sample Volume: Up to 530 ml
 Paddle: API Consistometer Paddle or SGS Paddle
 Calibration: By Weight per API Standards
 Slurry Cup Rotation: 0-250 rpm
 Static Gel Speed: 0.2 deg/min.
 Thickening Time Range: 0-100 Bearden Units (Bc)
 Compliances: API Spec 10A & 10B, ISO 10426-1



M7550 ULTRA HPHT CONSISTOMETER/SGS TESTER

Features

- A top magnetic drive with standard Fann Macs II style paddle and operations
- An additional bottom magnet drive to perform standard consistometer operations
- Automatically conditions slurry
- Computer-controlled data logging
- Control panel optimized for ease of use
- Constant temperature control system
- Over temperature/pressure protection installed
- Designed for maximum accuracy and operator safety
- Comparison of current test data with historical test data
- Data analysis software compatible with MS Windows
- Automatic control from PC

Specifications

Dimensions: 64" height x 34" width x 33" depth
 Weight: 650 lbs.
 Temperature Range: Up to 600°F (315°C)
 Pressure Range: Up to 30,000 psi
 Slurry Cup Rotation: 0 - 250 rpm
 Static Gel Speed: 0.2 deg/min
 Pressure Medium: White Mineral Oil
 Power Supply: 240 V, 50/60 Hz
 Heater Power: 4,000 W
 Compliance: API Spec 10 and ISO 10426-2



U.S. Pat. 10,845,285; 11,300,557; 11,378,568

M7600 COMPREHENSIVE CEMENT ANALYZER

Features

- Simulates downhole cementing conditions to study gas flow across a cement sample and measures cement volume.
- Unit offers Static Gel Strength (SGS) testing.
- Capable of Ultrasonic Cement Analysis (UCA) to measure transit time and compressive strength of cement samples.
- Pressurized using N₂ and includes pressure safety control.
- Data acquisition system included—FREE Grace M7600 PC Software.
- Temperature control can be user programmed.
- Real-time test data can be saved and exported as a .csv file.

Specifications

Standard: API RP 10B-2
 Max Temperature: 400°F
 Max Pressure: 5,000 psi
 Measurement Resolution: 0.25 psi
 Measurement Accuracy: 0.2% of full scale (±2 psi)
 Pressure Control Accuracy: ± 10 – 20 psi (Approx.)
 Water Inlet: 20 – 160 psig
 Air Supply Inlet: 20 – 100 psig
 Nitrogen Gas Inlet: 3,000 psig (Maximum)
 Accumulator Cell Volume: 100 ml
 Sample Cell Volume: 417 ml
 Power Supply: 120/240V at 50/60 Hz
 Crated Weight: 350 lb

Consistometer

Consistometers are used to determine thickening time, or the length of time cement slurry is capable of being pumped within a well, under simulated downhole conditions of elevated pressure and temperature.



M7200 ATMOSPHERIC CONSISTOMETER

Features

- Reliable overtemperature protection.
- Easy-to-use PID temperature controller.
- Efficient operation with dual rotating cups.
- Stainless-steel bath.
- Time saver—fast cooling with cooling coil.
- API compliant instrument design.

Specifications

Maximum Pressure: Atmospheric
Maximum Temperature: Up to 200°F
Consistency Range: 0-100 Bearden Units
Slurry Cup Rotation: 150 rpm
Heater Power: 1,500 W
Voltage: 220-240V AC
Power: 1,500 W
Frequency: 50/60 Hz
Compliances: API Spec 10A / ISO 10426-1
Dimensions: 25" H x 15" W x 18" D
Weight: 63 lbs.



M7210 DIGITAL ATMOSPHERIC CONSISTOMETER

Features

- Reliable overtemperature protection.
- Easy-to-use PID temperature controller.
- Efficient operation with dual rotating cups.
- Stainless-steel bath.
- Time saver—fast cooling with cooling coil.
- API-compliant instrument design.

Specifications

Maximum Pressure: Atmospheric
Maximum Temperature: Up to 200°F
Heater Power: 1,500 W
Voltage: 220-240V AC
Frequency: 50/60 Hz
Power: 1,500 W
Slurry Cup Rotation: 150 rpm
Compliances: API Spec 10A / ISO 10426-1
Dimensions: 25" H x 15" W x 18" D
Weight: 63 lbs.



M7250 HPHT CONSISTOMETER

Features

- Standalone operation with ergonomic design.
- User-friendly, touchscreen display.
- Reliable overheating and overpressure protection.
- Easy to use PID temperature controller.
- Stainless-steel bath.
- Time saver—fast cooling with cooling coil.
- API compliant design.

Specifications

Max Pressure: 25,000 psi
Temperature Range: Ambient to 400°F
Thickening Time Range: 0 - 100 Bc (Bearden Units)
Pressure Medium: White Mineral Oil
Heater Power: 3,000 W
Voltage Requirements: 240V AC
Frequency Requirements: 50/60 Hz
Slurry Cup Rotation: 150 rpm
Compliances: API Spec 10A / ISO 10426-1
Dimensions: 26" W x 26" D x 70" H
Weight: 500 lbs.

Consistometer Series

**M7260 Ultra HPHT Consistometer****Features**

- Automatically conditions slurry under at desired temperature and pressure.
- Computer-controlled data logging.
- Control panel optimized for ease of use.
- Constant temperature control system.
- Designed for maximum accuracy and operator safety.
- Innovative data analysis algorithms.
- Comparison of current test data with historical test data.

Specifications

Max Temperature:	600°F
Max Pressure:	40,000 psi
Slurry Cup Rotation:	150 rpm
Heater:	4,000 W
Power Supply:	240V AC, 50/60 Hz
Thickening	0 - 100 Bc
Time Range:	(Bearden units)
Compliance:	API Spec 10A/ ISO 10426-1
Pressure Medium:	White mineral oil
Dimensions:	65"H x 33"W x 31"D

**M7270 HPHT Dual Cell Consistometer****Features**

- Conditions cement slurry under elevated temperature and atmospheric pressure.
- Performs two independent tests simultaneously.
- Custom PC software included with each unit allows the user to construct test sequences, run tests, and interpret test results quickly and efficiently.
- Control panel optimized for ease of use.
- Constant temperature control system.
- Designed for maximum accuracy and operator safety.
- Innovative data analysis algorithms.

Specifications

Max Temperature:	400°F
Max Pressure:	25,000 psi
Slurry Cup Rotation:	150 rpm
Heater:	6,000 W
Power Supply:	240V AC, 50/60 Hz
Thickening	0 - 100 Bc
Time Range:	(Bearden units)
Compliance:	API Spec 10A/ ISO 10426-1
Pressure Medium:	White mineral oil
Dimensions:	65"H x 50"W x 31"D

**M7280 Ultra HPHT Dual Cell Consistometer****Features**

- Automatically conditions cement slurry under elevated temperature of 600° F and pressure up to 40,000 psi.
- Performs two independent tests simultaneously at max pressure.
- Computer-controlled data logging.
- Control panel optimized for ease of use.
- Constant temperature control system.
- Designed for maximum accuracy and operator safety.
- Innovative data analysis algorithms.
- Comparison of current test data with historical test data.
- PC software capable of controlling up to 8 units.

Specifications

Max Temperature:	600°F
Max Pressure:	40,000 psi
Slurry Cup Rotation:	150 rpm
Heater:	8,000 W
Power Supply:	240V AC, 50/60 Hz
Thickening	0 - 100 Bc
Time Range:	(Bearden units)
Compliance:	API Spec 10A/ ISO 10426-1
Pressure Medium:	White mineral oil
Dimensions:	65"H x 50"W x 31"D

M1510 CEMENT SETTLING/STABILITY TESTING TUBE KIT**Features**

- Comprehensive, advanced testing tool accurately simulates and measures settling to determine slurry stability in real-world cementing applications.
- Results allow users to engineer cementing solutions that optimize well integrity.
- Withstands high-temperature testing.
- **API Recommended Practice 10B-2 (RP 10B-2)** compliant.

