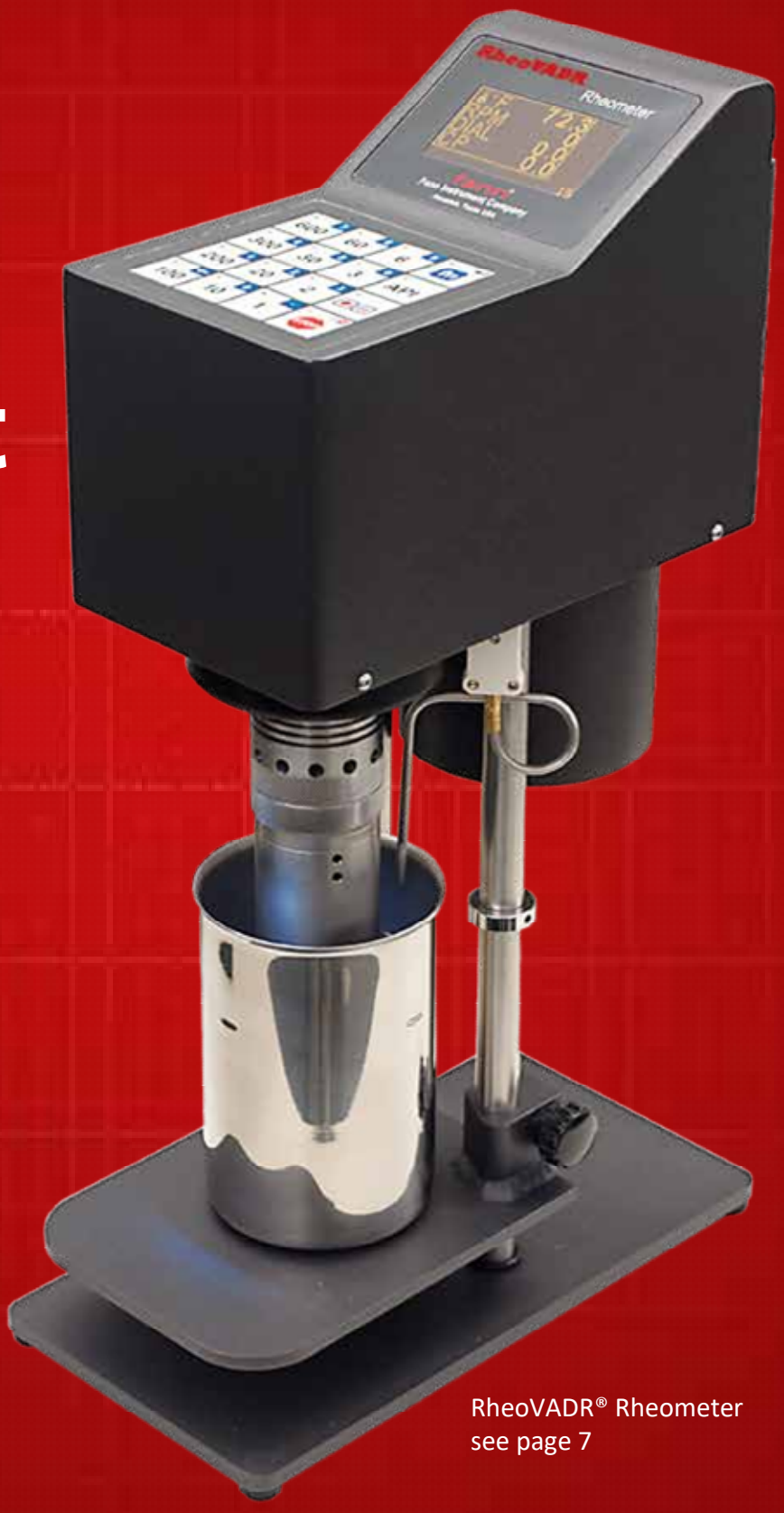
fann®

Product Catalog

DRILLING FLUIDS TESTING

OIL WELL CEMENT TESTING

INDUSTRIAL PRODUCTS



SHALE TECH SOLUTIONS

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April 2017

RheoVADR® Rheometer
see page 7

Fann Instrument Company
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Fann Instrument Company

Fann Instrument Company designs and manufactures instruments for measuring the physical and chemical properties of fluids, especially the measurement of flow and viscosity. Fann offers a broad array of instruments that help improve efficiency while reducing costs for customers around the world.

This catalog shows a product line that is a comprehensive set of instruments, accessories, test kits, and portable laboratories for testing drilling fluids, completion fluids, fracturing fluids, oilfield cements, and industrial slurries. Fann also provides reagents, supplies, and replacement parts through a worldwide distribution system.

Based in Houston, Texas, Fann Instrument Company has been the leading supplier of quality instruments for oilfield analysis since 1939. More than 65 years of continuous production has meant continuous improvement. Fann instruments have proven to be accurate and rugged.

Many instruments and test kits are designed to conform to the testing standards of the American Petroleum Institute (API), and are suitable for field and laboratory use. Others are designed to meet the requirements of the American Society for Testing and Materials (ASTM) as well as other technical specification groups.

Our ongoing research and product development program represents an investment in leading edge technology and a commitment to the design of sophisticated instrumentation used for laboratory research and highly efficient portable kits used on remote rig sites and other field locations. As we make changes, there may be differences between the product versions shown in this catalog and the currently available item.

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FANN AUTHORIZED DISTRIBUTORS

Fann Instrument Company products are available from companies around the world, Our distributors are as committed as we are to providing you with instruments that surpass your testing requirments and technical support that will keep you operating.

There is an authorized distributor near you whether you are testing in the field or in a lab. Contact your distributor for supplies, new equipment, or routine maintenance.

A list of distributors can be found on our web site www.fann.com.

FANN WORLD SERVICE

Technical Support Hotline

For troubleshooting and technical assistance call our 24/7 Technical Support Hotline at 1-713-268-6350. You will be put in touch with a qualified service technician in your region who will help you determine how to meet your repair needs. Please note that this line is for troubleshooting and technical assistance only.

Product Service and Support

Contact our service and support team during regular business hours (7 a.m.to 5 p.m. Central Time in the United States) at 1-281-871-4461 or 1-281-871-4484. Our fax number is 1-281-871-4446.

Customer Service

Please call toll-free1-800-347-0450 or 1-281-871-4482 from 7 a.m to 5 p.m. Central Time US for customer service related issues and order support.

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iX77® Rheometer

The iX77® Rheometer is a coaxial cylinder type rheometer designed to measure fluid rheologies under high pressures and temperatures with a high degree of safety. The Fann design is based on a machine developed by Sandia National Laboratories. Though designed with oil well and geothermal drilling fluids in mind, the instrument has applications in many other fields.

The iX77® Rheometer operates at temperatures up to 600°F (316°C) and pressures of up to 30,000 psig (206,840 kPa). Operation at below ambient temperatures is possible with an optional chiller controlled by the software .

This system uses a unique magnetic sensor to detect the motion of the jewel mounted torsion assembly in the test cell. The sensor system can be calibrated to ± one degree (equivalent to one centipoise at 300 RPM). Test pressures are generated by an air operated high pressure hydraulic pump and controlled by a smart back pressure controller, high pressure valve and pressure transducer. The pressurization fluid fills the upper portion of the test cell. The pressurization fluid is in direct contact with the quiescent sample, above the sample, not in the measurement area. The contact area is small to minimize mixing.

The rheometer's one-piece bench top design makes it suitable for use on a well site as well as in a laboratory. A strong low profile (22 inch high) bench top is recommended for easier cell removal.

SOFTWARE

The Fann control software allows the operator maximum flexibility by automating the operation, data collection, reporting and notification functions of the iX77® Rheometer. An advanced user can configure and operate the machine manually.

The operating system controls and records temperature, pressure, and rotor speed. It derives the fluid property measurements from the angle of rotation of the internal bob, as reported by the magnetometer. The instrument is calibrated using a standard fluid.

Shear stress values are calculated based on a "look up" table developed during calibration. The calibration file is loaded on startup, and evaluated for evidence of hysteresis. Excessive hysteresis indicates a likely mechanical problem, and a dialog is displayed when it is detected.

If the system starts up and detects it is under pressure (for instance after a power failure), it will use the detected pressure as its manual pressure set point. This is done to avoid decompressing the system suddenly. The temperature set point is always set to zero on startup.

Fann offers an optional chiller providing controlled sample cooling from ambient temperature to -10°C.

ORDERING INFORMATION

Part No. 101543382 - iX77® Rheometer Part No. 204160 - Chiller 115/120 Volts Part No. 381464 - Chiller 220/230 Volts

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Model 45 APV Viscometer

Fann Instrument Company introduces a new standard for accurate and user friendly viscosity testing.

The Model 45 APV (Automatic Programmable Viscometer) allows for customized, preprogrammed test schedules with touch screen controls.

This Couette type coaxial viscometer measures the shear stress in the gap between an outer rotating cylinder (rotor) and an inner suspended bob. The viscosity measurements are made by rotating the rotor at a known velocity and measuring the drag (torque) that is exerted on the bob. This measured torque value is then used to compute the viscosity in centipoise and dial units.

ADVANTAGES

- Springless design improves accuracy and resolution
- Measurements over a broad range of viscosity (0 to 30 oz-in of torque)
- Bi-directional testing functionality
- 100% digital measuring technology
- Onboard Smart Screen Computer with Windows® 7* touch panel technology
- Certified factory calibration

TESTING

Custom testing profiles can be created and saved on the unit, no external computer is required. Data is graphed on screen and saved into memory as tests are performed. The data can later be exported to an external drive through the USB port.

The Model 45 APV has pre-programmed sample test profiles including testing for:

- Viscosity: combining speeds, run-ins, moves, and naps in a single test profile
- Gel: designed to perform in accordance with the API procedure for measuring gel strength
- PV/YP Measurement: designed to perform in accordance with the API procedure for measuring Plastic Viscosity and Yield Point of a test sample
- Manual Mode: This test enables the user to select a speed, program a time, then observe the torque or dial units that are displayed as the test is performed

Specifications	
Speed Range	0.1 to 600 RPM
Speed Accuracy	+/- 0.001 RPM
Torque Accuracy	0.5%
Resolution	0.001 oz-in
Repeatability	+/- 1.0%

ORDERING INFORMATION

Part No. 102410859 - Model 45 APV Automatic Programmable Viscometer

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RheoVADR® Rheometer

The Fann RheoVADR®Variable Automated Digital Rheometer gives new meaning to the term “stand-alone.”

NO COMPUTER NEEDED

An operator can record test data without connecting the instrument to a computer or network. Speed, viscosity, dial reading, and temperature are recorded for each test.

Additional test data can be recorded on a USB flash drive. Plug a flash drive intothe USB port, select a data recording speed, and touch the “Record” button or select a pre-programmed API tests.

Data is captured in a standard CSV file that can be read by Microsoft Excel and other spreadsheet programs. Data recordings are limited by the capacity of the flash drive.

LAB OR FIELD

A Universal Power Adapter allows the RheoVADR® Rheometer to be used in the lab or in the field.

API TESTS PRE-PROGRAMMED

American Petroleum Institute standard drilling fluid and cement tests are pre-programmed into the RheoVADR® Rheometer. Detailed step by step instructions for each test are included in the manual.

ORDERING INFORMATION

Part No. 102267855 - RheoVADR® Variable Automated Digital Rheometer

RheoVADR® Rheometer Quick Look	
Power	100-240 VAC, 50/60 Hz
Temperature Accuracy	0.5°F
Operating Temperature Range	40°F-125°F
Size	18 in x 6 in x 10 in
Ports	Power, RJ45 serial, USB
Data Recording Speeds (intervals)	100, 200 & 500 ms; 1, 5, 10 sec
Speeds	12 preset, Variable 0.01-999 RPM
Shear Rate Range (sec-1)	.017-1700

Manual Test Set-up

Illuminated Sample Cup

RheoVADR™® Rheometer dial readings are accurate to within half a degree.

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RheoVADR® 50 Rheometer Series

Coming soon — the **RheoVADR® 50** Variable Automated Digital Rheometer builds on the accuracy of the Model 50 HPHT Rheometer in a benchtop footprint with digital technology. Tests can be conducted under conditions of accurately controlled shear rate, temperature, and pressure.

TWO MEASUREMENT TECHNOLOGIES

Two measurement technologies are used in the RheoVADR® 50 Rheometer series. The base unit uses a bob, rotor, and torsion spring to test fluids at temperatures up to 500° F and pressures up to 5000 psi.

The RheoVADR® 50 A features a springless active sensor allowing an operator to test a fluid through the full range of viscosities without losing resolution or changing springs. The active sensor continuously adapts to the range of viscosity in the test fluid while keeping the best resolution of measurement. There is no spring to adjust, change, or maintain.

INTEGRATED TOUCH SCREEN FOR CONTROL AND DISPLAY

Use the ten inch touch screen to program and control the instrument and display data, graphs, and trends. Each RheoVADR® 50 is a standalone unit right out of the box. Test data is recorded internally or to a separate computer[2] through a control interface.

REDUCED SETUP TIME

The RheoVADR® 50 is engineered to need less set-up time between tests.

PRE-ORDER NOW![1]

Part No. 102637242 - RheoVADR 50
Part No. 102650956 - RheoVADR 50A

RheoVADR® 50 Rheometer Quick Look	
Temperature Range	Ambient to 500° F
Temperature Ramp Rate	10°F/Minute
Temperature Subsystem	Non-contact ceramic heaters
Pressure Range	5000 psi using external N_2 system[2]
Speed Range	0.01 to 1000 rpm
Size	11 in x 22 in x 30 in
Power	Self-switching universal power supply
Viscosity Range	1 cP to 1,000,000 cP
Material (wetted parts)	SS 316 (Hastelloy available)

[1]The production version of this instrument may vary in appearance from the image seen here and may have additional capabilities not described in this document. Customers will be given an estimated price and delivery date for the product. The final sales price and delivery date are subject to change.

[2] Not provided with the system.

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Model 35 Viscometer

The Fann® Model 35 Viscometer is widely known as the “Standard of the Industry” for measuring drilling fluid viscosity.

The Model 35 Viscometer is a versatile instrument for use in research or production.

Six-speed models have test speeds of 600, 300, 200, 100, 6 and 3 rpm. Any test speed can be selected without stopping rotation.

The twelve speed models allow measurement over an extended shear-rate range with test speeds of 600, 300, 200, 180, 100, 90, 60, 30, 6, 3, 1.8 and 0.9 rpm.

Standard equipment includes factory installed R1 Rotor Sleeve, B1 Bob, F1 Torsion Spring, and a stainless steel sample cup for testing specified by the American Petroleum Institute. Other rotor and bob combinations and/or torsion springs can be substituted to extend the torque measuring range or to increase the torque measurement sensitivity.

Fann offers a complete line of viscometer parts and accessories, including:

- Rotors & Bobs in a variety of dimensions
- Torsion Springs of various constants
- Sample Heating Cups
- Certified Calibration Fluids
- Calibration Kits
- Deadweight Calibration Kit
- Cold Water Rheology Kit

ORDERING INFORMATION

Part No.	Model	Voltage	Frequency	
207198	Model 35A	115 volt	60 hz	
207199	Model 35SA	115 volt	50 hz	
101671768	Model 35A	115 volt	60 hz	with case
101671770	Model 35SA	115 volt	50 hz	with transformer and case
207200	Model 35A/SR12	115 volt	60 hz	
207201	Model 35SA/SR12	115 volt	50 hz	
101671771	Model 35A/SR12	115 volt	60 hz	with case
101671767	Model 35SA/SR12	115 volt	50 hz	with transformer and case
205722	Transformer	230/115 volt	50/60 hz	

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Torsion Springs

Torsion springs are readily interchanged on all Model 35 Viscometers. Instruments are normally supplied with the F1 torsion spring.

Other torsion spring assemblies are designed to be integral multipliers of the standard spring and can be used to increase or decrease the shear-stress range and the viscosity range of the instrument. Precision drawn tempered beryllium-copper wire helps ensure the precision linearity and long service life for these torsion springs, even in adverse environments.

Torsion Spring Assembly	Part No.	Torsion Spring Constant k1 (dyne-cm/deg. defl)	F Factor	Max Shear Stress With B1 Bob (dynes/cm2)	Color Code
F0.2	207656	77.2	0.2	307	Green
F0.5	207657	193	0.5	766	Yellow
F1	207465	386	1	1,533	Blue
F2	207658	772	2	3,066	Red
F3	207659	1,158	3	4,600	Purple
F4	207660	1,544	4	6,132	White
F5	207661	1,930	5	7,665	Black
F10	207662	3,860	10	15,330	Orange

Bobs

The B1 bob (inner cylinder) is the standard for drilling fluids and cements and handles other applications as well. This bob is made of 303 stainless steel for good wear resistance and is hollow for neutral buoyancy, low rotational inertia and fast response in typical test fluids. Maximum use temperature is 200°F (93°C). Three additional bobs are available for the R1 family of rotors.

ORDERING INFORMATION

Part No. 207521 – B1 Bob, Hollow, Stainless Steel
Part No. 207520 – B2 Bob, Solid, Stainless Steel
Part No. 207519 – B3 Bob, Solid, Stainless Steel
Part No. 207518 – B4 Bob, Solid, Stainless Steel

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Rotors

The R1 rotor sleeve normally supplied with the Model 35 Viscometer has an open bottom. The R2 rotor is available for smaller gaps and higher shear rates. Both are available in closed-end, rotor-cup configurations. An open-end R3 rotor is available for a larger shear gap. All Rotor sleeves are constructed of Stainless Steel.

ORDERING INFORMATION

Part No. 207523 - R1 Rotor Open Bottom
Part No. 207942 - R2 Rotor Open Bottom
Part No. 207943 - R3 Rotor Open Bottom
Part No. 208983 - R1 Rotor Closed End
Part No. 208985 - R2 Rotor Closed End

DW-3 Calibration Check Kit

Dead weight calibration checks help to maintain the accuracy of the torque measuring system on all Model 35 Viscometers. You can quickly determine the condition of bearings and the accuracy of torsion spring setting with this kit. It includes a support bracket, spool for bob-shaft, five metric weights, spare thread, instructions, and case.

