

CVN VOONER

PAPER MACHINERY

PHONE: 423-638-2211 • VISIT OUR WEBSITE: WWW.CVNVOONER.COM



ENSURING CUSTOMER SATISFACTION SINCE 1983

HERITAGE

CVN was founded in 1983 to offer fabric conditioning vacuum boxes and actuated showers in cooperation with new fabrics from Huyck/Formex in Greeneville, TN. Following Nash's acquisition of CVN in 1989, Vooner acquired the business in 2003. Vooner further expanded its paper machinery capability with the acquisition of the Weavexx equipment business of Greeneville in 2005.

CVN Vooner's acquired heritage has been producing paper machinery since 1983. We are committed to growth and service to the paper industry family throughout the world, with dedication to a more profitable industry.

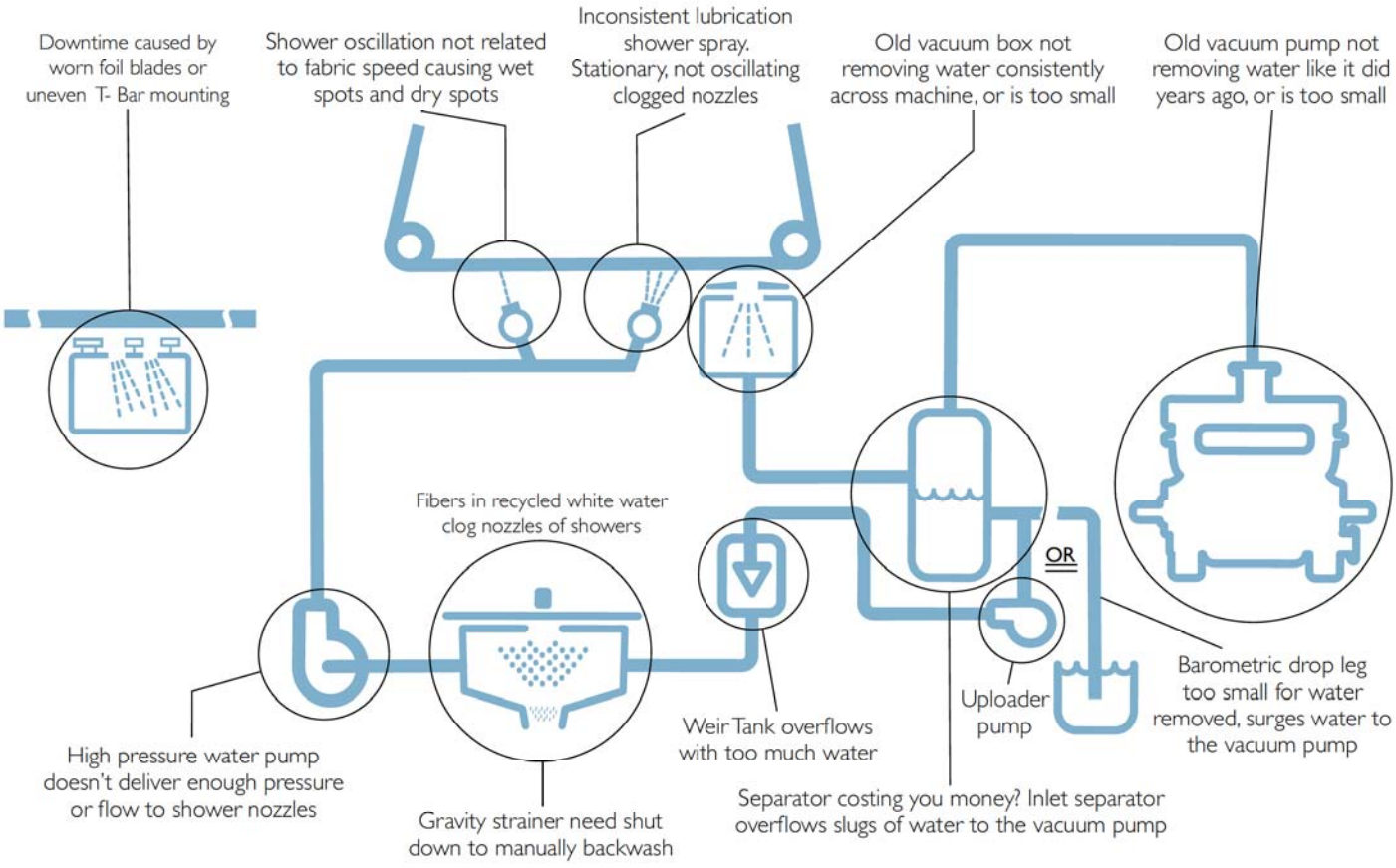
VISION STATEMENT

To offer paper mills cost-reducing equipment for formation section, water drainage and press fabric shower conditioning and vacuum dewatering.
To assist mills to evaluate their operating costs of installed equipment and evaluate alternative equipment investments for future new fabric technology and changes in paper grades and machine speeds.

PAPER MILL FABRIC CONDITIONING AND VACUUM DEWATERING EQUIPMENT

As paper machines age, with more grades produced, or the machine speed is increased, productivity is lost. Using older equipment at faster speeds may contribute to more sheet breaks. Newer technology fabrics may require more shower water, and vacuum airflow for dewatering. Using older equipment may increase the moisture into the dryer, requiring more steam to the dryer. With production changes, some part of this equipment may become a "bottleneck" or the weakest link.

Re-engineering of this equipment will look at resizing pipe and box volume, the shower performance and requirements for airflow at vacuum.