Specifications

Max Curing Temperature:	400°F (204°C)
Dimensions:	2" Dia. x 8¾" H

**M1520 HIGH-TEMPERATURE ANNULUS CEMENT EXPANSION AND SHRINKAGE MEASURING/TESTING KIT****Features**

- Comprehensive kit simulates and measures cement slurry volume expansion and shrinkage.
- Can be used to determine slurry volume change in real-world cementing applications.
- **API Recommended Practice 10B-5 (RP 10B-5)** compliant.

Specifications

Max Curing Temperature:	400°F (204°C)
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Cement Rheology

Cement rheometers and viscometers determine flow and viscous properties of cement.



M3400 DIAL-READING VISCOMETER

Features

- The unit features a control pad, dial reading, and can shift speeds with one button press.
- Able to perform automatic 10-minute or 10-second gel strength measurement of drilling muds, oil well cements, and fracturing fluids with alarm sound.
- Includes B1 bob, R1 rotor sleeve, and F1 torsion spring.
- Complies with API 10 and 13 standards.
- The unit is dual voltage.

Specifications

Sample Size: 35-220 mL (Depending on bob size, cup, and sleeve type.)
 Testing Sample Temperature Range: 32°F to 200°F (With Optional Heater Cup)
 Pressure Range: Atmospheric
 Viscosity Range: 0.5 to 10,000,000 cP
 Shear Stress Range: 1.02 to 61,200 dyne/cm² (Up to 3,500 dyne/cm² with standard R1B1 bob configuration. Up to 61,200 dyne/cm² with other optional bob options.)
 Resolution: 1 dyne/cm² to 10 dyne/cm² (Based on spring selection. Standard spring is 5 dyne/cm². 2 spring is 1 dyne/cm².)
 Available Springs: F0.2, F0.5, F1, F2, and/or F5
 Speed Range: 600, 300, 200, 100, 60, 30, 6, 3, 0.1 rpm
 Shear Rate Range: 0.17 - 1020 sec⁻¹ (With Standard R1B1 Geometries)
 Accuracy: ±0.5% of Torque Span
 Standards: API 10 & API 13 Compliant
 Sounds: Auto Beep for 10 Sec Gel and 10 Min Gel
 Dimensions: 16.5" H x 5" W x 8" D
 Weight: 10 lbs. (Standard)



U.S. Pat. 6,571,609

M3600 AUTOMATIC RHEOMETER

Features

- Sturdy, portable, and compact.
- Can create test sequences and record test data without use of external equipment.
- Exports test data in a spreadsheet format.
- Includes LCD display with automatic keypad control.
- Allows test flexibility.
- Stores test data.
- Low maintenance with repeatable results.
- All wetted materials are Hastelloy C276 construction.
- Chiller cup is made from stainless steel and can be purchased separately.
- Carrying case can hold the M3600 Rheometer with an attached rotor sleeve. It also has slots for a dust shield, three bobs (B1, B2, and B5), a heater cup, and other items can fit in an extra slot or between the M3600's legs.

Specifications

Sample Size: 35-500 mL (Depending on Bob/Cup/Sleeve Size and Type)
 Temperature Range: Ambient (20°F with Chiller) to 212°F
 Pressure Range: Atmospheric
 Viscosity Range: 0.1 to 100,000,000 cP
 Shear Stress Range: .02 to 3,500 dyne/cm²
 Resolution: 1 dyne/cm²
 Speed Range: 0.01 to 600 rpm Continuous
 Shear Rate Range: 0.0038 to 1021 sec⁻¹
 Accuracy: ±0.5% Torque Span or Better
 Standards: API 10 & API 13 Compliant
 Torque: 7 µN.m to 14 mN.m
 Dimensions: 16" Height x 5" Width x 8" Depth
 Weight: 13 lbs. (Standard) or 13 lbs. (Acid Option) (rheometer with standard setup and heater cup)



U.S. Pat. 6,571,609

M3600 ACID RHEOMETER

Features

- Allows the user to test samples with high acid concentrations, including fluids with 30% HCl.
- Sturdy, portable, and compact.
- Can create test sequences and record test data without use of external equipment.
- Exports test data in a spreadsheet format.
- Includes LCD display with automatic keypad control.
- Allows test flexibility.
- Stores test data.
- Low maintenance with repeatable results.
- All wetted materials are Hastelloy C276 construction.
- Chiller cup is made from stainless steel and can be purchased separately.
- Carrying case can hold the M3600 Rheometer with an attached rotor sleeve. It also has slots for a dust shield, three bobs (B1, B2, and B5), a heater cup, and other items can fit in an extra slot or between the M3600's legs.

Specifications

Same specifications as the M3600.



U.S. Pat. 8,850,874

M3900 IN-LINE VISCOMETER

Features

- Compliant with API 13 and API 39.
- Viscosity measurement unaffected by fluid flow.
- Computer-controlled speed, viscosity measurement, and calibration.
- Multiple data export formats.
- Easy to operate and calibrate.
- Unique and durable design with fast cleaning and simple maintenance.

Specifications

Viscosity Range: 5 cP to 1,000 cP
 Pressure Range: Atmospheric to 1,000 psi
 Speed Range: 3 to 600 rpm (Continuous)
 Output: RS-232 or RS-485 Modbus (0 to 10V DC Analog Optional)
 Voltage: Varies per unit. Either 110-120V AC or 220V-240V AC (not both).
 Frequency: 50-60 Hz
 Power: 500 W



U.S. Pat. 8,375,771



M7500 Ultra HPHT Rheometer

M7500 ULTRA HPHT CEMENT RHEOMETER

Features

- M7500 Cement Module prevents damage to the test cell even after a cement sample has cured and solidified inside.
- The cement sample can be easily removed after testing due to the uniquely patented design.
- M7500 HPHT Cement Rheometer is an add-on module for M7500 Ultra HPHT Rheometer
- Patented M7500 Ultra HPHT Rheometer is capable of testing fluid viscosity under conditions of temperature and pressure ranging from atmospheric to 30,000 psi and from 20°F (with chiller) to 600°F.
- M7500 add-on modules provide powerful new functionality at a lower cost than competing, stand-alone instruments, while maintaining a single instrument footprint and merging seamlessly with your existing software training.
- More specifications and other information can be found on our M7500 Ultra HPHT Rheometer page.

Specifications

Dimensions: 22" Height x 12" Width x 24" Depth (Tower) or 12" Height x 25" Width x 15.5" Depth (Cab)
 Weight: 250 lbs
 Construction: Stainless Steel
 Temperature Range: Ambient (20° with chiller) to 600°F (315°C)
 Pressure Range: Atm to 30,000 psi
 Speed Range: 0.01 to 600 rpm continuous
 Viscosity: 0.5 to 5,000,000 cP
 Voltage: 120 VAC or 240 VAC (with transformer)
 Coolant Supply: Tap water or chiller
 Compressed air: 120 psi



U.S. Pat. 8,813,542;
 7,412,877; and
 7,287,416



M7800 Ultra HPHT Rheometer

M7800 ULTRA HPHT HEMATITE RHEOMETER

Features

- Intended for use in rheological testing of magnetically-sensitive fluids such as those containing hematite.
- Configured to keep magnets completely separated from the testing fluid. This helps ensure that test results are free of magnetically-induced errors.
- Pressurizes the pressure chamber up to 40,000 psi, giving the researcher a pressure environment range greater than any competing instrument, while providing easy operation and simple maintenance.
- Built with a thick-walled pressure cell, which is surrounded by a fail-safe steel containment vessel to ensure operator safety.

Specifications

Dimensions: 22" height x 12" width x 24" depth (tower) or 12" height x 25" width x 15.5" depth (cab)
 Weight: 280 lbs.
 Construction: Stainless Steel
 Temperature Range: Ambient (20°F with chiller) to 600°F (315°C)
 Pressure Range: Atm to 40,000 psi
 Speed Range: 0.01 - 600 rpm continuous
 Viscosity: 0.5 to 5,000,000 Centipoise
 Torque: 7 µNm to 10 mN.m
 Shear Rate: 0.0082 to 1020 S-1
 Shear Stress: 2 to 10,000 dyn/cm2
 Repeatability: ±1% of full scale range or better
 Resolution: 0.3% of full scale range or better
 Power Supply: 120 VAC or 240 VAC (with transformer)
 Coolant Supply: Tap water or chiller
 Compressed Air: 120 psi
 Sample Size: 132 mL (depends on bob size)

Cement Density and Curing Chamber

A pycnometer measures the density of cement samples by calculating the ratio of volume to mass. A curing chamber cures cement slurry samples according to API Specification 10 under elevated pressure and temperature.