ORDERING INFORMATION

Part No. 207853 - DW-3 Calibration Check Kit

Thermo-Cups

Electrically heated sample cups incorporate a precision thermostat for close temperature control. Operating temperatures up to 200°F (93°C) are reached quickly and verified by an included dial thermometer. Pins in the base locate and lock to the stage of Model 35 Viscometers. The heater is made of epoxy-finished aluminum alloy for better heat distribution and easy cleaning.

ORDERING INFORMATION

Part No. 101558383 - 115 VAC 50/60 Hz, 2 Amps
Part No. 101558384 - 230 VAC 50/60 Hz, 1 Amp

Cold Water Rheology Kit

The Cold Water Rheology Kit provides controlled sample cooling for a Model 35 Viscometer. The circulating chiller is capable of regulated sample cooling from ambient temperature to -20°C. Sample temperature is indicated on the display screen of the circulator bath.

ORDERING INFORMATION

Part No. 207952 - Cold Water Rheology Kit 115/120 Volts
Part No. 207953 - Cold Water Rheology Kit 220/230 Volts

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Rheometer/Viscometer Check Kit

The Rheometer/Viscometer Check Kit is designed to be used to conveniently check the calibration of rheometers and viscometers. This kit contains all items necessary to determine the accuracy of any concentric cylinder viscosity measuring instrument. Two 16 oz bottles of certified viscosity standards (traceable to National Institute of Standards and Technology) are included.

ORDERING INFORMATION

Part No. 207026 - Rheometer/Viscometer Check Kit

Rheometer Calibration Stand

The Rheometer Calibration Stand is designed for use in recalibrating the Torsion Springs for Model 280 & 286VS Rheometers. Torsion springs must be removed from the instruments in order to perform this calibration.

Includes weights, thread, spool, and instructions.

ORDERING INFORMATION

Part No. 207083 - Rheometer Calibration Stand

Marsh Funnel Viscometer

The Marsh Funnel is a simple device for indicating viscosity on a routine basis. The viscosity measurement procedure requires a graduated container (Measuring Cup) to receive the fluid as it flows out of the funnel, a means to measure elapsed time (Stopwatch), and a thermometer for measuring the temperature of the sample.

ORDERING INFORMATION

Part No. 206884 - Marsh Funnel, Plastic No. 201
Part No. 206889 - Measuring Cup, Plastic No. 202, 1000 cc
Part No. 206893 - Measuring Cup, Stainless Steel, 500 cc
Part No. 206894 - Measuring Cup, Stainless Steel, 1000 cc
Part No. 206895 - Measuring Cup, Stainless Steel, 2000 cc
Part No. 206898 - Digital Stopwatch
Part No. 206044 - Digital Thermometer

Certified Viscosity Standard Fluids

Fann Viscosity Standards are certified by methods traceable to the United States National Institute of Standards and Technology (NIST). The selection of one or two fluids will normally provide sufficient measurement points to verify the calibration of your instrument. All fluids are supplied in 16 oz (1 pint) containers complete with a certificate of calibration and a temperature/viscosity table.

Part No.	Fluid
207124	10 Centipoise (cP)
207119	20 Centipoise (cP)
207120	50 Centipoise (cP)
207121	100 Centipoise (cP)
207122	200 Centipoise (cP)
207123	500 Centipoise (cP)
207126	30,000 Centipoise (cP)
207125	100,000 Centipoise (cP)

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Rheometer Model 280

The Model 280 Rheometer is a precision multiple-speed rotational viscometer designed specifically for field testing the rheological properties of drilling fluids.

The Rheometer is operated at two rotational shear rates, and the readings obtained are used to determine the plastic viscosity and yield point of the drilling fluid being tested.

The Model 280 is supported on a counterbalanced telescoping frame allowing easy adjustment of the rotor depth. Turning a small crank drives a rotor at a preselected constant speed through a precision gear train governor. Rotor speeds of either 300 or 600 rpm are obtained by setting the position of the speed control lever. A third position of the speed control lever is available for operating the rotor at a higher speed for stirring the drilling fluid sample.

Gel-strength measurements are read directly from the deflection scale. When making gel-strength measurements, force is applied manually by turning the gel knob and observing the maximum reading on the deflection scale before the gel breaks.

No field maintenance is required. It is the lightest field instrument available for determining plastic viscosity and yield point.

ORDERING INFORMATION

Part No. 206984 - Model 280 Rheometer, hand-operated

Fann Instrument Company offers a complete line of Instrumentation for use in testing drilling fluids in accordance with American Petroleum Institute publications:
API Recommended Practice 13B-1, ANSI/API 13B-1/ISO 10414-1
API Recommended Practice 13B-2, & API Specification 13A

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HT4700 HPHT Filter Press

Fann Instrument Company's Model HT4700 HPHT Filter Press is designed for safe and efficient high-temperature, high-pressure fluid loss testing that meets API specifications. The digital system is accurate and controllable.

The filter press consists of a heating jacket, Safe Cell, Type J themocouple probe, pressurizing assemblies, and two power cables - 115 volt and 230 volt. Safety features include a lock and release mechanism that secures the cell in place and maximizes heat transfer. The exterior of the jacket is safe to touch, less than 130° F.

The HT4700 has a digital temperature controller for better accuracy and control. The thermocouple probe allows precise temperture measurements. Logging test data is done using a data port on the heating jacket. (Data logger is not included.)

Heating Jacket Specifications	
Maximum Temperature	500°F
Heating Capacity	400 watts
Power Requirement	115/230 VAC 1000 watts
Dimensions L x W x D	12 x 12 x 17.8 in 30.5 x 30.5 x 45 cm
Weight	34 lb (15.4 kg)
Safe Cell Specifications	
Maximum Working Pressure	1800 PSI (12410 kPa)
Sample Cell Volume	100 ml @ 500°F (260°C) 130 ml @ 350°F (177°C)
Weight	9 lb (4.1 kg)

DNA This symbol means the instrument is compatible with the DNA System

ORDERING INFORMATION

	CO_2 Pressurization		Nitrogen Pressurization	
Filter Press Assembly Part Number	102195986	102196306	102197003	102197111
Safe Cell Configuration	Single Ended	Double Ended	Double Ended	Single Ended
Pressurization Part Number	CO_2 Assembly 209471		Dual Nitrogen Assembly 209545	
Backpressure Receiver Part Number	15 ml, CO_2 209503		15 ml, Nitrogen 209502	
HT4700 Heating Jacket	115/230 Volts, 400 Watts, Part No. 101631160			

Note: Items listed for each assembly part number are included. These items can also be ordered separately.

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HPHT Safe Cell

Fann Instrument Company introduces the new HPHT Safe Cell, offering a unique combination of safety, simplicity, and savings.

SAFETY COMES FIRST

The Safe Cell is designed to reduce the chance of accidental opening of the cell while still under pressure. The screw-in end cap is essentially impossible to remove without releasing internal pressure.

The Safe Cell also uses the CellTell™ pressure indicator to show pressure status at a glance.

NO WRENCH OR CLAMP NEEDED

Using the Safe Cell is simple. The screw-in end cap allows the cell to be opened and closed by hand. No screws hold the cap down so no wrench is needed. No cell clamp is required because the cap cannot be removed without releasing internal pressure.

SAVE TIME

The simple procedure means technicians save time opening and closing the Safe Cell.

ORDERING INFORMATION

Part No. 102312548 - HPHT Safe Cell

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Model 90 Dynamic HPHT® Filtration System

The Fann Model 90 Dynamic HPHT® filtration system is the industry's only true dynamic filtration system for conducting filter cake formation and permeability analysis for drilling fluids optimization. Utilizing a wide range of available filter media, the Dynamic HPHT Filtration System can be heated and pressurized to provide the closest possible simulation of downhole conditions. Safety features have been designed into the system to protect the user and help ensure reliable test results.

The filter medium is a thick-walled cylinder with rock-like characteristics to simulate the build-up of filter cake on the formation. Varying porosities and permeabilities are available. Filtration occurs radially from the inside of the filter core to the outside. At the same time, the filter cake is formed on the inside of the filter core to simulate filter cake formation on the wall of a borehole.

The filter cake can be inspected visually after the test is completed. The LCD display allows monitoring of real-time test results. Results can be printed for further analysis and retention.

The Dynamic HPHT filtration system also features an interface port, which allows downloading of data to a personal computer.

ORDERING INFORMATION

Part No. 209113 - Model 90 with software to evaluate drilling fluids
Part No. 209114 - Model 90B with software to evaluate breaker fluids
Part No. 219698 - Model 90BH w/software for breaker fluids, Hastelloy wetted parts

Ceramic Filter Cores

Ceramic Filter Core Specifications			
Part Number	**API Designation**	**New (Hg Data)**	**Old (Air) Data Previous Designation**
210545	12	12 micron	5 micron
210546	20	20 micron	10 micron
210547	40	40 micron	20 micron
213483	50	50 micron	35 micron
210548	55	55 micron	60 micron
210549	120	120 micron	90 micron
210550		--	150 micron
210551		--	190 micron

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HPHT Filter Press (175 ml)

HPHT Filter Presses are available in a number of configurations allowing greater flexibility in choosing the system and options that suit each individual need. Options for pressurization include CO_2 cartridges, bottled nitrogen, or an in-house source (user provided). Single or double opening cells are available. Filter media may be API standard filter paper, ceramic discs of several calculated porosities, and various mesh sized screens. The 175 milliliter High Pressure High Temperature Filter Press can be pressurized to 1800 psig on the cell and 750 psig on the back pressure receiver. Maximum operating temperature is 350°F.

Each filter press is supplied with all necessary operating supplies including:

- Pressurization System (Nitrogen or CO_2
- Back Pressure Receiver, 15 ml No. 209502CC
- Cell (see configuration chart for specific cell supplied with each unit

Part No.	Cell (1800 psi)	Description	Volts	Watts
101571372	Cell	CO_2 Pressurizing assembly 15 ml(CO2) Back-Pressure Receiver	115	400
101571374	Cell	CO_2 Pressurizing assembly 15 ml (CO_2) Back-Pressure Receiver	230	400
101571371	Double Ended Cell	CO_2 Pressurizing assembly 15 ml (CO_2) Back-Pressure Receiver	115	400
101571373	Double Ended Cell	CO_2 Pressurizing assembly 15 ml (CO_2) Back-Pressure Receiver	230	400
101565554	Double Ended Cell	Dual Nitrogen Manifold for Primary 15 ml Back Pressure Receiver	115	400
101565558	Double Ended Cell	Dual Nitrogen Manifold for Primary 15 ml Back Pressure Receiver	230	400

175 ml HPHT Filter Press units can be pressurized to 1800 psig on the cell and 750 psig on the back pressure receiver. Maximum operating temperature is 350°F.

Specifications	
Max Working Pressure	1800 PSIG
Maximum Temperature	350 °F
Power Requirement	115/230 VAC 50/60 Hz
Sample Cell Volume	175 ml
Receiver Volume	100 ml
Heating Capacity	400 watts
Filtering Area	22.6 cm² (3.5 in²)

Filter Press Cell Clamp

Laboratory technicians are increasingly concerned about opening a HPHT Filter Press cell with pressure trapped inside. This bench top cell clamp to maintains force on the lid while the set screws are removed. Once the screws are removed, the lid can be allowed to slowly rise and release any trapped pressure in a controlled manner.

Ordering Information

Part No. 232207 - Clamp for 175 ml HPHT Filter Press Cell
Part No. 232208 - Clamp for 500 ml HPHT Filter Press Cell

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HPHT Filter Press (500 ml)

The 500 milliliter High Pressure High Temperature Filter Press can be pressurized to 1800 psig on the cell and 750 psig on the back pressure receiver. Maximum operating temperature is 500°F. For operation above 400°F, the filter paper should be backed with a glass fiber filter, or a stainless steel filter.

Max Working Pressure	1800 PSIG
Maximum Temperature	500 °F
Power Requirement	115/230 VAC 50/60 Hz
Sample Cell Volume	493 ml
Receiver Volume	100 ml
Heating Capacity	800 watts
Filtering Area	22.6 cm² (3.5 in²)

Select your configuration from the table below.

HPHT Filter Press Assembly	**Part No. 101565562** (includes items listed below)	**Part No. 101565564** (includes items listed below)	**Part No. 101565561** (includes items listed below)	**Part No. 101565563** (includes items listed below)
Heating jacket	No. 209540 115 volt, 800 watts	No. 209541 230 volt, 800 watts	No. 209540 115 volt, 800 watts	No. 209541 230 volt, 800 watts
Pressurization	dual nitrogen manifold No. 209545		dual nitrogen manifold No. 209545	
Back Pressure Receiver	100 ml No. 209542		100 ml No. 209542	
Cell Configuration	500 ml, single opening No. 209586		500 ml, dual opening (open both ends) No. 209587	
Cap & Screen Configuration	Cap No. 209532 screen No.207232, 60 mesh (installed in cap)		1 Cap No. 209536 with No. 209534 detachable screen 325 mesh w/60 mesh backup 1 Cap No. 206568 pressure indicating	

Fann HPHT Filter Presses are furnished with the CellTell™ Positive Pressure Indicator. The CellTell™ Positive Pressure Indicator gives an instant indication of the pressure status of any HPHT cell. The CellTell indicator is unaffected by temperature, and resistant to motion caused by vibration and rotation. CellTell positive pressure indicators are standard equipment on all configurations of HPHT cells assemblies and all versions of HPHT Filter Presses.

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LPLT Filter Press (API Filter Press)

The Series 300 LPLT Filter Press (API Filter Press) is the most effective means of determining the filtration properties of drilling muds and cement slurries. LPLT Filter Press Assemblies consist of a mud reservoir mounted in a frame, a pressure source, filtering medium, and a graduated cylinder for receiving and measuring filtrate. Working pressure is 100 psig and the filtering area is 7.1 in2, as specified in the American Petroleum Institute API Recommended Practice 13B-1 and 13B-2.

ORDERING INFORMATION

No. 207127 Filter Press Basic Assembly Includes:	
208129 - Frame Assembly	382949 - Top Cap, Stainless Steel
208255 - Gasket, Rubber (6)	382950 - Base Cap & Tube, Stainless Steel
208310 - Screen, 60 Mesh	206051 - Filter paper, pkg of 100
382948 - Cell Body, Stainless Steel	205868 - Graduated Cylinder, 25 ml
101983293 - Filter Cake Ruler	
No. 207173 Filter Press Includes:	
207127 - Fiter Press Basic Unit	207929 - Air hose, 3 ft
No. 207174 Filter Press Includes:	
207127 - Fiter Press Basic Unit	208615 - Regulator
207929 - Air hose, 3 ft	208653 - Bleeder valve
No. 207223 Filter Press Assembly Includes:	
207127 - Filter Press Basic Unit	207127 - Fiter Press Basic Unit
207929 - Air hose, 3 ft	208653 - Bleeder valve
No. 207224 Filter Press Includes:	
207127 - Fiter Press Basic Unit	208647 - CO_2 pressuring assembly
No. 207290 Filter Press With Hydraulic Dead-Weight Assembly	
207127 - Fiter Press Basic Unit	208594 - Dead-weight hydraulic asmbly
No. 207503 Filter Press Includes:	
207391 - Filter press, wall mount	205868 - Graduated cylinder, 25 ml
208647 - CO_2 pressure assembly	206051 - Filter paper, pkg of 100
No. 207356 Filter Press In Stainless Steel Case (209184)	
207391 - Filter press, wall mount	205869 - Cylinder, graduated, 10 ml
208647 - CO_2 pressure assembly	206035 - Timer, interval, 30-minute
205868 - Cylinder, graduated, 25 ml	206051 - Filter paper, 2 pkg of 100

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Half Area Filter Press

The Half Area Filter Press is a compact version of the standard Filter Press and employs a 1/2 size filtration area. Time and pressure requirements are the same as for the API filter press. All filtrate volumes must be multiplied by 2 to correlate with API specifications.

The Half Area Filter Press consists of a filter cell body (cell) containing a pressurizing inlet, a pressure regulator, and a pressure gauge. A rubber diaphragm (boot) is supplied to contain the drilling fluid and separate it from the pressurizing gas. The boot allows the filter cell to be operated in any position. A reversible frog mounting is provided on the exterior of the cell to allow conventional filtration or upside down filtration. A wall mounting bracket is provided for supporting the filter press on a wall.

ORDERING INFORMATION

Part No. 207228 - Half Area Filter Press

Multiple Unit Filter Press

Multiple unit filter press assemblies permit running one to six filtration tests simultaneously. Each assembly consists of a frame with the indicated number of complete filter cells. Manifolds are complete with air hoses, cut-offs and bleeder valves. Accessories such as pressure regulators and hoses for connection to pressurization sources are sold separately.

ORDERING INFORMATION

Part No. 207673 - Filter press, 6 cells no. 311
Part No. 207785 - Filter press, 4 cells no. 313

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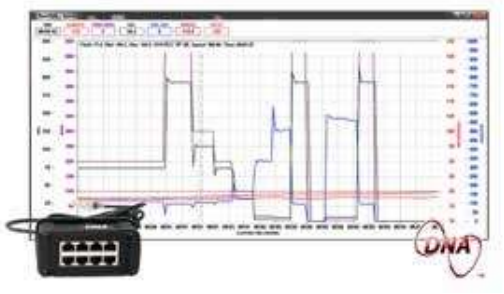
The DNA System

The DNA System is a proprietary hardware and software system that adds capabilities to existing Fann instruments by connecting them to a computer using Fann's exclusive Data Acquisition and Control Software. By connecting and controlling individual instruments the system creates one integrated test system.

For example, by combining RheoVADR® Rheometer and Model 741 Temperature Controller into one integrated system, the user can create custom schedules to control speed, temperature, time, and data rates.

The DNA System is ideal for users who want to automate several simultneous tests and collect reliable data for every test. With this system, the user can set up the tests to automatically start, run custom schedules, and stop, giving the user freedom to work on other projects.

The DNA System works with RheoVADR® Rheometer, Model 741 Temperature Controller, and HT4700 HPHT Filter Press. In the future, more Fann instruments will be available for connecting to the DNA System.

