

CRANE[®]

CRANE ChemPharma Flow Solutions™

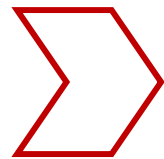


Solutions for the Chlor-Alkali Industry

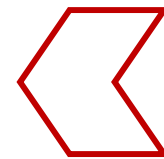
CRANE ChemPharma

Solutions for the Chlor-Alkali Industry

This document highlights valve and piping problems that are found within a Chlor-Alkali facility and CRANE Chempharma's product solutions.



This Problems & Solutions guide can be navigated by clicking the links within each page.

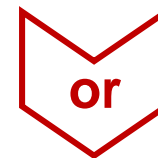
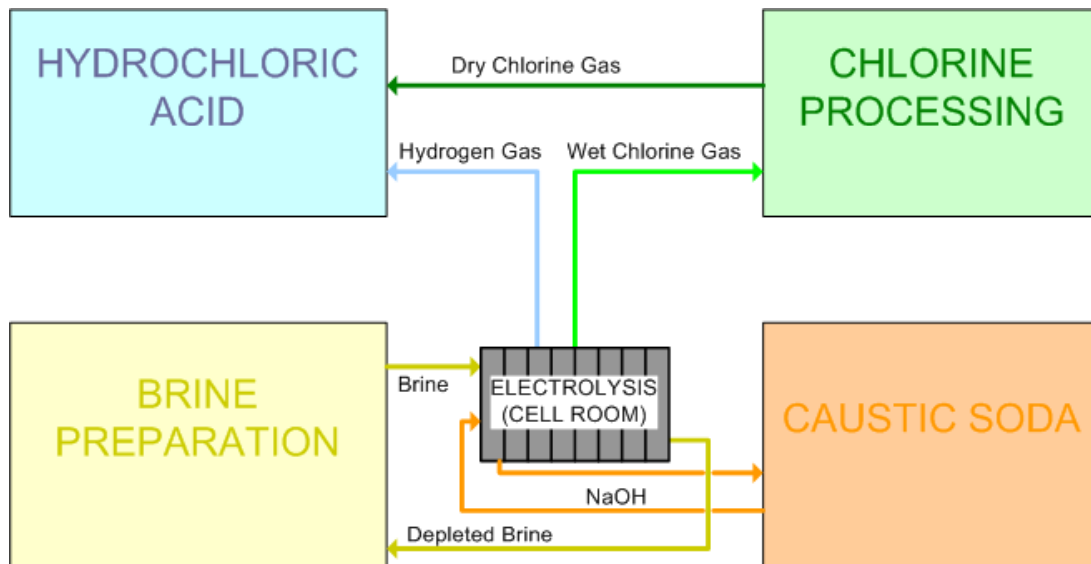


Proceed to the following page to begin.

CRANE ChemPharma

Solutions for the Chlor-Alkali Industry

Click on a sub-process to proceed



*go straight to
ALL PROBLEMS*

Simplified Process Diagram

Downstream Leakage

Downstream leakage can be caused by:

- ✓ internal corrosion
- ✓ seats damaged by abrasion
- ✓ complete valve closure prevented by deposits
- ✓ seat wear over time
- ✓ uni-directional seal designs

External Emissions

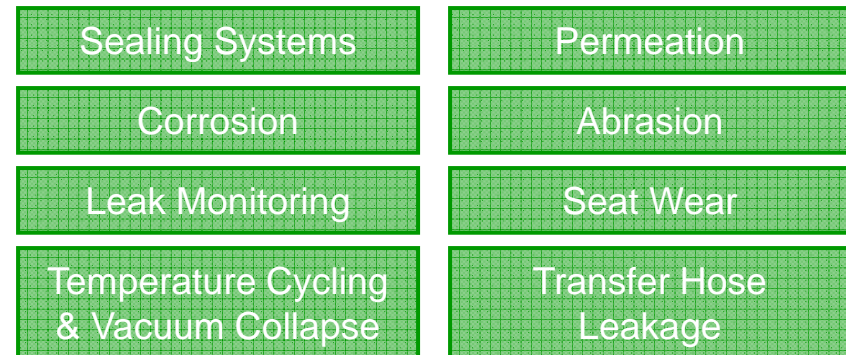
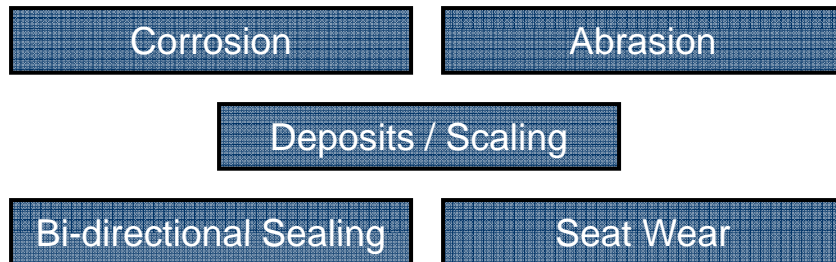
External leakage can be caused by:

- ✓ Corrosion of wetted valve components (especially in the case of inappropriate media/lining combinations)
- ✓ Insufficient sealing systems
- ✓ Shaft side loading (due to: heavy manual operation, actuation loads, misalignment, abusive contact)
- ✓ Thermal cycling and delayed seal “rebound”
- ✓ Wear on the seal over time
- ✓ Inability to conduct “preventive leak detection”

More →



Click on a problem
to view CRANE
product solutions



Back to all subprocesses.

General Problems

Valve repair often involves a production downtime. Whether for scheduled or emergency maintenance, downtime decreases the profitability of a plant.

- ✓ valve jams
- ✓ repair
- ✓ replacement



Click on a problem
to view CRANE
product solutions

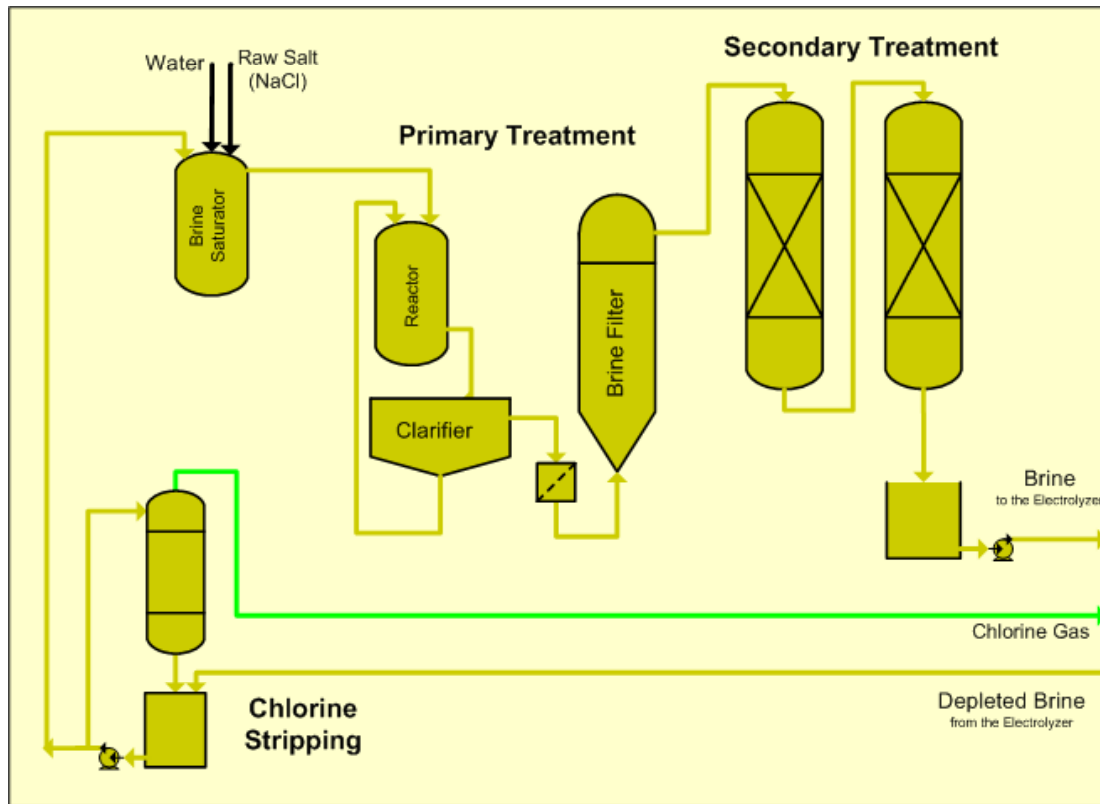
Valve Jams in Place

Frequent or Extended
Downtime

High Cost of Valve
Repair and Replacement



Brine Preparation



Click on a problem to view CRANE solutions

- Particulate Abrasion
- Valves Jam in Place
- Internal Corrosion
- Deposits / Scaling (downstream leakage)
- External Corrosion (from vapor leakage)

