Celleco Hedemora Inc.

Alfa Laval

CLEANPAC 350

Centrifugal Cleaner System

The CLEANPAC® 35

The CLEANPAC 350 Twin-Wall cleaner is the most widely used hydrocyclone in the pulp and paper industry for the removal of contaminants from stock.

Major benefits of the CLEANPAC 350 system include:

- High cleaning efficiency
- Twin-wall design
- Wide range of cone and head configurations
- Low pressure drop, resulting in low energy consumption
- Totally pressurized system that facilitates safe operation at high temperatures and eliminates air entrainment
- Flexible installation due to canister, horizontal-bank and vertical-bank configuration
- Separate cleaner sight glasses for easy inspection
- Easy to remove, pressure-tight redesigned cleanout plug for clearing clogged cleaners. Virtually eliminates pressure leakage.

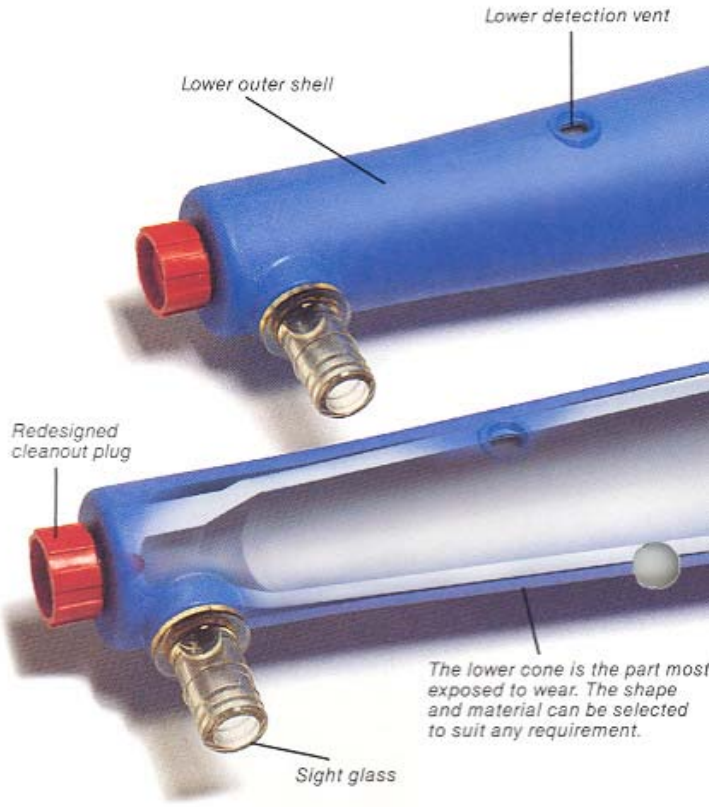
In addition, the hydrocyclone has been developed to:

- Optimize the internal hydrodynamic flow pattern
- Reduce the thickening ratio
- Withstand higher temperatures
- Eliminate downtime attributable to malfunctions in individual units.

These developments support our basic philosophy that a fault in an item of equipment must never cause a production stoppage.

The most notable design feature is the outer protective and structural shell. This allows us to manufacture those parts of the cleaner most subjected to wear in material that ensures maximum wear resistance. The cones may also be selected to give a desired thickening ratio or suitable fractionating effect. Cones are available in various types for different temperatures and pulp freeness.

The twin-walled design facilitates replacement of the lower cone, the part of the cleaner that is normally subjected to heavy wear. This cone length has been made as short as possible to reduce maintenance costs.



Total reliability and safety

Our first consideration in designing CLEANPAC 350 was to ensure total operational reliability and safety to plant personnel.

