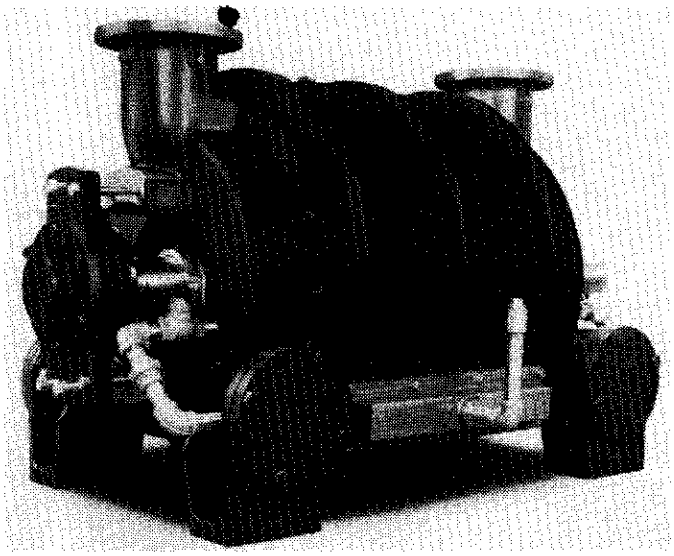


New VOONER VANEGARD® Vacuum Pump "When Protecting Vacuum Counts"

In order to stay competitive in today's world, it is essential for industries to increase production while reducing production related costs. The VOONER VANEGARD® liquid ring vacuum pump with its pioneer design accomplishes just this. By reducing fresh water usage costs and maintenance related downtime, while at the same time extending the pump's overall useful life, the VANEGARD® reduces full life cycle cost.

DESIGN FEATURES

1. **Cast Stainless Steel Rotor and Cones**
   All VOONER VANEGARD® pumps come equipped with solid cast 304 stainless steel (CF-8) Rotor and Cones as standard construction. The 304 stainless steel prevents erosive and corrosive wear at the critical seal area, therefore maintaining the original close tolerance clearance between the Rotor and Cones much longer than cast iron (see Figure 1).

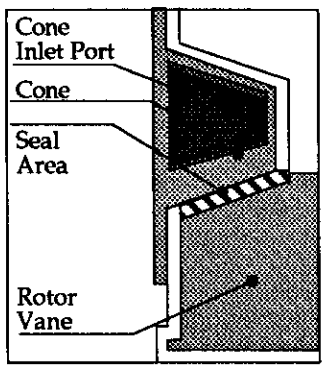


Figure 1: Rotor/Cone Clearance

The loss of this original clearance is what allows air to slip from the discharge port to the inlet port and recirculate inside the pump. This recirculated air, known as Vaneslip, prevents process air from entering the pump thus reducing the pump's useful capacity. With 304 stainless steel Rotor and Cones, a close clearance and vacuum pump capacity are retained longer. The Packing Glands and Gland Fixtures are constructed of 316 stainless steel (CF-8M) as standard. Solid cast 304 or 316 stainless steel Body (Rotor Housing) and replaceable Wear Plates can be added as options.

2. **Multi-Patented Dual Water Supply System:**
   With the ever increasing costs of fresh or treated water, its conservation is becoming a necessity. The Multi-Patented Dual Water Supply System of the VOONER VANEGARD® enables the use of up to 75% preused secondary water, and as little as 25% fresh water for the sealing liquid. The secondary water is introduced into the pump Housing through the VOONER® patented Secondary Water Manifold (see Figure 2).