M7500 PVT ULTRA HPHT PYCNOMETER

Features

- M7500 PVT is an add-on module for M7500 Ultra HPHT Rheometer
- Patented M7500 Ultra HPHT Rheometer is capable of testing fluid viscosity under conditions of temperature and pressure ranging from atmospheric to 30,000 psi and from 20°F (with chiller) to 600°F.
- M7500 add-on modules provide powerful new functionality at a lower cost than competing, stand-alone instruments, while maintaining a single instrument footprint and merging seamlessly with your existing software training.

Specifications

Dimensions: 22" Height x 12" Width x 24" Depth
Resolution: 0.5% of initial density
Temperature Range: Ambient (20° with chiller) to 600°F (315°C)
Pressure Range: Atmospheric to 30,000 psi
Density Range: 71% to 142%
Sample Size: Small Piston: 185 to 193 ml
Large piston: 120 to 170 ml
Compressibility Range: 150 rpm
Compliance: API Spec 10A / ISO 10426-1



M7450 CURING CHAMBER

Features

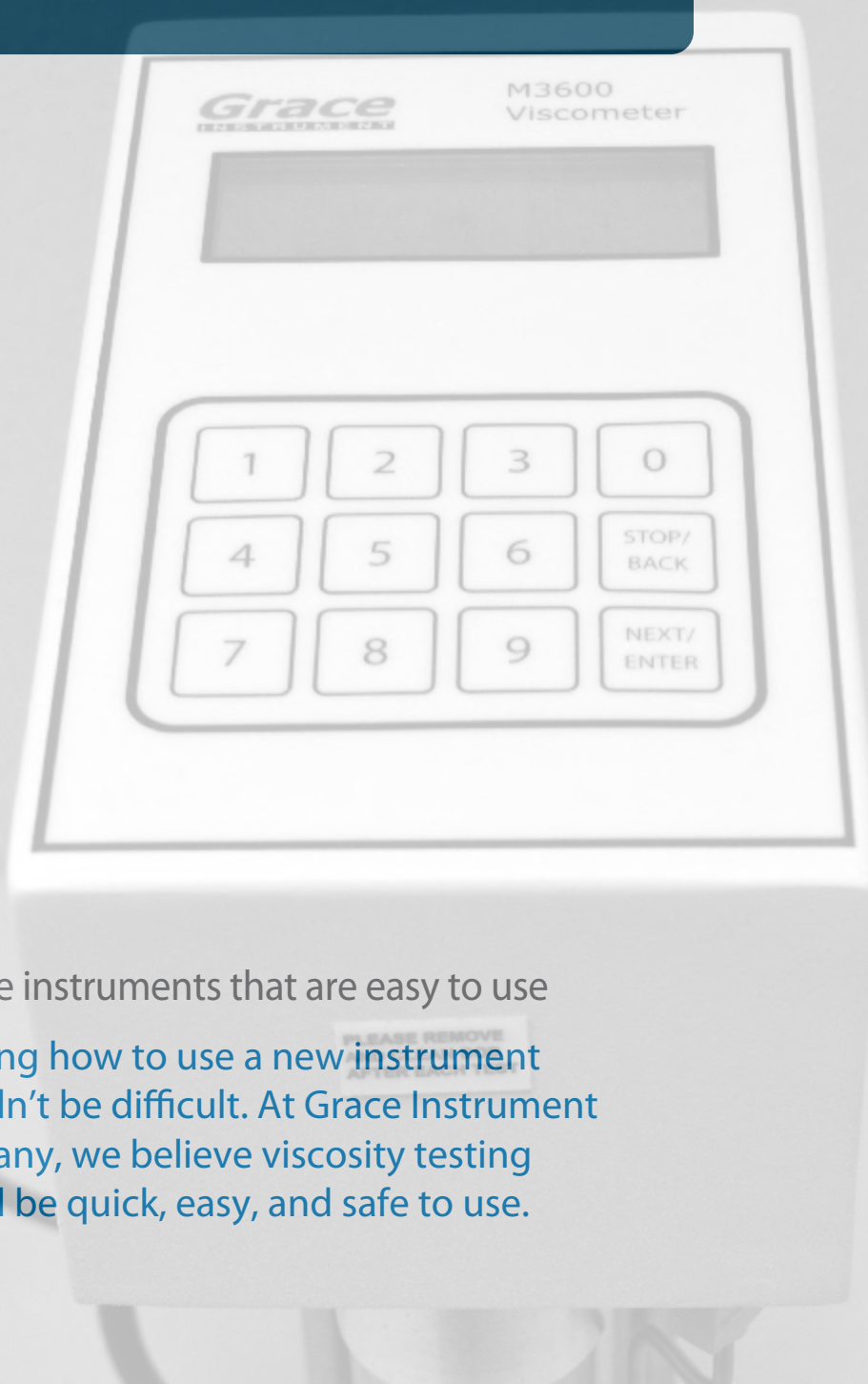
- Light-weight slurry mold
- Hardware specifications conform to API standards
- Test sequences can be created or edited by users to perform testing under a wide variety of simulated downhole conditions
- Slurry mold design allows quick thermocouple insertion and withdrawal
- Control panel and handles allow for easy and safe operation

Specifications

Dimensions: 46" height x 30" width x 28" depth
Weight: 500 lbs.
Temperature Range: Ambient to 700°F (371°C)
Pressure Range: Atm. to 3,600 psi (optional 5,000 psi)
Operating Temperature: 32 - 105°F
Heater Power: 6,000 W
Current: 240V, 50 Hz or 60 Hz

VISCOSITY TESTING INSTRUMENTS

SHOP FOR EASY-TO-USE SOLUTIONS.



Choose instruments that are easy to use

Learning how to use a new instrument shouldn't be difficult. At Grace Instrument Company, we believe viscosity testing should be quick, easy, and safe to use.

Viscosity Testing

Viscosity is the measure of a fluid's resistance to flow. Viscosity is often measured using various types of viscometers and rheometers, which test the shear stress and shear rate among other variables.



M3400 DIAL-READING VISCOMETER

Features

- The unit features a control pad, dial reading, and can shift speeds with one button press.
- Able to perform automatic 10-minute or 10-second gel strength measurement of drilling muds, oil well cements, and fracturing fluids with alarm sound.
- Includes B1 bob, R1 rotor sleeve, and F1 torsion spring.
- Complies with API 10 and 13 standards.
- The unit is dual voltage.

Specifications

Sample Size: 35-220 mL (Depending on bob size, cup, and sleeve type.)
 Testing Sample Temperature Range: 32°F to 200°F (With Optional Heater Cup)
 Pressure Range: Atmospheric
 Viscosity Range: 0.5 to 10,000,000 cP
 Shear Stress Range: 1.02 to 61,200 dyne/cm² (Up to 3,500 dyne/cm² with standard R1B1 bob configuration. Up to 61,200 dyne/cm² with other optional bob options.)
 Resolution: 1 dyne/cm² to 10 dyne/cm² (Based on spring selection. Standard spring is 5 dyne/cm². 2 spring is 1 dyne/cm².)
 Available Springs: F0.2, F0.5, F1, F2, and/or F5
 Speed Range: 600, 300, 200, 100, 60, 30, 6, 3, 0.1 rpm
 Shear Rate Range: 0.17 - 1020 sec⁻¹ (With Standard R1B1 Geometries)
 Accuracy: ±0.5% of Torque Span
 Standards: API 10 & API 13 Compliant
 Sounds: Auto Beep for 10 Sec Gel and 10 Min Gel
 Dimensions: 16.5" H x 5" W x 8" D
 Weight: 10 lbs. (Standard)



U.S. Pat. 6,571,609

M3600 ACID RHEOMETER

Features

- Allows the user to test samples with high acid concentrations, including fluids with 30% HCl.
- Sturdy, portable, and compact.
- Can create test sequences and record test data without use of external equipment.
- Exports test data in a spreadsheet format.
- Includes LCD display with automatic keypad control.
- Allows test flexibility.
- Stores test data.
- Low maintenance with repeatable results.
- All wetted materials are Hastelloy C276 construction.
- Chiller cup is made from stainless steel and can be purchased separately.
- Carrying case can hold the M3600 Rheometer with an attached rotor sleeve. It also has slots for a dust shield, three bobs (B1, B2, and B5), a heater cup, and other items can fit in an extra slot or between the M3600's legs.