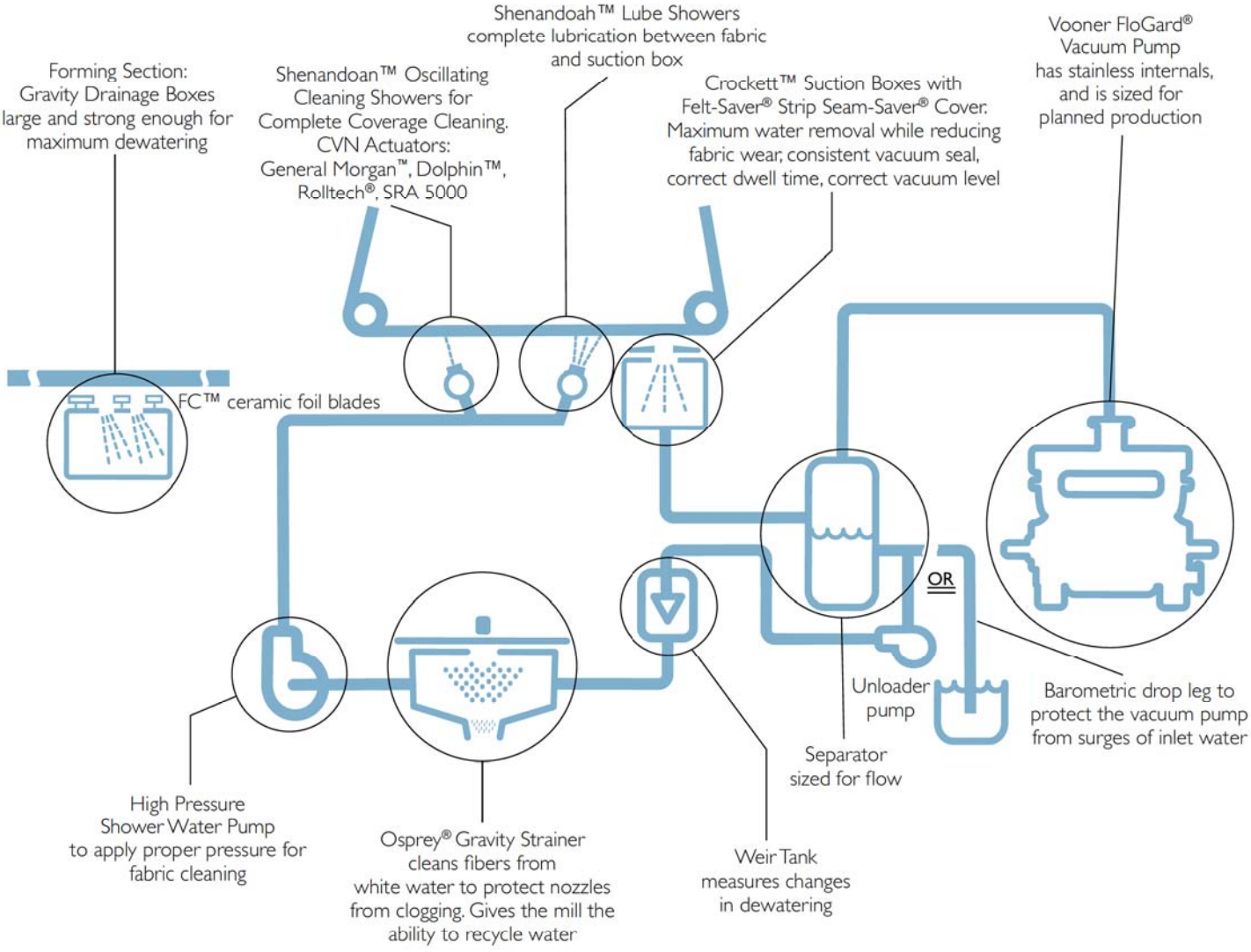
Do you have these pains?
Who else in your company is affected by these pains?
What are they costing you?
What are these losses in productivity costing your company?
Are you interested in how CVN Vooner can eliminate these costs at other mills?
Are you interested in how others have eliminated these losses?

CAPABILITIES OF CVN VOONER PAPER MACHINERY

As paper machines are running faster than original and mills have changed grades from original, the size of dewatering equipment maybe too small. CVN Vooner can evaluate potential wrong sizing and recommend multiple improvements for the future.

Years of experience and many custom designs enable our CVN Vooner team to evaluate mill equipment, apply new production goals and recommend new equipment with fast return on investment. Technical reference to TAPPI recommendations are used.

The diagram below highlights the CVN Vooner Paper Machinery components and the way that they can contribute to improving productivity.