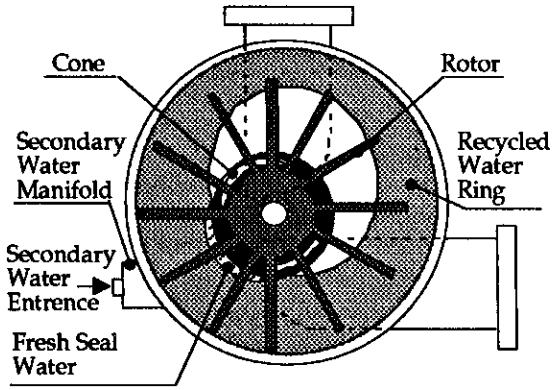


Figure 2: Recycled Water Flow

The secondary water acts as water pistons compressing the gas in the Body of the pump. This corrosive and erosive water does not come in contact with the critical seal and Packing areas. The small flow of fresh water is introduced directly into each Head to the seal area of the Cones (see Figure 3).

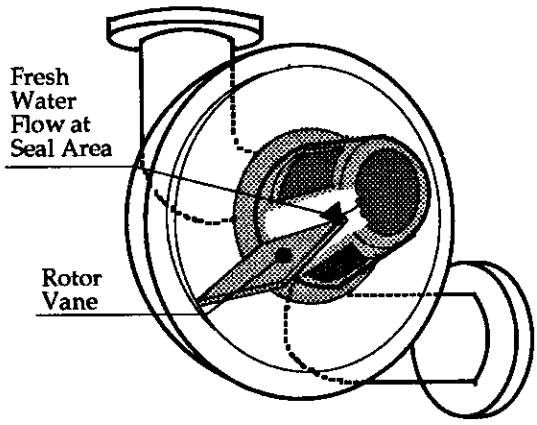


Figure 3: Fresh Water Flow

The fresh water forms the seal between the Rotor and Cones and lubricates the Packing. This prevents erosion and corrosion at the critical seal area and Shaft/Packing area, and results in reduced Vaneslip, less Shaft wear, and extended pump life.

3. **Self Aligning Removable Bearing Carrier**
The unique self aligning Bearing Carrier featured in the VOONER VANEGARD® allows Bearing removal and replacement without removing the Heads from the pump Housing. By simply turning the Carrier jack-bolts against the Head, the Bearing Carrier (with the Bearing) slides off the Shaft (see Figure 4).

Figure 4: Removable Bearing Carrier

This feature greatly reduces pump down-time when a Bearing change is necessary. The unique machine fitted circular design of the VANEGARD® Bearing Carrier concentrically aligns the Bearings in the horizontal, vertical, and axial directions. The VANEGARD® pump can be completely disassembled using only hand tools.

4. **410 Heat Treated Stainless Steel Shaft**
All VOONER VANEGARD® pumps come with 410 heat treated stainless steel Shafts that are more corrosion and abrasion resistant than common carbon steel Shafts. The 410 stainless steel also has greater strength than carbon steel thus reducing the risk of Shaft failure under abnormal loads.

Vooner VaneGard

FEATURES & BENEFITS

1. Feature
Cast Stainless Steel Rotor and Cones

Benefits
Maintains Airflow Capacity Longer
Increases Pump Life

2. Feature
Multi-Patented Dual Water Supply System

Benefits
Reduces Fresh Water Requirement Up To 75%
Protects Rotor/Cone Seal Area
Protects Shaft/Packing Area

