

Measuring Instruments for Testing Drilling Mud, Cement Slurries and Fracturing Fluids

Content	Page
Sample Preparing Instruments: Mixer / Blenders	2
Density: Areometer / Hydrometer / Mud Balance	3
Filter Press: MFP1 / MFP2	4
pH-Tester	5
Filtration Control: Mud Testing Ring	6
Sand Content Determining: Sand Content Kit	6
Eff τ_f Classification Instrument: Ball harp	7
Viscosity: Marsh-Funnel / Shearometer	8
Viscosity: Direct indicating Viscosimeter	9
Laboratory Accessories: Measuring Cylinder, Blend Cylinder, Measuring Cup	10
Laboratory Accessories: pH-Indicator Stick, Indicator paper, Litmus paper	11
Laboratory Accessories: Stop-watch, Bimetall Thermometer	12

Sample Preparing Instruments

Below specified instruments are required to prepare the solutions to be analysed.

Mixer

Standard Hamilton Beach Mixer

- 1 spindle
- 3 test speeds:
13000, 16000 und 18000 rpm
- stainless steel mixing cup
- 230 V AC / 50 - 60 Hz



Multimixer

- 5 spindles
- speed 11000 rpm
- 230 V AC / 50 - 60 Hz



Blenders

Highspeed blenders are also supplied for general purpose mixing used in laboratories. A lightweight, multispeed Hamilton Beach Blender with a plastic housing and mixing container is suitable for field use.

Highspeed Blenders

Types:

Model HB 11349: 7 speeds, 115 V

Model WB 11480: 2 speeds, 230 V



Density

Special Areometer (Hydrometer)

This instrument is sufficiently accurate for well site determination of drilling fluid or cement slurry density, but it is not suited for precise laboratory purposes. Its operation is simple. A small cup, attached by a bayonet fitting to the lower end of the Areometer is filled with the fluid to be tested. The Areometer is then immersed in a water-filled cylindrical cylinder, and the density value is read from the graduation mark at water level.

The instrument is calibrated for a water temperature of 20 °C (68 °F) but for field purposes variations of water temperature can be neglected.

The instrument is made of powder-coated aluminum as protection against alkali-corrosion. Density range of the instrument is from 0.9 kg/1000 cm³ to 2.5 kg/1000 cm³ and 7.5 lbs/gal to 21.0 lbs/gal.

Accessories: We recommend a plastic stand-cylinder.

Areometer

Length:	approx. 715 mm	28.15"
Diameter:	approx. 35 mm	1.38"
Weight:	approx. 0.4 kg	0.88 lbs

Stand cylinder

Length:	approx. 910 mm	35.83"
Diameter base plate:	approx. 200 mm	7.87 "
Diameter cylinder:	approx. 60 mm	2.36"
Weight:	approx. 2.3 kg	5.07 lbs



Mud Balance

The four-scale mud balance is an accurate, self-contained measuring device used to determine the density of drilling mud and cement slurries. It has a range of 7 to 24 pounds per gallon (specific gravity of 0.84 to 2.88). The Mud Balance consists of a constant-volume sample cup and lid connected to a balance arm that has four graduated scales. On the front side are scales for measuring density in pounds per gallon and pounds per square inch per 1000 feet of depth, and on the back side are scales for measuring pounds per cubic feet and specific gravity. A rider is moved along the balance arm to indicate the scale readings. A knife edge is attached to the arm near the balance cup, and a bubble level is built into the knife edge to level the arm. A fulcrum mounted in the plastic carrying case serves as a holder for the arm. A base with fulcrum is available.

Lid, knife edge with level, base with fulcrum and carrying case are available as spares.



Specifications Mud Balance in carrying case:

Length:	approx. 540 mm	21.26"
Width:	approx. 130 mm	5.12"
Height:	approx. 105 mm	4.13"
Weight:	1.7 kg	3.75 lbs

Filter press according to DIN 4127

Filtration and wall-building properties of drilling fluids and cement slurries are determined by a LEUTERT filter press.

