



**TECHNICAL  
ARTICLE  
SERIES**

# **Flexible Liner Pump Cuts Scrubber Maintenance**

**ARTICLE #** TL-109

**INDUSTRY:** Chemical

**ENTITY:** Gaylord Foundry Equipment

**SOLUTION(S) PUMPED:** Sulfuric acid, Caustic solutions

**PUMP TYPE(S):** FLEX-I-LINER Sealless Self-Priming Peristaltic Pumps

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# Flexible Liner Pump Cuts Scrubber Maintenance

**Nonmetallic wetted parts handle 98% sulfuric acid, 50% caustic, and up to 1/2" solids with ease**

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Packed tower recirculating scrubbers made by Gaylord Foundry Equipment use 98% sulfuric acid and 50% caustic solutions as neutralizing agents in cold box processes to capture amine gases and sulfur dioxide. All components of the scrubber systems must be compatible with these harsh chemicals.

The recirculating pump service required accurate, repeatable and reliable metering, self-priming and the capability of handling solids up to 1/2" in diameter without damage.

For the original design, a bellows-type pump was used. Monitoring of the scrubber systems throughout North America revealed excessive pump maintenance and costly downtime because of delays in replacement parts deliveries.

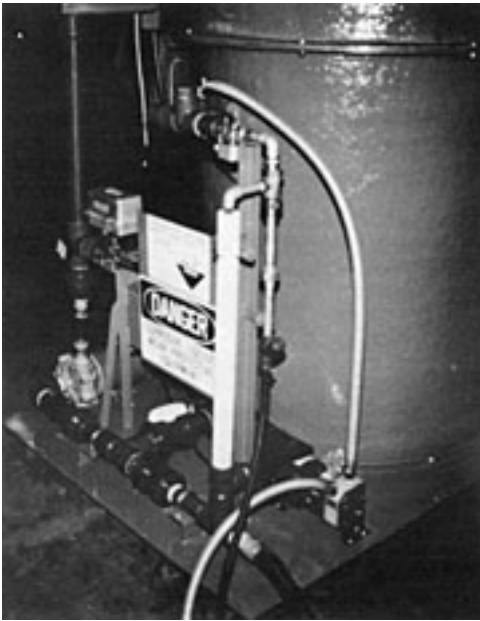
The company sought a better pump for the service, and found it in a flexible-liner, nonmetallic unit with only two parts in contact with the neutralizing solution.

Driven by a 1/4-hp electric motor, the rotary diaphragm pump uses a Teflon® pump casing and a Hypalon® flexible liner. The compact and rugged pump uses a progressive, compressive force imposed by an eccentric lobe rotating against an elastomeric diaphragm to propel fluids trapped between the outer surface of the diaphragm and the inner surface of the plastic pump casing.

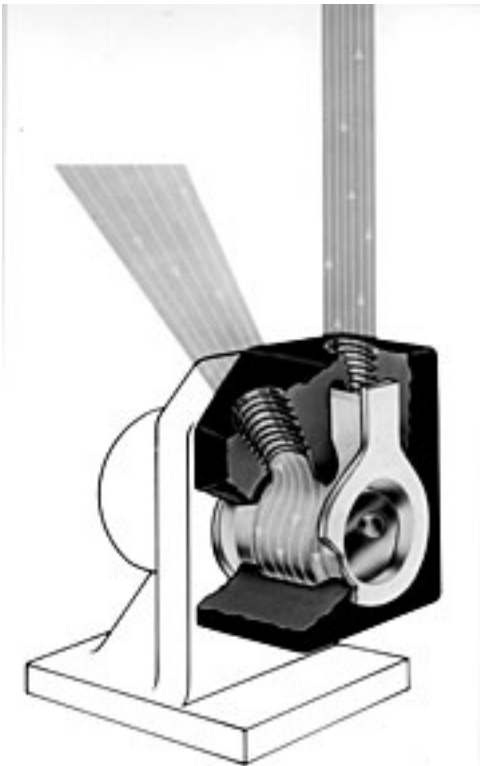
Leak- and maintenance-prone components such as stuffing boxes, glands, shaft seals, gaskets and check valves are not required in the flexible liner pump. It is sealless, self-priming and capable of running dry without damage to the pump or the motor. The only wearing part is the flexible liner, which can be replaced in minutes at low cost. The vice president of the company manufacturing the scrubber systems reports that the flexible liner pumps have improved accuracy and dependability and practically eliminated downtime and maintenance. They are now standard on all new systems. Older systems are being retrofitted in the field whenever pump problems are reported.