3. Feature
Self Aligning Removable Bearing Carrier

Benefits
Reduces Downtime For Bearing Change

4. Feature
410 Heat Treated Stainless Steel Shaft

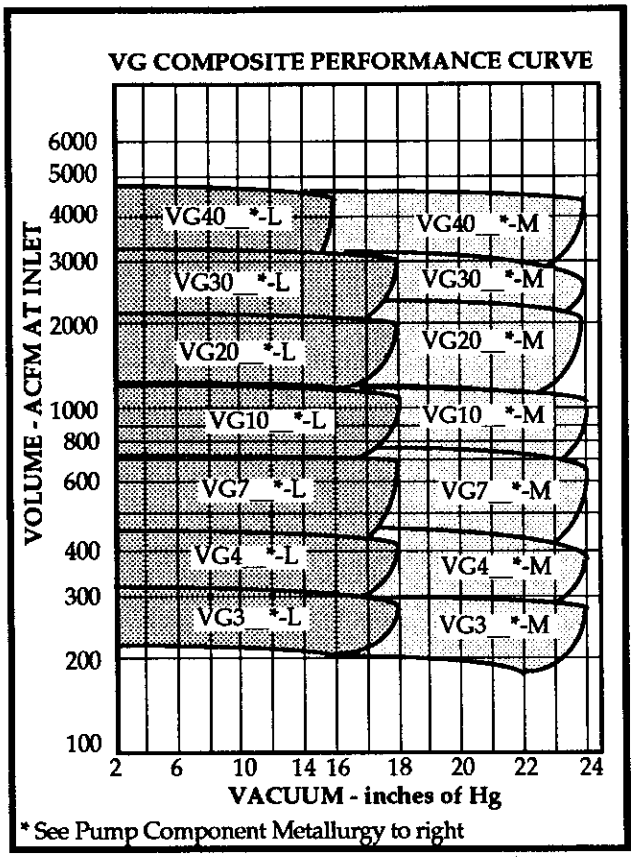
Benefits
Resists Corrosion and Abrasion
Increases Shaft Durability

VaneGard® Data

Pump Model Number Specification

VG [20] [C] - [M]

20	Actual Cubic Feet per Minute in Hundreds (example indicates 2000 ACFM)
C	Pump Component Metallurgy (see below)
M	Vacuum Level Ranges L - Low, 4-16"HgV ; M - Medium, 12-24"HgV



* See Pump Component Metallurgy to right

BOLT IN REPLACEMENT

VaneGard Model	Replaces Models		
VG3	LR3	LP3	CL300
VG4	LR4	LP4	CL400
VG7	LR7	LP7	CL700
VG10	LR10	LP10	CL1000
VG20	LR20	LP20	CL2000
VG30	LR30	LP30	CL3000
VG40	LR40	LP40	CL4000

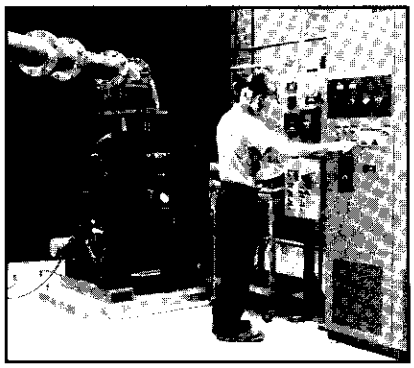
PUMP COMPONENT METALLURGY

*	Rotor	Cones	Heads	Bearing Carrier	Housing	Shaft	Packing Gland
C	304 SS	304 SS	CI	CS	CI	410 HT	316 SS
S	304 SS	304 SS	CI	CS	304 SS	410 HT	316 SS
XVC	304 SS	304 SS	^304 SS	CS	CI	410 HT	316 SS
XVS	304 SS	304 SS	^304 SS	CS	304 SS	410 HT	316 SS
PVS	316 SS	316 SS	^316 SS	CS	316 SS	410 HT	316 SS
SS4	304 SS	304 SS	304 SS	CS	304 SS	410 HT	316 SS
SS6	316 SS	316 SS	316 SS	CS	316 SS	410 HT	316 SS

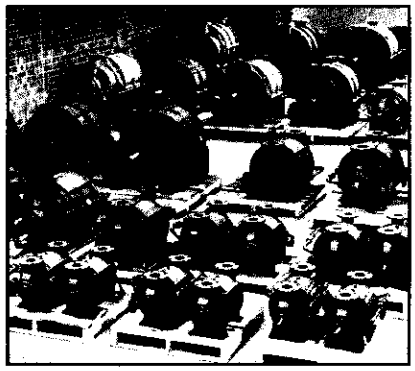
SS - Stainless Steel CI - Cast Iron CS - Cast Steel
HT - Heat Treated
^ Replaceable Wear Plates on Cast Iron Heads