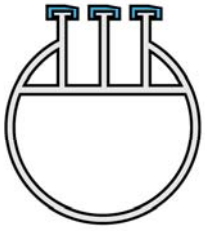


CROCKETT™ SUCTION AND UHLE BOXES

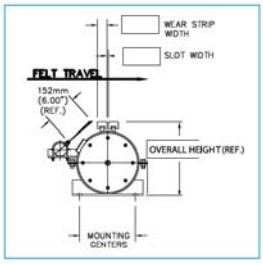
RIGID MACHINE WIDTH DESIGN

- Uniform distance from box to fabric
- Supports ceramic wear strips

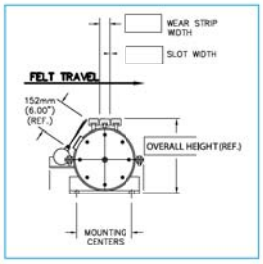
Single Slot



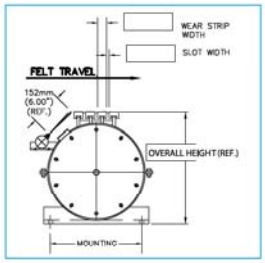
Double Slot



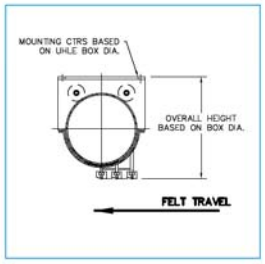
Single Slot



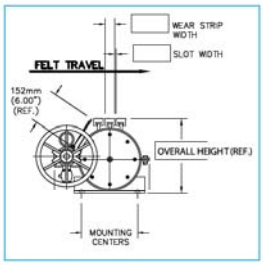
Double Slot



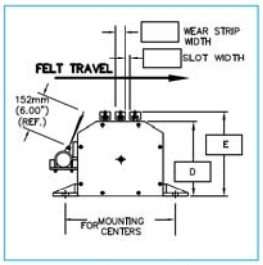
Triple Slot



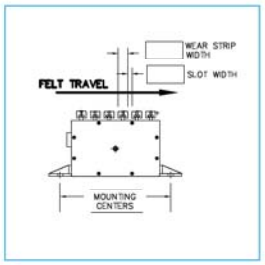
Inverted



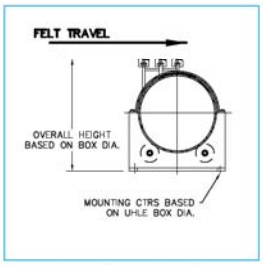
With Brush Lube



Formed Double Slot



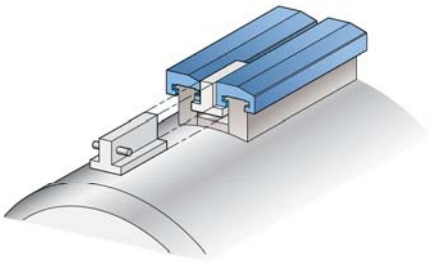
Flat Box



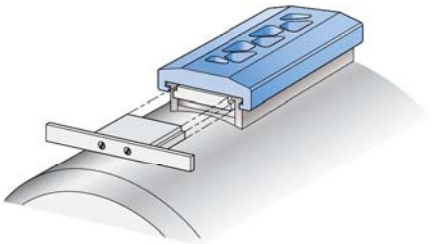
Rotating Double Slot

FELT AND SEAM-SAVER

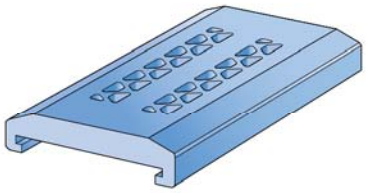
- UHMW Polyethylene or UHMW Ceramic Filled.
- Tapered lead-in improves surface lubrication and reduces impact to clothing, which contribute to improved felt life and less sheet contamination.
- Seam-Saver® provides support for pin seamed clothing, reducing wear in the pin seam area for improved felt life with reduced sheet marking.
- Seam-Saver®, compared to herringbone, requires less vacuum air capacity for equivalent water removal.



Felt-Saver®
Single Row - for when the slot width needs to be wider than one inch



Seam-Saver®
Single Row

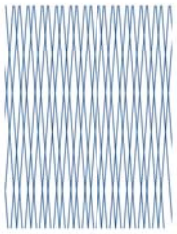


Double Row
Double row - for when the slot width needs to be wider than one inch

SHENANDOAH™ SHOWER ACTUATORS FOR COMPLETE COVERAGE CLEANING

COMPLETE COVERAGE CLEANING

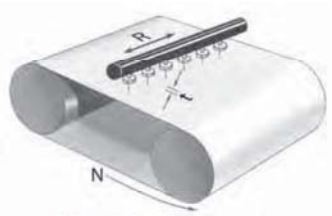
The shower oscillating speed is related to the fabric speed. For each revolution of the fabric, the nozzles move the width of its spray. This shower stroke rate ensures coverage of every point on the fabric by the nozzle spray. The "Complete Coverage Cleaning" from CVN avoids the "other way diamond shape wet spots and dry spots."



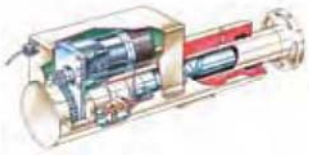
The CVN Way

The Other Way

After 100 revolutions of the fabric



R = Stroke rate
N = Revolutions per minute
t = Nozzle coverage

CVN Actuators	Reversing Design	Variable Speed For Complete Coverage Cleaning	Fixed Speed	Fixed Stroke Length	Variable Stroke Length	Maximum Paper Machine Width
GENERAL MORGAN™ 	3 Ball in track mechanical	✔ (with control panel)		✔		500" 12.7 meters
DOLPHIN™ 	3 Ball in track mechanical	✔ (with control panel)	✔	✔		276" 7.0 meters
ROLLTECH® 	4 rollers in a single track	✔ (with control panel)			✔	500" 12.7 meters
SRA5000 	3 Ball in track mechanical	✔ (with control panel)		✔		500" 12.7 meters

CVN GIMBLE MOUNT™ for CVN oscillators eliminates damage from binding load on oscillator drive shaft from misalignment of shower and oscillator.