Specifications

Sample Size: 35-500 mL (Depending on Bob/Cup/Sleeve Size and Type)
 Temperature Range: Ambient (20°F with Chiller) to 212°F
 Pressure Range: Atmospheric
 Viscosity Range: 0.1 to 100,000,000 cP
 Shear Stress Range: .02 to 3,500 dyne/cm²
 Resolution: 1 dyne/cm²
 Speed Range: 0.01 to 600 rpm Continuous
 Shear Rate Range: 0.0038 to 1021 sec⁻¹
 Accuracy: ±0.5% Torque Span or Better
 Standards: API 10 & API 13 Compliant
 Torque: 7 µN.m to 14 mN.m



U.S. Pat. 8,850,874

M3900 IN-LINE VISCOMETER

Features

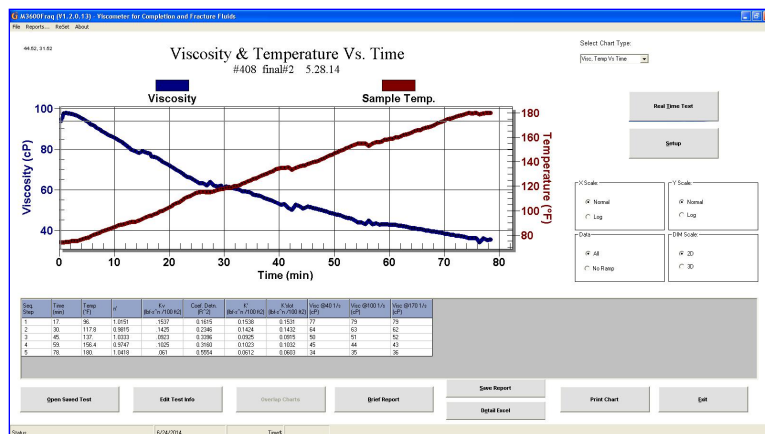
- Compliant with API 13 and API 39.
- Viscosity measurement unaffected by fluid flow.
- Computer-controlled speed, viscosity measurement, and calibration.
- Multiple data export formats.
- Easy to operate and calibrate.
- Unique and durable design with fast cleaning and simple maintenance.

Specifications

Viscosity Range: 5 cP to 1,000 cP
 Pressure Range: Atmospheric to 1,000 psi
 Speed Range: 3 to 600 rpm (Continuous)
 Output: RS-232 or RS-485 Modbus (0 to 10V DC Analog Optional)
 Voltage: Varies per unit. Either 110-120V AC or 220V-240V AC (not both).
 Frequency: 50-60 Hz
 Power: 500 W



U.S. Pat.
6,571,609



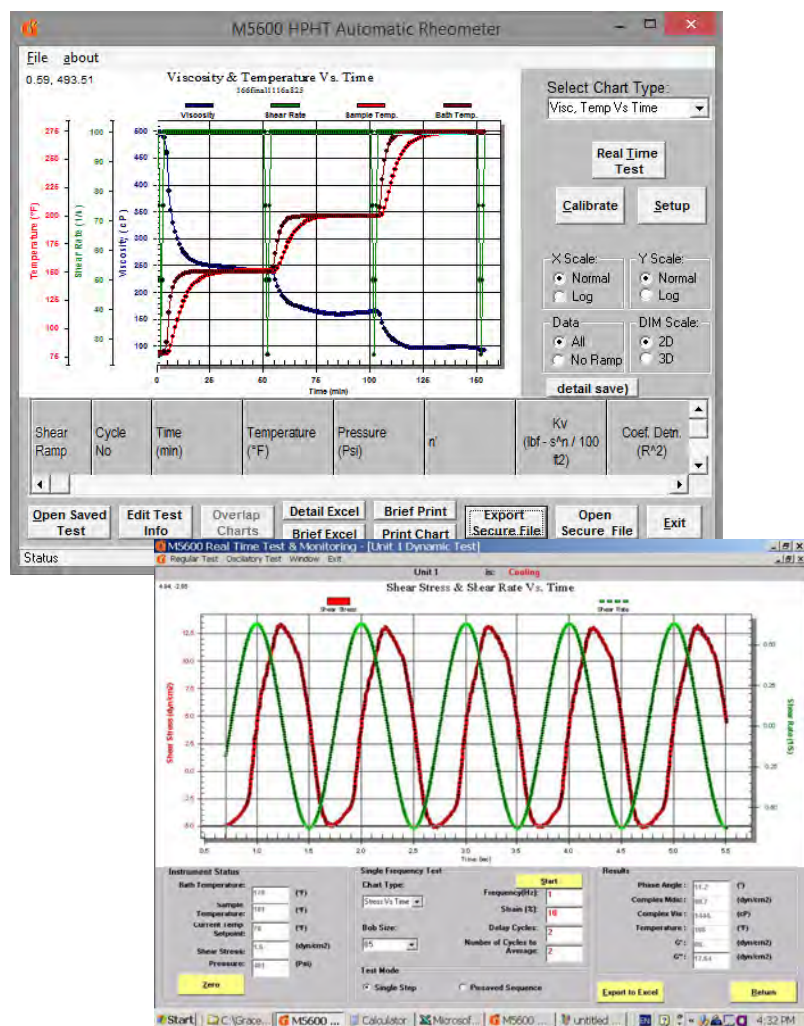
M3600 AUTOMATIC RHEOMETER

Features

- Sturdy, portable, and compact.
- Can create test sequences and record test data without use of external equipment.
- Exports test data in a spreadsheet format.
- Includes LCD display with automatic keypad control.
- Allows test flexibility.
- Stores test data.
- Low maintenance with repeatable results.
- All wetted materials are Hastelloy C276 construction.
- Chiller cup is made from stainless steel and can be purchased separately.
- Carrying case can hold the M3600 Rheometer with an attached rotor sleeve. It also has slots for a dust shield, three bobs (B1, B2, and B5), a heater cup, and other items can fit in an extra slot or between the M3600's legs.

Specifications

Dimensions: 16" Height x 5" Width x 8" Depth
 Weight: 13 lbs. (Standard) or 13 lbs. (Acid Option) (rheometer with standard setup and heater cup)
 Temperature Range: Ambient (20°F with Chiller) to 212°F (100°C)
 Pressure: Atmospheric Pressure
 Sample Size: 35-500 mL (Depending on Bob/Cup/Sleeve Size and Type)
 Resolution: 1 dyne/cm²
 Speed Range: 0.01 to 600 rpm Continuous
 Shear Rate Range: 0.0038 to 1021 sec-1
 Shear Stress Range: .02 to 3,500 dyne/cm²
 Viscosity Range: 0.1 to 100,000,000 Centipoise
 Torque: 7 µN.m to 14 mN.m
 Accuracy: ±0.5% Torque Span or Better
 Rheometer Voltage: 90V AC to 240V AC
 Rheometer with Heater Cup Wattage: 350 W
 Frequency: 50/60 Hz



U.S. Pat.
6,938,464
6,951,127
9,157,846



M5600 HPHT Rheometer

Features

- Allows the user to test samples with high acid concentrations, including fluids with 30% HCl
- All wetted materials are Hastelloy C276 construction
- Incorporates years of research into its innovative design
- Oil or dry heat option (oil bath shown, above)
- Fully digital with LCD screen
- Fast test cycle: Setup-load-test-clean
- Safety feature of temperature controller will stop heating if it sees temperature is above 520°F.
- Separate thermostat from temperature control loop that will cut off bath heater power supply when its temperature is above 500°F
- Includes 2 temperature controllers, one for control, the other for safety.
- Over pressure relief valve
- Repeatable results with Test flexibility
- Includes M5600 PC™ software, which connects the M5600 with a Windows®-based PC
- Tests are simple to set up and run
- Customizable charts and real-time data are displayed during tests
- Saved tests can be searched by any specified test parameter: test name, fluid ID, additive, researcher name, or more
- SBC software on unit will stop heating if it sees temperature is too high
- PC software will send stop heating command if it sees temperature is too high.

