

®

1/2 Area Filter Press Instruction Manual

Part No. 302020001EA

Rev. C

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DESCRIPTION

The filtration and wall-building characteristics of drilling fluids at ambient temperature are determined by a filter press. By applying 100 psi (689 kPa) pressure with a non hazardous fluid (in this case, a midget CO₂ pressure cartridge), a sample of drilling fluid is filtered through a sheet of specially hardened filter paper. The filtrate is then discharged through a screen and a filtrate tube into a graduated cylinder or glass pipette. The volume of the filtrate collected will indicate the degree of permeability (fluid conductivity) of the mud sample.

The 1/2 area filter press can be used in the conventional manner or in the upside down position to make measurements free of settling of the solids. Laboratory tests indicate that variation in filtration rate may be obtained due to solids settling. This unit makes possible a routine test to determine more nearly the true filtration and wall cake condition of the hole. The 1/2 area filter press has 1/2 the API filtration area and all filtrate volumes must be multiplied by 2 to correlate with API specifications.

The 1/2 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.

FILTRATION TEST PROCEDURE

1. Unscrew the end cap from the cell. Make sure that the boot is properly seated around its top edge to ensure a tight seal. The top edge of the boot is the gasket which provides the seal to the filter paper and end cap.
2. Pour the Drilling fluid sample into the boot to within 1/16" (1.6 mm) of the top. Place a sheet of the proper size (9 cm) filter paper across the top of the boot and screw down the end cap firmly. Hand tightening is sufficient.
3. Holding the cell with the T-screw up and end cap down, mount the cell in the bracket on the wall. Position a 10 ml graduated cylinder directly under the filtrate tube to catch the filtrate.
4. Open the cell valve by pushing it toward the back of the cell. After checking that regulator adjusting screw is backed out, remove barrel and insert a CO₂ cartridge. Turn barrel until contact with puncturing pin is felt. Advance an additional ¼ turn.
5. Rapidly screw the regulator T-screw into the regulator so that 100 ± 5 psi (689 ± 35 kPa) is applied. Timing of the test should begin as soon as proper pressure is applied. If this pressure cannot be applied, replace the CO₂ Cartridge.

CO₂ CARTRIDGE REPLACEMENT

6. Close the cell valve by pushing it toward the front of the cell. This will bleed the CO₂ out of the cell. Return the regulator T-screw to its maximum outward position.
7. Remove the barrel from the pressure unit. Remove and discard the spent CO₂ cartridge.
8. Repeat step 4.

COMPLETING TEST EVALUATION

9. At the end of 30 minutes, close the cell valve by pushing it toward the front of the cell. This will also bleed the CO₂ out of the cell and relieve the pressure on the boot.
10. Record the volume of filtrate collected in the cylinder in cubic centimeters (to 0.1 cm³ resolution). Correct to API by multiplying by 2.
11. With the cell valve closed, unscrew the T-screw to its maximum outward position. Remove the end cap, discard the Drilling fluid sample.
12. Use extreme care to save the filter paper with a minimum of disturbance to the filter cake.
13. Wash the filter cake on the paper with a gentle stream of water or, in the case of oil based drilling fluids wash with diesel oil. Measure the thickness of the filter cake.
14. Record the thickness of the filter cake to the nearest 1/32 in. (0.8 mm).
15. Record cake description using such notations as hard, soft, tough, rubbery, firm, etc. These terms are helpful in conveying some idea of cake consistency.

PREVENTIVE MAINTENANCE

16. Remove the boot and thoroughly clean the boot and the chamber. Thoroughly rinse all filtrate from the screen and filtrate tube. Wipe off the remainder of the filter press. Dry all parts completely.
17. Replace the boot in the cell, place a new sheet of filter paper on the screen, and screw the end cap back onto the cell.
18. Remount the filter press on the wall.

UPSIDE DOWN FILTRATION

For upside down filtration, proceed as before, and make the following substitutions:

1. **STEP #3**

Holding the cell with the end cap and the T-screw down, mount the cell in the bracket on the wall. Insert a 10 ml or 5 ml pipette through the optional pipette holder and seat its tapered end in the "O" ring inside the filtrate tube.