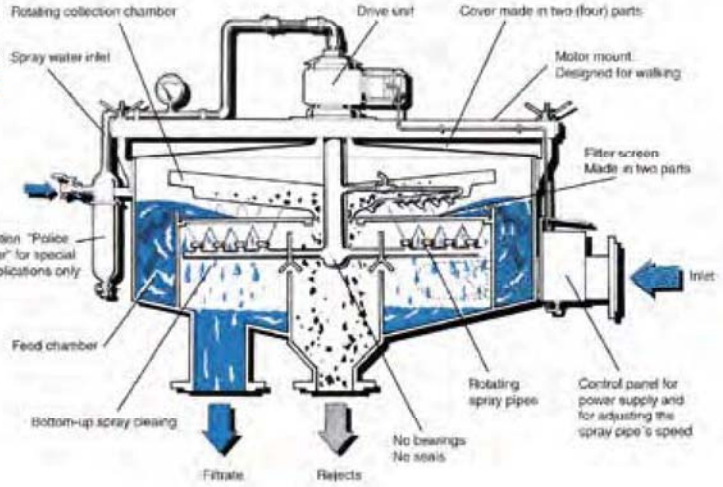
NOZZLES

Nozzles from self cleaning to convertible are available in Greeneville, TN.
NozzleHead™ says, "Call Nina @ 423-638-2211 and see how she can help you with nozzles."

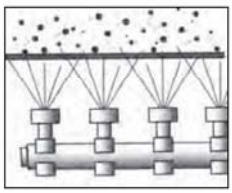
A small sampling of nozzles available

FIBER STRAINER FOR SHOWER WATER AND VACUUM PUMP SEAL WATER

NozzleHead™ says, "If your nozzles are clogging, you can use the Osprey Strainer to take out those fibers that are doing the clogging."



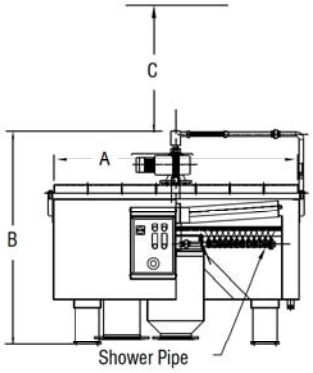
- Patented "vertical-up" continuous spray cleaning of screen, no cycle backwash or bag changing
- Fibers that "staple" over the wire screen are continuously removed by patented backwash spray
- No trapping or driving solids through screen openings
- No long shutdown required for high-labor backwash cleaning



Lifts fibers/debris off of screen

- Minimizes potential for clogging and chance of fiber stapling over wire
- Allows a larger mesh than equivalent "top-down" filter

- High-quality stainless steel construction
- Performance can be altered (variable speed) for change in concentration or flow rate
- Four-quadrant screen is easy to remove and clean if necessary; spare screen not necessary
- Easy visual performance check, inspection and infrequent cleaning
- Easy to install, self-contained modular unit, gravity process, no pressure drop in pipeline
- Small floor space for flow capacity
- Start-up assistance, service support with pilot tests
- Two-year warranty on material and workmanship, except for normal wear



LEGEND:
A- Diameter, inches
B - Height, inches
C - (Min) clearance above spray water feed, inches

Model	A**	B**	C (min)**	Gross Wt.***
10	49.00"	65.00"	20.00"	1,900 lbs.
14	62.00"	66.00"	20.00"	2,400 lbs.
17	74.00"	69.00"	20.00"	2,600 lbs.
22	93.00"	76.00"	20.00"	3,800 lbs.
25	106.00"	78.00"	20.00"	4,300 lbs.
30	124.00"	80.00"	20.00"	5,200 lbs.

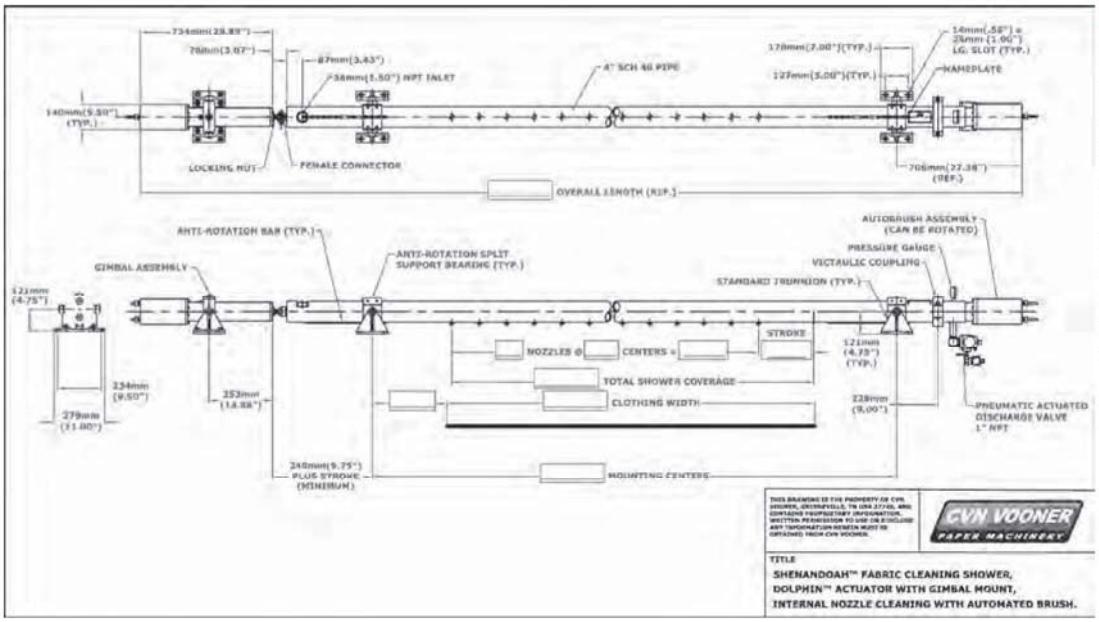
** +/- .25" *** Approximate Weights +/- 50 lbs.