Valves

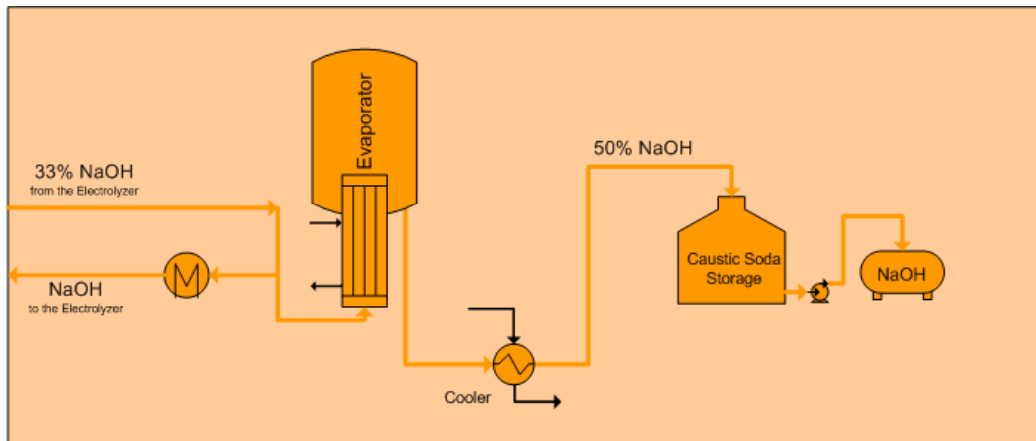
Teflon lined valves (ball, butterfly, plug, and diaphragm) are all used in brine applications.

Pipe

Plastic lined stainless steel pipe is used throughout most of the brine preparation area.

Caustic Soda

Click on a problem to view CRANE solutions



- External Leakage
- Abrasion
- High Temperature Corrosion
- Transfer Hose Leakage
- Deposits / Scaling (downstream leakage)

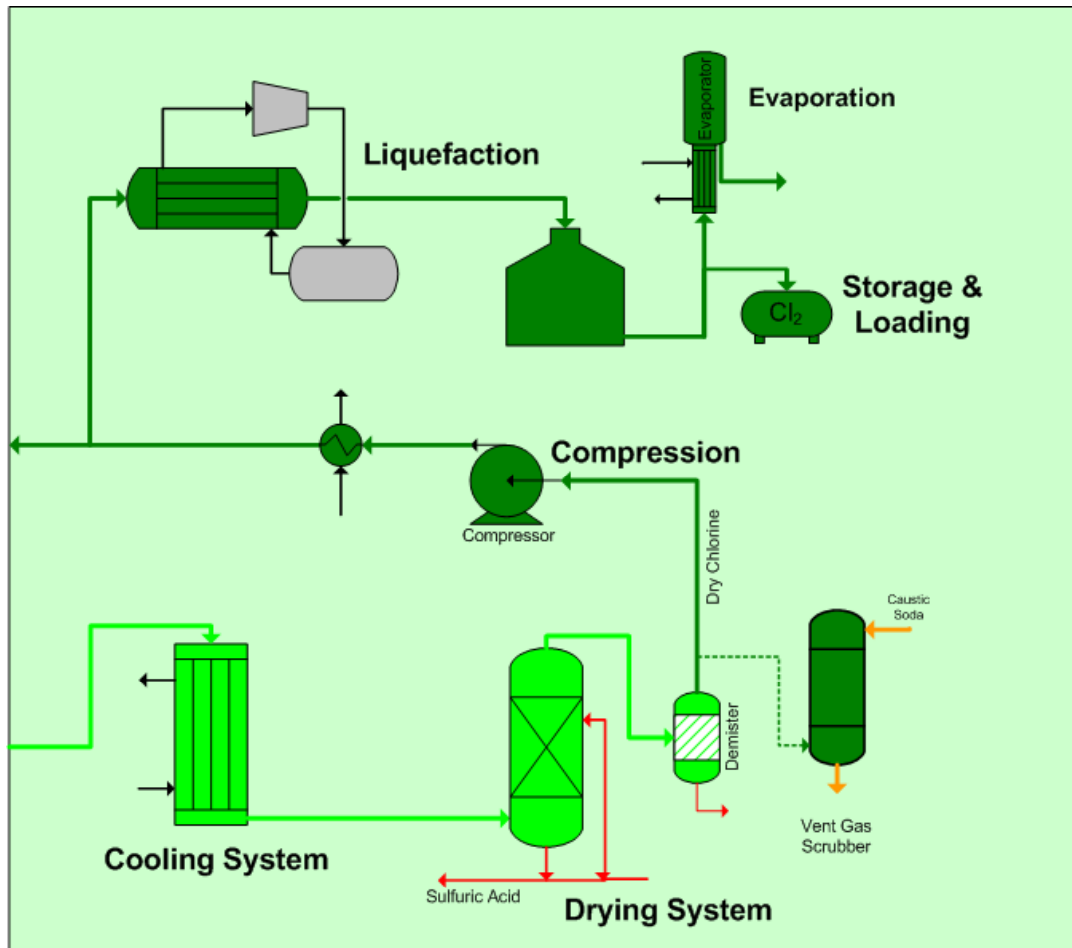
Valves

Lined plug and lined ball valves are most commonly used in caustic soda applications.

Pipe

Depending on the concentration of sodium hydroxide, stainless steel, Alloy 20, or nickel can be used.

Chlorine Processing



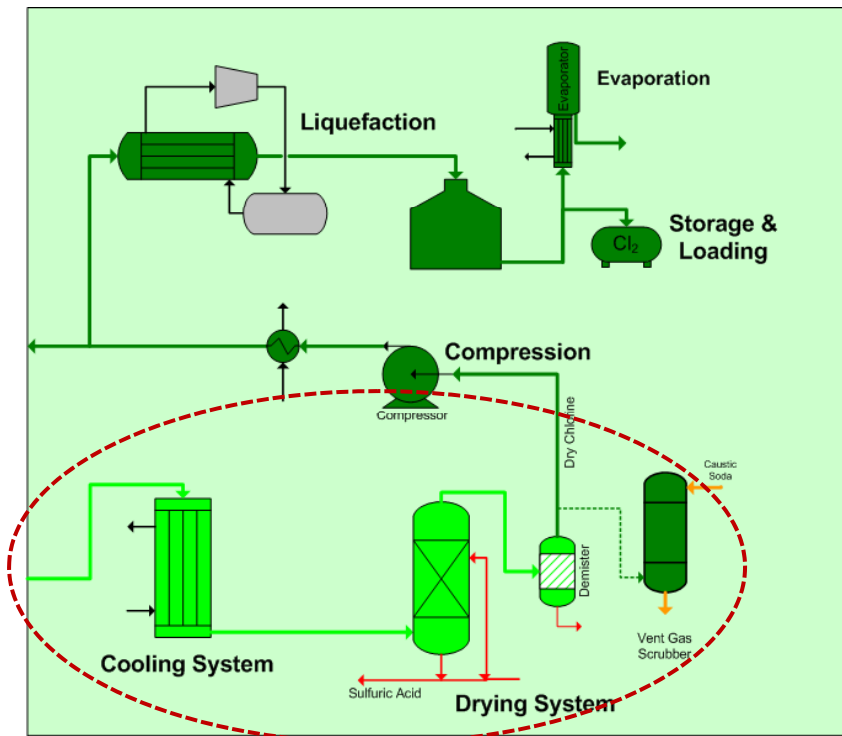
Click below on a media to view CRANE solutions

Wet Chlorine Gas
Cooling System
Drying System

Dry Chlorine Gas
Compression
Downstream Processes

Liquid Chlorine
Liquefaction
Storage and Loading

Wet Chlorine Gas



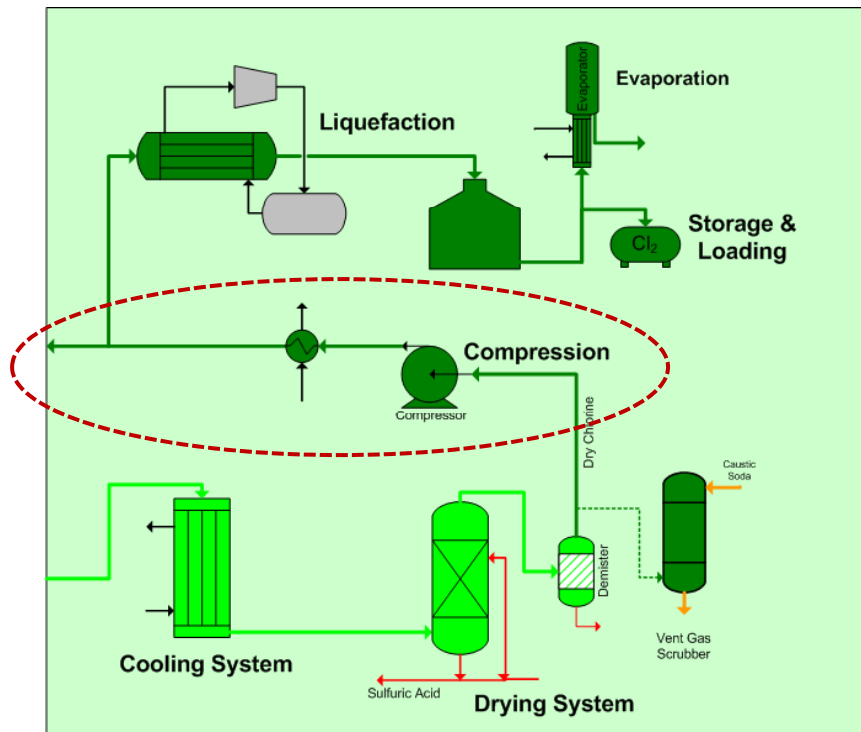
Click on a problem to view CRANE solutions

- External Emissions
- Corrosion
- Bi-directional Sealing (downstream leakage)
- Lining Permeation
- Extended Maintenance Downtime
- High Cost of Valve Repair and Replacement

Valves
Primarily lined butterfly valves are used in these large lines.