- Also available: M5600 HPHT Rheometer Carrying Case
- Carrying Case includes an extendable handle and wheels for easy transportation
- Each M5600 unit has multiple thermocouples, dedicated thermostat for over heating shutoff, special relief valves, integrated N2 regulator, all internal tubing rating for 10ksi, and pre-programmed shutoff points within M5600 software.
- The new carbon bath is much cleaner than older oil bath and allows for heating at 2x rate.

Specifications

Pressure Range: Atm to 2,000 psi
 Sample Size: 32 to 78 ml
 Resolution: 0.01% of full scale range or better
 Temperature Range: Amb. (20°F with Chilling Device) to 500°F (260°C)
 Speed Range: 0.0001 to 1,100 rpm continuous
 Frequency Range: 0.01 to 5 Hz (Optimized at 0.2 to 3 Hz)
 Amplitude Range: 0.1% to 500% (Optimized at 0.2% to 500%)
 Shear Rate Range: 0.00004 to 1870 sec⁻¹
 Shear Stress Range: 1 to 15,000 dyn/cm²
 Viscosity Range: 0.5 to 5,000,000 Centipoise
 Torque: 14 μN.m to 100 mN.m
 Repeatability: ±0.05% of full scale range or better
 Construction: Hastelloy C Wetted Material
 Dimensions: 8.5" Depth x 12.5" Width x 25.5" Height
 Weight: 66 lbs (with bath) or 61 lbs (with carbon block)

Data sheets and full product specifications can be found on our website at www.gic.com



M7500 ULTRA HP/HT RHEOMETER

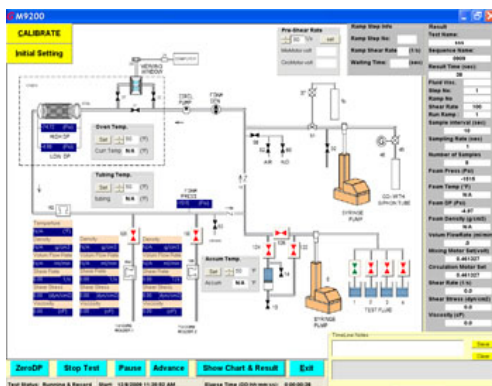
Features

- The M7500 is built with a thick-walled steel pressure cell, which is surrounded by a fail-safe steel containment vessel to ensure operator safety.
- It is designed for easy test set up, sample loading and post-test cleaning.
- Cool-down after tests can be accomplished more quickly by connecting a tap water supply or a chiller into the M7500 cooling fluid loop.
- Innovative patented design ensures against contamination of test sample with pressurization fluid.
- Recently patented design eliminates the need for fragile and expensive "V" jewel bearings.
- A computer-controlled, magnetically-coupled stirrer agitates the sample during testing
- Provides users with sturdy unit, safe operation, and low maintenance
- Engineered for safe testing with extreme pressure and temperature settings
- Offers repeatable results and test flexibility
- Unit includes an LCD screen and PC interface
- Instrument does not compromise sample integrity
- Fully digital and automatic



Specifications

Max Temperature:	600° F
Max Pressure:	30,000 psi
Sample Size:	132 ml
Resolution:	0.3% of full scale range or better
Speed Range:	0.01 to 600 rpm continuous
Shear Rate Range:	0.0082 to 1020 sec ⁻¹
Shear Stress Range:	2 to 10,000 dyn/cm ²
Viscosity:	0.5 to 5,000,000 Centipoise
Torque:	7 μ N.m to 10 mN.m
Repeatability:	\pm 1% of full scale range or better
Voltage:	120 / 240 V, with transformer
Construction:	Stainless Steel
Coolant Supply:	Tap water or chiller
Compressed Air:	120 psi
Dimensions:	22"H x 12"W x 24"D (tower) 15.5 H x 14"W x 25"D (cab)



M9200 HPHT FOAM LOOP RHEOMETER

Features

- Single or dual gas (CO₂ and/or N₂) foam testing capability.
- Continuous foam circulation ensures uniform foam properties.
- Constant foam circulation and shear.
- HPHT viewing cell allows testing of acid samples and ensures safe operation.
- Visual determination of foam half life and digital measurement of bubble size and distribution.
- Integrated heating trace ensures that all lines are subjected to a uniform temperature.
- Accumulator for testing high viscosity and/or corrosive samples.
- Viewing cell images can be digitized and processed digitally.
- Designed to handle fluids and gases at temperatures up to 350°F, under a working pressure up to 5,000 psi.

Specifications

Dimensions: Custom (depending on client's desired specifications)
 Weight: Custom (depending on client's desired specifications)
 Operating Temperature: Amb. to 350°F (or 392°F)
 Working Pressure: Atm to 5,000 psi
 Shear Rate: 0 to 1,500 S⁻¹
 Sample Volume: 115 ml
 Accumulator: 500 ml capacity, 6,000 psi
 Viewing Cell: Stereo microscope; Sapphire window
 Dual Gas: CO₂ or N₂ gas injection for foam creation
 PC (Included): Desktop PC with MS Windows 11, M9200 PC software preinstalled.

CORE ANALYSIS AND CORE TESTING INSTRUMENTS

SHOP FOR CUSTOMIZABLE SOLUTIONS.

Choose instruments that fit YOUR needs.

The 9000 series of products are all highly customizable and made to fit your individual needs. Each unit is personalized depending on the client's testing requirements to allow for a greater degree of control.

Core Porosity

A porosimeter measures porosity of a core sample using Boyle's law.



M9140 CORE POROSIMETER

Features

- Air relief valve prevents overpressurization.
- Calibration block included.
- Digital display of pressure.
- Calculation spreadsheet included.
- Compact size.
- Easy to maintain.
- Precision regulator and display for accurate pressure control.
- Precise pressure transducer provides accurate pressure measurement.
- Optional vacuum pump is available (sold separately) for evacuation of core sample.

Specifications

Core Diameter: Up to 1.5"
 Core Length: Up to 3"
 Nitrogen/Helium Requirement: 200 psi Minimum
 Voltage: 120/240V AC
 Frequency: 50-60 Hz
 Power: 50 W
 Dimensions: 16" W x 12" D x 12" H
 Weight: 30 lbs.



M9145 POROSIMETER

Features

- Digital display of pressure and temperature
- Pressure transducer provides high accuracy
- Interchangeable sample holders for more test variation
- Data acquisition software allows for easy data logging and collecting
- Precision regulator and gauge for accurate pressure control
- Designed to test core samples with diameters up to 1.5" or larger upon request
- Built-in overpressure safety feature
- Compact size for easy test setup and maintenance

Specifications

Core Diameter: up to 1.5" (or larger upon request)
 Core Length: up to 3"
 Pore Pressure: 200 psi
 Confining Pressure: 1,000 psi
 Power: 50 W
 Electrical Requirement: 110/220 VAC or 50/60 Hz
 Dimensions: 12.5" height x 22" width x 12" depth
 Weight: 40 lbs. (Unit only)

Core Permeability

Permeameters are used to measure the permeability, or capacity of fluid to pass through a porous material, of a core sample. Permeability is important in determining which rock formations readily transmit fluids.



M9170 HIGH PRESSURE POROSITY AND PERMEABILITY SYSTEM

Features

- Performs porosity and permeability tests on plug-sized core samples under confining pressures of up to 10,000 psi.
- Supports nitrogen & helium as testing media (dry compressed air is optional)
- Porosity range from up to 60%.
- Permeability measurement range from 0.0005 mD to 10 D.
- Multi-sample loading facilities.
- User friendly, Windows-based system.
- Software handles all control, measurement, data collection, calculation, and report generation.
- Minimal maintenance required.