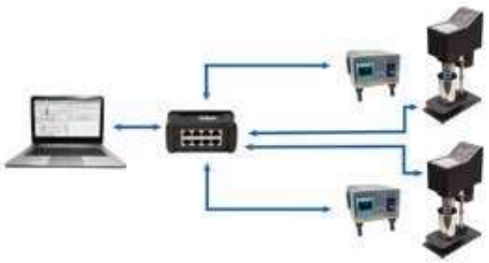


CUSTOM SCHEDULES

- Combines units to act as one, increasing overall capabilities
- Schedules for time, temperature, speed, and data rate
- Temperature ramping
- Saves test profiles and combines profiles to run complex schedules

FEATURES

- Controls and collects data from various instruments
- Graphical display of set points, real-time values, elapsed time and more variables
- Records data at 100 ms, 500 ms, 1 s, 2 s, 5 s, 10 s
- Audible alerts for end of test, temperature set point, and other important steps or events
- Compatible with Fann Data Manager for organizing and printing data or exporting it to a spreadsheet
- System Updates available
- Operating system— Microsoft® Windows® 7*



This illustration shows the DNA System connecting two RheoVADR® Rheometers and two Temperature Controllers. The computer (not included) operates the DNA software.

ORDERING INFORMATION

Part No. 102410489 – DNA System

Includes Data Network Adapter box (USB to RJ45) with USB computer connector, software, and two 10 ft CAT5 RJ45 cables

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Data Manager Software

Fann's Data Manager software is available to view, analyze, and print data after the test is complete. The Data Manager also allows manipulation of test data for various Fann products and customization of reports. It also allows printing and exporting of data to TXT and CSV formats for import into spreadsheet programs.

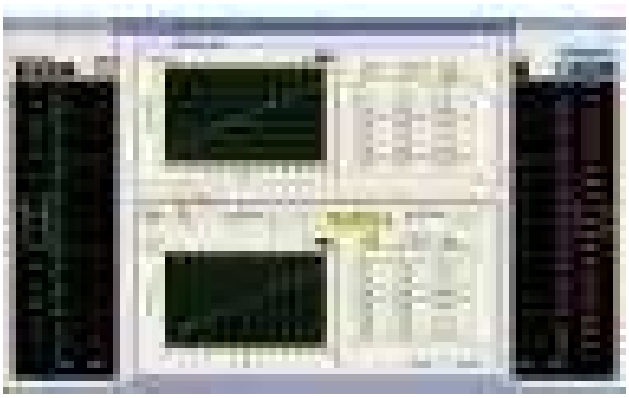
DATA INTERPRETATION

Interpreting the data is easy because the individual graphs for Temperature, Pressure, SGS, are color coded to respective scales. The software plots all of the data with respect to these parameters.

In the case of SGS, the data contains meaning only during the Gel Stage. Data collected during conditioning is of no value.

ORDERING INFORMATION:

Data Manager software is included with various Fann products. Updates and replacements are available on the web site.



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Model 802P 600º Roller Oven

Fann raises the temperature for drilling fluids aging tests to 600° F. The new Model 802P Roller Oven has a maximum temperature of 600° F (315° C). It features two power driven rollers, a digital temperature controller, data logger port, timer, and a fail-safe over-temperature protection system. An internal fan assures uniform temperature distribution throughout the oven.

Innovative insulating materials make the Model 802P light in weight. At 90 pounds (40.8 kg) the Model 802P can easily be moved around the lab. Its compact design makes it easier to install and occupy less laboratory space.

The Model 802P has a switchable power supply and will run on 115 volt or 230 volt power.

A high temperature oven requires a high temperature aging cell. The Model 802P uses a 550 ml stainless steel aging cell certified for 600° F (315° C) and 2500 psig (17,237 kPa) maximum working pressure.

The Model 802P Roller Oven meets the essential requirements of the IEC System for Conformity Testing and Certification of Electrical Equipment (IECEE), by using the relevant standard shown below to indicate compliance.

IEC 61010-1:2001 (Second Edition)
Safety requirements for electrical equipment for measurement, control, and laboratory use, Part 1: General requirements

ORDERING INFORMATION

Part No. 102030761 – Model 802P 600° Roller Oven
Part No. 102111608 – 600° F High Temperature Aging Cell, 550 ml

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High Temperature Aging Cell

Fann Instrument Company now offers a 600º F High Temperature Aging Cell for tests evaluating the high temperature performance of drilling fluids or muds. This is the preferred cell for the Model 802P roller oven.

Fann high temperature aging cells can be pressurized with nitrogen or carbon dioxide to a desired pressure, preventing boiling and vaporization of the drilling fluid before it reaches the test temperature.

The 550 ml stainless steel aging cell is used for tests at temperatures up to 600ºF (315º C) and pressures up to 2500 psi (17,237 kPa). This cell can hold a 350 ml sample with adequate room for volume expansion. Shear tests can also be run on this sample.

These cell assemblies are made of Type 316 stainless steel and can be pressurized using the Fann High Temperature High Pressure Filter Press manifolds.

SPECIFICATIONS

Volume	550 ml
Maximum working pressure	2500 PSI (17237 kPa)
Maximum temperature	600°F (315°C)

ORDERING INFORMATION

Part No. 102111608 – 600° F High Temperature Aging Cell, 550 ml

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Model 704ET and 705ET Roller Oven

Fann Model 704ET and Model 705ET roller ovens are designed for laboratory use. These roller ovens provide an excellent method for aging fluid samples. The 704ET has four rollers, the 705ET has five.

Both are constructed of polished stainless steel and other corrosion resistant materials.

FEATURES:

- Digital Temperature Controller displays present and set point temperatures and supports both Fahrenheit and Celsius
- Programmable Timer can be set for delayed start, delayed stop, and immediate start (default)
- Fans help maintain uniform temperature and cool controls and roller drive motor
- Voltage Selector gives options to set voltage at 115VAC or 230VAC
- Push Button Circuit Breakers, 5A and 10A, are manually resettable

ENHANCED SAFETY FEATURES

The Enhanced Safety System uses an over-temperature controller to shut off power to the oven heaters when the internal oven temperature is greater than 525°F ± 1°F (274°C± 0.5°C).

Specifications			
Model	**Temperature Range**	**Heater Power**	**Power Required**
704ET	Ambient to 500°F	1000 watts	110-230 VAC, 50/60 Hz
705ET	Ambient to 500°F	1000 watts	110-230 VAC, 50/60 Hz

Aging Cell Capacity					
Model	**Rollers**	**260 ml cell w/o valve stem**	**260 ml cell w/ valve stem**	**500 ml cell w/o valve stem**	**500ml cell w/ valve stem**
704ET	4	9	6	6	3
705ET	5	16	12	8	8

ORDERING INFORMATION

Part No. 102365469 – Model 704ET Roller Oven, 4 Rollers
Part No. 102365354 – Model 705ET Roller Oven, 5 Rollers

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Aging Cells

Most drilling fluid formulations contain a base liquid and additives which must be dissolved or mechanically dispersed into the liquid to form a homogenous fluid. The resulting fluid may contain one or more of the following: water-dispersible (soluble) polymers or resins, clays or other insoluble but dispersible fine solids, and soluble salts.

The fluids are mixed or sheared for times appropriate to achieve a homogenous mixture and are then set aside to “age.” Aging is done under conditions which vary from static to dynamic and from ambient to highly elevated temperatures.

ORDERING INFORMATION

Please order aging cells using the chart below

Part No.	Material	Volume	Maximum Working Pressure		Maximum Temperature	
		ml	psig	kPa	°F	°C
210285	303 Stainless Steel	500	2500	17237	500	260
210286	316 Stainless Steel	500	2500	17237	500	260
210288	303 Stainless Steel	260	2500	17237	350	177
210289	303 Stainless Steel	260	2500	17237	350	177
210290	303 Stainless Steel	500	2500	17237	500	260
210291	316 Stainless Steel	260	2500	17237	350	177
210292	316 Stainless Steel	260	2500	17237	350	177
210294	303 Stainless Steel	500	2500	17237	500	260
210316	316 Stainless Steel	500	2500	17237	500	260

Corrosion Test Cell

The Corrosion Test Cell is designed for testing fluids at temperatures up to 500°F (260°C) and pressures to 2,500 psig (17,237 kPa). The lightweight, compact cell includes a built-in coupon holder and pressurization valve. The 500 ml cell is constructed of 303 Stainless Steel. Corrosion Coupons are available in a variety of materials and configurations for use with the Corrosion Test Cell.

ORDERING INFORMATION

Part No. 210294 - Corrosion Test Cell

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Model 389AP APPA

The Automated Permeability Plugging Apparatus (APPA), Model 389AP is useful in predicting a drilling fluid's ability to form a semi-permeable filter cake that will seal off depleted or under pressure intervals and help prevent differential sticking.

The APPA is a high pressure, high temperature instrument that automatically controls the temperature and pressure.

Monitoring is easier with a real-time display of temperature and pressure. Data is automatically stored for future reference, printing, and downloading.

The Model 389AP is compatible with filter media in various pore sizes, features a built-in heating chamber, air pump and hydraulic pump.

Routine operations are controlled from a keypad, including starting and stopping the test, priming the cell, test profile and adjusting pressure or temperature.

FEATURES

- Realistic and accurate downhole simulation
- Automatic pressure control
- Allows filter media of various pore sizes
- Built in heating chamber, hydraulic pump, and air pump
- Real-time data in graph
- Store test data

SPECIFICATIONS

Pressure range	0 PSI to 5000 PSI (34473 kPa)
Temperature range	Ambient to 500°F (260°C)
Compressed air	80 PSI (551 kPa) minimum
Nitrogen inlet	1000 PSI (6895 kPa) maximum
Power supply	115/230 VAC, 50/60/Hz, 1000 watts
Dimensions (W x D x H)	29.7 x 29.9 x 26.2 in / 75.4 x 75.9 x 66.5 cm
Weight	175 lb (79.4 kg)

ORDERING INFORMATION

Part No. 101967987 - Model 389AP Automated Permeability Plugging Apparatus

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Permeability Plugging Apparatus (PPA)

The Permeability Plugging Apparatus (PPA) is designed to provide accurate simulation and measurement of downhole static filtration.

The PPA utilizes a conventional HTHP Heating Jacket to simulate reservoir temperature. The fluid cell is inverted, with pressure applied from the bottom of the cell and filtrate collected out the top. Pressure is transferred to the mud by a small hydraulic hand pump through a small floating piston within the cell.

The PPA employs a ceramic filter disc, which is available in varying porosities. The disc offers a more authentic representation of the formation.

ORDERING INFORMATION

Part No. 206845 - PPA 115 Volts/800 Watts
Part No. 206846 - PPA 230 Volts/400 Watts

Ceramic Filter Discs

Ceramic filter discs are stronger and more durable than natural materials, allowing for testing with greater pressures and back pressures. Select a filter porosity that closely matches the actual formation being drilled from Fann's wide assortment of discs. This provides a more realistic simulation of filtration properties than using the conventional filter paper.

ORDERING INFORMATION

Part No. Box of 10	API Designation	New (Hg)Data	Old (Air) Data Previous Designation
210536	10	10 micron	3 micron
210537	12	12 micron	5 micron
210538	20	20 micron	10 micron
210539	40	40 micron	20 micron
210540	50	50 micron	35 micron
210541	55	55 micron	60 micron
210542	120	120 micron	90 micron
210543		--	150 micron
210544		--	150 micron

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Drill Pipe Corrosion Coupons

The placement of corrosion test rings in the drill string is one of the more common techniques used to evaluate the corrosiveness of drilling-fluid environments on the drill string and other steel equipment. Removal and examination of these rings after a period of exposure downhole can be highly informative as to the corrosiveness of the drilling fluid, as well as to the type of corrosion encountered.

Fann Drill Pipe Corrosion Coupons are made of cold-drawn seamless mechanical tubing Type 4130 machine-finish steel. Each coupon supplied by Fann is stamped with a serial number and packaged in a special corrosion-inhibitor envelope to prevent atmospheric corrosion.

ORDERING INFORMATION

Order the appropriate coupon using the part number below.

Part No.	Drill Pipe Size & Type	Coupon Size
210091	2-7/8 in. internal flush and 3-½ in. slim hole	2 1/2-in OD x 0.250-in wall
210092	3-1/2 in. extra hole and 3-½ in. full hole	2 3/4-in OD x 0.188-in wall
210093	3-1/2 in. internal flush and 3-½ in. extra hole	3-in OD x 0.313-in wall
210094	4 in. full hole	3 1/4-in OD x 0.250-in wall
210095	4 in. internal flush and 4-1/2 in. extra hole	3 3/4-in OD x 0.3125-in wall
210096	4-1/2 in. full hole and 4-1/2 in. extra hole and 4 in. internal flush	3 5/8-in OD x 0.375-in wall
210097	4-1/2 in. internal flush and 5 in. extra hole	4 1/2-in OD x 0.3125-in wall
210098	5-9/16 in., 5-1/2 in. API regular or full hole and 6-5/8 in. API regular	4 5/8-in OD x 0.500-in wall
210099	6-5/8 in. full hole K=202	4 11/16-in OD x 0.282-in wall
210100	4-1/2 in. extra hole	3 13/16-in OD x 0.200-in wall
210101	6-5/8 in. full hole K=123.3	5 3/4-in OD x 0.375-in wall
210102	5 in. x H tool joint	4 3/16-in OD x 0.2185-in wall

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AutoCalcimeter Model 442

The AutoCalcimeter determines the amount of calcium carbonate ($CaCO_3$ or calcite) and calcium magnesium carbonate ($CaMg(CO_3)_2$ or dolomite) in alkaline earth carbonate samples - such as oil well cores or drill cuttings. Calcite or dolomite buildup in drilling fluids and water treatment process causes scaling problems, and data from the Fann AutoCalcimeter can help determine the most optimal chemical treatment.

This instrument is in compliance with ASTM D4373-84: Standard Test Method for Calcium Carbonate Content in Soils.

FEATURES

- Automatic and accurate dispensing of HCl when test begins
- Automatic stirring of sample with acid, by built-in stirring mechanism
- Automatic recording of pressure readings and elapsed time
- Automatic calcite and dolomite percentage reporting
- Real-time clock stamps date and time
- Data communication port for integration with computer

APPLICATION

Samples containing calcite and dolomite are reacted with 1 Normal HCl to measure CO_2 released in a sealed reaction cell. A calibration curve (determined using a pure calcium carbonate reagent) is used to relate the pressure to the weight of the calcium carbonate in the sample. Several weights of the sample are utilized, to ensure the most accurate curve, and pressures for the curve are measured and stored automatically when running the appropriate calibration sample size.

RECORDING AND INTERPRETING TEST DATA

The AutoCalcimeter will record the test data onto a USB drive in .csv file format. If no drive is present the data is recorded in the internal memory, use the transfer button on the keypad to download this data later.

SPECIFICATIONS

Dimensions (W x D x H)	16 in x 9 in x 9.5in
Weight	15 lb
Power Supply	100 to 240 VAC, 50-60 hz, 75 watts
Ports	Power, RS485 serial, USB
Data Communication	USB

ORDERING INFORMATION

Part No. 102452754 - AutoCalcimeter Model 442

Includes plastic carrying case, mortar and pestle, pocket digital Weighing scale, CaCO3 compound, HCl, and instruction manual

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Calcimeters

The compounds responsible for scale build-up in drilling fluids must be determined before an effective chemical treating program can be implemented to control the scale.

Fann Calcimeters are used to determine the amount of Calcium Carbonate and Magnesium Carbonate (Dolomite) in a sample of alkaline earth carbonates such as oil well cores or drilled cuttings. Calcite build-up in drilling fluids and in water treatment processes causes scaling problems. Data from the Fann Calcimeter can help determine the proper chemical treatment.

Fann Calcimeters can determine, quickly and with a high degree of accuracy, if the scale build-up is composed of Calcium Carbonate. Both models are suited to a differential measure of the calcite to dolomite content of the unknown sample. The main difference in the two models lies in the fact that an operator must be present during the test with Model 432 (Pressure Gauge Model) to record readings at regular intervals. The Model 43210 records its results directly to a strip chart, leaving the operator free to perform other duties. In both models, the calcite contents are available in a matter of seconds and the dolomites can be determined in 15-20 minutes.

ORDERING INFORMATION

Part No. 209698 – Model 43210 Recording Calcimeter
Includes:
Reaction Chamber with Basket
0-15 psig Recorder - Digital Balance
Reagents - Hardware - Instructions
Stainless Steel Carrying Case

Part No. 209696 – Model 432 Gauge Calcimeter
Includes:
Reaction Chamber with Basket
30 psig Gauge - Instructions

These instruments comply with the ASTM D 4373-84 Standard Test Method for Calcium Carbonate content in soils. This test method is under the jurisdiction of ASTM Committee D-18 on Soil and Rock and is the direct responsibility of Subcommittee D-18.13 on Marine Geotechnics.

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EP (Extreme Pressure) Lubricity Tester

The Fann Model 212 Combination EP (Extreme Pressure) and Lubricity Tester is a high-quality instrument designed to measure the lubricating quality of drilling fluids, provide data to evaluate the type and quantity of lubricating additives that may be required, and predict wear rates of mechanical parts in known fluid systems.

EP tests are performed by applying a measured force with a torque arm to a torque-sensitive, rotating bearing cup. This provides a means of testing lubrication under extreme pressure conditions and produces an indication of the film strength of the fluid being tested.

The more common lubricity test measures fluid resistance (lubricating character) between two hardened steel moving surfaces at a hundred pounds force (which translates into a 5,000 to 10,000 psig (34,474 to 68,948 kPa) pressure on the intermediate fluid film).

ORDERING INFORMATION

Part No. 206923 - EP/Lubricity Tester, 115 Volt

Differential Sticking Tester

The Differential Sticking Tester is designed to determine how likely a given drilling fluid will be to produce a stuck pipe situation and how effective a given drilling fluid treatment or application of spotting fluid in any given drilling fluid would be in reducing this tendency. This measurement is called the Stuck Tendency Coefficient. It takes into account both the stickiness and the cake building capability of the drilling fluid. The Stuck Tendency Coefficient is determined by the Timed Filtrate Test.

The unit can be pressurized by the CO_2 regulator assembly or from any nitrogen source. If nitrogen is to be used, the Differential Sticking Tester must be fitted with a suitable nitrogen regulator, gauges, relief valve, hose and fittings.

ORDERING INFORMATION

Part No. 206906 - Differential Sticking Tester

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Resistivity Meter Model 653B

The Fann Model 653B Resistivity Meter is a portable measuring device designed to give a quick, reliable measurement of the resistivity of a small sample (expressed in ohm-meters). This electronic meter accurately measures the resistivity of fluids, slurries, and semisolids having resistivities from 0.1 to 10 ohm-meters/meters^2.