Pipe
Wet chlorine gas lines use lined or dual-laminate pipe or FRP pipe.

Dry Chlorine Gas



Click on a problem to view CRANE solutions

- External Emissions
- Bi-directional Sealing (downstream leakage)
- Temperature Cycling and Vacuum Collapse
- External Ingress Corrosion
- Extended Maintenance Downtimes

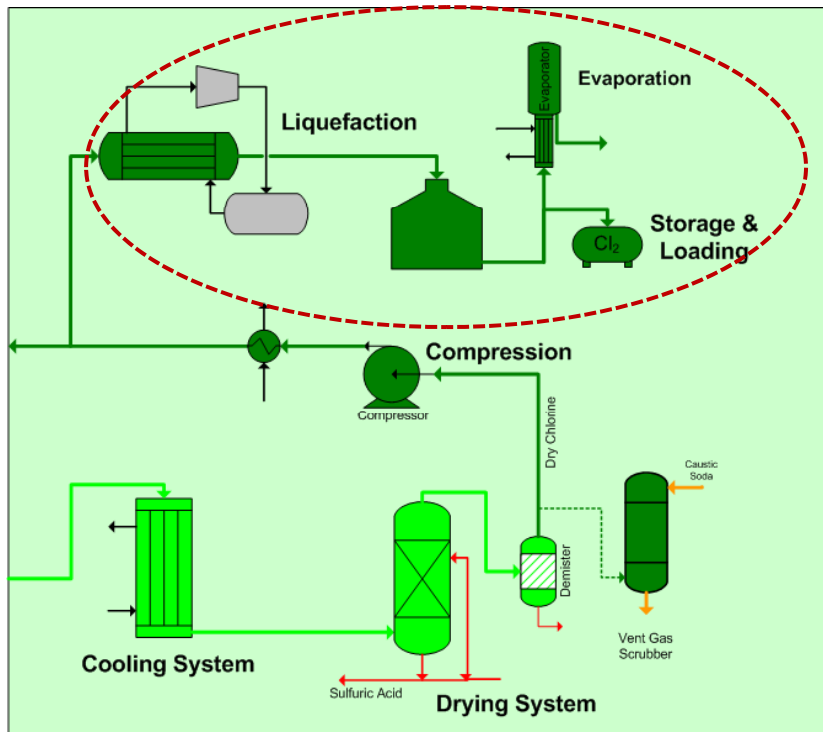
Valves

Lined plug valves and lined ball valves are most commonly used.

Pipe

Dry chlorine gas lines use carbon steel pipe.

Liquid Chlorine



Click on a problem to view CRANE solutions

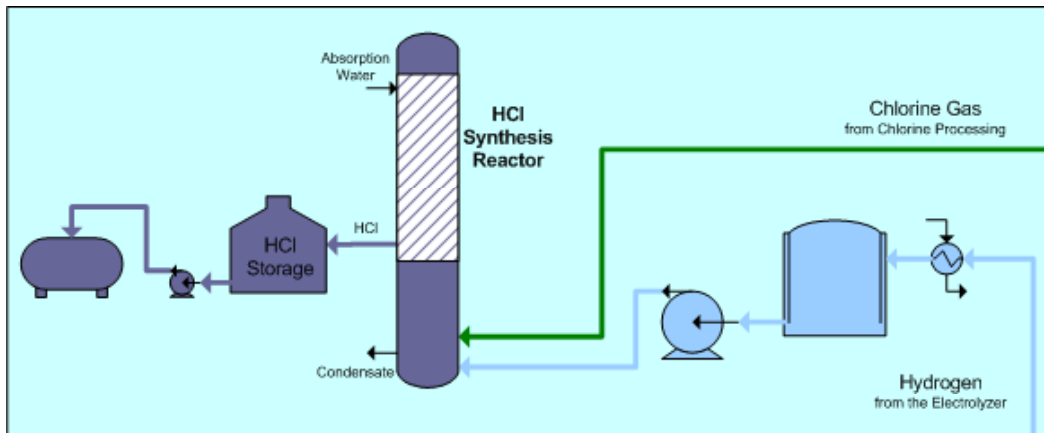
- Transfer Hose Leakage
- Temperature Cycling and Vacuum Collapse
- Maintenance Difficulty

Valves
Lined plug valves and lined ball valves are most commonly used.

Pipe
Dry chlorine gas lines use carbon steel pipe.

*Click on a problem
to view CRANE solutions*

Hydrochloric Acid Synthesis



Valves

Hydrochloric acid lines will contain a variety of lined valves – butterfly, plug, ball, check and diaphragm valves.

Pipe

HCl piping is typically PTFE lined stainless steel.

Hydrogen Gas

External Emissions

Downstream Leakage

Hydrochloric Acid

Downstream Leakage

Corrosion

Transfer Hose Leakage

High Maintenance Costs

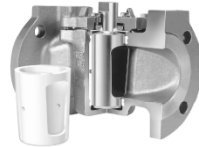
External Corrosion
(from vapor leakage)

Particulate Abrasion

Line media erodes metallic valve components resulting in in-line leakage



Saunders Diaphragm Valve



XOMOX Plug Valves



XOMOX High Performance Butterfly Valves

Click on a solution
to view CRANE
product features

Problem found within

Brine Preparation

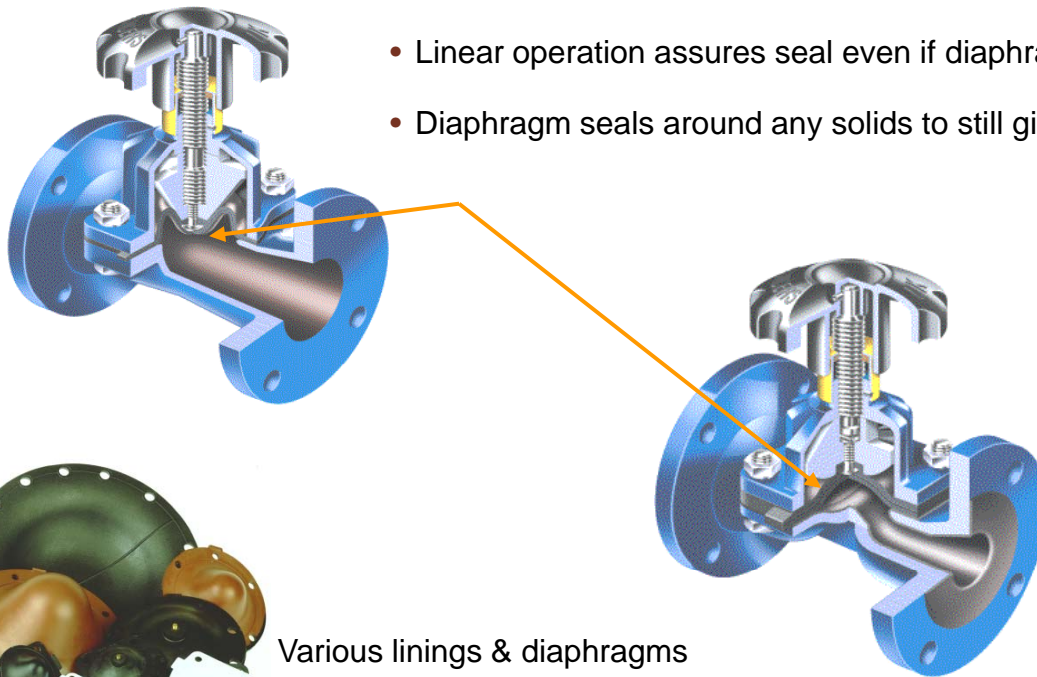
Caustic Soda

Click text above to return to a subprocess

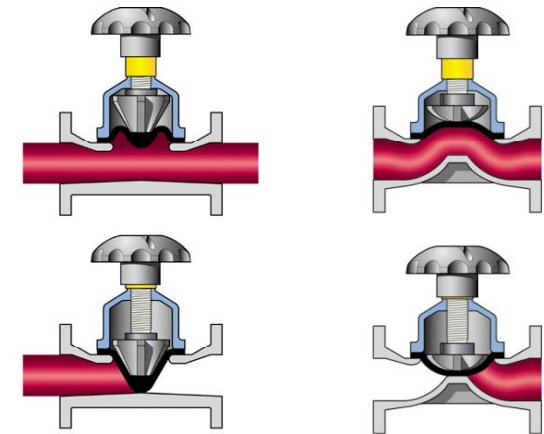
Return to "All Problems" page.