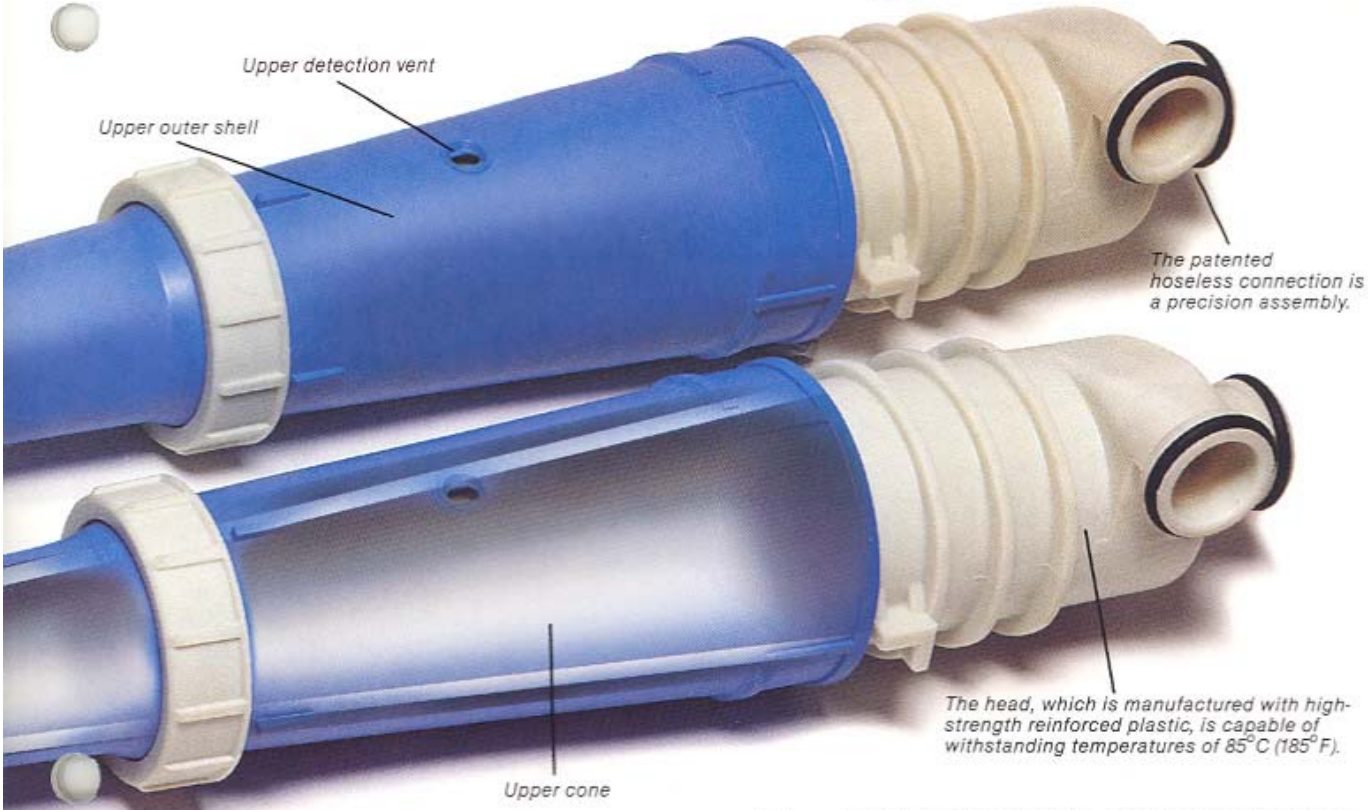
As a result of this "safety-first" approach, the twin-walled unit complies with a number of stringent safety and reliability requirements.

- Uninterrupted operation of the product line
- Unimpaired cleaning
- High personnel safety

Since the reject system is pressurized, it allows the size of the reject openings to be larger, thereby reducing the likelihood of blockage.

The outer shell protects against leakage of hot stock or pulp in the event that the cleaner should be damaged by junk. A detection vent indicates whether leakage is occurring. The vent is then sealed with a special protective device to prevent further

0 Cleaner System



leakage of stock and permit the cleaner to continue in operation until the next shutdown. The protection devices are easily visible for quickly locating the plugged cleaners. This is important in a system containing several hundred cyclones.