Wall building characteristics are demonstrated by the thickness and consistency of the filter cake, deposited on the filter paper at the end. The filter press consists of a stand, the CO₂-cartridge holder assembly or the quick-coupling connection for compressed air, the mud cup carrier with safety valve, the pressure regulator and the mud cup with clamp and cap. The cap consists of a filtrate tube and an interchangeable screen. The filter paper of 9 cm diameter (3-1/2") is placed on the screen.

Filter press Model MFP 1

to pressurize the filter press with a CO₂- cartridge pressure source



Filter press Model MFP 2

to pressurize the filter press with compressed air



Specifications Filter press:

Diameter base plate: approx. 200 mm | 7.87"
Height: approx. 500 mm | 19.68"
Weight: approx. 6 kg | 13.23 lbs

Accessories/Expendable material:

- Filter paper
- Graduated cylinder
- CO₂-cartridge
- Set of gaskets
- Instruction manual

For Model MFP 2 a pressure regulator with 2 m (6.56 ft.) pressure hose and a connector is available.

pH-Tester

Microprocessor based pocket pH-Tester

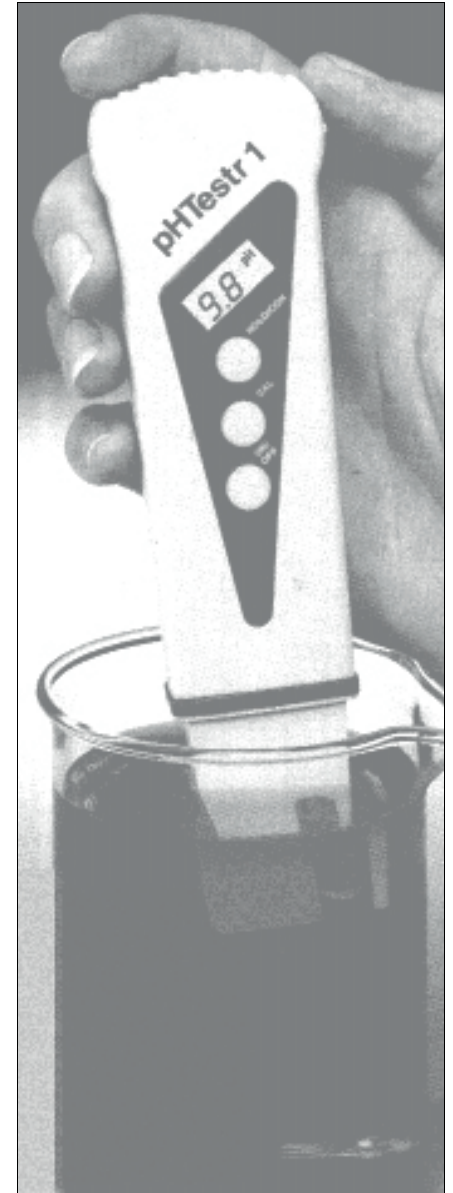
Part-No. 8030.0.0060040

- $\pm 0,2$ pH Accuracy
- Hold function
- Easy maintenance
- Large easy-to-read display
- Automatic shut-off after 8,5 minutes helps to conserve batteries

CAUTION: To avoid cross contamination between samples, never immerse the electrode above color band!

Specifications

Range:	-1,0 to 15,0 pH extended range
Resolution:	0,1 pH
Accuracy:	$\pm 0,2$ pH
Operating temperature:	0 °C to 50 °C 32 °F to 122 °F
Battery:	3 pcs. 1.4 V Eveready EP675E Life 100 hrs. (Silver Oxide batteries may be substituted; use Model 303, typical life approx. 70 hrs.)
Dimensions:	151 mm x 42 mm x 24 mm 5.94" x 1.65" x 0.94" (L x W x H)
Weight:	90 gr. 3.17 oz.



Filtration control (water loss)

Mud Testing Ring

This device allows a simplified determination of the water separation of drilling mud and cement slurries. It takes over a part of the work of the filter press, although it will not give the same precise results. The values obtained, however, are sufficiently exact to allow conclusions as to the characteristics of the mud and cement slurries.

