

**Model 25-48PP  
with optional pneumatic  
plate spreader**

### *Liquid / solid separation for:*

**WASTE & SEWAGE TREATMENT  
BREWING / CEMENT / CERAMIC  
MINING & PLATING INDUSTRIES  
FOOD & VARNISH PROCESSING  
CHEMICALS**

- **MANUAL HYDRAULIC**  
0.6 to 3 cu.ft.expandable
- **SEMI-AUTOMATIC**  
1 to 50 cu.ft. expandable
- **AIR BLOWDOWN MANIFOLD**
- **CORROSION RESISTANT**
- **40-60% SOLIDS CONCENTRATION**
- **LOW ENERGY REQUIREMENT**
- **EASY DROPOUT CLEANING**

The ReCESSED Plate Filter Press will compact sludges to a dry cake with a density that is dependent upon the ultimate compaction pressure and the characteristics of the particular sludge.

Each pressload will require from 2-4 hours cycle time. To insure adequate time, the press should be sized for at least 8 hours working capacity. The table and formula below can be utilized to size your press. To confirm your sizing and evaluate the process for your application with a laboratory-sized model,

contact the Application Engineering Dept. to arrange a pilot test.

Presses feature structural steel frame, coated with tough chemical resistant epoxy paint. High density molded polypropylene filter plates are light weight and corrosion resistant. Special polypropylene quick cake release filter cloths. Air actuated hydraulic system for parting and closing the filter plates. Automatic self-compensating hydraulic system. Conveniently located operator control console.

**TO SIZE YOUR PRESS**, the following information is required:

SLUDGE TYPE	% OF CAKE DRY WEIGHT SOLIDS	AVERAGE DRY WEIGHT/ CUBIC FOOT
Biological Sludge	15-25	15
Metal Hydroxide Sludge	25-40	25
Lime Treated Sludge	15-60	30

- A.** Total gallons to be processed in selected press in specified period, e.g., U.S gals./8 hours. Twenty-four hours can be used to insure adequate capacity.
- B.** Percent by weight of filterable suspended solids.
- C.** Average dry weight per cubic foot for a particular sludge (obtained from table.)

**CALCULATIONS:**

$$\frac{A \times B \times 8.33 \text{ LBS./GAL.}}{C} \text{ OR } \frac{(\text{U.S. GALS./8 HRS.}) \times (\% \text{ SUSPENDED SOLIDS}) \times 8.33 \text{ LBS./GAL.}}{(\text{AVERAGE LBS. DRY WT./ CUBIC FT.})} = \text{CU. FT. CAPACITY FOR A DURATION}$$

# EFFICIENT, ECONOMICAL

*The Recessed Plate Filter Press incorporates modern materials and methods suited to dewatering applications in plating and other industries.*

The graph on the right demonstrates the savings possible relative to other sludge dewatering methods. Sludge dewatering and thickening equipment is classified into two basic categories: gravity dewatering equipment, which relies on the difference in size and/or density between the solids and the water to thicken the sludge, and mechanical dewatering devices, which subject the sludge to external forces to affect liquid/solid separation.

Underflow from most clarifiers, where metal hydroxides have been precipitated, flocculated, conditioned and allowed to settle, usually contains 99 to 99.5 percent water. With the enactment of the Resource Conservation and Recovery Act (RCRA), these metal hydroxides must be disposed of in a licensed landfill. This involves transportation and disposal costs to be paid by the generator. Both costs depend to a large extent upon the volume of the sludge. Reducing the water content reduces the volume and, ultimately, the disposal costs.

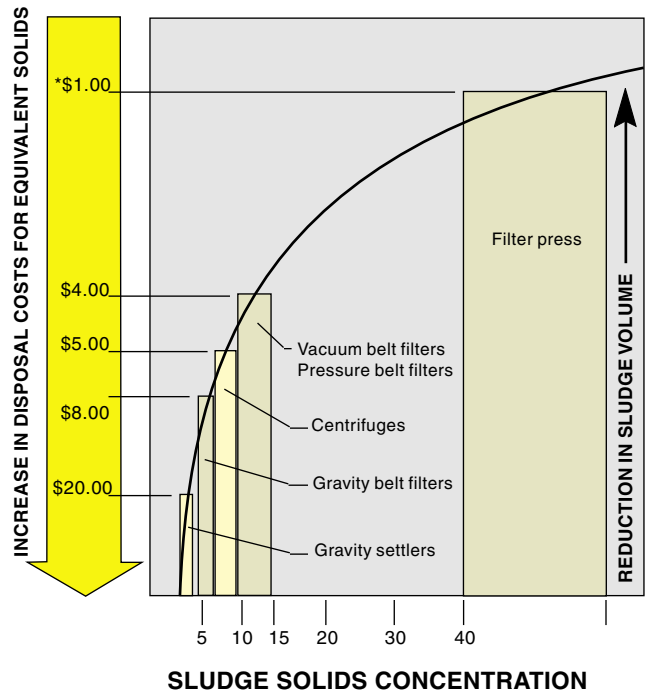
Thickening equipment, such as gravity settlers and gravity belt filters, remove the "free" water contained in the cavities between the particles, producing up to 10% total solids concentration. Removing floc water, water bound to the particles as a result of attraction to polar hydroxide particles, cohesive forces and surface tension, requires mechanical dewatering equipment applying forces stronger than gravity. Filter presses supply the type and amount of force necessary to achieve 25 to 50 percent solids content. The Recessed Plate Filter Press applies sufficient compaction pressure to compress the sludge and "squeeze out" the water, yielding a dry cake of 25% to 60% total solids concentration in many cases.

The reduction in disposal costs resulting from the decrease in sludge volume amounts to as much as a 99% savings. In most cases, the Filter Press pays for itself by reducing sludge disposal costs.

## PRESS APPLICATION

**GENERAL:** The filter press has been utilized for many years to separate liquids from solids. In many cases the liquid is saved, while in other cases, the solids are the desired product. The filter press is an efficient system which provides high pressure filtration and/or compaction and ease of operation. Other filtration systems offer high pressure filtration, but only the filter press has both high pressure capability and efficient filter cake removal.

The filter elements are constructed of lightweight polypropylene. They are extremely corrosion resistant and virtually eliminate plate breakage.



\* ASSUME SLUDGE DISPOSAL COSTS TO BE \$1.00 PER GALLON.

## HEAVY DUTY CONSTRUCTION

The filter's skeletal framework is completely fabricated of heavy gauge steel. The internal stresses and pressures generated by the hydraulic ram are absorbed by the steel frame. Only the stationary weight of the press is transferred to the support structure. Heavy duty side bars connect the head section to the tail section and support the filter plates.

## RECESSED PLATE CHAMBERS

When two recessed plates are held together, a cavity is created between them, thereby eliminating the need for a frame. A filter membrane is stretched across each plate to retain the filter cake.

The cake is not suspended in a frame as in the conventional plate and frame unit and thus is readily discharged when the press is opened. Since the external surfaces of the cavity are now structurally tied together by the plate, the unit can withstand much higher internal filtration pressures.

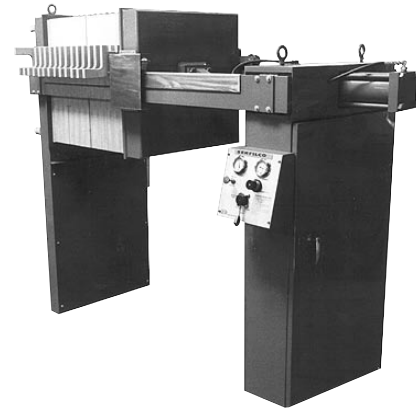
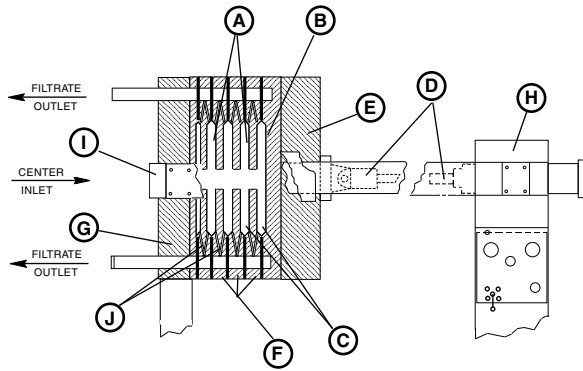
## NON-GASKETED AND GASKETED PLATES

The filter cloth forms the seal between the plates. Latex tacking can be applied to the cloth to limit the leakage of the filtrate. The high internal filtration pressures will, however, force a small quantity of the filtrate from between the plates. Gasketed plates are available which retain valuable filtrate and also prevent leakage.

## MANUAL HYDRAULIC

These units are available in the smaller sizes for an economical press without sacrificing solids concentration or press quality.

# DEWATERING OF SLUDGE



## OPERATION

Dewatering is accomplished by pumping a slurry or sludge into chambers (A) surrounded by filter membranes (B). As pumping pressure is increased the filtrate is forced through the accumulated filter cake (C) and membrane until the chamber is full of solid filter cake.

The chambers are formed by two recessed plates held together under hydraulic pressure. The hydraulic ram (D) moves the follower (E) against the stack of filter plates (F) closing the press. The ram continues to apply sealing pressure of sufficient force to counteract the high internal compaction pressures. The head stock (G) and tail stock (H) are held in place by specially engineered side rail support bars (I).

The filtrate passes through the membrane and is directed by channels in the plates and drain ports (J) to the head stock for discharge. The filtrate typically contains less than 15 PPM suspended solids. The filter cake is easily removed by simply reversing the hydraulic ram, thus opening the press. The lightweight plates may then be moved apart, permitting the compacted cake to fall from the chambers.

The higher the internal pressure, the greater the solids compaction. The standard press is constructed to withstand 100 PSI compaction pressure producing a hard dry cake. The special high pressure press can withstand 225 PSI for sludge more difficult to dewater.

Air diaphragm type pumps provide very efficient compaction of the sludge. The maximum pressure can be set with the air supply regulator and the pumping rate set with the volume of air flow. The pump will run rapidly during the initial phase of the cycle, slowing steadily as back pressure increases due to cake formation. Low initial back pressure induces rapid pumping and shortens the overall cycle time. When the pump attains the desired pressure and the flow rate slows, the compaction cycle is complete. An air blowdown manifold allows influent to be purged from piping before the press is opened.

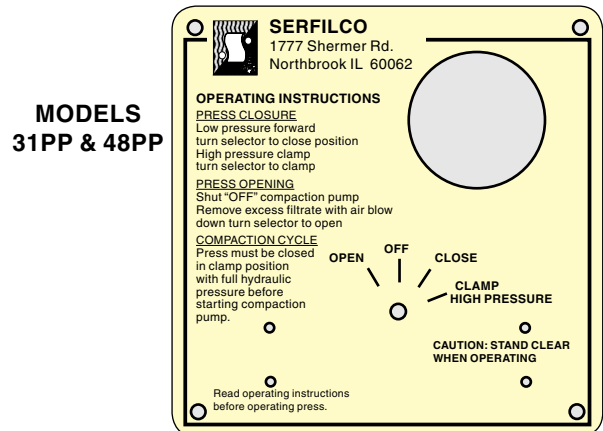
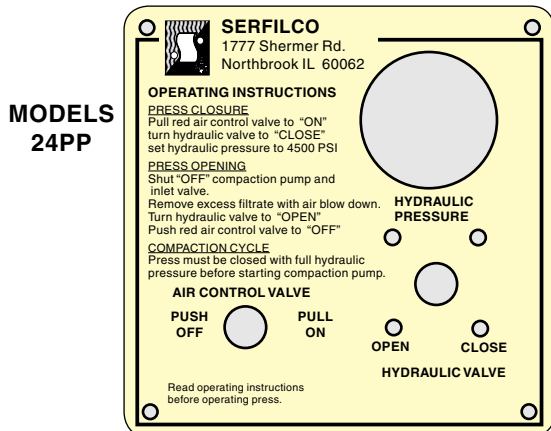
Overall cycle time is dependent upon the concentration of the influent sludge. Higher concentrations dramatically reduce cycle time. Typical cycle time is two to four hours. Typical cleaning time is less than 30 seconds per plate.

## SEMI-AUTOMATIC OPERATION

The follower is moved into the operating or pressure position and back to the cleaning position with a heavy duty air powered hydraulic ram. This self-compensating hydraulic system prevents over pressurization and automatically prevents loss of closure pressure from thermal expansion/contraction of the polypropylene filter chambers. All components are mounted inside the tail stock. A check valve prohibits loss of hydraulic pressure if air pressure is lost. Manual hydraulic models use a hand jack.

## CONTROL CONSOLE FOR SEMI-AUTOMATIC

One convenient control console houses all air and hydraulic controls. The compact console contains the off/on switch, press opening/closing control lever, and hydraulic pressure gauge.



**TO ORDER, use Price Code Number**

<b>MANUAL HYDRAULIC</b>													
MODEL	CUBIC FEET <sup>1</sup>	IN-OUT NPT & SQUARE PLATE SIZE	DIMENSIONS (IN.)						NO. OF CHAMBERS	APROX. WEIGHT (LBS.)	PRICE CODE NUMBER		
			A	B	C	D	E	F			NON-GASKETED	GASKETED	
0.6-18PPMH	0.6	1½" x 1" 18½"(470mm)	32	24	49	31	37	52	4	800	43-0804	43-0804G	
1-18PPMH	1.0						41	56	6	850	43-0805	43-0805G	
2-18PPMH	2.0						55	70	12	940	43-0806	43-0806G	
3-18PPMH	3.0						73	87	19	1060	43-0807	43-0807G	
<b>SEMI-AUTOMATIC</b>													
1-24PP	1	2½" x 1½" 24" (610mm)	39	31	56	30	57	84	3	1700	43-0601	43-0601G	
2-24PP	2						67	93	7	1900	43-0602	43-0602G	
3-24PP	3						74	100	10	2050	43-0603	43-0603G	
4-24PP	4						80	107	14	2150	43-0604A	43-0604AG	
5-24PP	5						89	116	17	2300	43-0605A	43-0605AG	
6-31PP	6	3" x 1½" 31½"(800mm)	48	40	63	30	82	109	12	4200	43-0606	43-0606G	
8-31PP	8						92	119	16	4450	43-0608	43-0608G	
10-31PP	10						102	129	20	4900	43-0610	43-0610G	
15-31PP	15						127	154	30	5500	43-0615A	43-0615AG	
20-31PP	20						152	179	40	6000	43-0620A	43-0620AG	
25-48PP	25	3" x 2" 48" (1200mm)	66	58	86	35	105	133	21	11,380	43-0625A	43-0625AG	
30-48PP	30						116	144	25	11,850	43-0630A	43-0630AG	
40-48PP	40						141	169	34	13,100	43-0640	43-0640G	
50-48PP	50						163	191	42	14,000	43-0650	43-0650G	

<sup>1</sup> Based on 1¼" thick filter cake.

NOTE: Air blowdown connections are ½" NPT on all models.

**OPTIONAL EQUIPMENT**

**SLUDGE HOPPER**

Self-dumping hoppers to transfer compacted solids from the press to a large roll-off type container. The hoppers, specifically engineered for each class of press, are easily moved with forklift truck and dumping is accomplished merely by a trip handle.

**AUTOMATIC PUMP CONTROL**

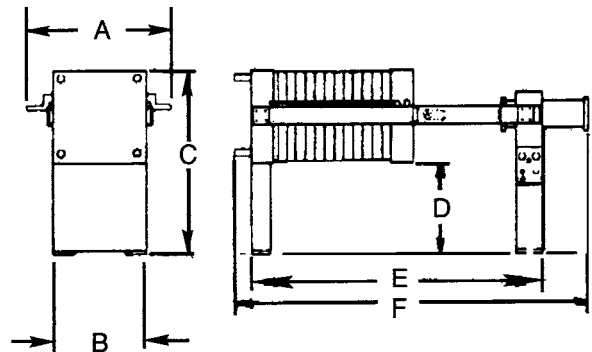
Allows progressively increasing air pressure on diaphragm pump to attain a denser, drier cake.

**DRUM DISPOSAL SYSTEM**

For presses up to 5 cubic feet. Includes chute and extended legs to raise press to permit adequate clearance for a drum.

**PLATE SPREADER, SAFETY LIGHT CURTAIN, PRESS-FULL INDICATOR and HYDRAULIC INTERLOCK** are additional features on some models.

**DIMENSIONS**



DESCRIPTION	PRICE CODE NO.
Air diaphragm pump, ½" - 14 GPM	55-7120A
Polypropylene w/nitrile 1" - 40 GPM	55-7144A
See Bulletin P-605 2" - 135 GPM	55-7208
Drum disposal system w/extended legs & carbon steel chute for 1 to 5 cu. ft. size	43-0667
Manual hydraulic 18"	43-0648
Semi-automatic 24"	
Self-dumping sludge hopper (Order 2X press capacity)	43-0641
6 cu. ft.	43-0642
10½ cu. ft.	43-0644
21 cu. ft. (Cu. ft. capacity of dumpster is 32 cu. ft. total of 2 hopper units provided)	43-0649
PRESS-FULL indicator	43-0668

DESCRIPTION	PRICE CODE NUMBER			
	18"	24"	31"	48"
<b>FOR PLATE SIZE</b>				
Pneu. plate spreader	-	43-0680	43-0656	43-0658
Safety light curtains	-	-	43-0659	43-0661
Replacement cloth				
Non-gasketed	SF-U18 <sub>H</sub>	SF-U24 <sub>H</sub>	SF-U31 <sub>H</sub>	SF-U48 <sub>H</sub>
Gasketed	SF-U18 <sub>G</sub>	SF-U24 <sub>G</sub>	SF-U31 <sub>G</sub>	SF-U48 <sub>G</sub>
Expander piece (For the future addition of up to 10 plates)**	43-0672	43-0673	43-0674	43-0675
Additional plates (each)	43-0676	43-0677	43-0678	43-0679
Automatic pump control				
3 stage		43-0662		
4 stage		43-0670		
Hydraulic interlock for feed pump air supply		43-0671		

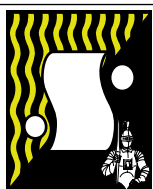
Consult Application Engineering Dept. for options not shown, such as high pressure units, catwalks, drum carts, etc.

\* To designate cloth position, add to Price Code Number: H Head T Tail M Intermediate

\*\*Expander piece for maximum of 7 plates for manual hydraulic 18" size plates.

F.O.B. Houston, Texas

Specifications subject to change without notice.



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