Since individual cyclone failures can be tolerated, there is no need to shut down the system. Instead, a faulty unit can be left unattended until the next planned shutdown. The savings in manhours and downtime through avoidance of unnecessary shutdowns is easily calculated.

Extended version

Special extended cone versions are available, designated CLEANPAC 350 L, CLEANPAC 350 LS and CLEANPAC 350 LX, for certain applications choosen by Celleco-Hedemora.

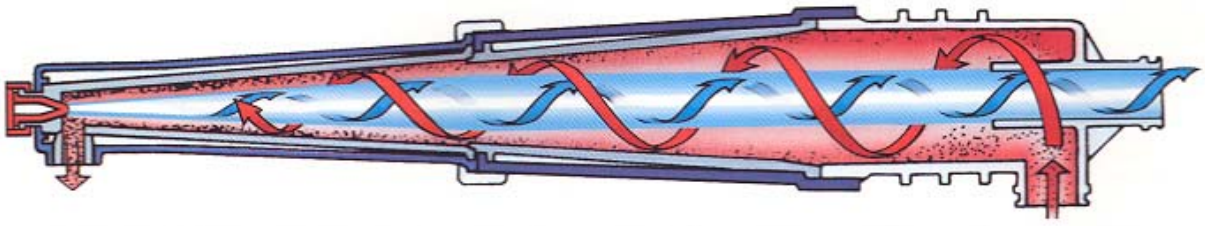
Head with boosted capacity

A specially designed head is available that can be installed for the following cases:

- Higher filler-loaded stocks
- Stocks with high thickening tendency
- Increasing plant capacity, while maintaining existing banks and pipework installation

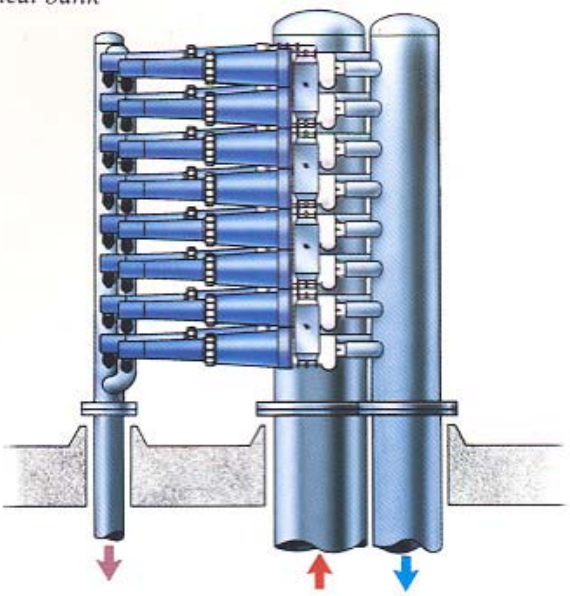
This head version is designated CLEANPAC 350 HQ. CLEANPAC HQ has a higher flow rate at given pressure drop than the standard CLEANPAC 350 model. See capacity data on page 7.

Internal flow pattern

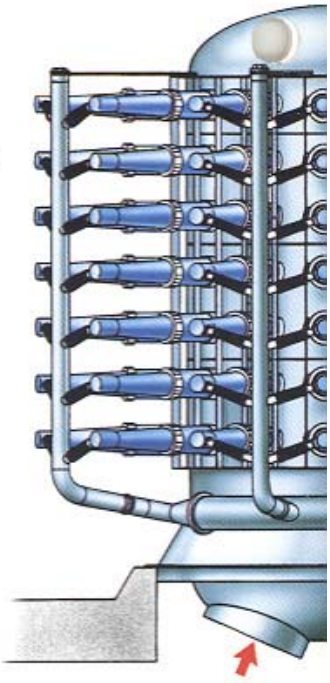


Compact Cost-Savi

Vertical bank



Canister

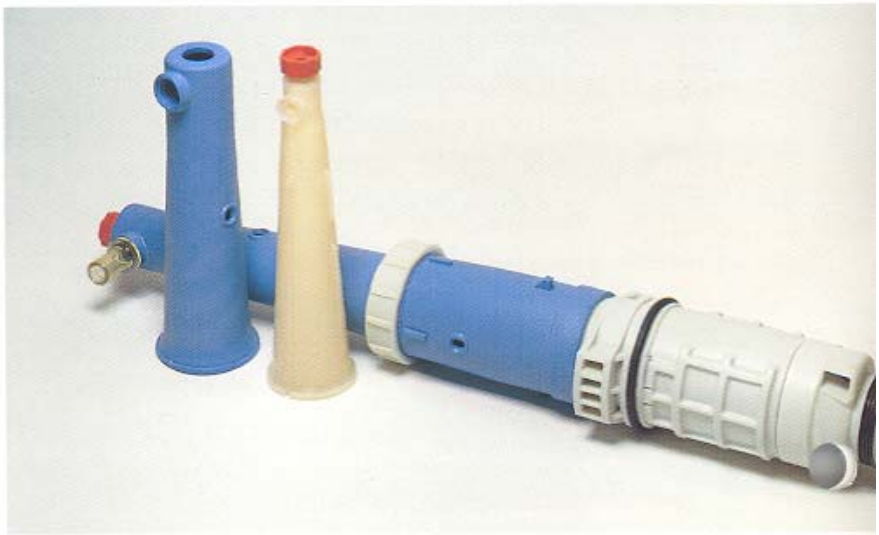


Module system

The CLEANPAC 350 is a highly compact module system of hoseless bank and canister assemblies.

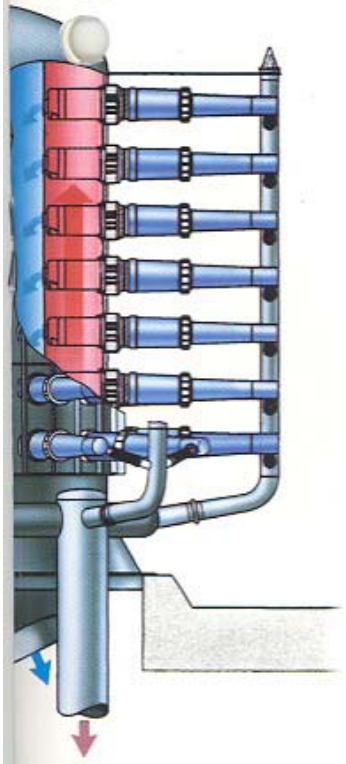
The figure in the center of the page above shows a "canister." The advantage with canisters is that they are capable of handling very large flow rates and are extremely competitively priced. The figures to the left and right of the canister show "vertical bank" and "horizontal bank" assemblies. The banks are available with one, two or four rows of cleaners. The wide product range offers a large number of choices, which ensures that mills can select a bank that is well suited for individual space and operational requirements.

A horizontal bank.

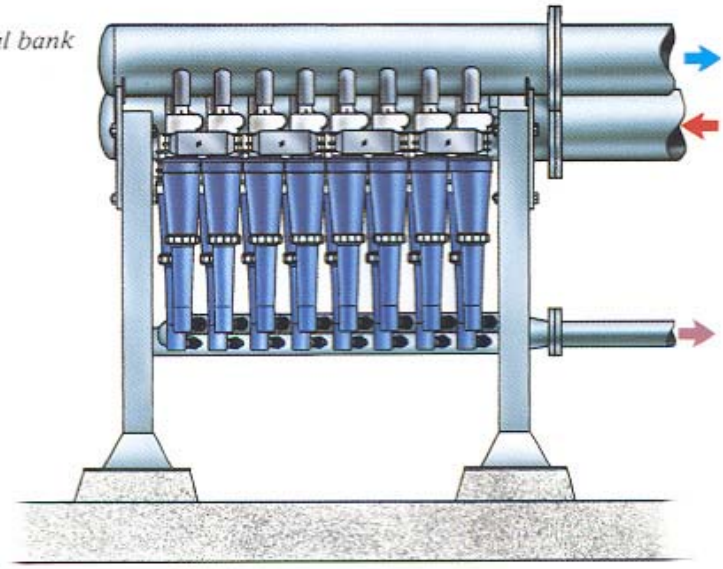


Canister unit with lower shell and cone.

ng Assembly Design



Horizontal bank



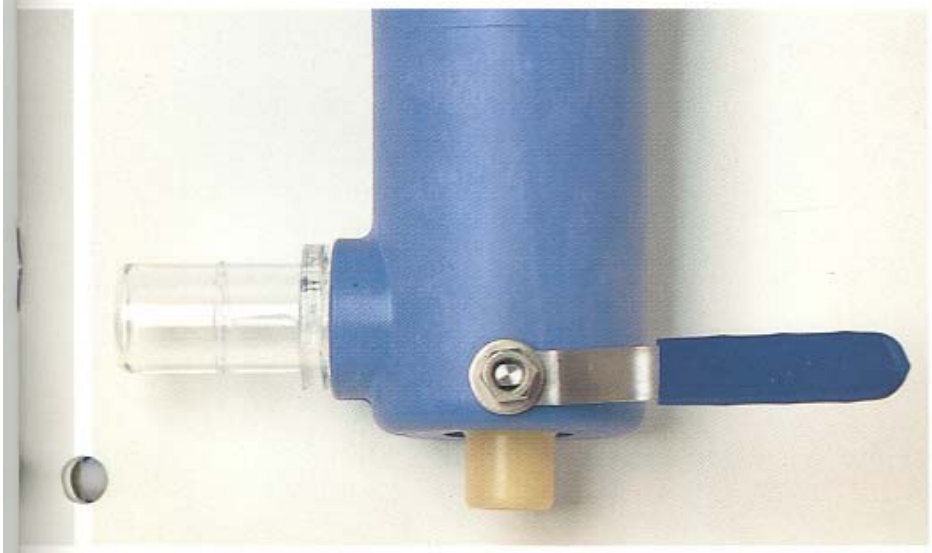
System cleanliness

The accept space in both the canisters and banks is completely smooth and free from projections. This reduces resistance to the stock flow and prevents the accumulation of slime or sediment. Canisters and banks are available with electrolytically polished accept compartments and accept headers.

Interchangeability

Existing canister or bank installations can be upgraded by installing:

- Other head assemblies
- Various cone lengths
- Combi design



Steel ball cleanout valve.

Both upper and lower cones are available in different designs and material, including ceramic.

Technical specifications

Pressure drop		FEED CAPACITY					
		Standard-design		Long-design		HQ-design	
m w.g.	psi	l/min	USgpm	l/min	USgpm	l/min	USgpm
10	14	360	95	375	100	455	120
12	17	400	106	410	110	500	132
15	21	440	116	460	122	560	148

The capacities shown are guidelines. Capacity varies due to type of inner cone, application and process temperature, among other factors.

Minimum accept counter pressure requested:
3.5 m w.g. (5 psi)

Maximum feed pressure allowed:
Bank type — 42 m w.g. (60 psi)
Canister — 30 m w.g. (42 psi)

Type 1

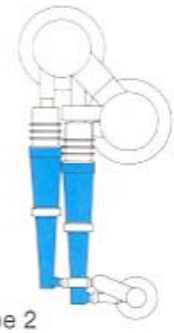
Material

All cleaner units, including seals, are made of wear-resistant synthetic material. Max. temperature: 85 °C (185 °F). Contact Celleco-Hedemora if higher temperatures are used.

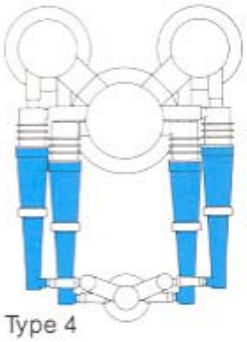
Canisters and banks are made with all-wetted parts of stainless steel. SS 2343-AISI 316. Bank structures are made of painted mild steel.

Patents

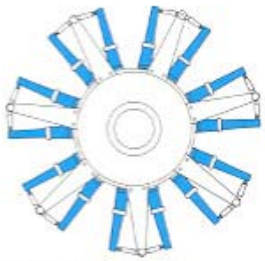
The design is protected by a series of patents and patent applications.



Type 2



Type 4



Canister

Assembly alternatives

Number of units	FEED CAPACITY/STANDARD TYPE						BANK						CANISTER
	l/min			USgpm			Horizontal			Vertical			
	Pressure drop, m w.g.			Pressure drop, psi			Type			Type			
	10	12	15	14	17	21	1	2	4	1	2	4	
4	1440	1600	1760	380	423	465	●			●			
6	2160	2400	2640	571	634	697	●			●			
8	2880	3200	3520	761	845	930	●			●			
10	3600	4000	4400	951	1057	1162	●			●			
12	4320	4800	5280	1141	1268	1395	●	●		●	●		
16	5760	6400	7040	1522	1691	1860		●			●		
20	7200	8000	8800	1902	2114	2325		●			●		
24	8640	9600	10560	2283	2536	2790		●	●		●	●	
28	10080	11200	12320	2663	2959	3255		●			●		
32	11520	12800	14080	3044	3382	3720		●	●		●	●	
36	12960	14400	15840	3424	3805	4184		●					
40	14400	16000	17600	3805	4227	4650		●	●			●	
44	15840	17600	19360	4185	4650	5115		●					
48	17280	19200	21120	4565	5073	5580		●	●			●	
56	20160	22400	24640	5326	5918	6510			●			●	●
64	23040	25600	28160	6087	6764	7440			●			●	
70	25200	28000	30800	6658	7398	8137							●
72	25920	28800	31680	6848	7609	8370			●				
80	28800	32000	35200	7609	8454	9300			●				
84	30240	33600	36960	7989	8877	9765							●
88	31680	35200	38720	8370	9300	10230			●				
96	34560	38400	42240	9131	10145	11160			●				
98	35280	39200	43120	9321	10357	11392							●
104	37440	41600	45760	9892	10991	12090			●				
109	39240	43600	47960	10367	11519	12671							●
112	40320	44800	49280	10653	11836	13020			●				
115	41400	46000	50600	10938	12153	13369							●
120	43200	48000	52800	11413	12682	13950			●				
129	46440	51600	56760	12269	13633	14996							●
143	51480	57200	62920	13601	15112	16624							●
157	56520	62800	69080	14933	16592	18251							●
171	61560	68400	75240	16264	18071	19878							●
185	66600	74000	81400	17596	19551	21506							●
199	71640	79600	87560	18927	21030	23133							●

You can rely on Celleco-Hedemora

Celleco-Hedemora, a member of the Alfa-Laval Group, specializes in separation technology for the pulp and paper industry.

We are a part of the Celleco Group, which includes Celleco-Hedemora (with sales offices in Sweden, the U.S., Canada and Finland), Hedemora AB and AB Lingbo Verkstäder.

Celleco-Hedemora is active worldwide through its own companies or independent agents. Our customer list includes practically all pulp mills and papermills worldwide.

Celleco-Hedemora is an extraordinarily development-intensive company. A high percentage of annual sales are allocated to R&D.

All of the key components in our products and systems are manufactured in our own plants. Purchased components are subjected to an exacting quality inspection. Customers can trust our products and systems to perform as intended. The resources of the Alfa-Laval Group are a guarantee of our capability to support customers even over the long-term, anywhere in the world.

Our product range:

- Centrifugal cleaner systems
- Stock deaeration systems
- Disc filters for fiber recovery and thickening of pulp
- Gravity deckers
- Pressure screens
- Bow screens
- Strainers
- Screw presses
- Tall oil recovery systems
- Recausticizing systems and equipment

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