Specifications

Max Confining Pressure:	10,000 psi
Core Diameter:	1.5 inches (1 inch optional)
Core Length:	Up to 3 inches
Porosity Range:	Up to 60%
Permeability Range:	0.0005 millidarcys to 10 darcys
Max Pore Pressure:	500 psi
Dimensions:	20"H x 24"W x 26"D



M9190 NANODARCY PERMEAMETER

Features

- Designed to measure the low and ultra low permeability of tight plug sized core samples from shale and other tight gas reservoirs.
- Uses a pulse decay procedure and high pressure nitrogen to measure permeability.
- Mercury-free design.
- Automatic pressure and temperature control.
- Digital Display and Accurate Measurement of Pressure.
- Real time test results and post-processing.
- Comprehensive data collection through custom PC software.

Specifications

Max Temperature:	175° C (347° F)
Max Confining Pressure:	10,000 psi
Working Pressure:	2,500 psi
Permeability Range:	10 nanodarcy to 0.5 millidarcys
Core Length:	0.125" to 3.0"
Core Outside Diameter:	1" to 1.5"
Pulse Range:	5 to 200 psi
Loading Type:	Hydrostatic, horizontal position
Wetted Material:	SS-316 Stainless Steel
Power Supply:	110/220V, 50/60 Hz
Dimensions:	2.9'H x 5'W x 2'D

Core Flood / Core Flow

Core flooding testing is the measurement of fluids injected into sample rock to determine the effects of fluids of an oil reservoir. Our core flooding instruments are designed to improve and enhance oil recovery techniques.



M9100 HPHT AUTOMATIC CORE FLOW TESTER

Features

- Optional automatic gas porosity and permeability measurement
- Optional automatic core loading
- Optional heating band or convection oven temperature control
- Optional fluid pre-heating prior to contact with the core sample
- Optional slim tube system
- Optional resistivity & ultrasonic measurement
- Includes pressure relief devices such as rupture discs and pressure relief valves
- PC software prevents user from setting temperature above 410°F
- Oven itself has heater cut off safety

Specifications

Dimensions: Customizable (depending on client's desired specifications)
 Weight: Customizable (depending on client's desired specifications)
 Core Dimensions: 1-1.5" diameter by 6-24" length
 Operating Temperature: Amb. to 350°F (or 392°F)
 Confining Pressure: Atm to 15,000 psi
 Working Pressure: Atm to 10,000 psi
 Back Pressure: Atm to 10,000 psi
 Accumulator: 1L sample capacity
 Fluid Injection Rate: 0 to 80 ml/min (depending on pump type)
 Voltage: 220 VAC±10% or three-phase AC 380 VAC±10%, 50Hz



M9300 HPHT FOAM LOOP & CORE FLOW TESTER

Features

- Combines operation of a foam loop system with a formation damage evaluation system.
- Foam generation & foam loop system can be used for foam creation, rheology and quality evaluation.
- Formation damage (core flow) system can be used for core fluid treatments and permeability analysis.
- Can be built to custom specifications.

Specifications

Temperature Range: Amb. to 350°F (or 392°F)
 Operating Pressure: Atm. to 5,000 psi
 Flow Rate Range: 0 to 375 ml/min
 Shear Rate: 0 to 1,500 S⁻¹
 Microscope Magnification: 11x to 144x
 Viewing Window: Quartz
 Rheology Characterization: API Standard Rheological and Shear History
 Foam Density: 0.3 to 1.0 g/cm³ controllable
 Half-life of Foam: 0 to 72 hr
 Diameter of Visible Foam Bubble: ≥ 1 μm

Foam Loop & Friction Flow Systems

Foam Loop Rheometers are designed to measure the rheological properties of foam systems under elevated pressure and temperature. The Friction Flow Loop Tester evaluates the reduction of friction on fracturing fluids.



M9200 HP/HT FOAM LOOP RHEOMETER

Features

- Single or dual gas (CO₂ and/or N₂) foam testing capabilities
- Continuous foam circulation ensures uniform foam properties
- HPHT viewing cell provides safe operation when testing acidic samples
- Direct visual assessment of foam half-life
- Computer-assisted analysis of bubble size and distribution
- Integrated heating trace maintains a uniform temperature on all sample lines
- Optional accumulator for injection of high viscosity and/or corrosive sample fluids

Specifications

Operating Temperature:	350° F (up to 400 ° F optional)
Max. Working Pressure:	5,000 psi
Shear Rate:	0 to 1,500 S ⁻¹
Sample Volume:	115 ml
Accumulator:	500 ml capacity (optional)
Viewing Cell:	Sapphire window Stereo microscope
Dual Gas:	CO ₂ or N ₂ gas injection for foam creation
Foam Density:	0.3 to 1.0 g/cm ³ controllable
Bubble Diameter:	≥1 μm
Microscope Magnification:	Up to 450x



M9250 FRICTION FLOW LOOP TESTER

Features

- Fill Automation
- Coriolis mass flow meter
- Safety control - Over-pressure relief valve
- DP Transmitter (up to 30 psi and 100 psi)
- Flow rate of 15 gallons per minute
- Mixing tank holds up to 30 gallons
- Includes 1/2" and 3/4" O.D., 25' straight tube length (10' test section)
- Real-time display of Reynolds number, flow rate, temperature, and differential pressure

Specifications

Max Temperature:	400° F
Max Confining Pressure:	10,000 psi
Working Pressure:	2,500 psi
Permeability Range:	10 nanodarcy to 0.5 millidarcys
Core Length:	0.125" to 3.0"
Core Outside Diameter:	1" to 1.5"
Pulse Range:	5 to 200 psi
Loading Type:	Hydrostatic, horizontal position
Wetted Material:	SS-316 Stainless Steel
Power Supply:	110/220V, 50/60 Hz
Dimensions:	25.5"H x 12.5"W x 8.5"L

Core Preparation

Core preparation instruments precisely measure specimens' weight or automatically saturates core samples to prepare them for core flooding analysis.



M1722 SCALE WITH SOFTWARE KIT

Features

- High capacity, high precision scale.
- RS-232 port for PC connection.
- Rechargeable battery built-in to unit.
- Stainless steel measuring tray
- Multiple weight formats, including g, oz, ct + PCS
- Easy to operate and calibrate
- Level bubble indicator
- Dual LED displays in front and rear
- Submersible electric water pump

Specifications

Dimensions: 9.1" height x 7.7" width x 9.5" depth
 Operating Temperature: 172 lbs
 Capacity Max: Up to 1000 grams
 Resolution: 0.01 gram
 Display: Red-color LCD
 Power: Rechargeable battery (included)
 AC adapter (included)
 Tare Feature: Yes
 Calibration: Yes
 PC Output: Yes; RS-232 Output
 Platform Size: 4.5" diameter
 Weighing Modes: Grams, Troy Ounces, Carats, and Parts Counting



M9106 AUTOMATED CORE SATURATOR SYSTEM

Features

- Choice of Saturant: Injects water, brine, refined oil, and other saturant fluids* into sample.
- Automatic pressure and valve control system.
- Saturation cycle time can be customized for each step from included software.
- Stainless-steel (SS-316) construction/wetted materials.
- Control console works seamlessly with included software on Windows PCs.

Specifications

Core Cell Inside Diameter: 2 to 4 in.
 (Smaller or larger sizes available upon request.)
 Core Cell Inside Length: 10 in. or Specified
 Max Pressure: 2,000 psi
 Compatible Saturant Fluids: Water, Brine, Refined Oil, Other Saturant Fluids*
 Voltage: Varies per unit. Either 110-120V AC OR 220-240V AC configuration (not both).**
 Frequency: 50-60 Hz
 Wattage: 250 W
 Wetted Material: SS-316 Stainless Steel
 Dimensions: 29" H x 26" W x 20" D
 Weight: 25 lbs. (Just Frame) or 80 lbs. (Total Weight Including Cell)

*Optional add-on to use crude oil and compatibility with other fluids available upon request. Contact Grace Instrument for details.

**Please check electrical labeling on your unit to verify which voltage configuration applies.

Reservoir Studies

Instruments used for reservoir studies help simulate the behavior of fluids within a reservoir under varying conditions of pressure, temperature, and time.



