DRILLING FLUIDS EQUIPMENT

For over 30 years OFI Testing Equipment (OFITE) has provided instruments and reagents for testing drilling fluids, well cements, completion fluids, and wastewater. In addition to these product lines we also offer a range of instruments for core analysis. From our manufacturing facility in Houston, TX we provide customers all over the world with quality products and exceptional service.

Our drilling fluids product line includes innovative designs such as the Model 900 Viscometer, which showcases our ability to develop new technology to meet customer and industry demands. We also offer Retorts, Aging Cells, Roller Ovens, Mud Balances, Filter Presses, and all other instruments required to evaluate drilling fluid properties according to API Recommended Practice 13B-1 and 13B-2.

As an independent manufacturer and supplier, OFITE has one priority, our customers.

Model 1100 Pressurized Viscometer

For enhanced data collection, OFITE is pleased to introduce its new Pressurized Viscometer. This fully-automated system accurately determines the fluid characteristics of stimulation fluids, completion fluids, drilling fluids, and cement in terms of shear stress, shear rate, time, and temperature at pressure up to 2,500 PSI.

Using the exclusive ORCADA™ software, a computer novice can operate the viscometer, and yet the system is versatile enough for advanced research and demanding test parameters. It is suitable for both field and laboratory use. A waterproof, compartmentalized case with wheels makes the unit completely portable.

Features

- **Low Shear Rates** - As low as 0.01 s-1
- **Portable** - Rugged case makes for easy transport
- **Rugged** - Designed for use in the field or laboratory
- **Corrosion Resistant** - Hastelloy-wetted parts provide extra corrosion control
- **Small Footprint** - Only 12" × 12" (30 × 30 cm). The all-in-one design includes the heating mechanism
- **Versatile** - Available in 115 or 230-volt models
- **Real Oilfield Geometry** - Uses traditional Bobs and Rotor for measurements that are easy to translate (shear stress range 0 - 4,000 dynes/cm^2)
- **Computer-Control and Data Acquisition** - Uses OFITE's exclusive ORCADA™ software connected via serial port or Ethernet
- **SAFEHEAT™** - Safe, Accurate, Fast, Environmentally friendly, High Efficiency Air Transfer system. More precise control over the sample temperature without the risks of hot oil, such as spilling, splashing or flashing. U.S. Patent Number 8,739,609.

Technical Specifications and Requirements

- #130-81-C Model 1100 Pressurized Viscometer, 115 Volt
- #130-81-1-C Model 1100 Pressurized Viscometer, 230 Volt

Specifications

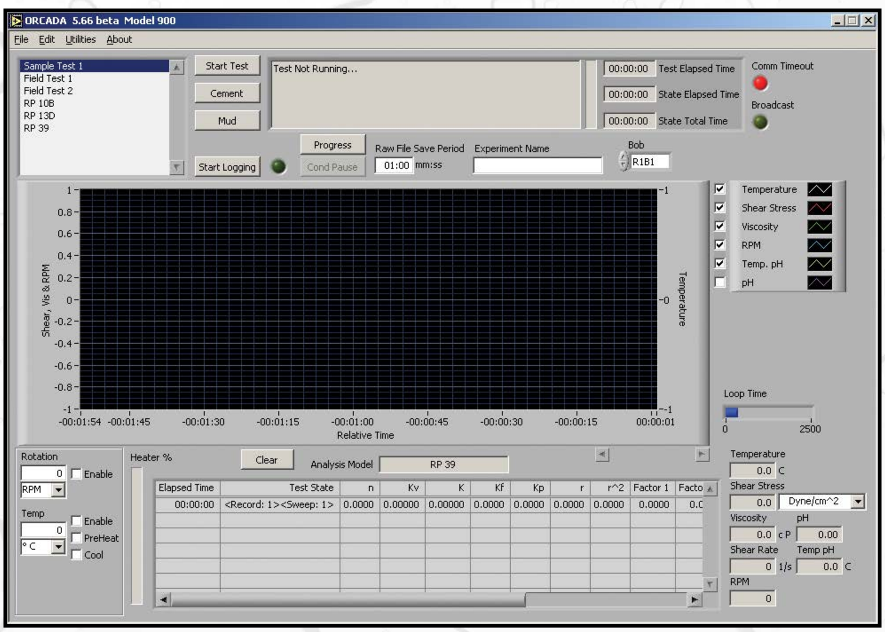
- Maximum Pressure: 2,500 PSI (17.2 MPa)
- Maximum Temperature: 500°F (260°C)
- Motor Speeds: Variable from .01 - 1,000 RPM
- Shear Rate Range: .01 - 1,002 sec^{-1}
- Size: 14" × 13" × 30" (36 × 33 × 76 cm)
- Weight: 85 lb (37.6 kg)