To size your strainer, we need from you:

- Diameter of the nozzle that is clogging in inches or mm
- Concentration of suspended solids by weight, percent or parts per million
- Flow rate of white water to be strained, gpm or liters per minute

SHENANDOAH™ SHOWERS FOR CLEANING OR LUBRICATION

Drawings can be downloaded from ***www.cvnvooner.com.*** We have over 200 shower drawings on file.



SHOWER IN A PIPE

Designed for strength in an environment of foreign material and easy cleaning. Both pipe and inner shower oscillate together. Inner shower can be easily removed for cleaning. Reinstallation guided by simple positive locking design, ensuring correct spray angle every time.

Shower In A Pipe

AUTOMATED BRUSH ROTATION

Highly recommended to keep nozzles clean and free of clogging. Simple and reliable. Programmable automatic rotation for consistent 1 - 12 hours between cleaning prevents hardened buildup. Random operator-initiated cleaning possible. Deduct for available manual brush rotation design.

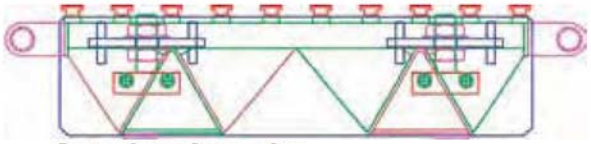
Automated Brush Rotation System

Manual Option

FORMING SECTION

FORMING SECTION GRAVITY DRAINAGE BOXES

Remove water and promote good sheet formation. A rigid box with three or more support T-Bars or other mounts to allow foil blades to be fitted. Designed to support level, rigid foil blade installation underneath the forming fabric



Forming Section Drainage Box

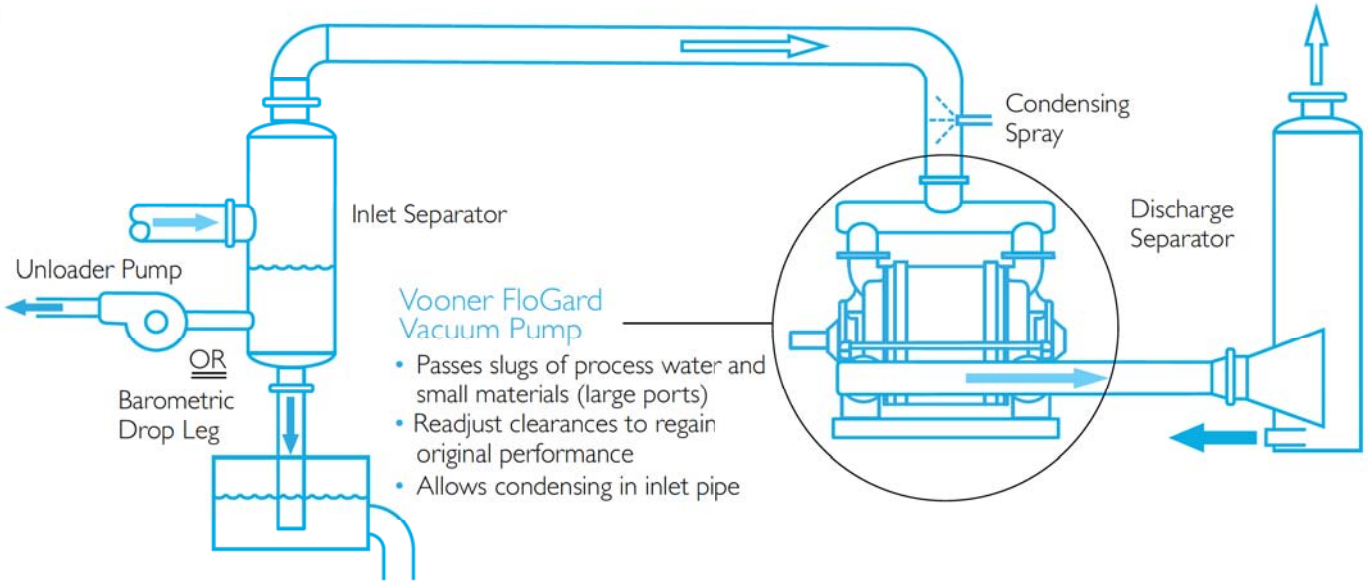
FOIL BLADES

Customers who use gravity drainage boxes also buy poly or ceramic foil blades.

Ceramic blades provide longer life and reduced drag force compared to worn poly foil blades. The Flexible Ceramic foil blade can be installed and removed during machine operation (on the fly) just like foil blades.

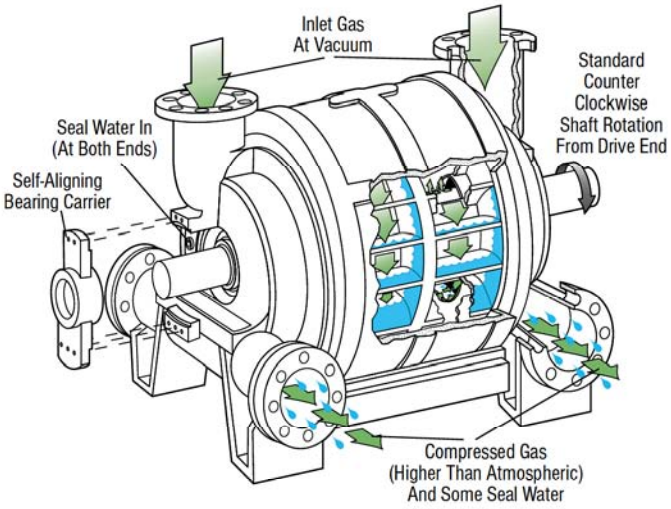
FC Flexible Ceramic Foil Blade (test sample shown in photograph)