M9720 MICROMODEL PHASE BEHAVIOR SYSTEM

Features

- Camera system has dual functions: recording and visualizing wax and asphaltenes precipitation during testing.
- Two positions for micromodel experiments: vertical and horizontal.
- Reaction cells assembly rotates up to 90° inside of oven.
- Constant temperature control system provided by oven.
- High pressure scaling factor studies.
- Provides valuable details on different EOR methods.
- Allows engineers to optimize injection schemes to increase recovery.
- Comprehensive data collection (pressure/temperature).
- Minimal maintenance required.

Specifications

Temperature Range:	Up to 302°F (150°C)
Pressure Range:	Up to 20,000 psi
Wetted Material:	HC-276 or Inconel
Particle Size Detection:	5 microns or better
Pressure Accuracy:	± 0.1% of Full Scale
Temperature Accuracy:	±0.2% °C
Electrical Requirements:	120/240V
Dimensions:	10' H x 9' W x 2' D

M9730 RECOMBINATION CELL

Features

The Grace Instrument M9730 Recombination Cell is designed to inject oil and gas at a predetermined volume, mix them together, and heat the resulting mixture in elevated temperature and pressure conditions.

Specifications

Max Pressure:	15,000 psi
Max Temperature:	350°F (175°C)



M9710 FLOW ASSURANCE SYSTEM

Features

- Two 1000 mL accumulators for sample loading.
- Data recorded in .csv file format for easy analysis with MS Excel or other spreadsheet programs.
- Test cell can be viewed and recorded using the microscope and camera.
- User-friendly, Windows-based system.
- Software handles all control, measurement, data collection, and report generation.
- Includes magnetic mixer and chemical injection pump for simulating additional flow conditions.

Specifications

Max Temperature:	400°F (205°C)
Max Pressure:	10,000 psi (690 bar)
Pump Volume:	100 ml
Cell Volume:	200 ml
Accumulator Volume:	1,000 ml
Wetted Materials:	SS-316 Stainless Steel (Pump) HC-276 Hastelloy (Accumulator & Fittings)
Power Requirements:	110-120V AC, 50 or 60 Hz
Dimensions:	M9000 series units are customized to client's request

Proppant Conductivity & Acid Stimulation

A proppant conductivity tester performs fracture conductivity and leak-off testing under conditions of varied temperature and pressure. The acid reactor is designed to analyze acid stimulation performance at reservoir conditions.



M9500 AUTOMATIC PROPPANT CONDUCTIVITY TESTER

Features

- Air relief valve prevents over pressurization
- Calibration block included in the package
- Digital display of pressure and temperature
- Calculation spreadsheet included
- Compact size and easy to maintain
- Precision regulator and gauge for accurate pressure control
- Precise pressure transducer provides accurate pressure measurement
- Vacuum pump is optional for the evacuation of the core sample

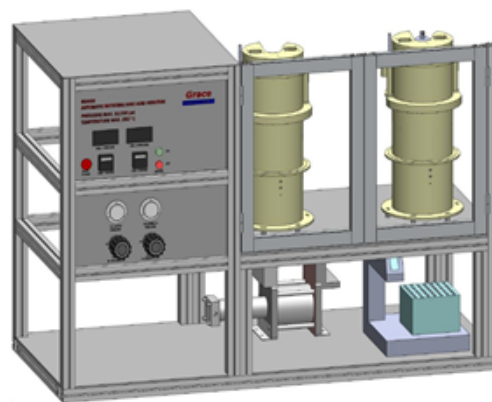
Specifications

Fracture Conductivity System

Dimensions: Custom (per client's request)
 Weight: Custom (per client's request)
 Flowing Pressure: Atm to 3,000 psi
 Closure Stress: Atm to 20,000 psi
 BP Regulators: Atm to 3,000 psi
 Accum. Pressure: Atm to 3,000 psi
 ISO-Standard: Adheres to ISO-Standard 13503-5

Leakoff System

Back Pressure: Atm. to 3,000 psi
 Digital Pressure Transducer: $\pm 0.1\%$ of full scale or better
 Closure Stress: Up to 20,000 psi
 Temperature Range: Atm. to 400°F (204°C) (with $\pm 1^\circ\text{F}$ accuracy)



M9400 AUTOMATIC ROTATING DISC ACID REACTOR

Features

- Automatic hands free operation after loading samples.
- Steel shield tower provides further protection to test cells.
- Automatic sampling system.
- Proprietary design prevents debris plugging sample tubing.
- Capable of testing hydrochloric, hydrofluoric, and organic acids used for acid stimulation of carbonate and sandstone reservoirs.
- The rotating reactor puts the rock sample in motion for uniform reaction with the acid system.

Specifications

Temperature Range: Amb. to 482°F (250°C)
 Max. Pressure: 7,000 or 10,000 psi
 Reactor Cell Capacity: 600 to 850 ml (custom option available)
 Rotation Speed: 100 to 2,000 rpm (custom option available)
 Material: Hastelloy B and Hastelloy C
 Dimensions: Custom

EOR/IOR INSTRUMENTS

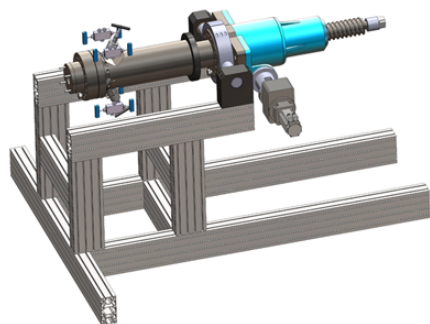
SHOP FOR METHOD-IMPROVING SOLUTIONS

Choose instruments that **improve oil recovery**

Improving the current methods for oil recovery is important. Grace Instrument's EOR/IOR testers help to evaluate oil displacement and formation pressure in the reservoir. Data collected from these tests contributes to the research towards improving the current trends for oil recovery.

PVT Testing

PVT is an acronym for Pressure, Volume & Temperature. PVT testers are used to evaluate the various properties of fluid that are affected by PVT.



M9700 HPHT PVT SYSTEM

Features

- Mercury-free design
- Computer-controlled data logging
- Visual observation cell
- Constant temperature control system
- Detection in both oil and gas condensate studies
- Designed for maximum accuracy and operator safety
- Innovative data analysis algorithms
- Comparison of current test data with historical test data
- System hardware and software customized to your specifications

Specifications

Dimensions: All of the M9000 series products are customizable per customer's request.

Temperature Range: -40°C to 205°C (401°F)

Pressure Range: Atm. to 15,000 psi/ 104 MPa

Volume Accuracy: 0.1 cm³

Cell Volume: 210 ml and above

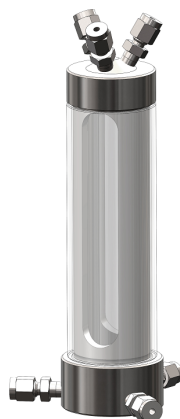
Temperature Reading: ± 0.2°C

Frequency: 50 or 60 Hz

Viewing Cell: U-shaped and see through

Material: SS-316, HC-276, or Inconel

Visual Volume: 400cm³ or 240cm³



M9715 HPHT SAPPHERE PVT VISUALIZATION CELL

Features

- Robust visualization solution for optimal observation of one-phase and multiphase testing fluids (including gases).
- Compatible with crude oil, live oil, polymer surfactants, salt water, and more.
- Sapphire cell construction.
- Graduated volumetric bar with 0.2 ml (0.2 cc) increments.
- All required components to ensure cell securely remains in place included. (Can be customized.)
- Complementary polycarbonate jacket prevents breaking/scratches.
- Six ports (three at top and bottom) seamlessly transport fluid (including gas) in and out of cell. (Custom number available.)
- All required connections, valves, pistons, sealing piston o-ring(s), and support(s) to ensure the cell securely remains in place in your oven are included and can be customized.
- Used for one-phase or multiphase behavior, solubilization, atomization, SAS, spray visualization, enhanced oil recovery (EOR), and more.
- Includes Polycarbonate Jacket.