## **ENGINEERED FOR Acids, Caustics, Salts, Abrasive Slurries, Solvents, Chlorides, Viscous Fluids**

Vanton self-priming FLEX-I-LINER pumps are precision engineered with relatively few parts to provide efficient handling of corrosives, volatile fluids, abrasives and other products safely and dependably. Capacities to 40 gpm; discharge pressure as high as 45 psig; temperatures to 250°F. Suitable for vacuum service and for gases, liquids and viscous



Teflon® body and Hypalon® rotary diaphragm enable pump to handle both sulfuric and caustic solutions in recirculating scrubber service.



FLEX-I-LINER® rotary diaphragm pump

fluids up to 6,000 SSU. The Vanton FLEX-I-LINER can operate in either direction with equal effectiveness. It is recommended for slurries with as much as 20% soft solids and for gas service handling a maximum of 1 cfm, as well as the handling of clear, volatile fluids.

## **FLEX-I-LINER® FEATURES:**

### **No Stuffing Boxes, Glands, Shaft Seals or Gaskets**

The design of the Vanton Pump has eliminated the need for stuffing boxes, packing glands or mechanical shaft seals, completely removing the possibility of hazardous and wasteful external leakage. This design also avoids oil or grease contamination of pumped fluids. Stuffing boxes, shaft seals and gaskets are not necessary since the flanges on the flexible liner straddle the body block and are pressed to its sides by concentric machined grooves in the bearing sleeve and cover plate. This confines the fluid to a channel formed by the outer surface of the flexible liner and the inner surface of the body block while all mechanical action and moving parts are on the inside of the flexible liner.

### **No Check Valves**

Internal valves are not necessary. The absence of valves adds to the simplicity of construction and eliminates maintenance due to valve stickiness and wear. Sensitive fluids which might otherwise be damaged by opening and closing of check valves are readily handled by the FLEX-I-LINER pump.

### **Self-Priming/Wet or Dry Operation**

Vanton Flex-i-liner pumps will prime in any operating position without priming devices. Air bubbles will not cause locking or seizing of the pump nor impair efficiency... and running dry for extended periods is not detrimental.

### **Non-Agitating**

At selected RPM, depending on the fluid, the gentle pumping action prevents churning or foaming. This prevents excessive settling out of suspensions and avoids breakdown of various latex emulsions and other similar sensitive liquids.

### **External Bearings**

Both shaft bearings are housed in a cast iron pedestal, which is external to the fluid cavity itself. The rotor bearing is completely protected within the phenolic rotor and sealed off with a plug on one side and a spring-loaded phenolic bearing guard on the other, which rides on the lapped surface of the bearing sleeve. Bearings are sealed-in, permanently lubricated ball bearings and operate in a clean, isolated non-corrosive atmosphere.

### **Low Maintenance**

FLEX-I-LINER pumps, by eliminating stuffing boxes, shaft seals, gaskets and check valves remove the major causes of pump maintenance. The only wearing part is the low cost flexible liner, which can be replaced readily.

### **Easy Servicing**

There is no need to remove the pump to a workbench for expensive or intricate servicing... or to remove it from the base plate, which could

affect the precise alignment of shaft to motor. With the external bearing design, only the inexpensive flexible liner may require replacement after long periods of service. This can be accomplished in a matter of minutes, even by an inexperienced operator, and with no special tools.