2. **STEPS #8 & 9:**

At the end of 30 minutes, record the filtrate volume in the pipette in cubic centimeters (to 0.1 cm³) before relieving pressure on the mud. Correct to API by multiplying by 2. Close the cell valve by pushing it toward the front of the cell. This will also bleed the CO₂ out of the cell and relieve the pressure on the boot.

CAUTION

If the pressure is shut off before the reading is taken, some of the filtrate may be drawn from the cylinder back into the mud.

STORAGE

Unscrew the barrel from the cell and remove the CO₂ cartridge. Screw the barrel back into the cell. Unscrew the regulator T-screw to its maximum outward position. This will sufficiently prepare the filter press for storage.

WARNING

Do not unscrew the barrel from the cell until certain that the CO₂ cartridge is completely exhausted.

CAUTION

Exercise care when handling the cell when it is filled with

drilling fluid sample so that the valve is not accidentally opened before the end cap is screwed on.

CAUTION

Use care in handling CO₂ cartridges; keep out of direct sunlight and away from heat. CO₂ cartridges are not normally hazardous; however, they should be protected from extreme heat, such as might be attained in exposure to direct sunlight behind the windshield of a closed vehicle.

30205 FILTER PRESS - EXPLODED VIEW

OPERATING AND SPARE PARTS

The following parts and accessories are available for the 1/2 Area Filter Press:

ITEM NO.	PART NO.	DESCRIPTION
1	30203	CELL BODY
2	30204	END CAP
3	30206	RETAINER FOR SCREEN
4	L4984	RETAINER RING "E" FOR 3/8 SHAFT
5	30209	SCREEN, 60 MESH 1/2 AREA
6	30208	DIAPHRAGM, RUBBER BOOT
7	L4502	"O" RING, 5/32 X 1/16, NIT, B-46, #007-70
8	33751	BUSHING, FOR REGULATOR
9	33752	GLAND, FOR REGULATOR
10	33753	SPRING, VALVE
11	33743	HOLDER, SEAT ASSEMBLY (11-1,2,3,4)
12	33744	GASKET FOR REGULATOR
13	33742	NOZZLE, BRASS
14-1	33740	DIAPHRAGM, REGULATOR
14-2	33737	CENTRALIZER, DIAPHRAGM
14-3	33738	NUT, DIAPHRAGM
14-4	33739	PLATE, DIAPHRAGM
15	33755	RING, SLIP, REGULATOR
16	33756	SPRING, ADJUSTING
17	33757	BUTTON, SPRING, REGULATOR

OPERATING AND SPARE PARTS Continued

18	33773	CAP, REGULATOR, W/TEE SCREW (19)
19	--	TEE SCREW, REGULATOR (item 18)
20	11577	"O" RING, 5/16 X 1/8, NIT, B-46, (CO ₂ adapter head)
21	33620	ADAPTER HEAD FOR CO ₂ CARTRIDGES
22	33601	CO ₂ CARTRIDGES (Box of 10 Not Shown)
24	33606	BARREL FOR CO ₂ CARTRIDGES
25	30212	GASKET FOR RELIEF VALVE
26	33722	BALL, STAINLESS STEEL, 1/4 DIA.
27	33712	SPRING, RELIEF VALVE
28	30211	BODY, RELIEF VALVE
29	30207	PISTON, SLIDE VALVE
30	L4983	RETAINER RING, EXT, 1/4 IN
31	L4500	"O" RING, 1/8 X 1/16 NIT, B-46
32	L3706	GAUGE, 160 PSI (1100 kPa) 1.5 IN. DIAL, 1/8 IN. B.C.
34	N8800	FILTER PAPER, API, 2.5 IN. (6.3 cm)
35	30210	BRACKET, FROG, FILTER PRESS
36	A5102	8-32 x 3/8 FHMS, SS
37	37601	BRACKET, WALL MOUNT (Not Shown)
38	A5104	8 x 3/4 FHWS, (Mount bracket)
39	N3100	CYLINDER, GRADUATED, 10 ML "TD"
40	N6100	PIPETTE, 10 ML, SEROLOGICAL
41	30202	INSTRUCTION MANUAL (not shown)

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