Saunders Diaphragm Valve

- Working parts are isolated from line media by the diaphragm.
- Smooth flow characteristics allied with soft linings and diaphragms minimize abrasion.
- Linear operation assures seal even if diaphragm indicates signs of wear.
- Diaphragm seals around any solids to still give 100% shut off



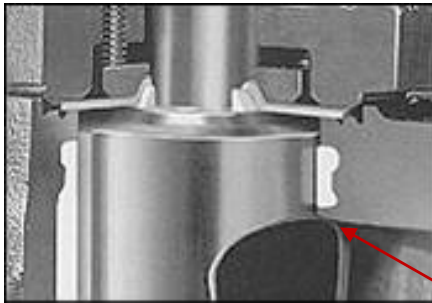
Various linings & diaphragms for abrasion resistance



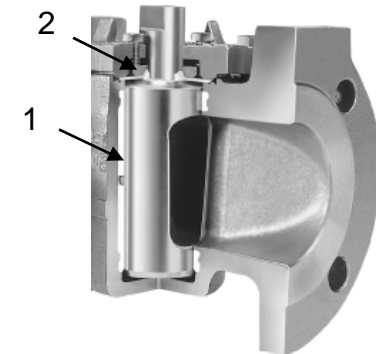
A Straight Through valve can handle up to 100% solids

A type Weir valve typically handles up to 15% solids

XOMOX Sleeved Plug Valve

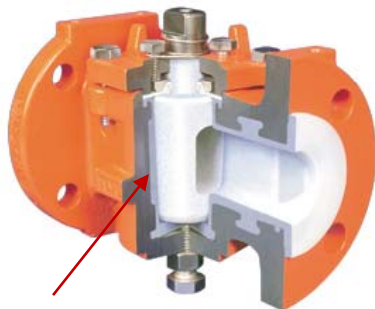


- All seating surfaces are protected by the plug when the valve is in the open or closed position.
- By design, the plug does not drag solids through the secondary seal (rotary seal), thus preventing this external leak path
- 360° port lips protect sleeve from abrasion & erosion



Two independent sealing systems provide double protection against downstream leakage and external emissions.

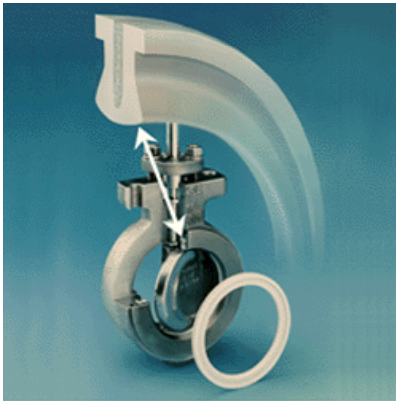
XOMOX Lined Plug Valve



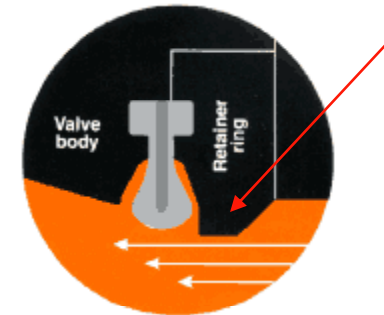
- Robust full-circumferential in-line seal, design ensures upstream & downstream sealing.

← Back to "Abrasion" page. | Forward to Additional Valve Solutions →

XOMOX High Performance Butterfly Valve



- Retainer ring protects seat from abrasion and erosion
- Optional hard facing on disc available



XOMOX Lined Butterfly Valve



- For larger sized lines, butterfly valves are a lighter and less bulky option for tight shutoff



Back to "Abrasion" page.



Internal Corrosion

Line media corrodes metallic valve components and can result in external emissions or an inability to maintain shutoff.



Click on a solution to view CRANE product features

Resistoflex Lined Piping

XOMOX Lined Products

Lined Ball Valves

Lined Butterfly Valve

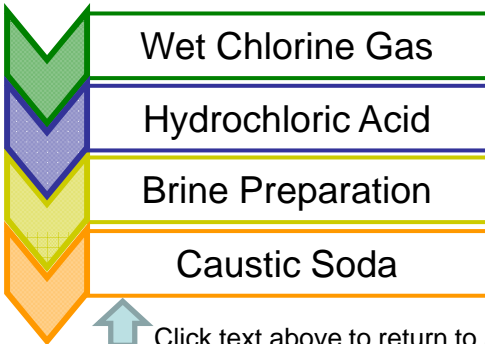
Lined Plug Valves

Lined Accessories

Saunders Lined Diaphragm Valves

XOMOX Sleeved Plug Valves
XOMOX High Performance Butterfly Valves

Problem found within



Click text above to return to a subprocess

Return to "All Problems" page.

Wet Chlorine Gas	Brine Preparation
Hydrochloric Acid	Caustic Soda

Resistoflex Lined Pipe and Fittings



- PTFE and Polypropylene liners offers excellent protection against corrosion
- Both bent pipe and spool options available

How does CRANE ChemPharma Resistoflex measure up to other materials for Chlor-Alkali applications?

Click here to
[View a comparison](#) of PTFE-lined pipe against

- Glass Lined P&F
- Exotic Alloys
- Other PTFE-Lined Pipe Manufacturers

Not sure if PTFE-lined pipe will work for you?

Click here to
[View Myths & Facts](#) about PTFE-lined pipe



← Back to "Corrosion" page. | Forward to Additional Product Solutions →

Wet Chlorine Gas	Brine Preparation
Hydrochloric Acid	Caustic Soda

Resistoflex Lined Pipe and Fittings

How does CRANE ChemPharma Resistoflex measure up to other materials for Chlor-Alkali applications?

vs. Glass Lined P&F

- | | |
|---|--|
| <ul style="list-style-type: none"> • Up to 25% material cost savings verses Glass Lined P&F • Equivalent in full vacuum rating at elevated temperatures | <ul style="list-style-type: none"> • Shorter delivery lead time • More user friendly (easier to install) • Glass Lined P&F susceptible to thermal shock and mechanical damage (brittle) |
|---|--|



vs. Exotic Alloys

- | | |
|---|--|
| <ul style="list-style-type: none"> • Up to 50% - 75% material cost savings verses exotic alloys • Alloy installation requires highly skilled (and highly paid) welders and costly radiography testing | <ul style="list-style-type: none"> • Less volatile pricing • Shorter delivery lead times • Equivalent performance up to 450°F • PTFE liner protects the fluid from leaching (metallic component contamination) |
|---|--|



vs. Other PTFE-Lined Pipe Manufacturers

- | | |
|---|--|
| <ul style="list-style-type: none"> • Improved permeation resistance • Superior vacuum rating at elevated temperatures | <ul style="list-style-type: none"> • Longer life span and lower total cost of ownership |
|---|--|



← Back to "Corrosion" page. | Forward to Additional Product Solutions →

[Click here to View Myths & Facts](#) about PTFE-lined pipe

Wet Chlorine Gas	Brine Preparation
Hydrochloric Acid	Caustic Soda

Resistoflex Lined Pipe and Fittings

Note sure if PTFE-lined pipe will work for you?

Common misunderstandings exist regarding the limitations of PTFE-lined pipe within the chemical industry. Product quality and manufacturing technique play a large role in the success of a product within a specific application.

In other words, **not all PTFE-lined pipe is restricted to such limited operating parameters.**

MYTHS

about PTFE-lined pipe:

Cannot be used in vacuum applications

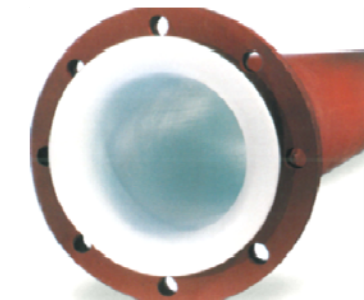
Maximum temperature capability is 100 C / 212 F

FACTS

about Resistoflex PTFE-lined pipe:

Rated for full vacuum as a standard

Maximum temperature capability is 232 C / 450 F.



Click here to

View a comparison of PTFE-lined pipe against

- Glass Lined P&F
- Exotic Alloys
- Other PTFE-Lined Pipe Manufacturers

← Back to "Corrosion" page. | Forward to Additional Product Solutions →

Wet Chlorine Gas	Brine Preparation
Hydrochloric Acid	Caustic Soda

XOMOX Lined Products

The wetted surfaces of Crane Lined Pipe and Valve Products fully protect all metallic parts from line media corrosion.

XOMOX Lined Valves

Fully lined plug, ball, and butterfly valves have coatings that extend over shafts to prevent corrosion.



XOMOX Lined Accessories

All wetted components are fluoropolymer lined



Strainers Vertical Poppet Horizontal Poppet



Ball, Piston, and Swing check

← Back to "Corrosion" page. | Forward to Additional Product Solutions →

Saunders Lined Diaphragm Valves



The wetted surfaces in contact with sulfuric acid (the lining and the diaphragm) fully protect all metallic parts.