VOONER FLOGARD VACUUM PUMPS



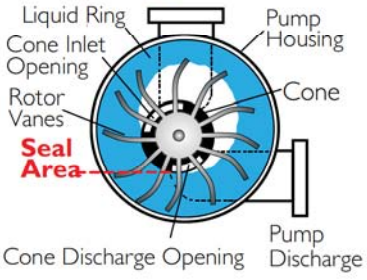
EASY BEARING CHANGES

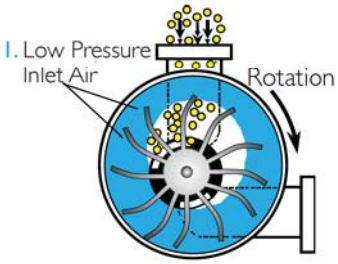
The unique, patented, self-aligning **Removable Bearing Carrier** allows for bearing removal without removing the pump from the process piping and taking it apart. This feature will significantly reduce process downtime if a bearing change is required. Because pump disassembly is not required for a bearing change, the critical internal clearances are not changed.

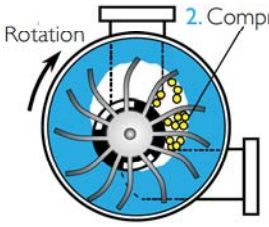


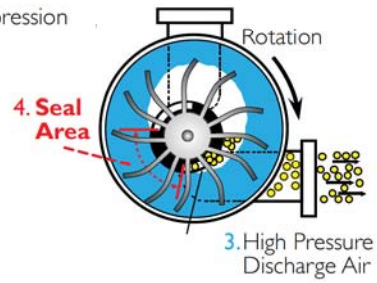
HOW THE PUMP WORKS

Liquid Ring Vacuum Pump



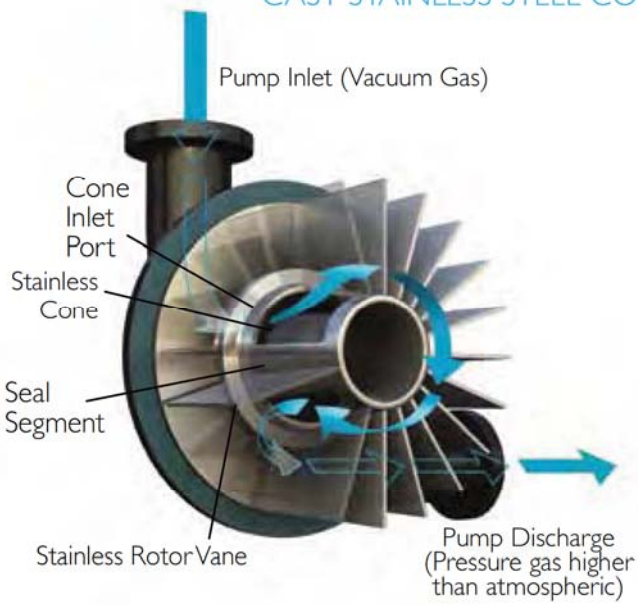


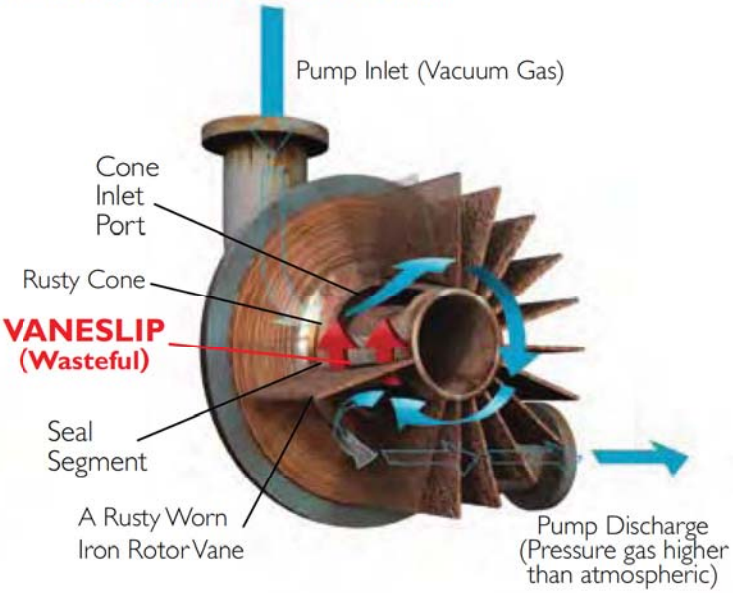




VALUE-ADDING BENEFITS FROM VOONER FLOGARD

CAST STAINLESS STEEL CONE AND ROTOR MINIMIZE VANESLIP





Vooner FloGard's Stainless Steel Difference For Better Airflow Performance

Stainless steel dynamically hardens its surface with the formation of chromic oxide. This resists erosive attack from solids and corrosive attack from chemicals. The standard materials for Vooner's rotors and cones are cast stainless steel. The very close tolerance clearance between the inside ends of the rotor blades and the cone surface of the seal segment can be maintained for long-term retention of performance.

Vooner FloGard's Stainless Steel Structural Difference

Stainless steel housings and heads can also be supplied in stainless steel for erosion and corrosion protection in very severe service such as when recycled fibers enter the pump, or if white water is used as the sealing liquid.

Rusty. Worn. Vaneslip.

With cast iron pumps in operation, the iron oxide (**rust**) that forms on the rotor and cone surfaces is physically **worn** away with use, increasing the clearance between the rotor vanes and the seal segment of the cone. This decreases the seal which is to prevent the high pressure gas of the discharge segment from entering into the vacuum inlet segment of the pump.

