



# SAFE AND EFFICIENT **PUMPS & VALVES** FOR THE SULFURIC ACID INDUSTRY

**The trusted solution:** where precision, safety, and innovation  
Inspire confidence

SULFURIC ACID INDUSTRY



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# INTRODUCTION

**Sulfuric Acid** is a vital chemical component across a wide range of industries, including chemical manufacturing, fertilizer production, metal processing, and more. Its high corrosivity & temperature volatility acid concentrations pose significant operational challenges, such as mechanical seal failures, premature metal wear, and permeation of inferior lining materials.

With over six decades of expertise in chemical process technology, Richter Pumps & Valves offers a proven range of PFA-lined products, engineered specifically for **Total Corrosion Resistance**, operational safety, and long term reliability. At Richter, we build solutions to deliver peace of mind where failure is not an option.

## SULFURIC ACID PRODUCTION: AN OVERVIEW

Sulfuric acid is most commonly produced through a five-step process involving various pump and valve applications. The process begins with the combustion of sulfur to form sulfur dioxide ( $\text{SO}_2$ ), followed by gas cleaning to remove impurities. The  $\text{SO}_2$  is then converted to sulfur trioxide ( $\text{SO}_3$ ) in a catalyst converter. The  $\text{SO}_3$  is absorbed into concentrated sulfuric acid, producing oleum, which is subsequently diluted with water to achieve the desired acid concentration. Throughout these stages, lined pumps and valves are critical for handling highly corrosive substances, ensuring safe and efficient production.



# SOLUTIONS

## RELIABLE SOLUTIONS FOR SULFURIC ACID PRODUCTION

Richter is a leading supplier of PFA-lined pumps and valves widely used in the sulfuric acid industry. Specifically designed to handle highly corrosive conditions presented by varying acid concentrations and high temperatures.

### 1. Corrosion & Abrasion Resistance:

- A thick 3.5 to 5mm High purity PFA lining ensures high resistance to aggressive chemical, abrasion, permeation, and temperature.
- High Pressure Injection Transfer process ensures uniform thickness and high-quality lining to minimize permeability.
- Richter's special anchor groove design ensures strong bonding between the PFA lining and metal body, providing the strength to withstand pressure gradients.
- The anchor grooves enable the PFA liner to resist cold flow under vacuum conditions, preventing unfastening.



### 2. High Temperature Applications:

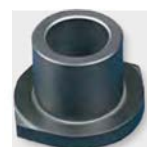
- Richter's Pure PFA lining withstands up to 360°F, making it suitable for various sulfuric acid grades and concentrations



### 3. Leakproof and Efficient Design:

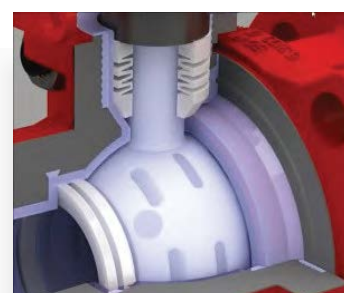
#### Pumps:

- SAFEGLIDE® PLUS silicon carbide (SSiC) plain bearings provide dry-run capability.
- The SAFESEAL system ensures zero atmospheric leakage.
- The dual non-metallic can system enhances efficiency and safety.
- The metal-core impeller, replaceable rotor assembly, and double back pull-out design enhance pump reliability.
- Optional sensors for leakage, temperature, and pressure enable comprehensive pump monitoring. \*Options available are dependant on pump series



#### Valves:

- Resilient PTFE seat rings and maintenance-free ENVIPACK stem sealing with an active stainless steel packing gland ensure gas-tight operation.
- The labyrinth-type design with virtually metal-to-metal contact ensures a permanent tight body construction, minimizing risk of leakage.





## BENEFITS

### WHY RICHTER PRODUCTS ARE THE FIRST CHOICE FOR THE SULFURIC ACID INDUSTRY:

- Corrosion Resistance:** The **high purity PFA** lining offers exceptional resistance to highly corrosive & varying concentrations of sulfuric acid, ensuring optimal performance, safety and durability in sulfuric acid production
- Reliability and Durability:** Richter pumps & valves are known for their high **reliability and long service life**, making them ideal for use in critical Sulfuric Acid processes.
- Safety:** The products are designed to meet the highest safety standards, which is particularly important **when handling highly corrosive sulfuric acid at varying concentrations**.
- Cost Savings:** Thanks to the high durability and reliability of the products, the lowest life cycle costs are incurred. Every avoided replacement of failed valves and pumps saves time and money.
- Effortless Maintenance:** The products are designed to be quick disassembly and easy servicing. This saves time and reduces downtime in production.
- TA Luft Certification:** The products are certified according to the latest TA Luft standards of 2021 (ISO 15848). This certification confirms that the products meet the stringent German emission requirements, underscoring their environmental friendliness and safety.