Back to "Corrosion" page. | Forward to Additional Product Solutions



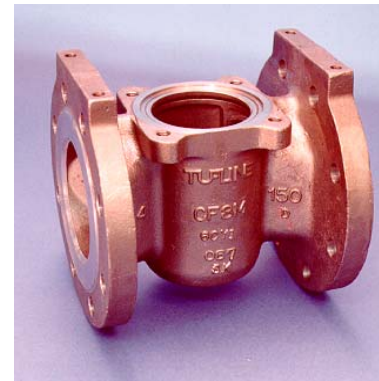
XOMOX

High Performance Butterfly Valve



XOMOX

Sleeved Plug Valve



- All wetted parts available in Stainless Steel, Alloy C4, Titanium, and Monel for maximum corrosion resistance
NOTE: Titanium can be used only for wet chlorine!
- Chlorine service valves are protected from over pressure with relief devices and are cleaned, degreased, and bagged



Back to "Corrosion" page.

Valves Jam in Place

Deposits can form on valve components and create difficulty in operation. Especially in larger valves, operating torques can become substantial.

Click on a solution
to view CRANE
product features



Saunders Diaphragm Valve



XOMOX High Performance Butterfly Valves

Problem found within

Brine Preparation

Caustic Soda



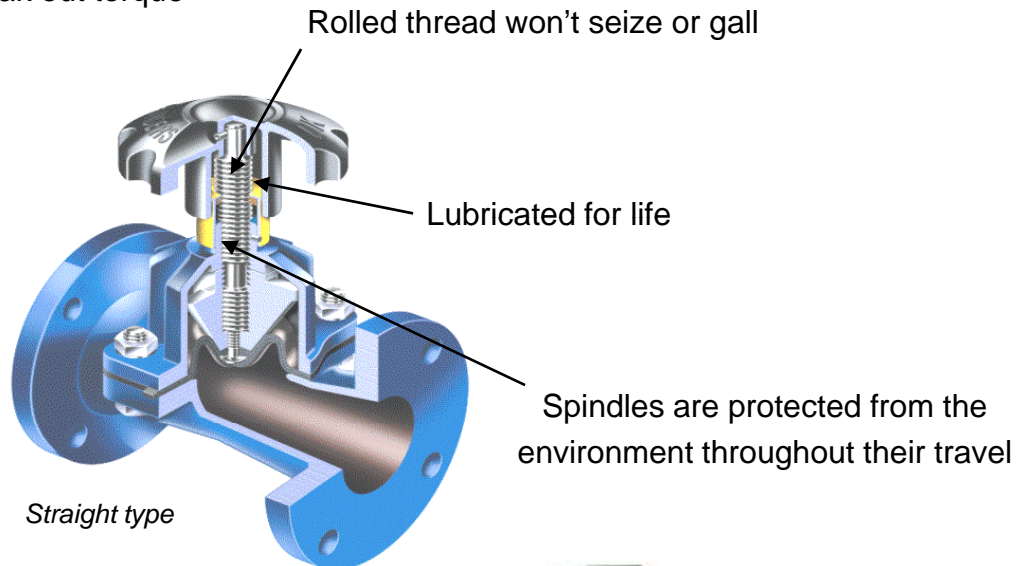
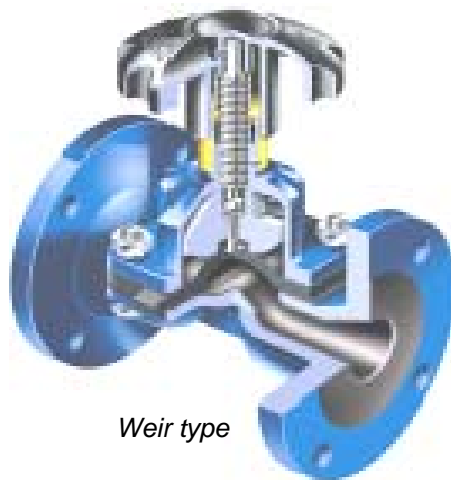
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Return to "All Problems" page.

Saunders Diaphragm Valves

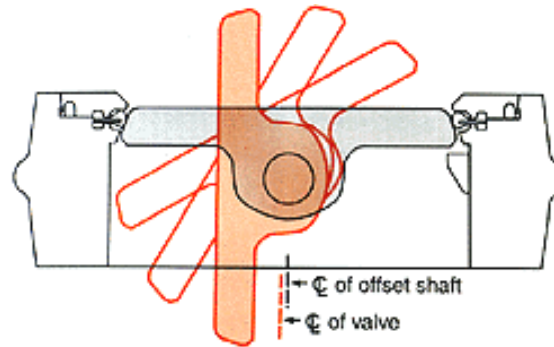
Linear motion means no break in or break out torque



Actuators are also protected throughout their travel

← Back to "Valve Jams" page. | Forward to Additional Product Solutions →

XOMOX High Performance Butterfly Valve



Double offset means much lower operating torques

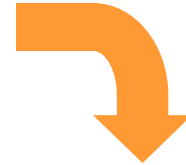


Smaller torque also means a smaller actuator

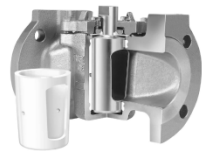


Back to "Valve Jams" page.

High Temperature
Corrosion (>100°C)



Click on a solution
to view CRANE
product features



XOMOX Sleeved Plug Valves



XOMOX High Performance Butterfly Valves

Problem found within

Caustic Soda



Click text above to return to a subprocess



Return to "All Problems" page.

XOMOX High Performance Butterfly Valve



XOMOX Sleeved Plug Valve



- Seals are PTFE and impervious to almost all chemicals
- No body cavities where flow media can accumulate

Nickel Options in both HPBV and SPV



Back to "Corrosion" page.

Permeation

Permeation occurs when molecules from the media pass into and through a barrier material to an area of lower concentration.

In wet chlorine applications, chemical molecules can permeate through valve or pipe lining and become trapped between the lining and the metal body.

These trapped molecules can either escape to the atmosphere or can build up pressure and cause valve or pipe failure.

Click on a solution to view CRANE product features



Resistoflex Lined Pipe and Fittings



Valves: Saunders Diaphragm Valves
XOMOX Lined Valve Products

Problem found within

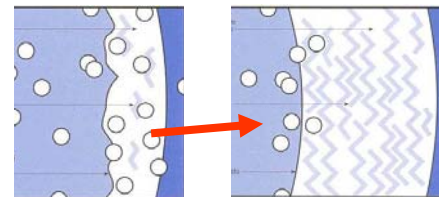
Wet Chlorine Gas



Click text above to return to a subprocess



Return to "All Problems" page.



Permeation is reduced by:

- Increasing barrier thickness
- Increasing barrier crystallinity
- Smoothing the barrier wall finish
- Decreasing boundary gradients
- Using less permeable materials!

Resistoflex Lined Pipe and Fittings



- Improved permeation resistance over other PTFE manufacturers
- Liner thickness is greater than ASTM F1545 requirements



- Resistoflex pipe & hose has super smooth bore finish to help minimize permeation



Back to "Permeation" page. | Forward to Additional Product Solutions



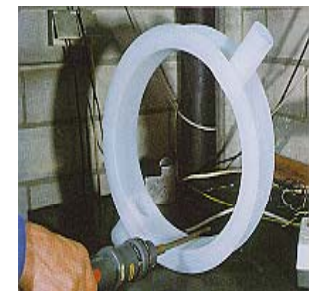
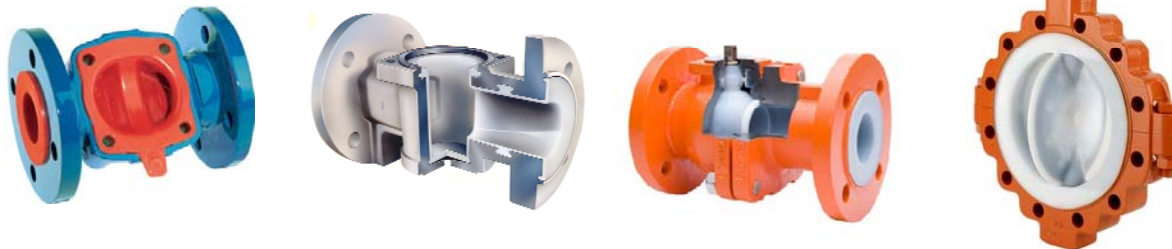
Saunders Lined Diaphragm Valves



3 Piece Interlayer diaphragm gives maximum permeation resistance

XOMOX Lined Products

All Saunders and Xomox lined products have minimum 3mm plastic lining thickness to avoid permeation



Butterfly seats are made as a single piece of uniform thickness



Back to "Permeation" page.

Extended Maintenance Downtime

Valve repair often involves a production shutdown.

Whether it is scheduled or emergency maintenance, downtime decreases the profitability of a plant.

Extended downtime can be avoided through quick and easy valve repair features and also through extended valve life.