Requirements

- Power: 115 or 230 Volt AC, 50/60 Hz
- Nitrogen: Up to 2,500 PSI (17.2 MPa)

Software Features

- Write programs based on time, temperature and shear rates
- Multiple calibration points: low and high shear rates
- Computer automatically stores data
- Multiple rheological programs available



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Intro

For enhanced data collection, OFITE is pleased to introduce the new Model 1100 Pressurized Viscometer. This fully-automated system accurately determines the flow characteristics of fracturing fluids and drilling fluids in terms of shear stress, shear rate, time, and temperature at pressure up to 2500 PSI.

Using the exclusive ORCADA™ software, a computer novice can operate the Model 1100, and yet the system is versatile enough for advanced research and demanding test parameters. The rugged Model 1100 is suitable for both field and laboratory use. A waterproof case with wheels makes the unit completely portable.

Components

#130-75-02	Cap O-ring, -036, Viton 75D
#130-75-04	Thermocouple O-ring, -002, Viton 75D
#130-75-20	3⁄16" Spanner Wrench
#130-75-27	3⁄16" T-handle Allen Key
#130-75-28	1⁄16" Allen Key
#130-75-70	Waterproof Plastic Case with Casters
#130-78-04	Sample Thermocouple
#130-78-05	Main Seal
#130-78-13	B1 Bob; Hastelloy with Threads for Stainless Steel
#130-78-17	Bob Shaft Bearing
#130-78-18	Bearing, Main Body
#130-78-20	Rotor Cup O-ring, -218, Viton 70D
#130-78-34	Packing Washer
#130-78-36	O-ring, -117, Viton 75D
#130-79-15	Serial Cable; OB9; M/F
#130-81-001	O-ring, -029, Viton 75D
#130-81-002	Internal Pressure O-ring, -034, Viton 75D
#130-81-003	O-ring, -010, Viton 70D
#130-81-04	Spiral Retaining Ring
#130-81-07	Valve Stem
#130-81-071	Rotor, R1 (C276), HP
#130-81-082	Torsion spring, 4,000 Dyne/cm^2
#130-81-19	Bearing Retainer
#130-81-21	Seal Nut
#130-81-22	Lower Bearing
#130-81-27	Retaining Ring, VHM-28
#130-81-37	.050 Allen Key
#130-81-38	Seal Nut Wrench
#130-81-169	Shaft Assembly
#132-83	Calibration Fluid; 200 cP; 16 oz; Certified
#135-05	Spring Retaining Ring
#152-38	AC Power Cord; 3-Conductor International (Continental European)
#153-00	Bottle Brush
#153-55	Silicone Stopcock Grease; Dow Corning; 150g Tube
#153-67	60cc Disposable Syringe
#170-17	Valve Stem O-ring, -008, Viton 75D

Optional:

#132-80	100 cP Calibration Fluid; 16 oz.; Certified
#130-81-084	Torsion spring, 16,000 Dyne/cm^2
#132-82	500 cP Calibration Fluid; 16 oz.; Certified
#152-55	Bath/Circulator; Caron Model 2050W; Refrigerated and Heated; 115V
#152-55-1	Bath/Circulator; Caron Model 2050W; Refrigerated and Heated; 230V
#165-44	High-Temperature Thread Lubricant; 1 oz Tube

Features

- **High Pressure** - Up to 2,500 PSI (17.2 MPa)
- **High Temperature** - Up to 500°F (260°C)
- **Low Motor Shear Rates** - As low as 0.01s-1
- **Portable** - The rugged carrying case is designed for field or laboratory use and is easy to transport.
- **Small Footprint** - Only 12" × 12" (30 × 30 cm). The all-in-one design includes the heating mechanism.
- **Couette Geometry** - Uses traditional Bobs and Rotor for measurements that are easy-to-translate (shear stress range 0 – 4000 dynes/cm^2).
- **Computer Controlled** - Using the exclusive ORCADA™ software system, this viscometer is ideal for advanced research and demanding test parameters.
- **Data Acquisition** - Store your data in a text format or in a Microsoft Excel file for easy access and reporting capabilities.
- ***SAFEHEAT™** - Safe, Accurate, Fast, Environmentally friendly, High Efficiency Air Transfer system. Compared to traditional oil bath heating systems, *SAFEHEAT™ provides more precise control over the sample temperature without the risks of hot oil, such as spilling, splashing or flashing.
  *U.S. Patent Number 8,739,609