# APPLICATIONS

## PROVEN APPLICATIONS FOR SULFURIC ACID INDUSTRY:

Richter pumps and valves are engineered to endure the demanding conditions of sulfuric acid applications. They ensure safety, reliable performance, and minimized downtime, making them the ideal choice for your operations. Below are the key proven applications in the sulfuric acid industry.

### Chemical Manufacturing

- \_ Oleum Production
- \_ High Concentrations/High Capacities
- \_ High Purity Sulfuric Acid



### Fertilizer Production

- \_ Molten Sulfur Processing
- \_ Mixing Applications
- \_ Phosphoric Acid Production



### Semiconductor & Electronics

- \_ Ultra-Pure / High Purity Sulfuric Acid
- \_ Electronics Grade Sulfuric Acid (IC Fab)
- \_ Piranha Solution



### MINING & MINERALS

- \_ Leach Solutions
- \_ Spent Acid Streams



### OIL & GAS REFINING

- \_ Alkylation Units (SAAU)
- \_ Sulfuric Acid Regeneration



### AGRICULTURE PROCESSING

- \_ Ph Adjustment
- \_ Water Quality Treatment
- \_ Pest & Disease Control



# PRODUCTS

## PRODUCT RANGE FOR SULFURIC ACID INDUSTRY: VALVES

### 1. Ball Valves :

Richter ball valves are used for on-off and control applications, providing precise flow regulation during critical-stages such as combustion, gas cleaning, and absorption. By preventing leaks and maintaining system integrity, Richter's lined ball valves optimize safety and efficiency for users.


**Features:** Long-lasting protection due to One-piece PFA ball stem unit with uniform thick-walled pure PFA lining, Maintenance-free due to self-adjusting ENVIPACK stem sealing & leak-free operation.

			
	<b>BVA</b> Lined Standard Duty Ball Valve	<b>KNA</b> Lined Heavy Duty Ball Valve	<b>HPCV</b> Lethal Service Ball Valve
	<b>BVA/F</b>	<b>KNA/F</b>	<b>HPCV</b>
<b>Sizes</b>	1"-6"	1/2"-8"	1/2"-10"
<b>Temperature</b>	-75°F to 400°F	-75°F to 400°F	-75°F to 400°F
<b>Max Pressure</b>	250 PSIG	250 PSIG	750 PSIG
<b>Design · Ranges</b>	ASME · CL150	ASME · CL150	ASME · CL150, CL300
<b>Body · Lining</b>	DI ASTM A395 · PFA	DI ASTM A395 · PFA	CW12MW C276 · N/A
<b>Ball &amp; Stem · Lining</b>	17.4 PH SS · PFA	17.4 PH SS · PFA	Hast. C276 · N/A

### 2. Butterfly Valves:

These butterfly valves are known for their reliability and durability. They are a good option for larger pipe sizes compared to ball valves, especially for shut-off and control tasks.

**Features:** Corrosion resistance, reliability, leak-free operation and durability

			
	<b>NKL</b> Lined Lug-Style Butterfly Valve	<b>NKS</b> Lined Water-Style Butterfly Valve	
	<b>BVA/F</b>	<b>NKS/F</b>	
<b>Sizes</b>	2"-40"	2 "-16"	
<b>Temperature</b>	-75°F to 400°F	-75°F to 400°F	
<b>Max Pressure</b>	150 PSIG (Operating)	150 PSIG (Operating)	
<b>Design · Ranges</b>	ISO · Drilled to ASME CL150	ISO · Drilled to ASME CL150	
<b>Body · Lining</b>	DI ASTM A395 · PFA	DI ASTM A395 · Mod · PTFE	
<b>Ball &amp; Stem · Lining</b>	CD4MCu SS · PFA	CD4MCu SS · PFA	

# PRODUCTS


## PRODUCT RANGE FOR SULFURIC ACID INDUSTRY: VALVES

### 3. Diaphragm Valves:

These diaphragm valves are known for their reliability and durability. They are most widely used for shut-off, control and throttling valves.

**Features:** Corrosion resistance, reliability, leak-free operation and durability

MVM/F	
Sizes	1/2" - 8"
Temperature	-20° F to 300° F
Max Pressure	250 PSIG
Design - Ranges	ASME - CL150
Body - Lining	DI ASTM A395 - PFA
Cv Range	CF8M SS - TFM/PTFE





**MVM**  
Lined Diaphragm  
Valve

### 4. Control Valves:

Richter control valves offer precise control and regulation of liquids and gases in sulfuric handling processes. They are designed with low dead space and are easy to maintain and clean due to the top-entry design.