Click on a solution to view CRANE product features



Saunders Diaphragm Valves



XOMOX Valve Products

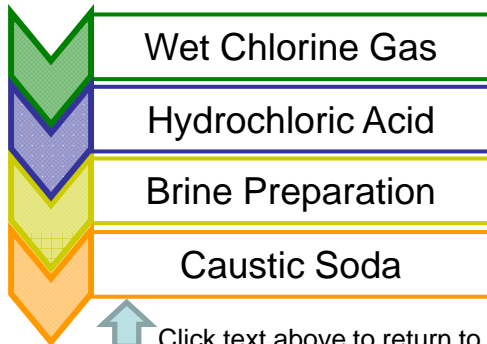
Problem found within

Wet Chlorine Gas

Hydrochloric Acid

Brine Preparation

Caustic Soda



Click text above to return to a subprocess

All ChemPharma Products

- Extended downtime can be avoided through quick and easy valve repair features.
- Crane's worldwide After Sales & Service team can support shutdown and turnaround needs.

Return to "All Problems" page.

Wet Chlorine Gas	Brine Preparation
Hydrochloric Acid	Caustic Soda

Saunders Diaphragm Valves



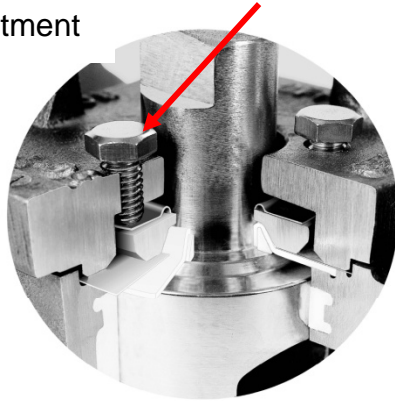
CRANE's Worldwide After Sales & Service team
can support turnaround needs

Wet Chlorine Gas	Brine Preparation
Hydrochloric Acid	Caustic Soda

XOMOX Valve Products

XOMOX Sleeved Plug Valves

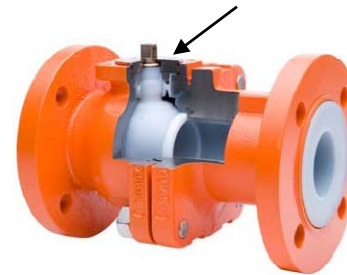
Fully adjustable in-line seal provides quick and easy adjustment without requiring a shutdown, saving on valve repair/replacement.



- Cartridge design
- Easily repaired in line
- Developed for remote manual & robotic repair

Easi-Sleeve Design

XOMOX Lined Ball Valves



Fully adjustable in-line seal provides quick and easy adjustment.

XOMOX High Performance Butterfly Valves



Retainer ring can be quickly and easily removed to change seal ring

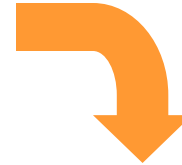
CRANE's Worldwide After Sales & Service team can support turnaround needs

← Back to "Downtime" page.

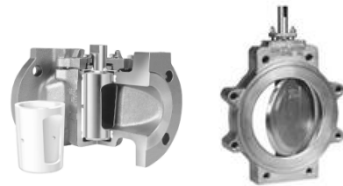
High Cost of Valve Repair & Replacement

In demanding services, the frequency and cost of repairing and replacing valves and their components can easily add up and significantly increase operating costs.

Click on a solution to view CRANE product features



Saunders Diaphragm Valves



XOMOX Valve Products

Problem found within

Wet Chlorine Gas

Hydrochloric Acid

Brine Preparation

Caustic Soda

All ChemPharma Products

- Features that provide solutions to Chlor-Alkali manufacturing problems give Crane products an extended valve life and lower the customer's overall cost of ownership.
- Extended downtime can be avoided through quick and easy valve repair features.
- Crane's worldwide After Sales & Service team can support repair and replacement needs.

Click text above to return to a subprocess

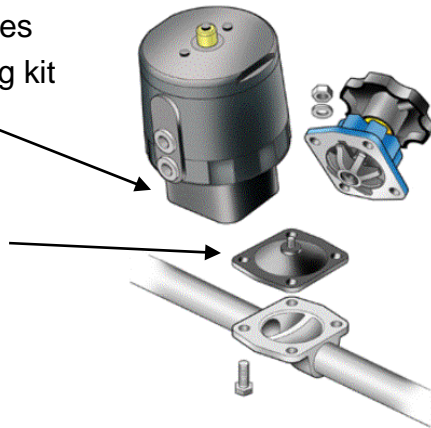
Return to "All Problems" page.

Wet Chlorine Gas	Brine Preparation
Hydrochloric Acid	Caustic Soda

Saunders Diaphragm Valves

Actuator retrofit does not require mounting kit

Diaphragm is the only wear part



ETFE (Tefzel) is a lower cost alternative to PFA or PTFE



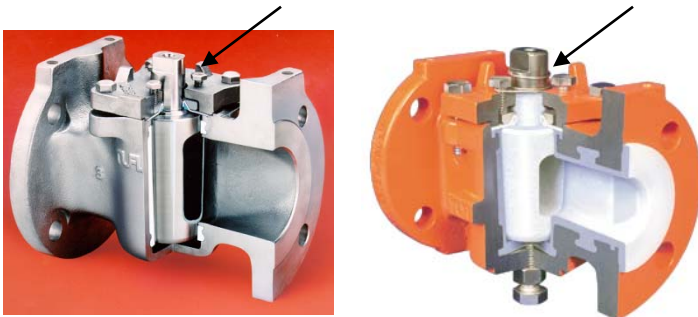
It also has an improved permeation & particulate resistance

Wet Chlorine Gas	Brine Preparation
Hydrochloric Acid	Caustic Soda

XOMOX Valve Products

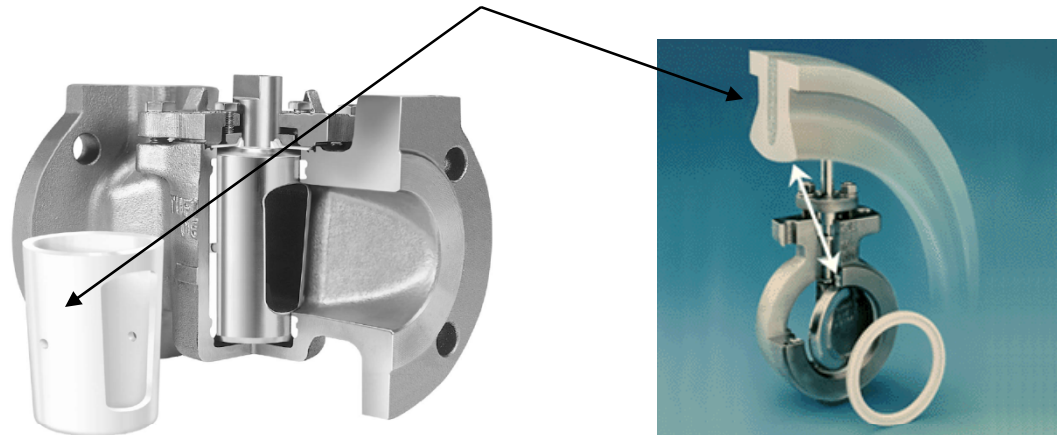
XOMOX Sleeved Plug Valves

Plug & seat adjustment extend valve life



XOMOX High Performance Butterfly Valves

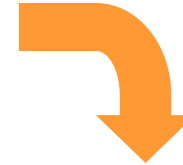
Seats are easily replaced



External Corrosion

External corrosion leads to reduced service life of the valve.

It can cause working parts to seize and become inoperable.

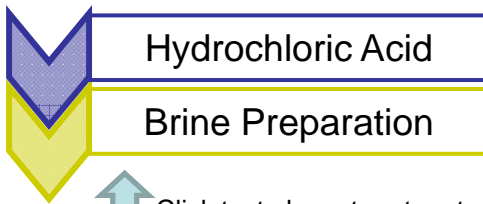


Crane Valve Coatings

Valves with special coatings that resist external corrosion are available.

Visit www.cranepharmachem.com and “Ask our Expert” for specific coatings and applications.

Problem found within



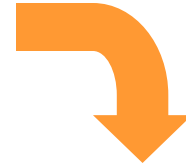
Click text above to return to a subprocess



Return to “All Problems” page.

Thermal Cycling and Vacuum Collapse

As process temperatures fluctuate between high and low extremes, delayed seal “rebound” can create an external leak path in valves. For lined piping, thermal cycling can result in liner collapse in inferior products.



Click on a solution to view CRANE product features



Resistoflex Lined Pipe



XOMOX Sleeved Plug Valve

Problem found within

Dry Chlorine



Click text above to return to a subprocess



Return to “All Problems” page.