The instrument features a transparent sample cell with a built-in thermometer. It is packaged in a lightweight case and is suitable for onsite testing. It is powered by a 9 volt battery.

ORDERING INFORMATION

Part No. 101582036 - Model 653 Resistivity Meter

Resistivity Meter Model 88C

The Model 88C Resistivity Meter is designed for field or laboratory use for resistivity measurements. It is suitable for filtrates, muds, filter cakes or slurries and provides a direct digital readout in three ranges: 2, 20 and 200 ohm·meters/meters^2. A built-in temperature probe provides direct measurement of the sample temperature.

The instrument features high accuracy with a built-in “Test” circuit to check calibration. It is packaged in a lightweight case suitable for onsite testing.

It is powered by four 9 vold batteries. Optional battery eliminators are available for use with the Model 88C.

ORDERING INFORMATION

Part No. 207960 - Model 88C Resistivity Meter

Parts and Accessories	
Part No.	**Item**
210174	Sample cell for Model 653
205643	9 volt battery
205644	9 volt battery
210441	Pipe cleaners
210179	Calibration kit
210181	Probe cleaning fluid, 4 oz
210182	Standard resistance fluid, 4 oz
207262	Sample cell for Model 88C
101710234	Battery eliminator, 115/230 volt
203623	Carrying case

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Electrical Stability Tester

The Electrical Stability (ES) of an oil based drilling fluid is the property of the material related to its emulsion stability and oil wetting capability

The Fann Model 23E Electrical Stability Tester (EST) conforms to the test procedure as described in the API Recommended Practice 13B-2.

The Model 23E EST is powered by two 9-volt batteries in the field and comes with a power cord for use in the lab.

It is calibrated in peak volts which is the maximum voltage that the fluid experiences between the two electrodes. Peak voltage may be converted to Root Mean Square (RMS) voltage by multiplying the peak voltage by 0.7071.

The Fann Model 23E Electrical Stability Tester includes: Meter, Probe, 2 Batteries, 2 Calibration Resistors, Power Cord, and a Water-Tight Carrying Case.

ORDERING INFORMATION

Part No. 102130986 - Electrical Stability Tester

Parts and Accessories	
Part No.	**Item**
208557	Probe with cable
205643	9 Volt battery
209067	Calibration standard high range
209068	Calibration standard low range
209066	Calibration standard set

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Shearometer

The Shearometer is used for determining the gel strength of drilling muds. The results are read directly from a calibrated scale, and give gel strength in pounds of shear per 100 square feet of area.

The Fann Shearometer Kit includes a Shearometer cup with graduated scale, two 5-gram Shearometer tubes and instructions.

ORDERING INFORMATION

Part No. 206952 - Shearometer Kit No. 240
Part No. 206955 - Shearometer cup with Scale
Part No. 206956 - Shearometer Tube, 5-gram
Part No. 206958 - Shearometer Tube, 20-gram
Part No. 206967 - Weight set, 1 to 200 grams

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Linear Swell Meter

The Fann Linear Swell Meter Model 2100 (LSM) is an instrument used to determine shale hydration or dehydration by measuring the increase or decrease in length over time of reconstituted or intact shale core. The LSM test is used with a Capillary Suction Time (CST) test to determine the recommended mud system for drilling through a specific shale formation. First, a CST test is conducted to determine the correct inhibitor for the shale. Then, a variety of fluids are tested.

Test results are graphed to show the percent of swelling versus swelling time in minutes. The LSM test demonstrates the inhibitive effects of these various fluids on shale swelling.

Computer Not Included

CONFIGURATION

The Linear Swell Meter system features an automated electronic measuring system. Multiple measuring heads allow up to four cores to be analyzed simultaneously. Data from these measurements is processed by a dedicated personal computer-based program that processes data from the measuring heads provides enhanced data logging and graphics.

The standard configuration for the complete Linear Swell Meter System includes the four-head measuring unit, the compactor unit, and software to gather and graph LSM data. (Computer not included.)
The LSM software will control up to ten additional four-head units. No additional hardware or software is required.

SOFTWARE

The customized software included features real-time data logging and data file updating. Constants, configuration details, location of data files, and other information are loaded through menus. The software will perform data acquisition for up to eight tests. The program permits simultaneous viewing of any combination of test data and old data. Test data input typically consists of sample length, logging frequency, channel number, and a description of the swelling test. A data sheet is provided in the instruction manual to collect this information. The operator can start and stop any one of the simultaneous swelling tests at any time or in any sequence.

ORDERING INFORMATION

Part No. 102123383 - Complete Linear Swell Meter System
Part No. 102100513 - Four head LSM Measuring Unit
Part No. 209745 - Compactor Unit only (Two Head)
Part No. 205722 - Transformer for 230 Volt operation

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Compactor

Shale core samples for Linear Swell tests are compacted (reconstituted) using the two-cell hydraulic compactor that complements the Linear Swell Meter.

Pulverized shale is placed in a cylindrical mold, where compacting pressure is then applied and maintained while compaction occurs. Tests indicate that a constant pressure of 10,000 psig (68,940 kPa) applied for 1.5 hours results in satisfactory shale core plugs.

Typically, approximately 20 grams of 200 mesh material will yield a cylindrical core plug measuring 1 1/8 in. (28.6 mm) in diameter and 5/8 in. (15.9 mm)" height. Material quantity requirements and specimen length will vary somewhat with the type of shale or clay.

See previous page for ordering information.

Capillary Suction Timer

The Model 440 Capillary Suction Timer (CST) consists of a digital timer, sample cell, and a specially selected filter paper composed of unidirectional fibers. Aqueous samples are placed in the sample cell, resulting in variable rates of water passing into the filter paper through capillary suction action.

The rates of filtration are dependent upon particle size, solids content, and settling rates of flocculation state. Thus, the instrument is adaptable for use as a control parameter for waste disposal facilities and for classification and qualification of soil types in geotechnical use, evaluation of soil/bentonite liners, and analysis of slurry trench fluids and drilling fluids.

The CST is ideal for use in the field as it operates on a single 9-volt battery which provides over 40 hours of use. A battery eliminator is supplied for laboratory use.

The complete CST device consist of a timer unit, test head assembly with funnel, nine volt battery and battery eliminator (115 VAC), one box of filter paper, and instructions.

ORDERING INFORMATION

Part No. 209703 - Capillary Suction Timer
Part No. 206059 - Filter Paper, 170/Box
Part No. 209710 - Funnel, Stainless Steel
Part No. 205235 - Syringe, 5cc Disposable
Part No. 205643 - Battery, 9VDC
Part No. 209998 - Battery Eliminator, 115VAC

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Filtrate Analysis Kit

The Filtrate Analysis Kit contains all equipment and reagents required to test drilling fluids for chloride content, alkalinity, lime content, sulfate content, and hardness as calcium, according to API Recommended Practice 13B-1.

ORDERING INFORMATION

Part No. 209815 - Filtrate Analysis Kit

KIT CONTAINS:

Part No.	Description
205869	Graduated cylinder, glass, 10 ml tc
205891	Syringe, glass tip, 2 cc
205902	Titration dish, plastic, 140 ml
205904	Funnel, plastic, 3 inch
206026	Pipette, serological, 1 ml
206028	Pipette, serological, 5 ml
206029	Pipette, serological, 10 ml
206031	Stirring rod, plastic, 4 in.
206050	Filter paper, 5 in. Dia (12.5 Cm) box of 100
209821	Versenate hardness indicator, (Calmagite) 2 oz
209824	10 mg/l EDTA 4 oz
209828	400 mg/l EDTA, 4 oz
209834	Versenate hardness buffer, 4 oz
209850	Potassium Chromate indicator, 2 oz
209855	Phenolphthalein indicator, 2 oz
209863	Sulfuric acid, n/50, 8 oz
209871	Sulfuric acid,, n/10, 4 oz
209885	Methyl Orange indicator, 2 oz
209894	Calcium indiator solution, 2 oz
209896	Sulfate indicator, 2 oz
209914	Silver Nitrate .282N, 4 oz
209922	Silver Nitrate .282N, 8 oz
209940	Calcium Carbonate powder, 2 oz
209945	Distilled water, 16 oz
210056	pH paper dispenser, 2 rolls, pH 6-8 & 8-9.5
210060	pH paper dispenser, 2 rolls, pH 10-12 & 12.5-14
209802	Instruction manual

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Chloride, Alkalinity & Water Hardness

This Kit contains all equipment and reagents required to test for chloride content, alkalinity, and hardness as calcium by the Versenate Method, according to API Recommended Practice 13B-1. All testing apparatus and reagents are contained in a specially designed stainless steel carrying case.

ORDERING INFORMATION

Part No. 209808 - Chloride, Alkalinity & Water Hardness Test Kit in case

KIT CONTAINS:

Part No.	Description
205902	Titration dish, plastic, 140 ml
206029	Pipette, serological, 10 ml
206031	Stirring rod, plastic, 4 in.
209821	Versenate hardness indicator, (calmagite) 2 oz
209826	Versenate hardness titration solution, 40 mg/l EDTA, 8 oz
209828	Versenate hardness titration solution, 400 mg/l EDTA, 4 oz
209834	Versenate hardness buffer, 4 oz
209839	Calcium buffer solution, 1n, 2 oz
209850	Potassium Chromate indicator, 2 oz
209855	Phenolphthalein indicator, 2 oz
209863	Sulfuric acid, n/50, 8 oz
209885	Methyl orange indicator, 2 oz
209910	Silver Nitrate .0282N, 8 oz
209922	Silver Nitrate .282N, 8 oz
209940	Calcium Carbonate powder, 2 oz
209945	Distilled water, 16 oz
101440812	Calver ii indicator powder, 20 gm
101450380	pH indicator sticks, range 0-14, box of 100
209802	Instruction Manual

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Chloride Content Kit

The Chloride Content Kit contains all equipment and reagents required to test fluids for chloride content according to API Recommended Practice 13B-1. Results are reported as milligrams per liter (mg/L) or parts per million (ppm) of Chloride (Cl-) Ion. All testing apparatus and reagents are contained in a specially designed stainless steel carrying case.

ORDERING INFORMATION

Part No. 209803 - Chloride Content Kit in Stainless Case

KIT CONTAINS:

Part No.	Description
205902	Titration dish, plastic, 140 ml
206026	Pipette, serological, 1 ml
206029	Pipette, serological, 10 ml
206031	Stirring rod, plastic, 4 in.
209850	Potassium Chromate indicator, 2 oz
209855	Phenolphthalein indicator, 2 oz
209869	Sulfuric acid, n/50, 4 oz
209910	Silver Nitrate .0282N, 8 oz
209916	Silver Nitrate .282N, 8 oz
209940	Calcium Carbonate powder, 2 oz
209945	Distilled water, 16 oz
209802	Instruction manual
Size:	14 X 6.5 X 11 inches
Weight:	13 Pounds

Part No. 205902 - Titration Dish, Plastic, 140Ml
Part No. 206026 - Pipette, Serological, 1 Ml
Part No. 206029 - Pipette, Serological, 10 Ml
Part No. 206031 - Stirring Rod, Plastic, 4 In.
Part No. 209850 - Potassium Chromate Indicator, 2 Oz
Part No. 209855 - Phenolphthalein Indicator, 2 Oz
Part No. 209869 - Sulfuric acid, N/50, 4 Oz
Part No. 209910 - Silver Nitrate .0282N, 8 Oz
Part No. 209916 - Silver Nitrate .282N, 8 Oz
Part No. 209940 - Calcium Carbonate Powder, 2 Oz
Part No. 209945 - Distilled Water, 16 Oz

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Methylene Blue Test Kit

The amount of reactive clays (bentonite and/or drill solids) present in a drilling fluid is determined by the methylene blue test.

Fann has a complete Methylene Blue Test Kit containing all reagents, glassware and hardware required to perform the methylene blue test according the API Recommended Practice, all neatly packaged in a rugged Stainless Steel carrying case.

Replacement parts and reagents are available.

ORDERING INFORMATION

Part No. 209679 - Methylene Blue Kit 115 Volt
Part No. 209694 - Methylene Blue Kit 230 Volt

KIT CONTAINS:

Part No.	Methylene Blue Solutions	Size
209687	3.20 grams/liter	8 oz
209688	3.20 grams/liter	16 oz
209689	3.20 grams/liter	32 oz
209690	3.20 grams/liter	1 gal
209686	3.20 grams/liter	5 gal
209691	4.5 grams/liter	8 oz
209692	4.5 grams/liter	16 oz
209693	4.5 grams/liter	1 gal

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Basic Mud Test Kit

The Basic Mud Test Kit is designed to provide the basic drilling fluid testing equipment required for field testing of water based drilling fluids according to API Recommended Practice 13B-1. All testing apparatus and reagents are contained in a specially designed stainless steel case.

Dimensions: 19.5 X 8.25 X 14.5 inches Weight: 36 pounds

ORDERING INFORMATION

Part No. 207357 - Basic Mud Test Kit

KIT CONTAINS:

Part No.	Description
206768	4-Scale mud balance
206884	Marsh Funnel viscometer
206889	Measuring cup, 1000 ml
207503	API Filter Press
206898	Digital stopwatch
209661	Sand content screen
209662	Sand content funnel
209663	Sand content tube
209821	Hardness indicator solution
209822	Hardness buffer solution
209824	Hardness titration solution, 40 mg/l
209828	Hardness titration solution, 400 mg/l
209839	Calcium buffer solution
101440812	Calver indicator powder
209850	Potassium Chromate indicator
209855	Phenolphthalein indicator solution

Part No.	Description
209863	Sulfuric acid
209885	Methyl Orange indicator solution
209910	Silver Nitrate, .0282N, 8 oz
209922	Silver Nitrate, .282N, 4 oz
209940	Calcium Carbonate powder
209945	Distilled water
101450380	pH indicator strips
205902	Titration dish
206026	Pipette serological, 1 ml
206028	Pipette serological, 5 ml
206029	Pipette serological, 10 ml
206031	Stirring rod, plastic
206038	Thermometer, 50-350°F

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Oil Mud Test Kit

The Fann Oil Mud Test Kit is designed as a compliment to the Basic Mud Testing Kit by providing all necessary drilling fluid testing equipment required for field testing of oil based drilling fluids according to API Recommended Practice 13B-2. All testing apparatus and reagents are contained in a specially designed stainless steel case.

Note: the Electrical Stability Tester is contained in a separate high-impact plastic carrying case to protect delicate electronics.

Dimensions: 26 X 9 X 12 inches Weight: 36 pounds

ORDERING INFORMATION

Part No. 210412 - Oil Mud Test Kit
Part No. 367395 - Oil Mud Test Kit w/o rheometer

KIT CONTAINS:

Part No.	Description
206984	Rheometer, hand crank
206961	Cup heater for rheometer
210485	Retort, 10 ml removable, 115 v
205986	Mixer, 115 vac w/cup
206044	Digital thermometer with probe
102130986	Electrical stability tester
205867	Graduated cylinder, 50 ml
205869	Graduated cylinder, 10 ml (2)
205891	Syringe 2cc
205896	Syringe 10cc
205914	Erlenmeyer flask, 250 ml
206026	Pipette 1ml
206028	Pipette 5ml
206029	Pipette 10 ml
205852	Brush large
205853	Brush medium
205902	Titration dish

Part No.	Description
205234	Test tube
206038	Dial thermometer, 50-350°f
206568	Pocket thermometer, 0-220°f
209821	Versenate hardness indicator
209822	Versenate hardness buffer
209828	Versenate hardness titrant, 400 mg/l
209850	Potassium Chromate
209855	Phenolphthalein indicator
209871	Sulfuric acid
209906	Sodium hydroxide
209922	Silver Nitrate, .282 N
209938	Wetting agent
209943	Distilled water
209954	Normal propoxy propanol
209957	Aquatone-S™solution
210154	Aniline, reagent grade
209951	BaraKlean®

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Porta Lab™ Model 853

The Fann Porta Lab™ Model 853 Mud Testing Kit is the most widely used field portable test kit in the world. This kit is designed to provide all necessary drilling fluid testing equipment required for field testing of drilling fluids according to API Recommended Practice 13B-1.

The kit contains a Rheometer, Retort, Mixer for Pilot Testing, Half Area Filter Press, Sand Content set, pH papers, Chemicals and Glassware for Chloride, Alkalinity, and Water Hardness Tests. All testing apparatus and reagents are contained in a specially designed stainless steel case. The front panel of the kit forms a work table when opened.

ORDERING INFORMATION

Part No. 210400 - Porta Lab Model 853 Mud Testing Kit

Part No.	Description
206984	Rheometer Model 280
207228	Filter-press 1/2 area
205854	Brush small 3/4 x 3-1/2 x 9in.
205858	Brush pipette 3/16 x 4 x 17in.
205869	Cylinder graduated glass 10 ml tc
205891	Syringe 2cc glass tip
205902	Dish titration plastic 140 ml
205986	Mixer 115v ac/dc w/clip & cup no. 202
206026	Pipette 1 ml serological
206028	Pipette 5 ml serological
206029	Pipette 10 ml serological
206031	Rod stirring 4in. Plastic
206034	Spatula 4in. Stainless blade
206038	Thermometer dial 50-350 deg f 5in. Stem
206898	Stopwatch digital electronic
209661	Screen plastic sand content
209662	Funnel sand content kit
209663	Tube sand content 100 ml glass
209821	Versenate hardness indicator 2 oz
209822	Versnate hardness buffer 2 oz
209824	40mg/l EDTA 4 oz
209828	400mg/l EDTA 4 oz
209850	Potassium Chromate indicator 2 oz

Part No.	Description
209855	Phenolphthalein indicator 2 oz
209869	Sulfuric acid n/50 4 oz
209871	Sulfuric acid n/10 4 oz
209885	Methyl orange indicator solution 2 oz
209894	Calcium indicator solution 2 oz
209896	Sulfate indicator 2 oz
209914	Silver Nitrate .0282N 4 oz
209922	Silver Nitrate .282N 4 oz
209938	Wetting agent 1 oz
209943	Water distilled 4 oz
210053	pH paper 2 roll pH 2-10 & 1-11
210056	pH paper 2 roll pH 6-8 & 8-9.5
210060	PH paper 2 roll pH10-12&12.5-14
210065	Formaldehyde test soln 'a' 2 oz
210066	Formaldehyde test soln 'b' 2 oz
210067	Formaldehyde test soln 'c' 2 oz
210068	Formaldehyde test soln 'd 2 oz
210485	Retort 10 ml removable 115 vac
210433	Spatula retort
210435	Lubricant high temperature
210439	Corkscrew
210440	Steel wool 1/4 pound pack
210441	Pipe cleaner 5mm 20/pkg

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Porta Lab™ Model 855

The Fann Porta Lab™ Model 855 is designed to provide all necessary drilling fluid testing equipment required for field testing of drilling fluids according to API Recommended Practice 13B-1. All testing apparatus and reagents are contained in a specially designed stainless steel case.