Specifications

Diameter:	approx. 75 mm 2.95"
Height:	approx. 22 mm 0.86"
Weight:	approx. 0.3 kg 0.66 lbs
Accessories:	Filter paper 100 pcs.



Sand Content determination by sieve and tube

Sand Content Kit

The Sand Content Kit is an easy, reliable, efficient and proven means for determining the sand content. The kit employs the sieve analysis method for determining the sand content. It uses a 200 mesh sand screen to trap the sand.

The Sand Content Kit contains the sand screen, a plastic funnel that fits over the end of the screen cylinder with the small end fitting into a glass measuring tube, and a wash bottle.

The measuring tube has a scale that is graduated from 0 to 20 % to measure percentage of sand by the volume of fluid. All parts are available as spares.

Specifications Sand Content Kit in carrying case

Length:	approx. 270 mm 10.63"
Width:	approx. 185 mm 7.28"
Height:	approx. 100 mm 3.94"
Weight:	approx. 0.6 kg 1.32 lbs



Eff τ_f Classification Instrument according to DIN 4126

Ball harp

10 glass, respectively steel, balls of different diameters are dipped simultaneously into the suspension. At a given density of the suspension, each ball is assigned to another critical efficient flow limit at which it would be in suspense in the suspension.

Balls, whose critical eff τ_f is smaller than eff τ_f of the suspension, swim on the suspension, those whose critical eff τ_f is greater, dip.

The balls are marked with continuous numbers from 1 to 10 in the sequence of their growing critical efficient flow limit. Thus the efficient flow limit of the suspension lies between the critical eff τ_f of the ball with the largest number which is still swimming and the eff τ_f of the ball with the smallest number which is dipping in the suspension.

The critical efficient flow limits of all balls are declared in a table for densities between $\rho_f = 1.02 \text{ g/cm}^3$ and 1.70 g/cm^3 , referred to the standard ball set.

The ball set "S" (special) is suitable for densities between $\rho_f = 1.15 \text{ g/cm}^3$ and 1.70 g/cm^3 .

The scope of supply includes:

- Stand with 2 harps
- 2 standard ball sets:
Ball no. 1 - 10 (10 pieces)
- 2 clear probe-cups, 1 L volume
- Instruction manual
- Expansion ball set:
Ball no. 8 - 20 (9 pieces)
Ball set "S" is available

Recommended accessories:

- Eggbeater to stir up the suspension
- Table ventilator to dry the balls

Note:

Easy and facile operation. All components such as ballsets, harps and probe-cups are available as spares.

Specifications (stand)

Length:	approx. 280 mm 11.02"
Width:	approx. 185 mm 7.28"
Height:	approx. 505 mm 19.88"
Weight:	approx. 5 kg 11.02 lbs



Viscosity

Marsh-Funnel

The Marsh-Funnel Viscometer is made of rugged, break-resistant plastic that resists temperature change deformation. Volumetric accuracy is assured. A metal orifice assures accurate readings. The Marsh Funnel is used for routine viscosity determinations. The 1.000 cc high-impact plastic measuring cup, graduated in cubiccentimeters and fluid ounces, is designed specifically for use with the Marsh Funnel Viscometer.

Specifications

Funnel

Length: approx. 360 mm | 14.17"
 Funnel diameter: approx. 160 mm | 6.30"
 Capacity: 1500 cm³ | 0.33 gal
 Weight: approx. 0.34 kg | 0.75 lbs

Metal orifice

Inner diameter: 4,76 mm | 3/16"

Cup

Diameter: approx. 130 mm | 5.12"
 Height: approx. 135 mm | 5.31"
 Weight: approx. 0.215 kg | 0.47 lbs

Stand

Diameter base plate: approx. 200 mm | 7.87"
 Length over all: approx. 510 mm | 20.08"
 Weight: approx. 1.5 kg | 3.31 lbs



Accessories: Stop-watch and stand

NEW: Marsh-Funnel with Metal orifice 8.0 mm und 10.0 mm

Shearometer

Shearometer Kit

The Shearometer is a measuring device used to determine the gel strength of drilling mud. The Shearometer kit consists of two 5-gram, hollow shear tubes, and a sample cup that has a graduated scale mounted in the center of the cup base. The graduated scale measures the gel strength in pounds per 100 square feet of area.

Specifications Cup base

Diameter: approx. 100 mm | 3.94"
 Height: approx. 220 mm | 8.66"
 Weight: 0.5 kg | 1.10 lbs



No. 1024E - 02.99

Viscosity

Direct Indicating Viscosimeters

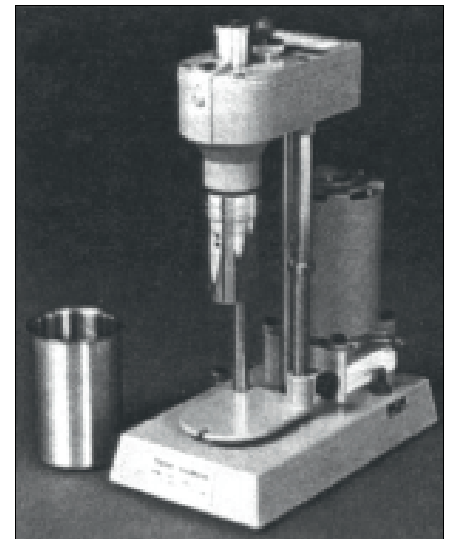
The direct indicating viscometers are versatile instruments for research or production use. They can be used wherever a regulated-frequency power source is available.

In the six-speed models (Model 35), test speeds of 600, 300, 200, 100, 6 and 3 rpm are available via synchronous motor driving through precision gearing. Any test speed may be selected without stopping rotation. The shear stress is displayed continuously on the calibrated scale allowing time-dependent viscosity characteristics to be observed as a function of time.

Specifications:

Model Chan 3500

12 speeds:	600, 300, 200, 100, 60, 30 20, 10, 6, 3, 2 und 1 rpm
Accuracy:	± 0.01 rpm
Accuracy / torque:	± 0.5 (Accuracy of reading)
Operating temperature:	0 °C to 55 °C 32 °F to 131 °F
Max. Sample temperature:	92 °C 197.6 °F
Power supply:	220 V AC / 50 Hz (700 Watt)



Model Fann 35

6 speeds:	600, 300, 200, 100, 6 und 3 rpm
Power supply:	115 V AC / 50 Hz

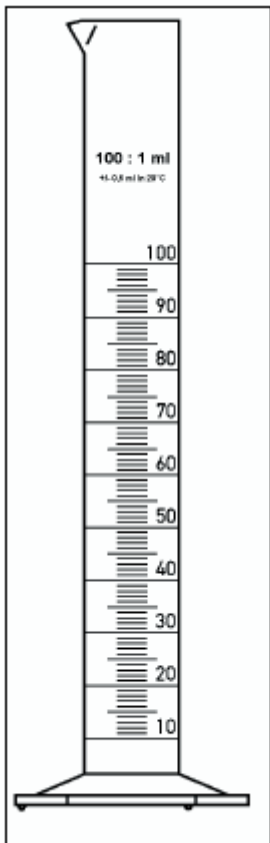
Application and accuracy see Model Chan 3500.

Accessories: different torsion springs, ample cups,
calibration kit and thermocup

Laboratory Instruments and Accessories

Measuring Cylinder

High and lower form



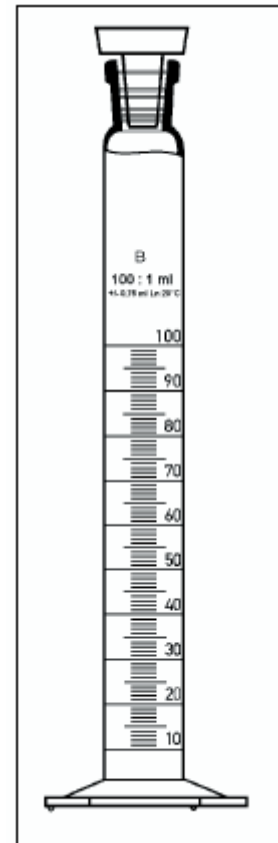
High Form

Capacity [ml]	Subdivision [ml]
10	0,2
25	0,5
50	1
100	1
250	2
500	5
1000	10
2000	20

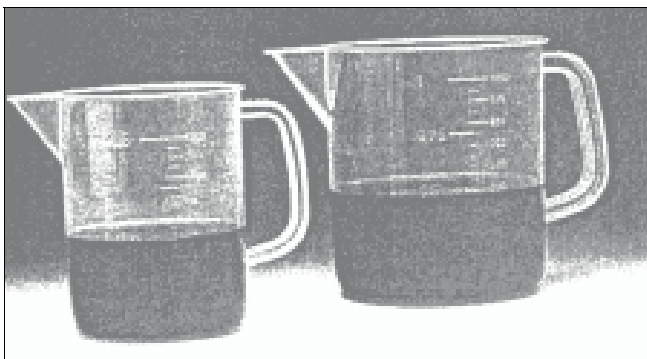
Lower Form

Capacity [ml]	Subdivision [ml]
10	0,2
25	0,5
50	1
100	1
250	2
500	5
1000	10
2000	20

Blending Cylinder



Measuring Cup



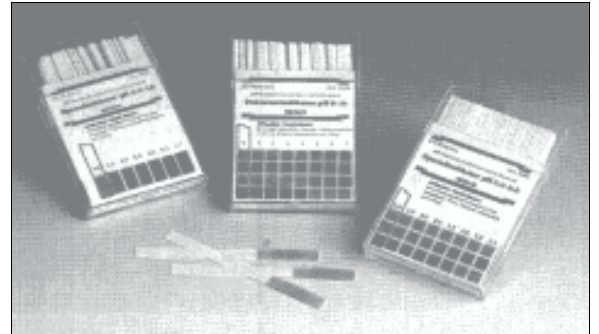
Capacity [ml]	Subdivision [ml]
50	2
100	2
250	5
500	25
1000	50
2000	50
3000	100
5000	250

Laboratory Instruments and Accessories

pH-Indicator Stick

Box with 100 pcs.

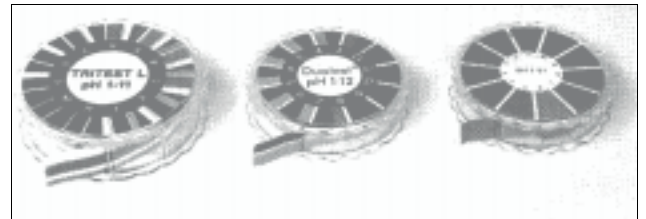
Type	pH-Range	Graduation
Universal	0 – 14	1
Acilit	0 – 6	0,5
Neutralit	5 – 10	0,5
Alkalit	7,5 – 14	0,5



Special Indicator Paper

Box with 3 rolls incl. colored scale or refill package with 3 rolls

pH-Range
0,5 – 5,5
3,8 – 5,8
4,0 – 7,0
5,4 – 7,0
5,5 – 9,0
6,4 – 8,0
7,2 – 9,7
8,0 – 10,0
9,0 – 13,0
12,0 – 14,0



Indicator Paper

Box with 3 rolls each 5 m long und 7 mm wide

Type	pH-Range
Acilit	0,5 – 5,0
Neutralit	5,5 – 9,0
Alkalit	9,5 – 13,0

Special Indicator Paper

Box with 3 rolls incl. colored scale or refill package with 3 rolls

pH-Range
1 – 11
1 – 14

Litmus Paper

blue (box)

Litmus Paper

red (box)

Laboratory Instruments and Accessories

Stop Watch

In various designs



Bimetal-Thermometer

In various designs



Wash Bottles

In various designs