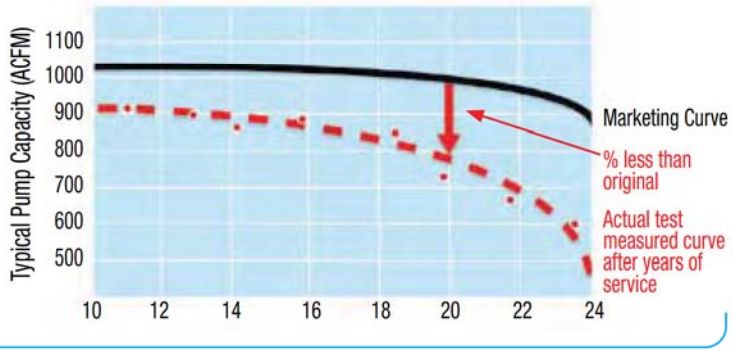
The portion of the discharge gas that does not get discharged out of the pump, but leaks past the seal clearance between the vane of the rotor and seal segment of the cone is called **VANESLIP. VANESLIP** allows high-pressure gas to enter the inlet segment and therefore robs space for new inlet air to enter the pump, thereby reduces the flow of vacuum gas from being removed from the process.

ORIFICE PLATE TESTING

Measure of airflow at vacuum of installed pumps based on Heat Exchange Institue, HEI standards. Vooner FloGard testing and report writing service basis for operating costs for a number of years.

- Seal water, volume per year
- Electrical energy, kw per year
- Maintenance
- Rebuild

VACUUM PUMP, ACFM AT VACUUM LEVEL



VOONER FLOGARD VACUUM PUMPS

PUMP AIRFLOW PERFORMANCE, ACFM (M^3/MIN)

Dry Air Capacity at 60°F with 60°F seal water

Single Stage Cone Port Model	Best efficiency, Slowest speed				Lowest initial investment, Fastest speed			
	19 - 21" Hg. Vacuum, (475-525 mm Hg. Vac.) L or M cone port		26" Hg. Vacuum, (650 mm Hg. Vac). M or H cone port		19 - 21" Hg. Vacuum, (475-525 mm Hg. Vac.) L or M cone port		26" Hg. Vacuum, (650 mm Hg. Vac.) M or H cone port	
V4T130	7,600	(215)	8,500	(241)	12,400	(351)	10,600	(300)
V4S110	6,800	(193)	7,400	(210)	11,000	(310)	9,500	(280)
V4R95	5,500	(156)	5,400	(160)	8,800	(260)	8,000	(230)
V4P75	4,600	(130)	4,600	(130)	7,500	(220)	6,500	(190)
V4M55	3,500	(99)	2,600	(80)	5,700	(160)	4,600	(130)
V4L50	2,800	(79)	2,300	(65)	4,800	(130)	4,000	(110)
V490	7,400	(210)	7,300	(210)	9,700	(270)	8,500	(240)
V460	5,200	(147)	4,400	(130)	6,800	(190)	5,900	(170)
VG40	3,100	(88)	2,500	(75)	4,400	(120)	4,000	(110)
VG30	2,300	(65)	1,700	(50)	3,000	(85)	2,600	(75)
VG20	1,400	(40)	1,000	(30)	2,100	(60)	1,400	(40)
VG10	800	(23)	710	(20)	1,100	(30)	1,000	(28)
VG7	550	(16)	450	(12)	700	(20)	600	(18)
VG4	350	(10)	300	(8)	450	(12)	350	(10)
VG3	200	(6)	-		300	(8)	-	

Two Stage Cone Port Model	Best efficiency, Slowest speed				Lowest initial investment, Fastest speed			
	19 - 21" Hg. Vacuum, (475-525 mm Hg. Vac.)		29" Hg. Vacuum, (735 mm Hg. Vac.)		19 - 21" Hg. Vacuum, (475-525 mm Hg. Vac.)		29" Hg. Vacuum, (735 mm Hg. Vac.)	
VTS20	1,680	(48)	1,100	(31)	2,050	(58)	1,200	(34)
VTS10	Please call the Vooner Office: 1-800-345-7879							

Single Stage Flat Port Model	Best efficiency, Slowest speed				Lowest initial investment, Fastest speed			
	19 - 21" Hg. Vacuum, (475-525 mm Hg. Vac.)		24" Hg. Vacuum, (600 mm Hg. Vac.)		19 - 21" Hg. Vacuum, (475-525 mm Hg. Vac.)		24" Hg. Vacuum, (600 mm Hg. Vac).	
FG147	10,000	(283)	9,500	(268)	14,600	(413)	13,200	(373)
FG107	6,520	(184)	6,050	(171)	10,300	(291)	9,250	(262)
FG77	4,350	(123)	4,040	(114)	7,370	(209)	6,620	(187)
FG57	3,370	(95)	3,140	(89)	5,430	(154)	4,820	(137)
FG100	485	(14)	430	(12)				
FG65	310	(8.8)	290	(8.2)				