Specifications

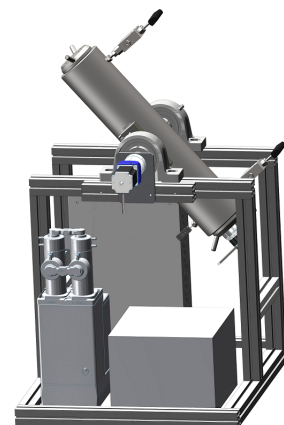
Cell Volume: 15 ml (15 cc)

Cell Construction: Sapphire

Maximum Pressure: 350 bars (5076 psi)

Maximum Temperature: 150°C (302°F)

Applications: One-phase Behavior, Multiphase Behavior, Solubilization, Atomization, SAS, Spray Visualization, Enhanced Oil Recovery (EOR), and more



M9730 HPHT RECOMBINATION CELL

Features

- Mercury-free apparatus used to combine liquid samples.
- Heating jacket/mantel allows user to control temperature.
- Volume of separator gas and separator oil are determined by user.
- Can be transferred from recombination cell to a sample piston bottle.
- Analyzes data of GOR, oil shrinkage, and gas compressibility factor.
- Instrument is based on a HPHT recombination cell.
- Motorized rocking jacket and magnetic drive stirrer included for proper agitation and mixing procedures.
- Pressure sensor and temperature probe measures pressure and temperature of recombined fluids.
- Sapphire bulleye window allows observation of saturation pressure.
- Temperature and pressure display/control panel.
- Unit easily moved lab to lab.

Specifications

Cell Type: Floating Piston

Cell Volume: 2,000 ml (2,000 cc)

Motor Type: Motorized

Max Working Pressure: 15,000 psi (~1,034 bars)

Max Working Temperature: Ambient to 350°F (175°C)

Pressure Accuracy: 0.1% FS

Temperature Accuracy: ±0.5 °C

Wetted Material: Stainless Steel SS-316

Viewing Window: Sapphire Bullseye

Interfacial Surface Tension

The Spinning Drop Tensiometer was developed for the measurement of interfacial tension, surface tension, adsorption rate and extreme low interfacial tension.



M6500 SPINNING DROP TENSIO METER

Features

- Measurement of extremely low interfacial surface tension.
- Accurate RTD temperature readout.
- Advanced PID temperature controller.
- Accurate speed controller ensures high image synchronization.
- High accuracy of reading with stroboscope illumination.
- LCD numerical display for integrated microscope
- Light weight.
- Adjustable leveling.
- Optional chiller sleeve for low temperature applications.
- Optional digital camera imaging system (includes third-party PC software for data measurement and image processing).

Specifications

Speed Range:	0 to 11,000 rpm continuous
Temperature Range:	Ambient to 212 ° F (45° F with chiller)

Surface Tension Measurement:	10^{-6} to 10^2 mN/m
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Capillary diameter:	2.0 mm
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Microscope Magnification:	25x
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LCD Numerical Display	0.0001 mm
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Resolution:

Voltage:	120V or 240V (with transformer)
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Live Resolution:	2.0 MP
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Optical Format:	1/3"
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Focusable Lens:	16 mm (adds approx. 3" H to unit)
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Dimensions:	19" H x 19.5" W x 11.5" D
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M6550 HP/HT SPINNING DROP TENSIO METER

Features

- Measurement of extremely low interfacial surface tension.
- Accurate RTD temperature readout.
- Advanced PID temperature controller.
- Accurate speed controller ensures high image synchronization.
- High accuracy of reading with stroboscope illumination.
- LCD numerical display for integrated microscope
- Light weight.
- Adjustable leveling.
- Optional chiller sleeve for low temperature applications.
- Optional digital camera imaging system
- Pressure vessel for HPHT testing with heating sleeve for operator protection

Specifications

Pressure Range:	Atmospheric to 1,000 psi
Temperature Range:	Ambient to 350 ° F (45° F with chiller)

Speed Range:	0 to 11,000 rpm continuous
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Surface Tension Measurement:	10^{-6} to 10^2 mN/m
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Capillary diameter:	2.0 mm
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Microscope magnification:	25x
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LCD Numerical Display	0.0001 mm
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Resolution:

Voltage:	120V or 240V (with transformer)
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Live Resolution:	2.0 MP
------------------	--------

Optical Format:	1/3"
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Focusable Lens:	16 mm
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Dimensions:	20" H x 15" W x 19" D
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Reservoir Stimulation

Reservoir studies instruments simulate the behavior of fluids within a reservoir under varying conditions of pressure, temperature, and time.



M9115 ELECTRICAL RESISTIVITY SYSTEM

Features

- Can perform measurement of rock electrical resistivity
- Choice of either fully or partially brine saturated core sample
- Resistivity Measurement based on two or four electrode method
- Includes core holder and hand pump for desaturation
- Burette used for core saturation determination

Specifications

Core Diameter: 1.5"
Core Length: Up to 4"
Resistivity Measurement: 2 and 4 electrodes
Pressure: Up to 10,000 psi
Temperature: Room Condition



M9117 CAPILLARY PRESSURE & RESISTIVITY SYSTEM

Features

- Determines positive and negative pressure curves
- Uses electrical resistivity index for core sample saturation capacity
- Calculates Saturation exponent "n"
- Calculates Cementation exponent "m"
- Core holder of Hydrophilic and hydrophobic ceramics used for resistivity measurement
- Resistivity cell used for brine resistivity measurement
- Automated pumping system used for fluid control
- Temperature-controlled bath houses entire instrument

Specifications

Max confining pressure: 10,000 psi (700 bar)
Max pore pressure: 10,000 psi (700 bar)
Working Temperature: Up to 302°F (150°C)
Capillary pressure range: 145 psi (± 10 bar)
Core length: up to 3 inches
Core Diameter: 1.5 inches (other sizes available upon request)
Power Supply: 220 VAC, 50/60 Hz
Brine wetted material: Stainless Steel (with optional Hastelloy)



M9130 SLIM TUBE SYSTEM

Features

- Determines miscibility at reservoir conditions
- Raw data obtained after testing
- Produced gas is measured by wet gas meter
- High level of automation
- Ultrasonic multiphase separator for liquid measurement
- Many add on tools extend unit capabilities
- Embedded gas injection pump makes safe and easy operation for user

Specifications

Tube Length: 80 ft. (24 m.)
Tube Diameter: 1/4 inches OD tube
Material: Stainless Steel
Porous Media: Calibrated 230 - 310 μ m silica
Approx porosity: 35 %
Approx pore volume: 100 cc
Working Temperature: 302°F (150°C)
Working Pressure: 10,000 psi (700 bar)
Fluids: Oil, HC gas, CO₂
Power: 220 VAC, 50 Hz

We provide calibration fluids and spare parts kits for use with our instruments.



Grace Instrument supplies calibration fluids for viscometers and rheometers. Each product is given a batch number to identify its age. Visit our website for the full list of our Safety Data Sheets (SDS), Certificates of Analysis, and Calibration Sheets.

CALIBRATION FLUID PRICE LIST

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Name	Part No.	U.S. Price per piece	Outside U.S. Price
20 cP CALIBRATION FLUID 16oz	CALI0000005	119.90	143.88
20 cP CALIBRATION FLUID ½ Gal.	CALI0000006	371.69	446.03
20 cP CALIBRATION FLUID 1 Gal.	CALI0000007	702.33	842.80
50 cP CALIBRATION FLUID 16oz	CALI0000001	87.18	110.00
50 cP CALIBRATION FLUID ½ Gal.	CALI0000008	272.31	298.98
50 cP CALIBRATION FLUID 1 Gal.	CALI0000009	535.48	588.50
100 cP CALIBRATION FLUID 16oz	CALI0000002	91.53	115.50
100 cP CALIBRATION FLUID ½ Gal.	CALI0000010	272.31	298.98
100 cP CALIBRATION FLUID 1 Gal.	CALI0000011	535.48	588.50
200 cP CALIBRATION FLUID 16oz	CALI0000003	87.18	110.00
200 cP CALIBRATION FLUID ½ Gal.	CALI0000012	272.31	298.98
200 cP CALIBRATION FLUID 1 Gal.	CALI0000013	535.48	588.50
500 cP CALIBRATION FLUID 16oz	CALI0000004	87.18	110.00
500 cP CALIBRATION FLUID ½ Gal.	CALI0000014	272.31	298.98
500 cP CALIBRATION FLUID 1 Gal.	CALI0000015	535.48	588.50

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