DESIGN ITEMS	PUMP MODELS						
	VG3	VG4	VG7	VG10	VG20	VG30	VG40
Maximum RPM	1170	980	800	630	450	400	300
Minimum RPM	1750	1470	1170	880	640	530	450
Minimum ACFM @ 10"HgV	210	315	510	820	1530	2500	3075
Maximum ACFM @ 10"HgV	310	455	730	1105	2100	3075	4600
Minimum ACFM @ 23"HgV	187	310	540	820	1320	2000	2300
Maximum ACFM @ 23"HgV	285	405	670	1030	2000	2800	4600
BHP @ 10"HgV (Min RPM)	7	12	17	25	50	74	85
BHP @ 10"HgV (Max RPM)	17	26	36	52	102	150	175
BHP @ 23"HgV (Min RPM)	11	20	27	40	65	100	132
BHP @ 23"HgV (Max RPM)	20.5	28	41	62	116	162	260
Seal Water Requirement Fresh / Recycled (GPM)							
@ 10"HgV	2 / 4	3 / 2	5 / 5	5 / 15	8 / 12	14 / 6	16 / 10
@ 23" HgV	2 / 5	3 / 9	5 / 15	5 / 15	8 / 22	14 / 42	16 / 48
Suction Size, in.	3	3	4	5	6	8	10
Discharge Size, in.	2	2.5	3	4	5	6	8
Pump Weight, lb.	320	500	770	1160	2900	4800	8500

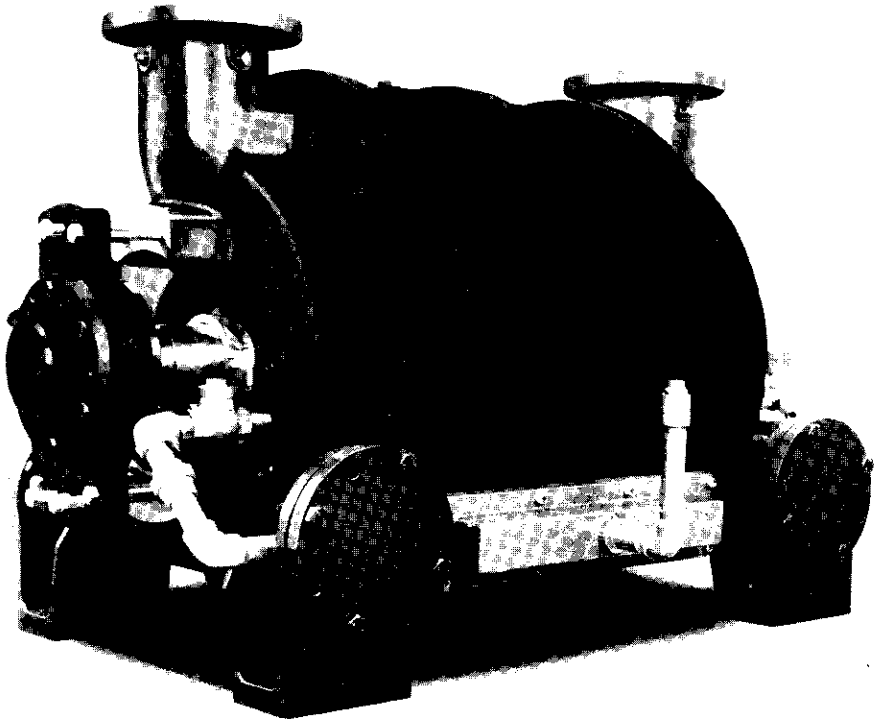
Liquid Ring Vacuum Pumps



Test Facility. *Every Vooner VaneGard® pump undergoes performance testing and vibration analysis before being shipped.*



Pumps and Parts in Stock. *Vooner maintains a large inventory of pumps and replacement parts — all available for immediate shipment.*



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