This kit includes a Model 280 Rheometer.

Dimensions: 20 X 7 X 12 in Weight: 35 pounds

ORDERING INFORMATION

Part No. 210402 - Porta Lab Model 855 Testing Kit
Part No. 210401- Porta Lab 855 w/o rheometer

Part No.	Description	Part No.	Description
206984	Rheometer Model 280	209850	Potassium Chromate indicator 2 oz
205854	Brush small 3/4 x 3-1/2 x 9 in.	209855	Phenolphthalein indicator 2 oz
205869	Cylinder graduated glass 10 ml tc	209869	Sulfuric acid n/50 4 oz
205891	Syringe 2cc glass tip	209871	Sulfuric acid n/10 4 oz
205902	Dish titration plastic 140 ml	209885	Methyl Orange solution 2 oz
205948	Bottle 4 oz plastic round w/ cap	209914	Silver Nitrate solution .0282N 4 oz
206026	Pipette 1ml serological	209922	Silver Nitrate solution .282N 4 oz
206028	Pipette 5 ml serological	209938	Wetting agent 1 oz
206029	Pipette 10 ml serological	209943	Water distilled 4 oz
206031	Rod stirring 4 in. Plastic	210060	pH paper 2 roll ph10-12&12.5-14
209661	Screen plastic sand content	210485	Retort 10 ml removable 115 vac
209662	Funnel sand content kit	210433	Spatula retort
209663	Tube sand content 100 ml glass	210435	Lubricant high temperature
209821	Versenate hardness indicator 2 oz	210439	Corkscrew
209822	Versnate hardness buffer 2 oz	210440	Steel wool 1/4 pound package
209824	40mg/l EDTA 4 oz	210441	Pipe cleaner 5mm 20/pkg
209828	400mg/l EDTA 4 oz		

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Rig Lab

The Fann Rig Lab Model 821 contains the basic mud testing equipment required for routine mud checks by rig personnel. The Stainless Steel cabinet is designed for long life and easy maintenance.

ORDERING INFORMATION

There are three versions of the Rig Lab available:
Part No. 210378 - Rig Lab Model 821
Part No. 210379 - Rig Lab Model 821H
Part No. 210382 - Rig Lab Model 821S

RIG LAB CONTAINS

Part No.	Description
205809	Stopper #2 rubber w/1 hole
205852	Brush large 2-1/2in. Dia x 12 in.
205854	Brush small 3/4 x 3-1/2 x 9 in.
205868	Cylinder graduated glass 25 ml tc
205869	Cylinder graduated glass 10 ml tc
205902	Dish titration plastic 140 ml
206026	Pipette 1 ml serological
206029	Pipette 10 ml serological
206031	Rod stirring 4 in. plastic
206036	Timer 2-hour
206038	Thermometer dial 50-350 deg f 5 in. Stem
207503	API Filter Press - wall mount no. 308
206051	API Filter paper 3.5 In dia (9 cm) 100/box
206769	Mud balance Model 1401 without case
[illegible]	Marsh Funnel viscometer

Part No.	Description
206889	Measuring cup, 1000 ml plastic no. 202
206898	Stopwatch digital electronic
208608	Cartridges CO_2 10/box
208613	Adapter rig air
209663	Tube sand content 100 ml glass
209850	Potassium Chromate indicator 2 oz
209910	Silver Nitrate solution .0282N 8 oz
209916	Silver Nitrate solution .282N 8 oz
209944	Distilled water 8 oz
210053	pH paper dispenser 2 roll pH 2-10 & 1-1
210060	pH paper dspenser 2 roll pH 10-12&12.5-1
210387	Instruction Manual
206031	Stirring rod 4 in. plastic
209662	Funnel, sand content kit
209661	Screen, plastic sand content

Model	Description
821	Basic Rig Lab
821H	Contains the same equipment as Model 821 except the No. 208594 Dead-weight Hydraulic Unit replaces the CO2 Pressuring Assembly
821S	Contains the same equipment as Model 821 in a larger cabinet with built-in sink and water connections

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Slurry Test Kit

The Slurry Test Kit Model 833 is a field portable kit designed for measuring the properties of slurries formulated in the field. This kit allows laboratory-quality measurements of viscosity, specific gravity/density, pH, water hardness, and sand content.

All testing instruments are contained in a customized high-impact plastic carrying case. The case is durable, compact, and provides convenient storage.

ORDERING INFORMATION

Part No. 210392 - Slurry Test Kit

KIT INCLUDES:

Part No.	Description
206769	Mud Balance, Model 140
206884	Marsh Funnel Viscometer, no. 201
206889	Plastic measuring cup 1000 ml, no. 202
206898	Digital stopwatch
209661	Sand content screen
209663	Sand content tube
209662	Sand content funnel
209658	Wash bottle, 500 ml
210151	Water hardness test strips pkg of 50
101450380	pH indicator sticks pkg of 100

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Super Slurry Test Kit

The Model 833S Super Slurry Test Kit is a field transportable kit containing testing equipment designed for measuring the physical and chemical properties of slurries formulated in the field.

This kit allows laboratory-quality measurements of funnel viscosity, plastic viscosity and yield point, specific gravity/density, pH, water hardness, sand content, and water loss (filtration) properties.

ORDERING INFORMATION

Part No. 101410656 - Super Slurry Test Kit Model 833S

KIT INCLUDES:

Part No.	Description
206769	Mud Balance, Model 140
206884	Marsh Funnel Viscometer, no. 201
206889	Plastic measuring cup 1000 ml, no. 202
206898	Digital stopwatch
209661	Sand content screen
209663	Sand content tube
209662	Sand content funnel
209658	Wash bottle, 500 ml
210151	Water hardness test strips pkg of 50
101450380	pH indicator sticks pkg of 100
206984	Rheometer, Model 280
207228	Filter Press, Half Area

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Slurry Test Kit IND

The Model IND Slurry Test Kit is a field transportable kit containing testing equipment designed for measuring the physical and chemical properties of slurries formulated in the field. This kit allows laboratory-quality measurements of funnel viscosity, plastic viscosity and yield point, specific gravity/density, pH, water hardness, sand content, and water loss (filtration) properties.

ORDERING INFORMATION

Part No. 101443615 - Slurry Test Kit Model IND

KIT INCLUDES:

Part No.	Description
206769	Mud Balance, Model 140
206884	Marsh Funnel Viscometer, no. 201
206889	Plastic measuring cup 1000 ml, no. 202
206898	Digital stopwatch
209661	Sand content screen
209663	Sand content tube
209662	Sand content funnel
209658	Wash bottle, 500 ml
210151	Water hardness test strips pkg of 50
101450380	pH indicator sticks pkg of 100
207228	Filter Press API w/ CO_2 pressure
101758214	Extended CO_2 barrel kit

Slurry Sampler

The Slurry Sampler is a simple, one-spring device for taking accurate samples. All Slurry Samplers feature a single trip anti-fouling flat bail assembly, full opening horizontal closure system with rotating valve, two adjustable springs (one each for closing tension and tripping tension, side hanger on the top casting for hanging on the hatch or equipment case, adjustable graduated trip rod (also holds sampler upright as a hydrometer cylinder).

ORDERING INFORMATION

Part No. 210415 - Slurry Sampler
Part No. 210416 - 25 ft. brass chain

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Oil and Water Retorts (10 ml and 50 ml)

Oil and Water Retorts provide a simple, direct field method for determining the percent by volume of oil and water in samples in drilling mud or in core samples of the formation.

The retort is especially useful in determining the oil content of emulsion muds. It may also be used to evaluate the volume of torque reducers, glycol volume and directional sliding additives.

Standard procedures for proper testing of water, oil and solids analysis are detailed in the API Publication Recommended Practice 13B-1, ANSI/API 13B-1 & API Recommended Practice 13B-2.

Fann has several models of 10 ml and 50 ml Oil and Water Retorts. A “removable” model can be used to replace field kits or used as a stand-alone unit.

ORDERING INFORMATION

Part No. 210442 - 10 ml Retort Kit, 115 Volt, 350 Watts
Part No. 210443 - 10 ml Retort Kit, 230 Volt, 350 Watts
Part No. 210485 - 10 ml Retort Kit, 115 Volt, 350 Watts, Removable
Part No. 210465 - 50 ml Retort Kit, 115 Volt, 700 Watts
Part No. 210463 - 50 ml Retort Kit, 230 Volt, 700 Watts

Fann has designed special receiver tubes for use when retorting oil muds. JP-Tubes are specially designed cylindrical glassware with rounded bottoms to facilitate cleaning and funnel-shaped tops to catch falling drops. They are API approved.

Part No. 205240 - JP-Tube, 10 ml
Part No. 205241 - JP-Tube, 20 ml
Part No. 205258 - JP-Tube, 50 ml

In a retort test, a measured sample of fluid is placed in a cup and heated until the liquid components have been vaporized.

The vapors are passed through a condenser and collected in a graduated cylinder or centrifuge tube that has been calibrated to record the volume of the condensed liquids at 20°C. The distillate is read directly as volume percent of the solids sample’s original volume. Suspended and dissolved solids are determined by subtracting these from 100 percent of the initial sample.

For fresh water fluids, the relative amount of barite and clay can be estimated. Corrections must be made for salt in the calculation for solids content by volume.

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Multi-Retort

The Multi-Retort is a five cell, 50 ml oil and water retort allowing faster, more accurate, consistent, and convenient gathering of oil on cuttings data as well as oil, water, and solids analysis of drilling fluids.

Fann's exclusive Multi-Retort can simultaneously test five separate samples of drilling fluids and/or cuttings. Offshore drilling rig operators may now gather samples quicker and then more accurately interpret data about the amounts of oil and water in drilling fluids or on cuttings. This helps ensure that the amounts of oil on cuttings does not exceed established environmental boundaries and helps protect against possible pollution problems.

Having the ability to test five different cutting samples under a uniform retorting temperature in all cells provides a total data consistency that is unavailable in other retort instruments.

SPECIFICATIONS

Capacity	50 ml each cell
Dimensions	18" x 18" x 25"
Weight	127 pounds
Power	3 kw
Voltage	115 volts, 27 amps 230 volts, 13.5 amps

ORDERING INFORMATION

Part No. 210528 - 50 ml Multi-Retort

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PHPA Concentration Test Kit

The PHPA Polymer concentration Test Kit selectively determines the concentration of PHPA (partially hydrolyzed Polyacrylamide) through a simple analytical field test utilizing a Kjeldahl procedure, modified by Fann. All equipment, glassware, and reagents are included in a rugged, lightweight plastic carrying case.

ORDERING INFORMATION

Part No. 208769 - PHPA Concentration Test Kit

KIT CONTAINS:

Part No.	Description
206555	Erlenmeyer flask 125 ml (4)
207560	Sample cup, stainless steel
209044	Generator tube (5)
209045	Collection tube (5)
205245	Boiling stones 250 grams
205247	Hot plate, 115 volt ac, max temp 371°c
205248	Rubber stopper w/2 holes (5)
205249	Rubber stopper w/1-5mm hole (5)
205623	Tygon® tubing ¼" x 1/16"
205868	Graduated cyclinder, 25 ml tc
205898	Syringe, plastic, 10cc (2)
205997	Magnetic stirrer, battery operated
206000	Stirring bar, magnetic 3/8" x 1" (2)
206028	Pipette, 5 ml, serological
206029	Pipette, 10 ml, serological
206666	Sodium hydroxide, 8n 4 oz
209835	Defoamer, 8 oz
209863	Sulfuric acid, n/50 8 oz
209878	Boric acid, 2% by volume, 16 oz
209891	Bromcresol Green Methyl Red indicator, 4 oz
209941	Calcium chloride solution, 2 oz
209945	Distilled water, 16 oz (2)

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Aqueous Phase Activity Kit

Electro Hygrometers are used to measure the relative humidity in a closed air space above an oil-based drilling fluid, and to relate humidity to the activity of the emulsified water. Activity, aw, is the measurement of the chemical potential or reaction availability of a chemical species. Hole conditions in water sensitive shales can be correlated with changes in the activity of emulsified water in oil-based drilling fluids. Using a hygrometer is the preferred method for determining the activity in oil-based drilling fluids.

This kit is designed for use in the determination of aqueous-phase activity of emulsified water using an electro hygrometer by the method describe in American Petroleum Institute publication API Recommended Practice RP 13B-2. The kit includes special flasks and adapters and premixed saturated salt solutions (relative humidity standards) for use in calibrating the hygrometer.

KIT CONTAINS:

Part No.	Description
205073	Seal ring 1.5 X .75 X 0.040 (2)
205625	Lubricant grease stopcock 75gm
205914	Erlenmeyer flask glass 250 ml (5)
205290	Stopper #6 rubber (5)
206671	Digital hygrometer kit
206663	Zinc Chloride.100 A_w 100 ml
206670	Calcium Chloride .295 A_w 100 ml
206668	Calcium Nitrate .505 A_w 100 ml
206669	Ammonium Sulfate .800 A_w 100 ml
209941	Anhydrous Calcium Chloride 2 oz
372313	Instructions

ORDERING INFORMATION

Part No. 204197 - Aqueous Phase Activity Kit

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Hygrometer, Digital Electronic

The Thermo-Hygrometer provides readings with high precision in a very short time for both R.H. and temperature. The detachable R.H. probe is housed in a rugged ABS cylinder with a thin-film polymer humidity sensor and a signal amplifier. A perforated cap on the probe allows the air to circulate while it protects the sensor.

This unit is specially designed for controlled environment applications. The smooth membrane keyboard has 4 keys that make operation simple and quick. Alarge LCD displays readings in easy-to-read digits each with a symbol next to it to identify the operating mode.

Supplied complete with RH probe with internal temperature sensor and 2 m (6.6') cable, battery, and instructions.

SPECIFICATIONS

Range	10.0 to 95.0% RH; 32 to 140° F (0.0 To 60.0°C)
Resolution	0.1% RH; 1°f (0.1°C)
Accuracy (@20°c/68°f)	2% RH; 1°f (0.4°C)
Probe	Thin film polymer sensor relative humidity probe
Battery type / life	9 Volt battery/ 100 hours of continuous use
Environment	32 to 122° F (0 to 50° C); RH 98% non-condensing

ORDERING INFORMATION

Part No. 206671 - Digital Electro Hygrometer

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Garrett Gas Train Kit

The concentration of soluble sulfides or soluble carbonates in a drilling fluid can be determined by the Garrett Gas Train method of measuring the concentration of sulfides or carbonates in drilling fluids and drilling fluid filtrates.

The Garrett Gas Train kit contains all hardware and reagents required to conduct the procedure according to API Recommended Practice 13B-1, 13B-2.

Two types of Dräeger tubes are supplied to adequately span the range of Hydrogen Sulfide concentrations that may be found in water based drilling fluid filtrates and in oil based drilling fluids. CO_2 Dräeger tubes and 1 liter gas bags are supplied for determination of carbonate concentration. Inert carrier gases, both CO_2 and NO_2 are supplied for all tests. All items are securely packaged in a waterproof, high-impact plastic carrying case.

ORDERING INFORMATION

Part No. 209961 - Garrett Gas Train, Complete kit in Case

Part No.	Description
209967	H_2S Dräeger tubes, low-range (0-120ppm), box of 10
209969	H_2S Dräeger Tubes, high-Range (60-4080ppm), box of 10
209964	CO_2 Dräeger tubes, low-range (0-120ppm), box of 10
210139	Hydrogen Sulfide Detection Kit
210141	Hydrogen Sulfide Test Paper, pkg of 100 discs

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Membrane Filter Tester

The Membrane Filter Test is designed to provide a qualitative and quantitative test for determining various aspects of water quality. Relative filtration rates, quantity and composition of suspended solids can be established.

Pressure may be provided by either nitrogen or carbon dioxide.

The tester can be used effectively to provide data for the following water problems:

- Relative plugging tendencies
- Chemical compatibility
- Suspended native solids
- Suspended corrosion by-products
- Suspended alkaline earth metal precipitates
- Biological by-product contamination
- Effect of entrained hydrocarbons on filtration

ORDERING INFORMATION

Part No. 209664 - 3200 ml Membrane Filter Tester
Part No. 209674 - 4000 ml Membrane Filter Tester
Part No. 209665 - Hard Case (optional)

PRESSURING SYSTEMS

Part No. 209666 - CO_2 Pressuring System
Part No. 209667 - Nitrogen Pressuring System

Hydrogen Sulfide Detection Kit

The Hydrogen Sulfide Detection Kit provides a rapid and inexpensive (qualitative) procedure for detecting the presence of H_2S. This colorimetric method uses the same Hydrogen Sulfide Test paper discs as the Garrett Gas Train and can detect as little as 0.3 ppm H_2S.

This kit contains all hardware and reagents, including the color comparison chart, needed for H_2S detection.

ORDERING INFORMATION

Part No. 210139 – Hydrogen Sulfide Detection Kit

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Aniline Point Determination Kit

This test method covers the determination of the aniline point of petroleum products and hydrocarbon solvents, such as diesel oils and mineral oils used in preparation of oil-based drilling fluids.

This method is suitable for transparent liquid samples having an initial boiling point above room temperature and where the aniline point is below the bubble point and above the solidification point of the aniline-sample mixture.

KIT INCLUDES:

Part No.	Description
206568	Metal pocket thermometer, 0-220°F
206681	Clamp, Fiberglass Utility
210070	Pipette, Dropper 1 ml
210071	Rubber Bulb
210073	Plastic Case
210153	Cork Stopper
210154	Aniline reagent grade, 2 oz
205234	Test Tube, 16 X 125 mm
208770	Calcium Sulfate anhydrous, 2 oz

ORDERING INFORMATION

Part No. 210152 - Aniline Point Determination Kit

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Model 140 Mud Balance

The Fann Mud Balance provides a simple, practical method for determining fluid density accurately. The temperature of the drilling fluid does not materially affect the accuracy of readings. The durable construction of the Fann Mud Balance makes it ideal for field use.

The balance consists of a base and graduated arm with cup, lid, knife edge, rider, built-in spirit level, and counterweight.Despite its sensitivity, it contains no easily breakable parts.

A plastic carrying case is available that holds the balance intact and in working position.

ORDERING INFORMATION

Part No. 206768 - Model 140 Mud Balance with case
Part No. 206769 - Model 140 Mud Balance without case

Model 141 Tru-Wate™ Mud Balance

With the TRU-WATE™ Balance, the density of a fluid sample, such as cement slurry, can be measured in a fixed volume sample under pressure.

By pressurizing the sample cup the entrained air or gas can be decreased to a negligible volume, thus providing a slurry density measurement more closely in agreement with the true density which will be realized under downhole conditions.

Fann density balances are constructed of premium metals for durability, accuracy and ease of use. A high impact plastic case protects the balance during transport and provides a secure base in its working position.

ORDERING INFORMATION

Part No. 100003565 - TRU-WATE™ Pressurized Balance

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MACS II® Multiple Analysis Cement System

Computer Not Included

The Multiple Analysis Cement System (MACS II®) is an instrument that performs static gel strength (SGS) tests on cement slurry samples.

The MACS II system accepts a sample of cement slurry and applies a controlled set of temperature, agitation, and pressure parameters that simulate the downhole conditions of a well. During testing, it monitors, controls, and records these parameters to form a data set.

This data can then be analyzed to assist in predicting the performance of cement slurry in a well. If a situation exists that a well presents particular problems or special conditions of temperature and/or pressure, the MACS II can assist to minimize possible problems by providing a safe and controlled environment in which to test different cement slurries for the drilling process.

FEATURES & BENEFITS

- Capabilities - 600°F temperature and 30,000 psig
- Pressurizes with water
- Uses a conventional-style slurry cup
- Slurry cup has an isolation volume chamber
- Variable speed rotation
- No time limit on the test duration
- Plumbing allows for chilled water circulation
- Magnetic-Drive system mounted out of the path of routine operations
- Drive system is completely isolated from the test chamber
- Not required to remove/replace the measurement system for each test
- The pressure vessel is on a hydraulic lift and it lowers away from the head and moves forward for inserting/removing the slurry cup.
- Slurry cup volume is same as that for a HTHP Consistometer
- Completely computer controlled. Fully automated start-up, conditioning, gel strength testing, and shut-down

ORDERING INFORMATION

Part No. 101677665 – MACS II Multiple Analysis Cement System

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HPHT Consistometer Model 290

The Model 290 HPHT Consistometer exposes a cement slurry sample to a controlled set of parameters of temperature, agitation and pressure that simulate the downhole conditions.

During a test, these parameters are carefully monitored and precisely controlled by Fann's proprietary Control System Software. A flat panel, High-Resolution, LCD touch-screen provides the interface between the user and the software. The LCD screen provides real-time viewing of temperature, pressure, and consistency data in graphic and text formats.

This data is automatically recorded to a database for future analysis to help predict the cement slurry's downhole performance.

SAFETY FEATURES

- Rupture disc for accidental chamber overpressure
- Automatic power shutdown if test temperature exceeds safe operating limits or if a break occurs in the temperature controlling thermocouple

SOFTWARE FEATURES

- Distributed Software; machine control code is run from embedded controller
- Web enabled user Interface Software Wizard for test setup
- Remote test control & monitor via LAN, Intranet, and Internet
- File Transfer Utility will not allow tests to proceed when embedded controller flash memory is full unless files have been moved or backed up to a network drive, thumb drive or other media
- Calibration Data is also protected by the File Transfer Utility
- Data Manager software allows viewing of test results locally or from remote computer
- Instrument calibration results are reviewable/printable with Data Manager
- Email test results from within software

SPECIFICATIONS

Electrical Power Supply	230Volts
Current	30A
Frequency	60 Hz or 50 Hz (specify)
Cooling Water Supply	30 psig min. (0.207 mPa)
Compressed Air Supply	90 psig min. (0.621 mPa) Drain for Cooling Water
Maximum Temperature	400°F (204°C)
Maximum Pressure	30,000 psig (206.8 MPa)

ORDERING INFORMATION

Part No. 101443590 - HPHT Consistometer Model 290

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Atmospheric Consistometer Model 165AT

The Fann Model 165AT Atmospheric Consistometer is specifically designed to prepare cement slurries for testing in strict compliance with API Specification 10A.

API Specification 10A outlines the requirements and provides the procedure for conducting the Free-fluid Test (free water) using the Model 165AT Atmospheric Consistometer. The testing of cement slurries requires the measurement of thickening time, free water content, viscosity, rheological properties, fluid loss and various other properties. The Model 165AT Atmospheric Consistometer provides a simple method for conditioning the cement slurries in preparation for performing these tests.

The Model 165AT Atmospheric Consistometer is used in laboratories involved in oil well cement research programs, research and testing of cement additives, cement manufacturers quality assurance programs, and in the research for well servicing companies and their field labs.

SPECIFICATIONS

Maximum Temperature	200° F (93° C)
Maximum Pressure	Atmospheric pressure only
Slurry Cup Rotational Speed	150 rpm
Viscosity Range	0 to 100 Bearden Units (Bc)
Slurry Container Volume	28 cu in (470 ml)
Input Voltage	115 or 220 VAC; 50/60 Hz
Input Power	2 KVA
Heater	1500 watts
Dimensions	25 in (64 cm) x 15.5 in (39 cm) x 18 in (45 cm)
Net Weight	80 lbs. (50 kg)

ORDERING INFORMATION

Part No. 359571 – Model 165AT Atmospheric Consistometer 115 Volt 50/60 Hz
Part No. 359572 – Model 165AT Atmospheric Consistometer 230 Volt 50/60 Hz
Part No. 101402595 – Calibrator for Model 165AT Atmospheric Consistometer

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Model 420ATC Twin Cell UCA

TWO UCA CELLS IN ONE SPACE-SAVING FOOTPRINT

The Fann Model 420ATC Twin Cell Ultrasonic Cement Analyzer (UCA) allows your lab to have two independent ultrasonic analyzers operating at the same time in the space of one traditional unit.

Two tests are conducted at the same time under separate simulated down-hole pressure and temperature conditions to determine the initial set time and the WOC (wait-on-cement) time of a slurry sample.

The Model 420ATC gives you versatility. Each cell can operate at up to 20,000 psi pressure. The operator independently controls the pressure and temperature of each cell from two touch screen displays. And it works with existing Fann UCA cells.

FEATURES

- Standalone unit, can be operated without a computer
- Two independently operating UCA cells with continuous automatic temperature and pressure control
- Digital control of pressure and temperature set point
- Integrated 5000 or 20,000 PSI pressure system
- Maximum temperature range up to 480° F
- Insulation eliminates the potential for heat migration between cells
- USB data transfer if running standalone
- Works with existing Fann UCA cells
- Coolant ports allow low temperature tests up to 40° F

SPECIFICATIONS

Size	24 x 24 x 33 in (W x D x H)
Weight	<200 pounds
Min Temperature	40° F
Max Temperature	480° F
Min Pressure	0 or 200 PSI
Max Pressure	5000 or 20000 PSI
Pressure Tolerance Minimum	100 PSI
Operating Temperature	4° C to 50° C (40° F to 122° F)
Power	230 VAC 50/60 Hz only
Water In	¼ in NPT female, 10 PSI min
Drain Out	¼ in NPT female, hot water
Air In	¼ in NPT female, 100 PSI min
High Pressure In	HF4 female
Ethernet	TCP/IP over RJ45

ORDERING INFORMATION

102551791 – Model 420ATC Twin Cell UCA, 5000 PSI
102551792 – Model 420ATC Twin Cell UCA, 20,000 PSI

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Ultrasonic Cement Analyzer System

The Ultrasonic Cement Analyzer System provides a non-destructive method for determining the relative strength development of a cement sample under downhole temperature and pressure conditions. The theory of operation is based on the correlation between ultrasonic pulse velocity in the cement sample and it's compressive strength. Strength indications are determined by measuring the change in velocity of an ultrasonic signal transmitted through the cement sample as it cures.

As many as eight cement samples can be analyzed simultaneously, with the addition of autoclave assemblies specifically designed to interface with the Model 304 Processor System. The Processor is the next generation of real-time data acquisition and instrumentation control. This powerful and unique processor was developed by Fann Instrument Company for the Ultrasonic Cement Analyzer.

CONTROLLER FEATURES

- Eight autoclaves can be controlled and monitored independently
- Read and Write to Temperature Profile on the autoclave
- Cursor can be put on the results graph to read out any point on the graph
- Graph can be zoomed for greater detail
- Start Test Wizard guides the user through starting a test
- Fool-proof wizard prevents starting a test before all steps are completed
- Four strength events can be set to trigger and record the resultant time
- Four time events can be set to trigger and record the resultant strength
- Remote Control via LAN, Intranet and Internet
- Email test results directly from Control Software
- Network Enabled (Email Reports, Monitor Tests via LAN)

DATA MANAGER FEATURES

- Recalculates data for different cement type or temperature units
- Data can be saved to spreadsheet file formats, such as TXT and CSV
- Option to calculate data for new compressive strength and time events after the test ends
- Zoom in or out of graph for detailed view

ORDERING INFORMATION

Part No. 102177691 - UCA system with 1 Autoclave
Part No. 102177696 - UCA system with 2 Autoclaves
Part No. 101443624 - UCA system with 4 Autoclaves
Part No. 102177697 - UCA system with 8 Autoclaves
Part No. 101638033 - UCA Processor, 230 Volt, 50/60Hz
Part No. 101002037 - UCA Autoclave, 230 Volt, 50/60Hz
Part No. 102271450 - Pressure Controller, 30,000 psig

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Static Fluid Loss Test Assemblies

Fann Fluid Loss Test Assemblies provide a reliable means of determining the fluid loss characteristics of an oil well cement. Fluid Loss Testers measure fluid loss of cement slurries, drilling fluids, and fracturing fluids under elevated pressure and temperature conditions.

Fann Fluid Loss Cells are fitted with a 325 mesh screen [3.5 in² (22.6 cm²) filtration area] backed by a 60 mesh screen. The 60 mesh screen provides a flow path for the cement filtrate as outlined in API Recommended Practice 10B. Cells are provided with openings on both ends with caps (double ended) for ease of maintenance.

SPECIFICATIONS

Rated working pressure	1000 PSIG (6.9 MPa)
Maximum temperature	200°F (93.33°C)
Power Required	115/230 VAC 50/60 Hz
Power Output	1,800 Watts
Power Required	800 watts
Filtering Area	3.5 in² (22.6 cm ²)

ORDERING INFORMATION

Part No. 210195 - Fluid Loss Tester, Dual Cell, 115 Volt
Part No. 210199 - Fluid Loss Tester, Dual Cell, 230 Volt
Part No. 101502980 - Fluid Loss Tester, Single Cell, 115 Volt
Part No. 101533370 - Fluid Loss Tester, Single Cell, 230 Volt

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Stirring Fluid Loss Test Assembly

The Stirring Fluid Loss Test Assembly provides a reliable means of determining the fluid loss characteristics of an oil well cement. This apparatus simulates downhole conditions where fluid loss can occur. When cement slurry is circulated past a permeable zone, pressure behind the slurry can force fluid out of the slurry and into the zone.

Circulation is simulated by a stirring apparatus and circulation temperature is simulated by a heating jacket. The pressure differential between annular and formation pressure is simulated by pressurized nitrogen. A screen (or porous core) and a filtration chamber simulate the permeable zone.

SPECIFICATIONS

Rated working pressure	2,000 PSIG (13.8 MPa)
Maximum temperature	400°F (204°C)
Power Required	230 VAC, 9.0 Amps, 50/60 Hz
Fluids Required	Water for Cooling
Pressurization Required	Nitrogen Gas 1,500 psig (20 MPa)
Filtering Area	3.5 in² (22.6 cwm²)
Measured Properties	Fluid Loss (ml/unit time)

ORDERING INFORMATION

Part No. 210194 - Stirring Fluid Loss Assembly, 230 Volt, 50 Hz

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Cement Curing Autoclave

The Cement Curing Autoclave simulates pressure and temperature conditions for curing cement samples in accordance with API test procedures. After a specified curing time, set cement cubes are removed for crush testing for determining compressive-strength development.

An Autoclave pressure vessel is inserted into an automatic temperature-controlled heating jacket and pressurized. An automatic bleed-off valve mounted atop the autoclave assembly prevents excessive pressure buildup within the curing vessel. This model cures two single-cube specimens at a time in the vessel. This Autoclave is equipped with a state-of-the-art digital programmable rate set-point temperature controller.

The Cement Curing Autoclave includes a heating jacket surrounding the cement curing pressure chamber, temperature controller, thermocouple, pressure gauge, adjustable pressure regulator, manual fill and bleed valve.

The autoclave requires an external pressure source such as compressed nitrogen gas or a hydraulic pump capable of providing pressure up to 3000 psig. A manually operated hydraulic pump capable of producing the required pressure is available as an optional accessory.

SPECIFICATIONS

Temperature	Temperature 400°F (204°C)
Pressure	5000 psig (34.5 MPa)
Volume	40.6 oz (1200 ml) Capacity 2 Cubes Power
Power Requirements	115/230 Volts, 16/8 amps, 50/60 Hz Power
Output	1800 Watts

ORDERING INFORMATION

Part No. 101497200 - Cement Curing Autoclave 115 Volt, 16 Amps 50/60 Hz
Part No. 101533369 - Cement Curing Autoclave 230 Volt, 8 Amps 50/60 Hz
Part No. 101443557 - Optional Hand Operated Hydraulic Pump (3000 psig)

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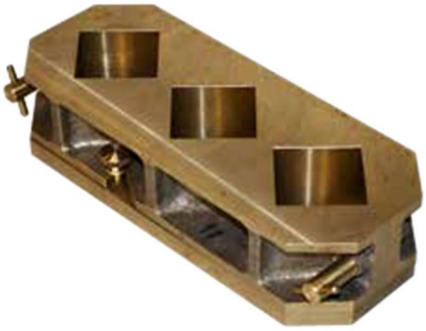
Cement Cube Mold

Designed and manufactured in strict conformance to ASTM standards, the 3-Gang Cement Cube Mold is used to form 2” (50.8 mm) cube samples for compressive strength testing of Portland cement, mortars, lime, gypsum and capping compounds.

The main feature in the design is the wide flange construction of the top and base. This wide flange simplifies the striking off of excess amounts of cement when the cubes are being prepared and gives greater stability to the mold in storage, preparation and curing. The sturdy flanges prevent warping of the mold during use.



ORDERING INFORMATION

Part No. 100011148 - Mold, 3-Gang Cement Cube
Part No. 101457237 - Cover Plate, 3-Gang Mold
Part No. 100012374 - Mold, Single Cement Cube
Part No. 100012375 - Cover Plate, Single Mold

Circular Expansion Curing Kit

The ring expansion mold is designed to simulate the expansion properties of cement compositions placed into the annulus of a well. The ring expansion mold can be used for atmospheric curing or placed into an autoclave for pressure testing.

The same mold can be used for determining shrinkage by slightly modifying the test procedure. Spacer blocks used for shrinkage testing are not included in the kit.

ORDERING INFORMATION

Part No. 205814 - Circular Expansion Cement Curing Kit
Part No. 100020342 – Mold Assembly
Part No. 101204060 – Micrometer and Base Guide

Compressive Strength Tester

The Compressive Strength Tester is a twelve ton, manual, two-column hydraulic press with 6" x 6" square platens. It features adjustable daylight, steel construction for rigid precision and includes safety shield for operator protection. Easy to-read dual scale gauge is calibrated in pounds and metric tons.

ORDERING INFORMATION

Part No. 204195 - Compressive Strength Tester

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Wettability Tester

The Model C1001 Wettability Tester is designed specifically for evaluation of spacer fluids, pre-flush fluids, or spacer and surfactant fluid combinations. These fluids are used to water-wet surfaces after exposure to oil-based or synthetic-based drilling fluids and before cementing operations.

Both the apparent wettability of various mud/spacer interface volumes and the apparent wettability of just the spacer system against oil-wetted surfaces can be evaluated.

This instrument consists of a double-walled stainless steel mixing container, blender base, variable transformer, and electronic control unit. A harness connection provides power to the heater, the thermocouple, and the electrodes.

The container can be used on most commercial blender bases. The accompanying electronics control unit contains the temperature controller and wettability electronics.

ORDERING INFORMATION:

Part No. 203936 - Wettability Tester Model C1001

Included Parts:

Part No. 203937 - Sample Cup Assembly
Part No. 205633 - Blender Base, Single Speed
Part No. 206536 - Variable Transformer, 120V, 1.4 KVA
Part No. 203938 - Electronic Control Unit
Part No. 203538 - Control Cable Harness Assembly

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Constant Speed Mixer

The Fann Constant Speed Mixer Model 686CS is designed to mix cements to comply with American Petroleum Institute (API) Spec 10A, Cements and Materials for Well Cementing and RP 10B-2 Recommended Practice for Testing Well Cements. This Mixer also complies with ASTM C1738 - Standard Practice for High-Shear Mixing of Hydraulic Cement Pastes.

The Model 686CS has a heavy-duty motor to handle thicker cements at the proper speed. Control buttons can be programmed by the operator for the proper mixing speeds and times. The API Profile button, is preprogrammed with the API standard settings, 12,000 rpm for 35 seconds. These programming features save the operator time.

The mixing assembly is constructed so that the blade can be removed for weighing and changing. The Constant Speed Mixer Model 686CS is equipped with a 32 ounce (946 ml) stainless steel jar. An additional 64 ounce (1.9 liter) stainless steel jar is also available and can be ordered separately.

The Model 686CS Mixer has a liquid crystal display (LCD) screen that shows the operating messages on a sharp, blue backlight, making it easy to read.

ORDERING INFORMATION

Part No. 101656308 - Model 686CS Constant Speed Mixer 115 V 50/60 Hz
includes 32 oz stainless steel container and remote control

OPTIONAL ACCESSORIES

Part No. 101969124 - Stand for 686CS Remote Control
Part No. 101553700 - Step-Down Transformer for 230 Volt operations
Part No. 101948588 - Stainless Steel Container 32 oz (946 ml) for 686CS
Part No. 101957727 - Blending Assembly for 32 oz (946 ml) Container
Part No. 102001777 - Blender Blade for 32 oz (946 ml) Container
Part No. 101948589 - Stainless Steel Container 64 oz (1.9 L) for 686CS
Part No. 101998395 - Blending Assembly for 64 oz (1.9 L) Container
Part No. 102001793 - Blender Blade for 64 oz (1.9 L) Container

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Dispersator / High Shear Mixer

The High Shear Mixer (Dispersator) utilizes a patented mixing head that pumps material into the hollow mixing chamber and outward through the chamber openings. The blades on the mixing head are designed to draft material from above and below the mixing head and pull it into the chamber. The suction of the blades and flow through the chamber provide a more homogeneous material mix compared to other mixers relying exclusively on centrifugal force.

This mixer achieves a higher shear in less time while maintaining a homogeneous mix of materials without shear degradation. The mixing head is easily disassembled for cleaning and the head and shaft are replaceable.

SPECIFICATIONS

Voltage	115
Power	AC/DC
Rpm	10,000, 1HP
Capacity	30 gallons
Material Weight	18 lb/gallon

ORDERING INFORMATION

Part No. 206008 - High Shear Mixer w/Stainless Stand
Part No. 206536 - Powerstat® var. transformer 115 volt

Field Portable Mixer

The Field Portable Mixer is designed for use with field test kits. The speed is 15,000 rpm. It features a spring clip and mud shield for direct attachment to the No. 202 High-Impact Plastic Measuring Cup. (Cup sold separately)

ORDERING INFORMATION

Part No. 205986 - Field Portable Mixer
Part No. 206889 - No. 202 High-Impact Plastic Cup

Laboratory Mixer

Fann Laboratory Mixers are two speed mixers, available in both 115 and 230 volt models with no load test speeds of 11,000 rpm and 15,000 rpm. The mixer comes with an impeller blade for mixing water-based or oil-based drilling fluids. The Powerstat® variable transformer (sold separately) is used to provide an extended mixing speed range. Mixer shown with optional Powerstat variable transformer.

ORDERING INFORMATION

Part No. 206562 - Laboratory Mixer 115 Volt, 60 Hz
Part No. 208760 - Laboratory Mixer 230 Volt, 60 Hz
Part No. 206536 - Powerstat 115 Volt
Part No. 208772 - Powerstat 230 Volt

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Hamilton Beach Mixers

Hamilton Beach Single and Three-Spindle Mixers are recommended for use in general purpose mixing of drilling fluids in preparation for laboratory tests of mud materials. The Three-Spindle Model has independent speed controls for each spindle. These mixers can also be used to mix cement for field or laboratory testing.

ORDERING INFORMATION

Please order mixers using the part numbers below.

Part No.	Description	Spindles	Volts/Hz	No. of Speeds & RPM	
205971	Model HMD400	3	115/60	3	10,000 -14,000 & 17,000
205970	Model HMD400	3	230/50	3	10,000 -14,000 & 17,000
205966	Model HMD200	1	115/60	3	10,000 -14,000 & 17,000
205974	Model HMD200	1	230/50	3	10,000 -14,000 & 17,000

Multi-Mixer®

The Five-Spindle Multi-Mixer® Model 9B mixer is recommended for use in general purpose mixing of drilling fluids in preparation for laboratory tests of mud materials. Five Spindle Multi-Mixer mixers are supplied with a single corrugated impeller blade on each spindle. No. 9B29X impellers are approximately 25 mm in diameter to conform to American Petroleum Institute (API) Specification 13A for mixing water-based and oil-based drilling fluids. These mixers can also be used to mix cement for field or laboratory testing.

Multi-Mixer cups are sold separately. Part Number 205967 mixer cups are 180 mm deep, 97 mm at top and 70 mm at bottom.

ORDERING INFORMATION

Part No.	Description	Volts/Hz	RPM
205976	Model 9B with 9B29X impellers	115/60	11,500
205979	Model 9B with 9B29X impellers	230/50	11,000
205967	Stainless Steel Mixer Cup		

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Waring Blenders

SINGLE SPEED BLENDERS

RPMs: 22,000 RPM
Capacity: 40oz (1.2 Liter)
Heat Resistant Glass Container w/Cover
Epoxy Coated Base, Stainless Steel Blades
Part No. 205632 - 120 Volt, 50/60 Hz Waring #700G
Part No. 205635 - 230 Volt, 50/60 Hz Waring #800G

TWO SPEED BLENDERS

Push-Button Solid State Control
RPMs: 18,000 & 22,000
Capacity: 40oz (1.2 Liter)
Heat Resistant Glass Container w/Cover
Epoxy Coated Base, Stainless Steel Blades

Part No. 206561 - 120 Volt, 50/60 Hz Waring #7011G
Part No. 206705 - 240 Volt, 50/60 Hz Waring #8011G

SEVEN SPEED BLENDER

Push-Button Solid State Control
RPMs: 3,500 - 7,000 - 11,500 - 14,500 - 17,000 - 19,000 - 22,000
Capacity: 40oz (1.2 Liter)
Heat Resistant Glass Container w/Cover
Epoxy Coated Base, Stainless Steel Blades

Part No. 206023 - 120 Volt, 50/60 Hz Waring #7012G

BLENDER ACCESSORIES

Part No. 205633 - 120 Volt, 50/60 Hz Waring #700BU
Blender Base, Single Speed (Base only without container)

Part No. 100002439 - Replacement Blade
Blender Blade Assembly

Part No. 205634 - Glass Container 40oz Waring #003573
Blender Jar

Part No. 206559 - Cover for Glass Container Waring #004315
Lid for Blender

Part No. 206021 - Mini Cup Waring #MC-1
Mini-Cup, Capacity: 12-37 ml
Plastic cup, double scale with Lid and Mixer Blade

Part No. 206022 - Mini Cup Waring #MC-1
Mini-Cup, Capacity: 37-100 ml
Plastic cup, double scale with Lid and Mixer Blade

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Lab pH Meter

The Lab Model Digital pH/Ion Meter is a high-quality, bench-type lab pH meter designed to measure the entire pH scale (0-14). This meter has a milli-volt range of +/-1000mV and easily converts from 115- to 230-volts AC power by use of a conveniently mounted switch. The unit provides accuracy and readability of 0.01 pH.

Features

- Selectable buffer sets
- Switch from pH to mV readings with a button press
- Features 0.1 mV resolution for ORP measurements
- Selectable manual or automatic temperature compensation
- Built-in memory function
- Hold function, “Ready” indicator, and diagnostic error messages
- Fully diagrammed manual, plus slide-out instruction card
- Includes combination probe, soaker bottle w/solution, and Automatic Temperature Compensation (ATC) Probe

Part No. 209994 - Lab Model Digital pH/Ion Meter

Portable pH Meter

The Digital pH Meter is easy to operate, rugged, portable and compact, measuring only 3” by 6”. It is battery operated and has a 5/16” high LCD display that is easy to read in all lighting conditions. The meter is packaged in a rugged carrying case with one 9-volt alkaline battery, permanently sealed combination probe, pH 4, 7 and 10 buffer capsules, plastic buffer bottles, and a comprehensive manual.

Part No. 209997 - Portable Digital pH Meter with case

Pocket Digital pH Meter

ThePocketpHMeterprovidesapracticalalternativetopHLitmuspaper.Thiseasy-to-use instrumentdoestheworkofhundredsofrollsofindicatorpaper.Witharesolutionof0.1pH and accuracy of +0.2 pH, the Pocket pH Meter is just as reliable as many laboratory models. State-of-the-art electronics and an easy-to-read digital display make this pH Meter the ideal portable meter.

Part No. 210004 - Pocket Digital pH Meter
Part No. 210006 - Waterproof Pocket Digital pH Meter
Part No. 101450380 - pH Indicator Sticks, Range 0-14
Part No. 101780174 - pH Indicator Sticks, Range 7.5-14

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Manual Centrifuge

This hand driven centrifuge is perfect for field use. The simple compact design eliminates complicated operation and assures years of dependable service. The centrifuge body is constructed of lightweight aluminum alloy with an integral clamp for fixing to a table. Removable pin connections for head and crank handle make storage easy. The maximum speed is 2,000 RPM.

ORDERING INFORMATION

Part No. 210419 - Centrifuge Model 18801 15 ml tubes
Part No. 204163 - Centrifuge Model 18811 100 ml tubes

Centrifuge (Unheated)

A centrifuge mechanically subjects fluids to increased G forces that accelerate the settling rate of particles within the fluid. This procedure separates particles from fluids into heavy-coarse and light-fine fractions and is dependent upon separation by particle size and specific gravity.

This centrifuge is ideally suited where testing does not require heat during the centrifuging period. This unit will meet the requirements of the API MPMS Chapter 10.4 Determination of Water and Sediment in Crude Oil by the Centrifuge Method (Field Procedure).

This is a 12 volt centrifuge. It will hold four 12.5 ml tubes.

ORDERING INFORMATION

Part No. 210418 - Centrifuge Model 18206

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Bench Top Centrifuge

A bench top centrifuge for the lab, this unit has many features.

- Speeds to 3300rpm/1380xG
- Accepts six tubes 15mL
- Built-in timer 0 to 15 minutes with 30 sec. resolution HOLD position allows continuous runs
- Quiet-running, permanently lubricated, long-life motor
- Numbered rotor positions, Fixed-angle rotor
- 115V 60Hz, 2.1A

ORDERING INFORMATION

Part No. 204175 - Centrifuge, Bench Top

Sieve Shaker

The Sieve Shaker has a uniform mechanical action comprising both a horizontal circular motion and a vertical tapping motion that allows particles to stratify and seek critical openings, ensuring accurate, repeatable results. Test sieve size is 8 in. diameter (20.3cm).

A maximum of six 2 in. high (5.1cm) or thirteen 1 in. high (2.5cm) sieves can be used for testing at one time. Shaker features vertically mounted 1/4hp motor and has a built-in 99-minute digital timer/clock accurate to 0.1 second.
Includes integral sieve cover but without sieves or receiver

Dimensions - 21” L x 28” W x 25” H (53 x 71 x 64cm)

110V 60Hz, 5.4 Amp, single-phase current only

ORDERING INFORMATION

Part No. 206650 - 115V/60Hz Shaker RO-TAP
Part No. 101583799 - 220V/60 Hz Shaker RO-TAP

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Bath, 33 Liter Heated

The Utility Heated Water Bath is ideal or research and control laboratories.

Chambers are one-piece, seamless, corrosion resistant stainless steel and have durable powder-coated exteriors. Capacities are given for bath filled to top.

High-efficiency strip heaters direct heat toward the chamber for efficient absorption and minimal heat loss. The removable diffuser plate distributes heat evenly. For added safety, each bath includes an independent, high-limit thermostat and a circuit breaker.

Maximum temperature without a cover is 65°C.

SPECIFICATIONS

Temp range	Ambient to 100°C
Temp control	Digital
Heater wattage	1000W
Bath opening	14.2” x 11.8”
Working depth	11”
Capacity	33 liters

ORDERING INFORMATION

Part No. 204161 - 33L Bath 120 Volts 60 Hz
Part No. 101583798 - 33L Bath 240 Volts 50/60 Hz

Bath, 6 liter Refrigerated/Heated

Bath features ±0.05°C temperature stability down to –20°C and three user-selectable preset temperature set points. Read temperature in °C or °F. Switch-selectable two-speed pump has ¼" NPT (F) inlet/outlet ports, and accept 13-mm ID tubing.

Temp range	–20 to 150°C
Temp control	Digital - PID
Heater wattage	1000 watts
Cooling capacity	
at 20° C	200 watts
at -10° C	100 watts
Compressor hp	1/4 hp
Working depth	5 1/4”

ORDERING INFORMATION

Part No. 208755 - 6L Bath 120 Volts, 60 Hz, 10 Amps
Part No. 208756 - 6L Bath 240 Volts, 50 Hz, 5 Amps

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Bath, 28 liter Refrigerated/Heated

This bath is perfect for large-volume applications that require precise temperature control. The LCD readout lets you continuously monitor fluid temperature. Set up to 10 time and temperature programs; includes software for data logging and PC control. High-temperature cutoff (adjustable from 60 to 220°C) and low-liquid cutoff help to ensure safe operation. Inlet and outlet ports on all models are ¼" FNPT and accept 13-mm ID tubing.

Includes: two feet of Buna N tubing and male adapters for 3/8", ¼", and 3/16" ID tubing

SPECIFICATIONS

Capacity	28 liters
Temp range	–25 to 150°C
Temp control	Digital - PID
Heater wattage	1000 watts
Cooling capacity	
at 20 C	700 watts
at -20 C	260 watts
Working depth	10"
Wetted materials	304 stainless steel

ORDERING INFORMATION

Part No. 101522348 - 28L Bath 120 Volts, 60 Hz, 14 Amps
Part No. 101526464 - 28L Bath 240 Volts, 50 Hz, 7 Amps

Bath, 19.5 Liter Heated

The bath includes a 304 stainless steel gable cover. The fiberglas insulation and the digital controller provide excellent heat control and uniformity.

This bath features a seamless stainless steel interior and epoxy powder-coated exterior.

SPECIFICATIONS

Temp range	Ambient to 99.9°C
Heater wattage	600
Bath opening	14" x 12"
Working depth	8"
Capacity	19.5 liters

ORDERING INFORMATION

Part No. 101522359 - 19.5L Bath 115 Volts 60 Hz 5 Amps
Part No. 101526462 - 19.5L Bath 230 Volts 50/60 Hz 2.5 Amps

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Digital Top Loading Balance

Capacity: 1500g
Readability: 0.1g
One Button Calibration – 3 weight options
Pan Size: 5.5” X 5”
Power: 9 Volt Battery Operation
Optional interface kit
120/240 Volt Adapter Included

Part No. 101464297 - Digital Top Loading Balance

Top Loading Electronic Balance

Capacity: 4100 g
Readability: 0.1 g
Display: LCD w/Backlight
Power: 120 VAC, 240 VAC, 50/60Hz

Part No. 206692 - Top Loading Electronic Balance

Digital Pocket Balance

Capacity: 500 g
Readability: 0.1 g
Display: Backlit LCD
Power: Two (2) AAA batteries (included)
One button Calibration
RS232 Port

Part No. 206690 - Digital Pocket Balance

Digital Pocket Balance

Capacity: 300 g
Readability: 0.1 g
Display: Backlit LCD
Power: Two (2) AAA batteries (included)
One button Calibration
RS232 Port

Part No. 206689 - Digital Pocket Balance

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Triple Beam Balance

Top Loading
Capacity (metric): 610 g
Capacity (metric): 2610 g*
Readability (metric): 0.1 g
Ohaus Model 710-00

Part No. 206687 - Triple Beam Balance

*Capacity of 2610 g requires purchase of optional
Part No. 206688 weight set

Top Loading Mechanical Balance

Capacity (metric): 2000 g
Readability (metric): 0.5 g
Ohaus Model 1200
Large interchangeable weighing pans, dual pointers, tare adjustment, molded handles, and an eight piece, solid brass weight set; 1 g to 50 g.

Part No. 206686 - Top Loading Balance

Fluoroscope

The oil fluoroscope is versatile, dual-purpose instrument designed for on-site or laboratory inspection of drill cuttings for the presence of oil. The compact handheld UV lamp fits comfortably in the hand. Special design viewing cabinet provides a darkroom environment for viewing materials.

Part No. 204265 - Fluoroscope Lamp, UV
Part No. 204268 - Fluoroscope Cabinet, Black

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Laboratory Supplies

Fann maintains a large inventory of labware, consumable supplies and reagents that are used in the various instruments, test kits, and mud laboratories supplied. This section is an alphabetical listing of all glass and plastic labware, special tools and fixtures, and all consumable supplies.

Part No.	Description
CUPS	
206894	1000 ml, measuring, stainless steel
206895	2000 ml, measuring, stainless steel
206893	500 ml, measuring, stainless steel
206896	EP/Lubricity Tester, stainless steel
207030	Rheometer, stainless steel
207560	Viscometer. stainless steel
FLASKS	
205921	25 to 40 ml graduations, for 50 ml retort
205931	35 to 50 ml graduations, for 50 ml retort
205922	100 ml, volumetric
206555	125 ml, Erlenmeyer
205914	250 ml, Erlenmeyer
206691	250 ml, volumetric, with stopper
206580	500 ml, Erlenmeyer
205920	Le Chatelier, for specific gravity
FUNNELS	
206711	Analytical, plastic, 100 mm
206884	Marsh Funnel viscometer
209662	Plastic, for sand content
205904	Plastic, 3 inch
101470574	Plastic, 6 inch
205905	Separatory, 125 ml, glass, with Stopcock and stopper
205906	Separatory, 500 ml, glass, with Stopcock and stopper
GLASSWARE	
210420	Centrifuge tube, 10 ml, 0.1 ml Divisions
205889	Centrifuge tube, API, 12.5ml, 100%
205890	Centrifuge tube, 100 ml, with stopper
206616	Receiver tube, for HPHT Filter Press
209663	Sand Content Tube, graduated 0 20%
210072	Test tube, culture, 20 ml. 1 6 x 125m mm
206676	Test tube, 25 x 150 mm
206677	Test tube, 38 x 200 mm
206558	Hydrometer Cylinder, 250 ml
209965	Dispersion Tube

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Part No.	Description
205240	Receiver Tube 10 ml, for Oil Mud Retort
205241	Receiver Tube 20 ml. for Oil Mud Retort
205234	Test Tube, 16 x 125 mm

GRADUATED CYLINDERS

205870	5 ml, glass, 0 1-ml divisions, TD at 20°C
205869	10 ml, glass, 0.2-ml divisions, TD at 20°C
208775	10 ml, glass, 0 1-ml divisions, TC at 20°C
206543	20 ml, glass, calibrated 0 to 100%, TC at 20°C
205868	25 ml, glass, 0.2-ml divisions, TC at 20°C
205867	50 ml, glass, 1.0-ml divisions, TD at 20°C
208776	50 ml, glass, 1.0-ml divisions, TC at 20°C
205866	100 ml, glass, 1 0 ml divisions, TD at 20°C
206737	250 ml, plastic, 2.0 ml divisions, TC at 20°C
205233	1000 ml, plastic, 10 ml divisions, TC at 20°C
205231	100 ml, Nalgene
205232	25 ml, Nalgene
206558	250 ml, hydrometer, heavy glass

FILTER PAPER

206709	18 ½ cm diameter, fluted, 100 per box
206050	12 ½ cm diameter, 100 per box
206051	3 ½ inch diameter, for API filter press, 100 per box
206053	47 mm diameter, Millipore, 0.45 Micron, 25 per box
206054	3 ½ inch diameter, Millipore, 0.45 Micron, 10 per box
206056	2 ½ -inch diameter, for HPHT and ½ Area Filter Press, 100per box
206057	2 ½-inch diameter, glass fiber, back up for Filter paper, 50 per box
206059	70 mm x 90 mm, for Capillary Suction Timer, 170 per box
206058	2 ½-inch diameter, stainless steel filter, Dynalloy X 5, each
206052	3 ½-inch diameter, glass fiber, back up for Filter paper, 100 per box

HOTPLATE

205741	Thermolyne with thermostat, 300 Watt, 115-volt 3 ½ in. dia.
205742	Thermolyne with thermostat, 300 Watt, 230-volt 3 ½ in. dia.
205247	Thermolyne with thermostat, 300 Watt, 115-volt 3 ½ in.dia.,to 371°C

SPATULAS

210337	Stainless steel blade, 3 inch
206034	Stainless steel blade, 4 inch
206033	Stainless steel blade, 6 inch
206032	Stainless steel blade, 8 inch
210433	For retort

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Part No.	Description
207811	Hyde, for Ministill
204678	Micro, 5 ½ inch

OIL AND LUBRICANTS

207874	Oil, viscometer head, 32 oz
205625	Lubriseal, stopcock grease, 75 gm/tube,
210435	Lubricant, high temperature, 1 oz

O-RINGS

205647	1/8x 1/4x 1/16 inch, Nitrile
205648	5/32 x 9/32 x 1/16 inch, Nitrile
208845	5/32 x 9/32 x 1/16 inch, Fluorocarbon
205649	3/16 x 5/16 x 1/16 inch, Nitrile
207383	7/32 x 11/32 x 1/16 inch, Neoprene
207893	7/32x 11/32x 1/16 inch, Nitrile
205650	1/4 x 3/8 x 1/16 inch, Nitrile
205651	5/16 x 7/16 x 1/16 inch, Nitrile
207455	5/16 x 7/16 x 1/16 inch, Fluorocarbon
205652	3/8 x ½ x 1/16 inch, Nitrile
207454	7/16 x 9/16 x 1/16 inch, Fluorocarbon
205653	1/2 x 1/16 x 3/32 inch, Nitrile
207187	1/2 x 5/8 x 1/16 inch, Nitrile
205654	9/16 x 3/4 x 3/32 inch, Nitrile
207738	9/16 x 11/16 x 1/16 inch, Nitrile
205657	3/4 x 5/16 x 3/32 inch, Nitrile
205658	1 x 1 ¼ x 1/8 inch, Nitrile
205656	11/16 x 7/8 x 1/16 inch, Nitrile
207456	1¼ x 1½ x 1/8 inch, Fluorocarbon
205667	1-5/16x 1 7/16x 1/16 inch, Nitrile
205668	1 3/8 x 1 1/2x 1/16 inch, Nitrile
205659	1 3/8 x 1 5/8 x 1/8 inch, Nitrile
205666	1 5/8 x 1 3/4 x 1/16 inch, Nitrile
205662	2 1/4 x 2 l /2 x 1/8 inch, Nitrile
206613	2 5/16 x 2 1 /2 x 3/32 inch, Fluorocarbon
207918	2 7/8 x 3 x 1/16 inch, Fluorocarbon
207810	3 x 3 1 /4 x 1 /8 inch, Nitrile
206712	3 x 3 1/4 x 1/8 inch, Fluorocarbon
207327	3 1 /4 x 3 1 /2 x 1 /8 inch, Nitrile
205660	3 5/8 x 4 x 3/16 inch, Nitrile
205661	3 5/8 x 4 x 3/16 inch, Teflon
207736	3 5/8 x 3 7/8 x 1/8 inch, Nitrile
205665	3 1/2 x 3 3/4 x 1/8 inch, Nitrile
207453	3 3/4 x 4 x 1/8 inch, Fluorocarbon
205663	4 x 4 1/4 x 1/8 inch. Nitrile

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Part No.	Description

STOPPERS

205290	Rubber, solid, No. 6
205861	Rubber, two holes, No. 8
206678	Cork, solid, No. 10
208027	Rubber, solid, No. 10
206679	Cork, solid, No. 20
205259	Cork, No. 10
205260	Cork, No. 20
210153	Cork, for No. 64100
205249	Rubber, one hole, No. 5
205248	Rubber, two holes, No. 5
205302	Rubber, one hole, No. 3
205809	Rubber, one hole, No. 2

SYRINGES

(Note: 1 cm^3 = 1 cc= 1 ml)

208674	With needle, 1 cc
205891	Glass tip, 2 cc
205897	Disposable, plastic, needle, 3 cc
205892	Glass tip, 5 cc
205898	Disposable, plastic, needle, 10cc
205893	Glass, Luer lock tip, 10 cc
206706	Glass, Luer lock tip, 30 cc
206736	Syringe 50/60 cc plastic Luer-Lok
205896	Metal, veterinary, 10 cc
205891	Glass tip, 50 cc
205895	Glass tip, 5 cc
205899	Disposable, without needle, 30 cc
205235	Disposable, without needle, 5 cc

THERMOMETERS

206568	O to 220°F, 1° divisions, 6 inch length, pocket, metal holder
206680	77 to 221 °F, 0.5° divisions, glass for ASTM Aniline Point
206037	O to 220°F, 2° divisions, dial with 5 inch stem, metal
206038	50 to 350°F 2° divisions dial with 5 inch stem, metal
206039	50 to 500°F 5° divisions dial with 8 inch stem, metal
206040	30 to 120°F 1° divisions 12 inch length, for Hydrometers
206042	O to 300°F, 2° divisions,
206043	40 to 11 0°F 2° divisions for Resistivity Meter
206044	30°F (34°C) to 1999°F (1093°C), digital, 9 volt battery operated, with probe
206045	Probe for Digital Thermometer
206048	Electronic Printing

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Part No.	Description

PIPETTES

	Capacity	Graduations	Type
206024	0.1 ml	.01 ml	Serological
206025	0.2 ml	.01 ml	Serological
206026	1.0 ml	.01 ml	Serological
206563	2.0 ml	.10 ml	Serological
206028	5.0 ml	.10 ml	Serological
206029	10.0 ml	.10 ml	Serological
210070	1.0 ml		Dropper
206015	1.0 ml		Volumetric
206265	25.0 ml		Serological
210423	5.0 ml		Serological
210069	1.0 ml		Dropper
205267	1.75 ml		Transfer

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Part No.	Description
206699	Acetic Acid 5% 32 oz
209948	Alcohol Isopropyl 1gal
208736	Aluminum Chloride 0.1m 8 oz
210108	Amine Buffer 2 oz
210106	Amine Indicator 2 oz
206727	Ammonium Fluoride 10% 32 oz
206729	Ammonium Hydroxide 16 oz
209884	Ammonium Persulfate Powder 100gm
206669	Ammonium Sulfate .800 Aw 100 ml
210154	Aniline Reagent Grade 2 oz
209927	Ascorbic Acid 10gm
206698	Barium Chloride 10% 16 oz
206571	Barium Chloride 10% 2 oz
210192	Barium Chloride Saturated 4 oz
210193	Barium Chloride Saturated 8 oz
209899	Barium Chloride Standard 50 epm 16 oz
209878	Boric Acid 2% By Volume 16 oz
209890	Bromcresol Green Methyl Red Ind. 2 oz
209891	Bromcresol Green Methyl Red Ind. 4 oz
210050	Bromophenol Blue Indicator 2 oz
210037	Buffer pH10-1oz
210038	Buffer pH4-1oz
210036	Buffer pH7-1oz
210039	Buffer Solution pH 10 16 oz
210040	Buffer Solution pH 10 2 oz
210043	Buffer Solution pH 10 8 oz
210041	Buffer Solution pH 4 16 oz
210044	Buffer Solution pH 4 8 oz
210035	Buffer Solution pH 7 16 oz
210042	Buffer Solution pH 7 8 oz
209839	Calcium Buffer Solution 1N 2 oz
206670	Calcium Chloride .295 Aw 100 ml

Part No.	Description
209941	Calcium Chloride Solution 2 oz
209942	Calcium Chloride Solution Saturated 8 oz
204853	Calcium Hydroxide Powder 57gm
209894	Calcium Indicator Solution 2 oz
209895	Calcium Indicator Solution 8 oz
206668	Calcium Nitrate .505 Aw 100 ml
208770	Calcium Sulfate Anhydrous 2 oz
204854	Calcium Sulfate Powder 57gm
206725	Calcium Titration Solution I 16 oz
206556	Calcium Titration Solution I 2 oz
206667	Calcon Powder 40gm
209949	Cholroethene 1qt
209879	Citric Acid Demulsifier IPA 16 oz
210145	Copper Sulfate Powder 757gm
208735	Creosol Red Indicator Solution 2 oz
209835	Defoamer 8 oz
209695	Dispersant Solution (API) 1 Qt
209838	Erichrome Black T 10gm
209953	Ethylene Glycol 2 oz
206728	Formaldehyde 32 oz
210065	Formaldehyde Test Solution ‘A’ 2 oz
210066	Formaldehyde Test Solution ‘B’ 2 oz
210067	Formaldehyde Test Solution ‘C’ 2 oz
210068	Formaldehyde Test Solution ‘D 2 oz
208763	Glacial Acetic Acid 4 oz
209930	Hydrochloric Acid .1N 8 oz
209935	Hydrochloric Acid 0.2N 8 oz
208768	Hydrochloric Acid 0.5N 2 oz

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Part No.	Description
209931	Hydrochloric Acid 1.0N 8 oz
209933	Hydrochloric Acid 10% 8 oz
209932	Hydrochloric Acid 15% 16oz
209936	Hydrochloric Acid 2.0N 8 oz
209934	Hydrochloric Acid 43% 8 oz
209928	Hydrochloric Acid Concentrated 2 oz
209929	Hydrochloric Acid Concentrated 32 oz
209937	Hydrochloric Acid N/50 8 oz
209847	Hydrogen Peroxide 3% 8 oz
210132	Iodine Solution 0.125N-2 oz
209844	Iron Buffer Solution 2 oz
209845	Iron Buffer Solution 8 oz
209842	Iron Indicator Solution 2 oz
209843	Iron Indicator Solution 8 oz
210114	Iron Sulfide Detection Solution 2 oz
207824	Liquid Steel Wool 1/2 oz
207981	Liquid Steel Wool 1gal
206600	Liquid Steel Wool 2 oz
209900	Magnesium Chloride 20 epm 8 oz
206697	Methyl Orange Bromocresol Green 2 oz
209886	Methyl Orange Indicator Sol'n W/AF 2 oz
209888	Methyl Orange Indicator Sol'n W/AF 8 oz
209885	Methyl Orange Indicator Solution 2 oz
209887	Methyl Orange Indicator Solution 8 oz
209889	Methyl Purple Solution 2 oz
209892	Methyl Red Indicator Solution 2 oz
209688	Methylene Blue .01 meq 16 oz
209690	Methylene Blue .01 meq 1gal
209689	Methylene Blue .01 meq 32 oz
209686	Methylene Blue .01 meq 5 gal
209687	Methylene Blue .01 meq 8 oz

Part No.	Description
209684	Methylene Blue .01 meq W/AF 16 oz
209685	Methylene Blue .01 meq W/AF 1 gal
209683	Methylene Blue .01 meq W/AF 8 oz
209692	Methylene Blue 4.5 g/l 16 oz
209693	Methylene Blue 4.5 g/l 1 gal
209691	Methylene Blue 4.5 g/L 8 oz
209849	Nitrate Nitrogen Std Sol'n 10 mg/L 8 oz
209848	Nitrate Nitrogen Std Sol'n 100 mg/L 8 oz
209925	Nitric Acid .1N 8 oz
209926	Nitric Acid 1N (6.4% X vol) 8 oz
209924	Nitric Acid 3N 8 oz
209955	Normal Propoxy Propanol 1 gal
209954	Normal Propoxy Propanol 8 oz
209818	Octanol Defoamer 2 oz
209818	Octanol Defoamer 2 oz
209950	Pentane Technical Grade 1 gal
209855	Phenolphthalein Indicator 2 oz
209856	Phenolphthalein Indicator 8 oz
210046	Potassium Chloride Saturated 4 oz
209901	Potassium Chloride Standard 4 oz
209850	Potassium Chromate Indicator 2 oz
209852	Potassium Chromate Indicator 8 oz
209851	Potassium Chromate Indicator AF 2 oz
209853	Potassium Chromate Indicator AF 8 oz
210138	Potassium Iodide Iodate 8 oz
209854	Potassium Nitrate .938 Aw 100 ml
210048	Quaternary Ammonium Salt (QAS) 32 oz

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Part No.	Description
204855	Sodium Bicarbonate Powder 57gm
204870	Sodium Carbonate Powder 57gm
209883	Sodium Chloride .753 Aw 100 ml
209882	Sodium Chloride 10,000 ppm 4 oz
204828	Sodium Fluoride Powder (Bulk)
209907	Sodium Fluoride Powder 100gm
209959	Sodium Hydroxide 15% 4 oz
210049	Sodium Hydroxide 20% 16 oz
206708	Sodium Hydroxide 20% 4 oz
209960	Sodium Hydroxide 5.0n 4 oz
206666	Sodium Hydroxide 8n 4 oz
209904	Sodium Hydroxide N/10 16 oz
209903	Sodium Hydroxide N/10 2 oz
209906	Sodium Hydroxide N/10 4 oz
209905	Sodium Hydroxide N/10 8 oz
204869	Sodium Hydroxide Pellets 57gm
208764	Sodium Hypochlorite 4 oz
209908	Sodium Perchlorate 16 oz
209909	Sodium Perchlorate 8 oz
206564	Sodium Sulfite Powder 2 oz
210047	Sodium Tetraphenol Borate (STPB) 32 oz
210047	Sodium Tetraphenol Borate (STPB) 32 oz
206707	Sodium Tetraphenol Borate (STPB) 4 oz
209902	Standard Soap Solution 32 oz
210135	Sulfide Ion Buffer 2 oz
210134	Sulfide Ion Indicator 2 oz
210125	Sulfide Ion Test ‘A’ 2 oz
210126	Sulfide Ion Test ‘B’ 2 oz
210127	Sulfide Ion Test ‘C’ 2 oz
210137	Sulfide Ion Titration 8 oz
209872	Sulfuric Acid 13% 2 oz

Part No.	Description
209875	Sulfuric Acid 5N 16 oz
209876	Sulfuric Acid 5N 32 oz
209873	Sulfuric Acid 5N 4 oz
209874	Sulfuric Acid 5N 8 oz
209860	Sulfuric Acid N/10 16 oz
209871	Sulfuric Acid N/10 4 oz
209865	Sulfuric Acid N/10 8 oz
209866	Sulfuric Acid N/10 Af 16 oz
209864	Sulfuric Acid N/10 Af 2 oz
209861	Sulfuric Acid N/50 16 oz
209862	Sulfuric Acid N/50 32 oz
209869	Sulfuric Acid N/50 4 oz
209863	Sulfuric Acid N/50 8 oz
209867	Sulfuric Acid N/50 AF 32 oz
209870	Sulfuric Acid N/50 AF 4 oz
209868	Sulfuric Acid N/50 AF 8 oz
209896	Sulfate Indicator 2 oz
209897	Sulfate Indicator 8 oz
209956	Surfactant Reagent No 1 2 oz
210136	Thiosulfate 0.1N 16 oz
209859	Thymophthalein Ind .04% 2 oz
209857	Thymophthalein Ind 0.1% 2 oz
209858	Thymophthalein Ind 0.1% 8 oz
209913	Silver Nitrate .0282N w/AF 8 oz
209911	Silver Nitrate .0282N 16 oz
209912	Silver Nitrate .0282N 32 oz
209914	Silver Nitrate .0282N 4 oz
209910	Silver Nitrate .0282N 8 oz
209923	Silver Nitrate .141N 8 oz
209920	Silver Nitrate .282N AF 16 oz
209921	Silver Nitrate .282N AF 32 oz
209919	Silver Nitrate .282N AF 8 oz
209917	Silver Nitrate .282N 16 oz
209918	Silver Nitrate .282N 32 oz
209922	Silver Nitrate .282N 4 oz

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Part No.	Description
209916	Silver Nitrate .282N 8 oz
209822	Versenate Hardness Buffer 2 oz
209834	Versenate Hardness Buffer 4 oz
209825	Versenate Hardness Buffer 8 oz
209821	Versenate Hardness Indicator 2 oz
209823	Versenate Hrdns Indicator Calmagte AF 2 oz.
209827	Versenate Hrdns Titr 400mg/L EDTA AF 16 oz.
209833	Versenate Hrdns Titr 400mg/L EDTA AF 2 oz.
209829	Versenate Hrdns Titr 400mg/L EDTA AF 8 oz.
209831	Versenate Hrdns Titr 40mg/L EDTA AF 8 oz.
209830	Versenate Hrdns Titrant 400mg/L EDTA 16 oz.
209828	Versenate Hrdns Titrrant 400mg/L EDTA 4 oz.
209832	Versenate Hrdns Titrant 400mg/L EDTA 8 oz.
209824	Versenate Hrdns Titrant 40mg/L EDTA 100 ml
209819	Versenate Hrdns Titrant 40mg/L EDTA 16 oz.
209820	Versenate Hrdns Titrant 40mg/L EDTA 16 oz.
209826	Versenate Hrdns Titrant 40mg/L EDTA 8oz.
204874	Xylenol Orange 0.1% Aqueous 2 oz

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