Resistoflex Lined Pipe and Fittings



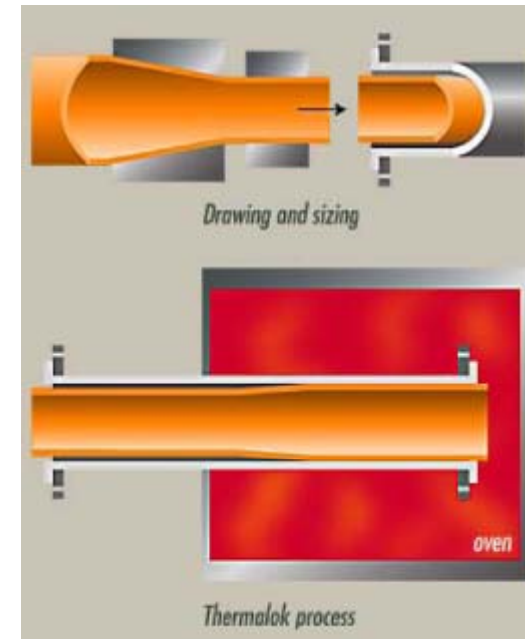
- Resistoflex Thermalok steel pipe and PTFE liner acts as one integral piece. This unique process provides pipe with dimensional stability under vacuum, pressure, and thermal cycling which prevents liner buckling and cracking. Temperature cycling minimally affects Resistoflex Heavy Duty PTFE Pipe & Fittings.

Resistoflex Hoses

- Designed specifically for chlorine service
- Meets Chlorine Institute recommendations (Pamphlet 6, Appendix A)



Convolutions and braiding work together to resist vacuum collapse



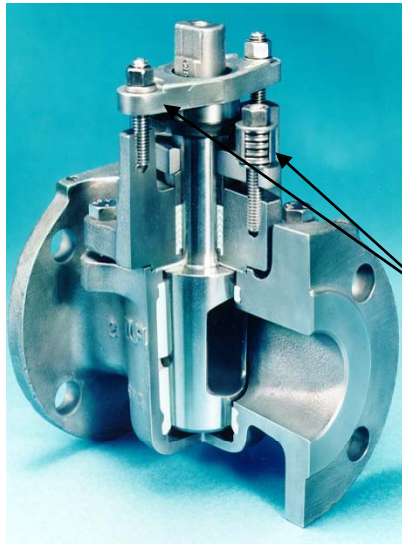
Thermalok piping system for vacuum resistance



Back to "Temperature Cycling" page. | Forward to Additional Product Solutions

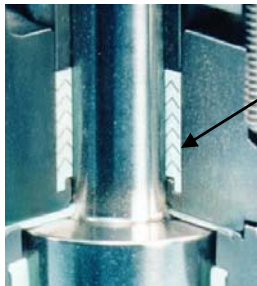


XOMOX Sleeved Plug Valves



XP Design

Independent primary & stem seal adjustment



Patented "shrink seal" negates the effect of thermal cycling

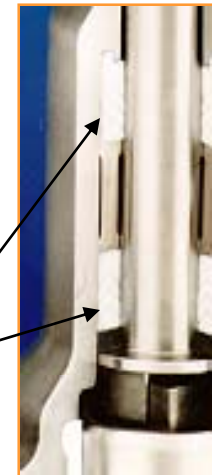
Severe Service Valve



Optional bleed off port (Also available on XP)

Live loaded double packed stem

Enhanced cover bonnet seal



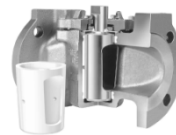
SSV also has additional stem shrink seal

← Back to "Temperature Cycling" page.

External Ingress Corrosion

If moisture from the atmosphere leaks into a dry chlorine line, rapid corrosion can result. Preventing internal ingress in this process area is critical.

Click on a solution
to view CRANE
product features



XOMOX Sleeved Plug Valve

Problem found within

Dry Chlorine



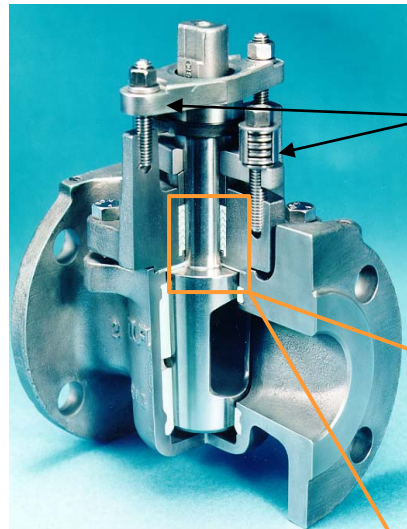
Click text above to return to a subprocess



Return to "All Problems" page.

XOMOX Sleeved Plug Valves

XP Design

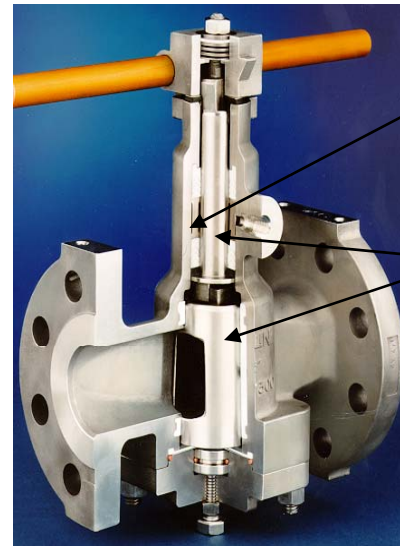


Independent primary & stem seal adjustment

Stem seal protects against internal ingress.

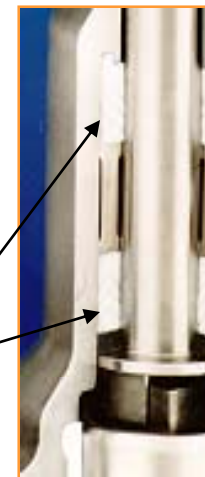


Severe Service Valve



Live loaded double packed stem

Separate plug & stem removes angular deflection potential



SSV has an additional stem seal



Back to "External Ingress Corrosion" page.

Transfer Hose Leakage

Loading and unloading facilities are a key problem area for external leakage. Transfer hoses often require frequent maintenance or replacement.

Click on a solution to view CRANE product features



Resistoflex Lined Hoses

Problem found within



↑ Click text above to return to a subprocess

← Return to "All Problems" page.

	Liquid Chlorine	
Hydrochloric Acid		Caustic Soda

Resistoflex Lined Hoses



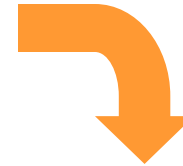
- Designed specifically for chlorine service
- Meets Chlorine Institute recommendations (Pamphlet 6, Appendix A)
- 5 to 1 Burst Safety Rating
- Many types of hose liners and outer covers are available

← Back to "Transfer Hose Leakage" page.

Sealing Systems for External Emissions

Hazardous media can reach the environment through various potential leak paths, including the valve stem and flange leaks.

Click on a solution to view CRANE product features



XOMOX Sleeved Plug Valves

XOMOX High Performance Butterfly Valves

Saunders Diaphragm Valves

XOMOX Lined Products

Lined Ball Valves

Lined Butterfly Valve

Lined Plug Valves

Resistoflex Pipe and Fittings

Lined Pipe & Fittings

Flange Solutions

Problem found within

Chlorine

Hydrogen

Hydrochloric Acid



Click text above to return to a subprocess

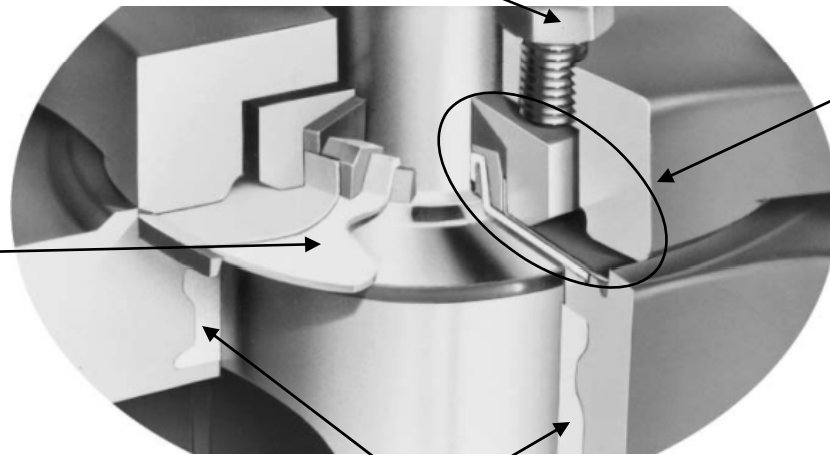


Return to "All Problems" page.

XOMOX Sleeved Plug Valves

Bolts in the top cover provide quick and easy adjustment to adjust-out potential stem leakage

XOMOX's standard dual stem seal includes two independent environmental seals



Optional **tertiary top seal** increases leakage protection.

Secondary Seal provides a wide comprehensive seal along the top edge of the plug and the stem.

Primary Seal (sleeve) is around the circumference of the plug. Flow media is prevented from reaching the stem.