**Features:** These valves are available with either standard or conductive lining. The standard lining is minimum 5mm thick of PFA material and offer control ranges starting from 0.4 GPM

 <p><b>KNAR</b> Lined Ball Control Valve</p>		 <p><b>RSS</b> Lined Globe Control Valve</p>	
KNAR/F		RSS/F	
Sizes	1/2" - 8"	Sizes	1/2" - 6"
Temperature	-75° F to 400° F	Temperature	-75° F to 400° F
Max Pressure	245 PSIG (Operating)	Max Pressure	230 PSIG (Operating)
Design Ranges	ASME - CL150	Design Ranges	ASME - CL150, CL300
Body - Lining	DI ASTM A395 - PFA	Body - Lining	DI ASTM A395 - PFA
Cv Range	0.10 - 1160	Cv Range	0.012 - 420




# PRODUCTS

## PRODUCT RANGE FOR SULFURIC ACID INDUSTRY: VALVES

### 5. Check Valves:

Richter check valves are used to prevent backflow and maintain system integrity during critical stages such as gas cleaning, conversion, and absorption.

**Features:** Superior corrosion resistance, Leak-Free Operation & PED compliance for safe handling of liquids, vapors, and gases of group 1

SR/F		 <p><b>SR</b> Lined Sight Glass Check Valve</p>
<b>Sizes</b>	2"-6" (2)	
<b>Temperature</b>	-20°F to 360°F	
<b>Max Pressure</b>	235 PSIG	
<b>Design Ranges</b>	ISO · Drilled to ASME CL150	
<b>Body · Lining</b>	DI ASTM A395 · PFA	
<b>Glass · Ball</b>	Borosilicate · PTFE	

### 6. Safety Valves:

Richter safety valves are designed to provide reliable overpressure protection by automatically releasing excess pressure, preventing potential equipment damage and ensuring process safety.

**Features:** Superior corrosion resistance, robust construction, Maintenance-friendly & Easy pressure adjustment

<div>  <p><b>GU, GUT</b> Lined Overflow Valve</p> </div> <div>  <p><b>KSE</b> Lined Safety Valve</p> </div> <div>  <p><b>LPV</b> Lined Low-pressure Safety Valve</p> </div>			
	GU/F, GUT/F	KSE/F	LPV-D/F, LPV-A/F
<b>Sizes</b>	GU: 1"-3", GUT: 1"	2"/1" -6"/4"	-D: 2"-4", -A: 3"/2" -5"/4"
<b>Temperature</b>	-75° F to 360° F	-75° F to 360° F	-75° F to 400° F
<b>Max Pressure</b>	235 PSIG	190 PSIG (Operating)	235 PSIG
<b>Design · Ranges</b>	ASME · CL150, CL300	ISO · Drilled to ASME CL150	ISO · Drilled to ASME CL150
<b>Body · Lining</b>	DI ASTM A395 · PFA	DI A395 · PFA/PTFE	DI ASTM A395 · PFA/PTFE
<b>Ball &amp; Stem · Lining</b>	Mod · PTFE · PTFE/Carbon	TFM/PTFE · PTFE/Carbon	N/A · PTFE

# PRODUCTS

## PRODUCT RANGE FOR SULFURIC ACID INDUSTRY: PUMPS

### 7. ANSI Centrifugal Magnetic Drive Pumps :




Richter horizontal pumps are designed for high performance and reliability, featuring PFA linings for maximum chemical resistance.

**Features:** Longest service life and lowest life cycle costs, Leak free operation & reliable performance.



	RMA Series	MNKA Series	MNKA 13" Series
Design	ASME/ANSI B73.3	ASME/ANSI B73.3	ASME/ANSI B73.3
Housing Material	Ductile Iron ASTM A 395	Ductile Iron ASTM A 395	Ductile Iron ASTM A 395
Lining Material	PFA	PFA/PTFE	PFA
Size	1.5 x 1 x 6" to 3 x 2 x 10"	1.5 x 1 x 6" to 2 x 1 x 10"	3 x 1.5 x 13" to 8 x 6 x 13"
Maximum Pressure	275 psi (PN 19)	275 psi (PN 19)	362 psi (25 bar)
Flange	ASME B16.5 Cl. 150	ASME B16.5 Cl. 150	ASME B16.5 - Cl. 150, 300
Delivery Head	500 ft (155 m)	480 ft (146 m)	700 ft (213 m)
Discharge Flow	750 US gpm (180 m³/h)	400 US gpm (90 m³/h)	3000 US gpm (681 m³/h)
Temperature Range	-20°F to +300°F (-30°C to +150°C)	-80°F to +360°F (-60°C to +180°C)	-80°F to +390°F (-60°C to +198°C)

### 8. Alternative Lined Pump Solutions :

SCK Series	MNK-S Series	MPB Series	MNK-X Series
			
PFA-Lined Mechanically Sealed Pump	PFA-Lined Self Priming Mag-Drive Pump	PFA-Lined Peripheral Mag Drive Pumps	PFA-Lined Vortex Mag Drive Pump

## NOTES

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**RICHTER**  
Process Pumps & Valves

## CUSTOM SOLUTIONS FOR UNIQUE NEEDS

Richter offers tailored solutions to meet specific needs in sulfuric acid applications. these custom solutions ensure optimal performance, reliability, and safety addressing unique operational requirements.



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