Two Stage Flat Port Model	Best efficiency, Slowest speed				Lowest initial investment, Fastest speed			
	19 - 21" Hg. Vacuum, (475-525 mm Hg. Vac.)		27" Hg. Vacuum, (675 mm Hg. Vac.)		19 - 21" Hg. Vacuum, (475-525 mm Hg. Vac.)		27" Hg. Vacuum, (675 mm Hg. Vac.)	
FGT150	1,820	(52)	2,070	(59)	1,480	(42)	1,870	(53)
FGT100	700	(20)	810	(23)	890	(25)	980	(28)
FGT80	365	(9.2)	360	(10)	455	(13)	505	(14)
FGT50	265	(7.5)	290	(8.2)				
FGT40	125	(3.5)	128	(3.6)				
FGT32	33	(0.9)	32	(0.9)				

www.vooner.com *Individual performance curves can be downloaded*

INTERCHANGEABLE MODEL CHART

Single Stage Cone Port	
Vooner	Nash
VG3	CL-300
VG4	CL-400
VG7	CL-700
VG10	CL-1000
VG20	CL-2000
VG30	CL-3000
VG40	CL-4000
V460	CL-6000
V490	CL-9000
V4L50	904-L
V4M55	904-M
V4P75	904-P
V4R95	904-R
V4S110	904-S
V4T130	904-T
Two Stage Cone Port	
Vooner	Nash
VTS10	AT1004,6
VTS20	AT2004,6

Small Flat Plate	
Vooner	Travaini
FG65	TRVA 65
FG100	TRVA 100
FGT32	–
FGT40	TRHC 40
FGT50	TRHC 50
FGT80	TRHC 80
FGT100	TRHC 100
FGT150	TRHC 150
Large Flat Plate	
Vooner	Siemens
FG57	2BE1405
FG77	2BE1505
FG107	2BE1605
FG147	2BE1705

STAINLESS STEEL - FOR LONGER LIFE

Pump Component Metallurgy						
Material Code	Rotor	Cones	Housing	Heads	Shaft	Packing Glands
A	DI	CI	CI	CI	CS	316 SS
C	304 SS	304 SS	CI	CI	410 SS	316 SS
S	304 SS	304 SS	304 SS	CI	410 SS	316 SS
XVS	304 SS	304 SS	304 SS	CI+316 SS wearplates	410 SS	316 SS
XVE4	304 SS	304 SS	CI+304L SS lining	CI+316 SS wearplates	410 SS	316 SS
PVE6	316 SS	316 SS	CI+316L SS lining	CI+316 SS wearplates	410 SS	316 SS
SS4	304 SS	304 SS	304 SS	304 SS	316 SS	316 SS
SS6	316 SS	316 SS	316 SS	316 SS	316 SS	316 SS

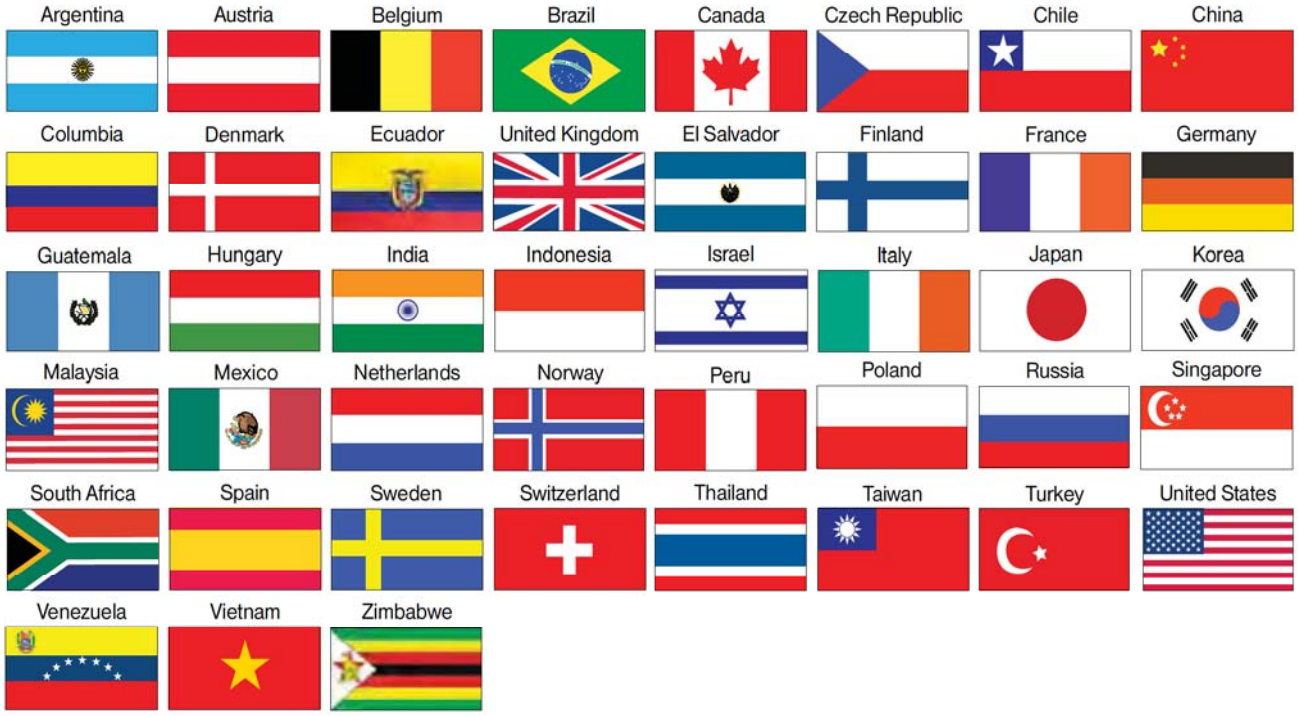
DI - Ductile Iron SS - Stainless Steel
CI - Cast Iron CS - Carbon Steel

Three Year Warranty on material and workmanship

CVN Vooner Paper Machinery
P.O. Box 129 • Greeneville, TN 37744
1612 Industrial Rd. • Greeneville, TN 37745
Phone: 423-638-2211 • Fax: 423-638-8805

www.cvnvooner.com

CVN Vooner Paper Machinery is running today in ...



Representing CVN Vooner Paper Machinery: