



Variable Volume Pressure Filters From Komline-Sanderson

**K-S Avery membrane plate filter presses
for high solids cake production,
clarification, and cake washing**

 **Komline-Sanderson**

**Packaging - Processing
Bid on Equipment**

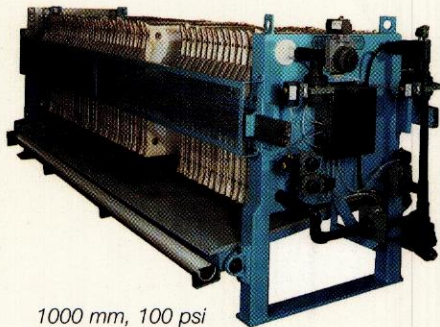
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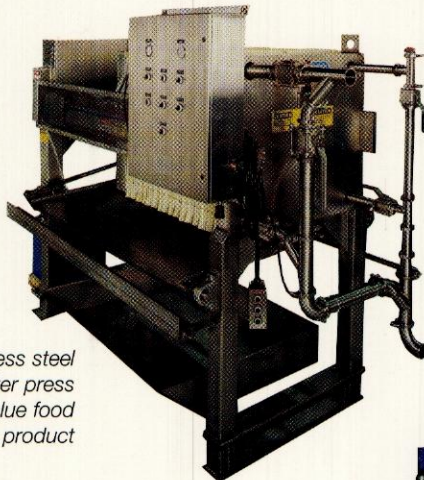
K-S Avery Variable Volume Membrane Filter Presses

For solids collection, liquid clarification or cake washing, you can be confident that a K-S Avery Filter Press will extract the absolute greatest value from your process. K-S Avery filter presses are recognized for efficient operation, longer life, lower maintenance, and lower operating costs. K-S Avery pioneered the use of membrane plate filter presses for many process applications.

For over 50 years, Komline-Sanderson has built an unparalleled reputation for quality products and superior support services. The performance of our equipment for process and wastewater treatment is backed by superior design and reliable service.



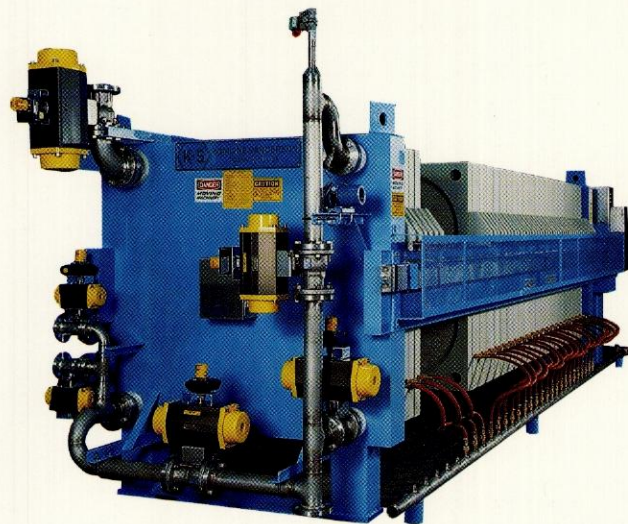
1000 mm, 100 psi membrane filter press for processing advanced ceramic powders



1000 mm, 100 psi stainless steel construction membrane filter press for extraction of high value food flavoring product



1200 mm, 225 psi membrane filter press with overhead plate suspension for production of iron oxide



1500 mm, 225 psi membrane filter press for production of an organic pigment as high solids filter press cake



1500 mm membrane filter press with sanitary piping for filtration of food products

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Applications

K-S Avery filter presses have reduced operating costs and improved productivity in a wide range of applications, including:

- Commodity and Specialty Chemicals
- Pharmaceutical Raw Materials and Intermediates
- Food Products and Ingredients
- Clay and Ceramic Powders
- Dyes and Pigments
- Industrial Waste Dewatering and Recycling

Selecting A Filter

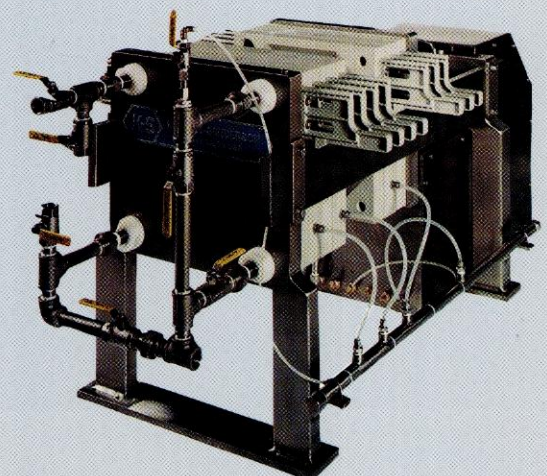
Calculate your required filtration area and/or maximum cake volume.
 Locate this value on the chart. Select a filter from the available
 options, or consult with your K-S Avery representative.

Plate Size (mm) and Cake Thickness (mm)	4	6	8	10	12	14	Chamber Quantity										
	4	6	8	10	12	14	16	18	20	24	32	40	48	60	72	90	110
See below for filtration area (ft ² , upper box) and chamber volume (ft ³ , lower box)																	
470 x 470																	
32	13.9	20.9	27.9	34.9	41.8	48.8	55.8	62.7	69.7								
	.66	.98	1.31	1.64	1.97	2.30	2.63	2.96	3.28								
40	14.9	22.3	29.8	37.2	44.7	52.1	59.6	67.0	74.4								
	.84	1.26	1.68	2.10	2.52	2.94	3.36	3.78	4.20								
See below for filtration area (ft ² , upper box) and chamber volume (ft ³ , lower box)																	
630 x 630																	
32		39.4	52.5	65.6	78.8	91.9	105.0	118.1	131.3	157.5	210.0						
		1.96	2.61	3.27	3.92	4.57	5.22	5.88	6.53	7.84	10.4						
40		41.1	54.8	68.5	82.2	96.0	109.7	123.4	137.1	164.5	219.3						
		2.47	3.29	4.11	4.94	5.76	6.58	7.40	8.23	9.87	13.2						
See below for filtration area (ft ² , upper box) and chamber volume (ft ³ , lower box)																	
800 x 800																	
32			84.6	105.8	126.9	148.1	169.2	190.4	211.5	253.8	338.5	423.1	507.7				
			4.28	5.35	6.42	7.49	8.56	9.63	10.7	12.8	17.1	21.4	25.7				
40			87.4	109.3	131.2	153.0	174.9	196.8	218.6	262.4	349.8	437.3	524.7				
			5.40	6.74	8.09	9.44	10.8	12.1	13.5	16.2	21.6	27.0	32.4				
50			91.2	114.0	136.9	159.7	182.5	205.3	228.1	273.7	365.0	456.2	547.5				
			6.81	8.51	10.2	11.9	13.6	15.3	17.0	20.4	27.2	34.0	40.8				
See below for filtration area (ft ² , upper box) and chamber volume (ft ³ , lower box)																	
1000 x 1000																	
32				163.6	196.3	229.0	261.7	294.4	327.1	392.5	523.4	654.2	785.0				
				8.23	9.87	11.5	13.2	14.8	16.4	19.7	26.3	32.9	39.5				
40				166.7	200.0	233.3	266.7	300.0	333.3	400.0	533.3	666.7	800.0				
				10.2	12.2	14.2	16.2	18.3	20.3	24.4	32.5	40.6	48.7				
50				170.0	204.0	238.0	272.0	306.0	340.0	408.0	544.0	680.0	816.0				
				12.8	15.4	17.9	20.5	23.1	25.6	30.8	41.0	51.3	61.5				
See below for filtration area (ft ² , upper box) and chamber volume (ft ³ , lower box)																	
1200 x 1200																	
32							387.7	436.1	484.6	581.5	775.3	969.2	1163.0	1453.8	1744.5	2180.6	2665.2
							19.6	22.0	24.5	29.4	39.1	48.9	58.7	73.4	88.1	110.1	134.5
40							392.7	441.8	490.9	589.0	785.4	981.7	1178.1	1472.6	1767.1	2208.9	2699.8
							24.5	27.6	30.6	36.7	49.0	61.2	73.5	91.8	110.2	137.8	168.4
50							398.9	448.8	498.6	598.3	797.8	997.2	1196.7	1495.8	1795.0	2243.8	2742.4
							30.8	34.6	38.5	46.2	61.6	77.0	92.4	115.5	138.6	173.2	211.7
See below for filtration area (ft ² , upper box) and chamber volume (ft ³ , lower box)																	
1500 x 1500																	
32													1809.7	2262.2	2714.6	3393.3	4147.3
													93.2	116.5	139.8	174.8	213.6
40													1832.0	2289.9	2747.9	3434.9	4198.2
													116.3	145.3	174.4	218.0	266.4
50													1860.4	2325.4	2790.5	3488.2	4263.3
													145.8	182.3	218.8	273.4	334.2
See below for filtration area (ft ² , upper box) and chamber volume (ft ³ , lower box)																	
1500 x 2000																	
32													2507.0	3133.7	3760.5	4700.6	5745.2
													130.9	163.7	196.4	245.5	300.0
40													2535.9	3169.9	3803.9	4754.8	5811.5
													163.0	203.7	244.4	305.6	373.4
50													2572.6	3215.7	3858.9	4823.6	5895.5
													203.9	254.9	305.8	382.3	467.2

Laboratory and Pilot Testing

Komline-Sanderson maintains a fully equipped laboratory ready to run tests on your product. Representative samples are run through the K-S Avery Model 177 laboratory filter press. Variable volume membrane filter press capabilities are evaluated with our compression simulator operating at various squeeze pressures.

For on-site testing, K-S Avery 470mm membrane pilot units are available for rental. Typical pilot filter presses provide 1.0 cubic foot of unsqueezed cake capacity and 21 square feet of filter area. These portable units are supplied completely pre-piped, including a feed pump and 225 psig water squeeze package. Only 100 psig compressed air is required for operation. Fixed volume and variable volume membrane squeeze tests can be run at various pressures to determine the best design for your application.



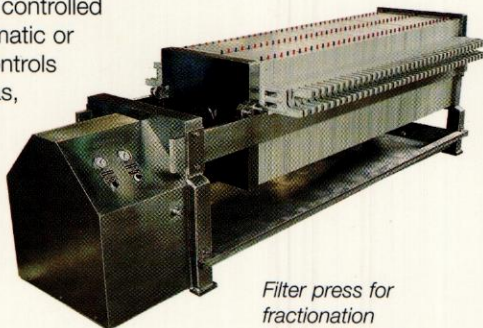
K-S Avery 225 psi
Membrane Filter Press Pilot Unit

Designed for Optimum Performance

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Application Engineering, Special Materials

K-S Avery provides filters specifically suited to meet your individual needs. We have the background and technical expertise needed to help you find the appropriate solution. We custom design filter presses including a wide range of options and ancillary equipment, such as overhead or sidebar configurations, process piping manifolds in a variety of materials of construction, PLC controlled automation, pneumatic or intrinsically safe controls for hazardous areas, and cake conveying equipment.



*Filter press for
fractionation
of blood plasma*

Filter Press Ancillary Equipment

Automated Plate Shifting Mechanisms

K-S Avery offers uniquely designed shifters recognized for their rugged construction, long life and ease of maintenance. Available as semi or fully automatic units, K-S Avery shifters are electrically, pneumatically or hydraulically powered to meet your needs.

Process Piping Manifolds

Provided in a variety of materials to meet your specifications with either manual or actuated valves, for fully automatic PLC/DCS control of the filter press batch sequence operation.

Access Platforms and Materials Handling

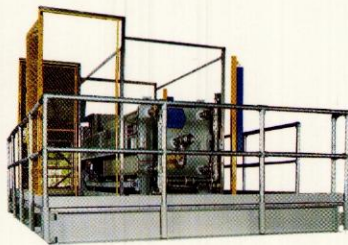
Raised access platforms are customized for individual site requirements. K-S Avery specializes in custom designed cake conveying systems for filter press applications.

Filter Plates

Plates of every design, including recessed or plate and frame, are available in all sizes: gasketed or non-gasketed, center or corner-feed, in polypropylene, PVDF, stainless steel, aluminum, or other materials.

Filter Media

Available in polypropylene, polyester, nylon, and other materials. Special media are available where extremely fine particle retention is required. Filter cloth is available in a variety of weaves with sewn feed eye sleeves or molded rubber necks and with latex edge treatment.



Platform mounted filter press

Automation of K-S Avery Membrane Filter Presses

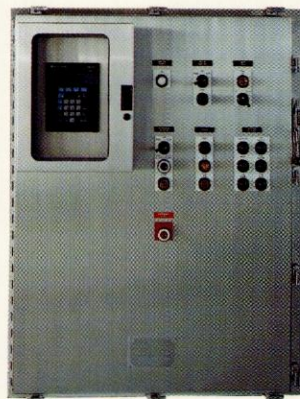
K-S Avery Filters offer full automation of the required batch sequence operation. Automated systems provide labor savings, assurance of proper equipment operation, consistency of production, reduction of downtime, and more reliable product quality.

Available automation features include:

- Opening and closing of the filter press
- Batch sequence operation of process valves
- Process feed pump control
- Filter cake washing cycle
- Automatic plate shifting
- Filter cake discharge conveyor operation
- Filter cloth washing

Where high production rates and consistent product are required, an automated K-S Avery Variable Volume Membrane Filter Press will do the job.

PLC Control Panels and Instrumentation



Designed, programmed and documented by the highly experienced K-S electrical engineering department. Built and thoroughly tested in our own panel shop. All electrical area classifications can be accommodated, incorporating PLC, communication protocol, panel components, and instrumentation.

PLC Control Panel

Other Optional Equipment

- Movable drip trays
- Filter cake chutes
- Cloth washers
- Filter cake carts
- Squeeze pressure systems
- Process feed pumps
- Pre-coat systems
- Safety light curtains



*High Pressure Water
Squeeze Package*

K-S Avery is committed to providing the most efficient system for your needs and will supply ancillary equipment as required.

Advantages of Variable Volume Membrane Filter Presses

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● Reduced Cycle Time

Conventional fixed volume filter presses filter only 75-80% of a given batch in the first 50% of the cycle time. If the plate stack is opened before the full cycle is complete, the result is a wet, sloppy cake. The cycle of a variable volume membrane filter press, however, can be stopped at its most efficient point. By applying pressure to the membrane built into the filter plate, the cake is squeezed to produce a high-solids filter press cake in a significantly reduced cycle time.

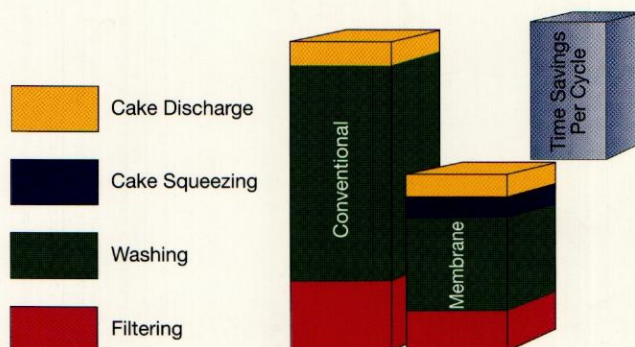
● High Cake Solids

By applying a high pressure membrane squeeze to the formed filter cake with pressurized fluid (up to 225 psi or higher), it is possible to produce a final cake with solids content from 50%-100% greater than can be achieved with conventional fixed volume filter presses. This is important for obtaining maximum yield, where a high-value liquid is your product, or producing a high solids-content cake, where it is critical to reduce moisture content.

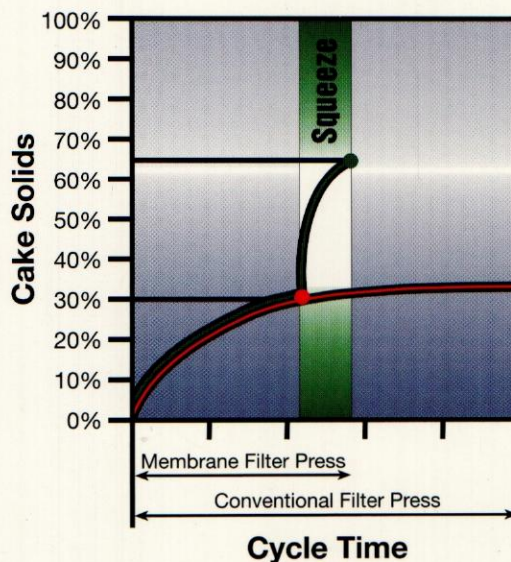
● Superior Cake Washing

The K-S Avery variable volume membrane filter press improves cake washing efficiency and reduces wash time by applying a low-pressure pre-squeeze before the wash cycle is begun. This pre-squeeze produces a uniform filter cake, eliminating wash liquid channeling through cracks and less well formed areas of the cake.

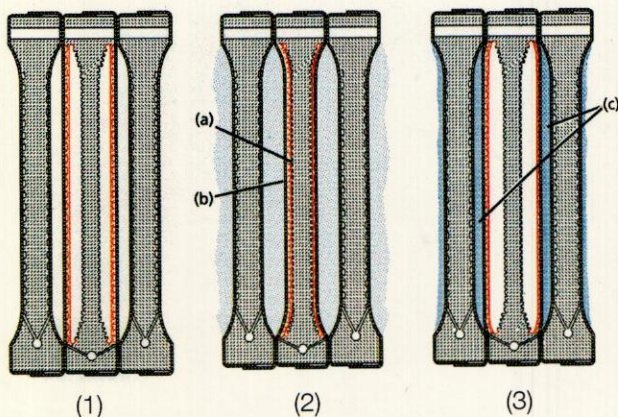
Time Savings Per Cycle



Increased Cake Solids Content



Membrane Filter Press Operation



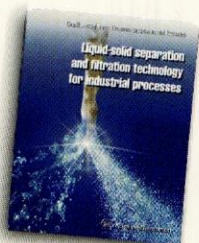
K-S Avery variable volume membrane filter presses utilize an impermeable membrane or "diaphragm," incorporated into the plate design, which allows cake compression in order to maximize cake washing efficiency, reduce cycle time, and create high solids filter press cake.

- (1) Initially the polypropylene diaphragms are in their relaxed position.
- (2) During pressure filtration, the diaphragms (a) are pressed against the plate core. Solids collect on the filter media (b) and a cake (c) is formed.
- (3) Cake compression or "squeeze" by controlled pressurization of the diaphragms produces uniform cake with desired solids content.

K-S Process Application Technology

● Liquid/Solid Separation

Filtration
Dewatering
Clarification
Cake Washing
Extraction
Product Recovery



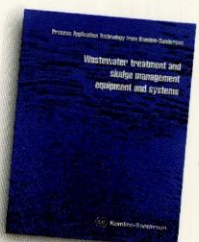
● Thermal Processing

Drying
Heating
Cooling
Reacting
Crystallizing
Sterilizing

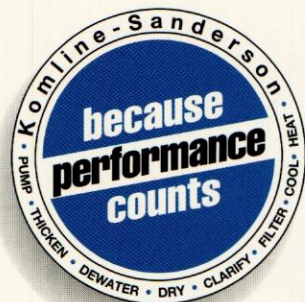


● Wastewater Treatment Sludge Management

Clarification
Thickening
Dewatering
Drying
Pumping



● Aftermarket Product



To Contact Komline-Sanderson:

Call: **1-800-CALL 4 K-S**
(225-5457)

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(329-7457)

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About Komline-Sanderson

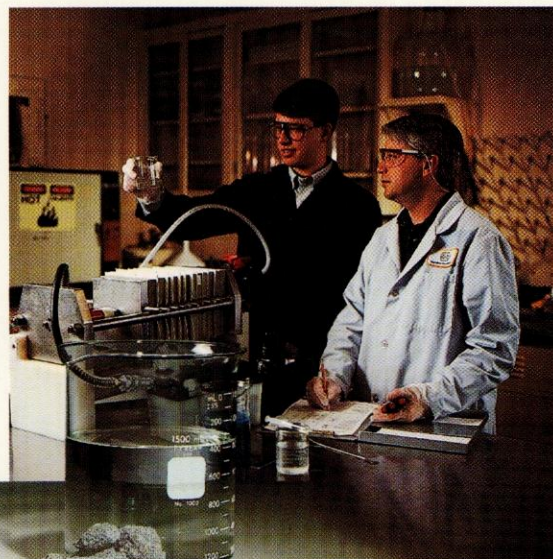
Komline-Sanderson provides technology for value-added materials processing in chemical, pharmaceutical, food, pulp and paper, and other industries, and for industrial and municipal wastewater treatment. K-S filtration products are used to filter, clarify, dewater, and thicken liquids and slurries. K-S thermal products are used to transfer heat into or from slurries, paste, cakes, granules or powders.

Scope: The breadth of our product line allows us to recommend the best engineering solution regardless of equipment type. Our people are familiar with projects of every size and scope, partnering with client technical staff and consulting professionals at every level.

Integrity: K-S process equipment is designed with skill, manufactured to meet high performance standards, and selected to assure proper integration with ancillary equipment and the process environment. Our company culture is committed to creating superior performance.

Experience: K-S originally developed critical high-performance process applications for nearby customers in applications such as specialty chemicals, pharmaceuticals, and food processing. We can draw on an unparalleled depth of experience in our own workforce and vendors to serve customers worldwide.

Laboratory
Facilities



Komline-Sanderson

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