Specifications

Range of Measurement for Model 1100

Rotor - Bob	R1B1	R1B2	R1B3	R1B4	R1B5
Basic Data					
Rotor Radius, RR (cm)	1.8415	1.8415	1.8415	1.8415	1.8415
Bob Radius, RB (cm)	1.7245	1.2276	0.8622	0.8622	1.5987
Bob Height, L (cm)	7.62	7.62	7.62	3.81	7.62
Shear Gap (cm)	0.117	0.6139	0.9793	0.9793	0.2428
R Ratio, RB/RR	0.9365	0.377	0.468	0.468	0.8503
Max Temperature (°C)	260	260	260	260	260
Min Temperature (°C)	0	0	0	0	0
Shear Stress Range (dyne/cm²)					
Spring, 130-81-080	1 - 1000	2 - 2000	4 - 4000	8 - 8000	1 - 1160
Spring, 130-81-082	4 - 4000	8 - 8000	16 - 16000	32 - 3200	4 - 4650
Spring, 130-81-084	16 -16000	32 - 32000	64 - 64000	128-128000	19-18600
Shear Rate Range*					
Shear Rate Constant (s^{-1} / RPM)	1.7023	0.3770	0.2682	0.2682	0.8503
Shear Rate Range (s^{-1})					
0.01 RPM	0.01702	0.00377	0.00238	0.00238	0.008503
0.1 RPM	0.1702	0.0377	0.02382	0.02382	0.08503
1.0 RPM	1.702	0.377	0.2382	0.2382	0.8503
10 RPM	17.02	3.77	2.382	2.382	8.503
100 RPM	170.2	37.7	23.82	23.82	85.03
1000 RPM	1702	377	238.2	238.2	850.3
Viscosity Range (cP)					
Minimum Viscosity with 130-81-080**	0.1	0.5	1.7	3.4	0.1
Maximum Viscosity with 130-81-080***	5,875,000	53,125,000	168,750,000	337,500,000	13,750,000
Minimum Viscosity with 130-81-082**	0.2	2.1	6.8	13.6	0.5
Maximum Viscosity with 130-81-082***	23,500,000	212,500,000	675,000,000	1,350,000,000	55,000,000
Minimum Viscosity with 130-81-084**	1.0	8.5	27.2	54.4	1.9
Maximum Viscosity with 130-81-084***	94,000,000	850,000,000	2,700,000,000	5,400,000,000	220,000,000

* Lower shear rates available on special order.
** At 1,000 RPM
*** At .01 RPM

When using the 130-81-079 spring use a maximum speed of 300 RPM.

Instrument Geometry	True Couette Coaxial Cylinder
Motor Technology	Stepper
Motor Speeds (RPM)	Variable Speed Range .01 - 1,000
Speed Accuracy (RPM)	.001
Shear Rate Range (sec^{-1})	.01 - 1,022
Readout	Computer Control and Data Acquisition
Heat System	300 Watt, Max Temp 500°F (260°C)
Temperature Measurement	Type "J" Thermocouple
Automatic Tests	API Cementing, Mud and Fracture Rheology
Power Requirements	115 or 230 Volts AC, 50/60 Hz
Weight	85 lbs (37.6 kg)
Dimensions	14" × 13" × 30" (36 × 33 × 76 cm)
Shipping Weight	150 lbs (68 kg)
Communication Requirements	RS-232 Serial Port or LAN or Bluetooth.
Operating System	Windows 2000, XP or higher.

Viscosity Conversions

To convert from units on left side to units on top, multiply by factor @ intercept.

From \ To	Centipoise (cP)	Poise (P)	g/(cm × s)	(mN × s)m^2	mPa × s	$\frac{(lb \times s)}{100\ ft^2}$
Centipoise	1	0.01	0.01	1	1	0.002088
Poise	100	1	1	100	100	0.2088
g/(cm × s)	100	1	1	100	100	0.2088
(mN × s)m^2	1	0.01	0.01	1	1	0.002088
mPa × s	1	0.01	0.01	1	1	0.002088
$\frac{lb \times s}{100\ ft^2}$	478.93	4.789	4.789	478.93	478.93	1

Shear Stress Conversions

To convert from units on left side to units on top, multiply by factor @ intercept.

	Dyne/cm^2	Pa	lb/100ft^2	lb/ft^2	DR
Dyne/cm^2	1	0.1	0.2084	0.002084	0.1957
Pa	10	1	2.084	0.02084	1.957
lb/100ft^2	4.788	0.4788	1	0.01	0.939
lb/ft^2	478.8	47.88	100	1	93.9
DR	5.107	0.5107	1.065	0.01065	1