Page 1 of 3
View More





	Chlorine
Hydrochloric Acid	Hydrogen

XOMOX Sleeved Plug Valves

Independent primary & stem seal adjustment

XP Design

Live loaded stem

Severe Service Design

Independent plug & stem eliminate side loading on the packing

Patented "shrink seal" negates the effect of thermal cycling

Severe Service Valve has an additional stem seal

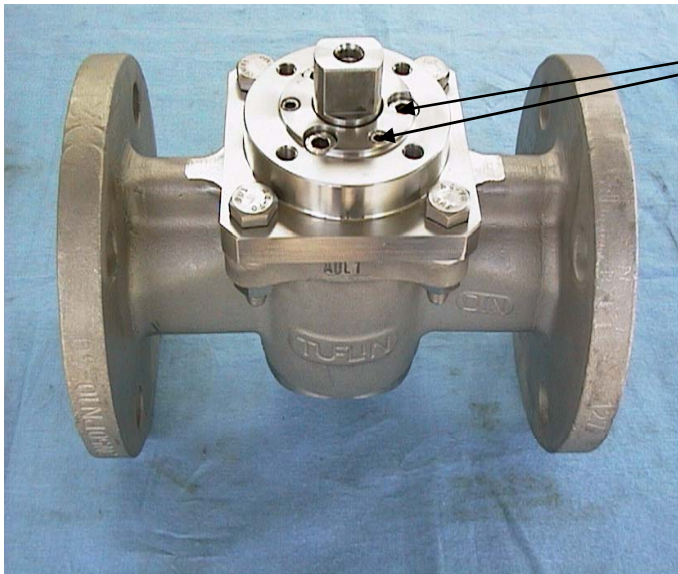
Page 2 of 3
View More ➔

⬅ Back to "Sealing Systems" page. | Forward to Additional Product Solutions ➔

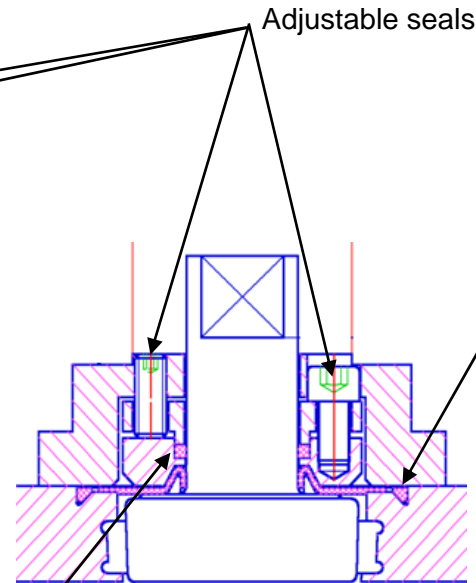


	Chlorine	
Hydrochloric Acid		Hydrogen

XOMOX Sleeved Plug Valves



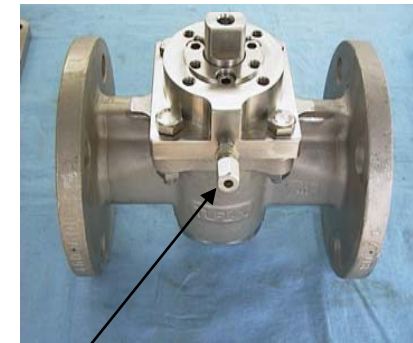
3D Design



Adjustable seals

Additional cover seal

Additional stem seal



3DL Design

Optional monitoring port

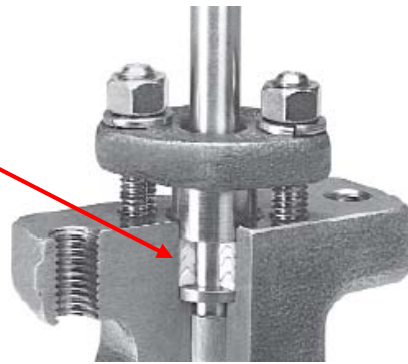
← Back to "Sealing Systems" page. | Forward to Additional Product Solutions →



	Chlorine	
Hydrochloric Acid		Hydrogen

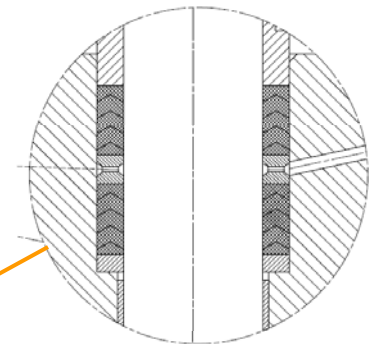
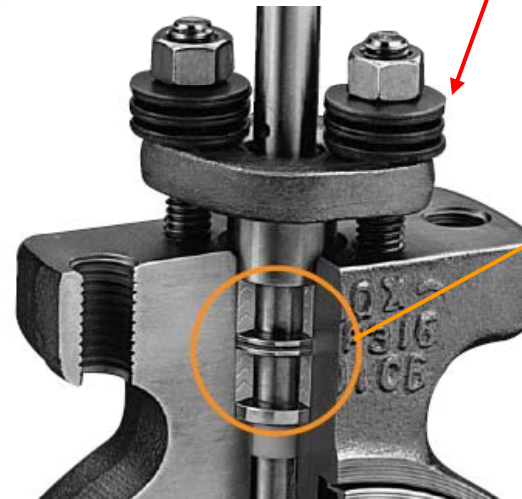
XOMOX High Performance Butterfly Valve

Durable, standard V-ring packing



Closed body offers a safer design compared to the alternative of drilling a through-hole.

Auxiliary live-loaded packing option

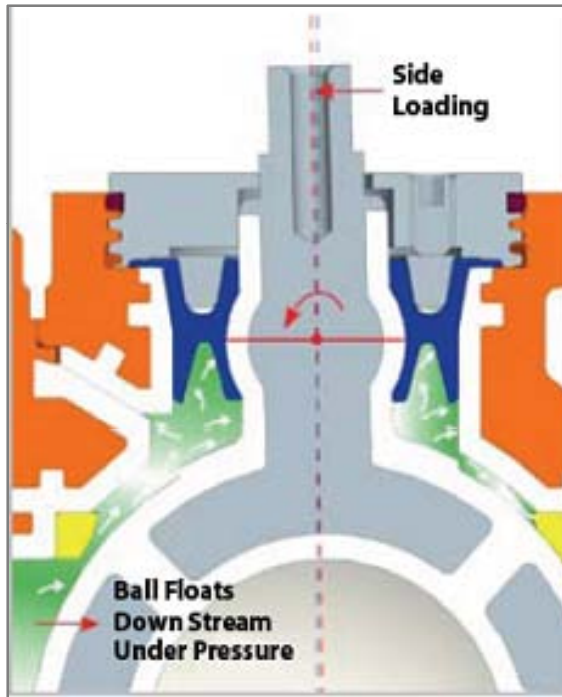


Two full sets of packing separated by lantern ring, also available with an optional leak monitoring port

← Back to "Sealing Systems" page. | Forward to Additional Product Solutions →

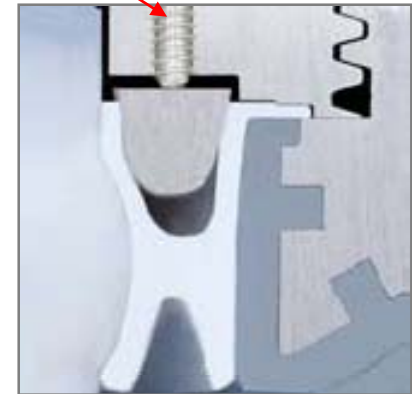
	Chlorine	
Hydrochloric Acid		Hydrogen

XOMOX Lined Ball Valve



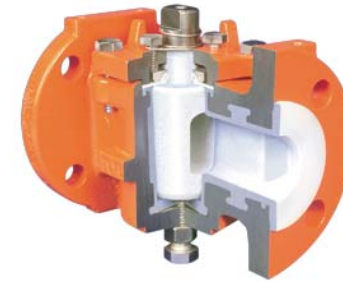
Innovative "pressure assisted" SX seal device providing the highest protection from fugitive emissions

Adjustable shaft seals

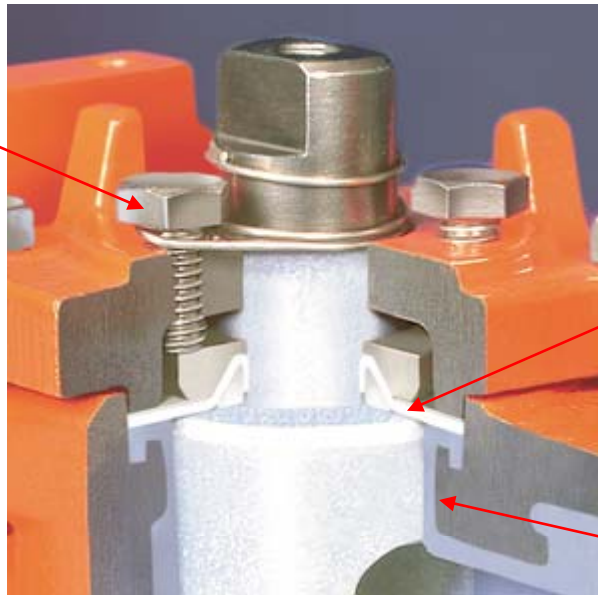


	Chlorine	
Hydrochloric Acid		Hydrogen

XOMOX Lined Plug Valve



Adjustable shaft seals

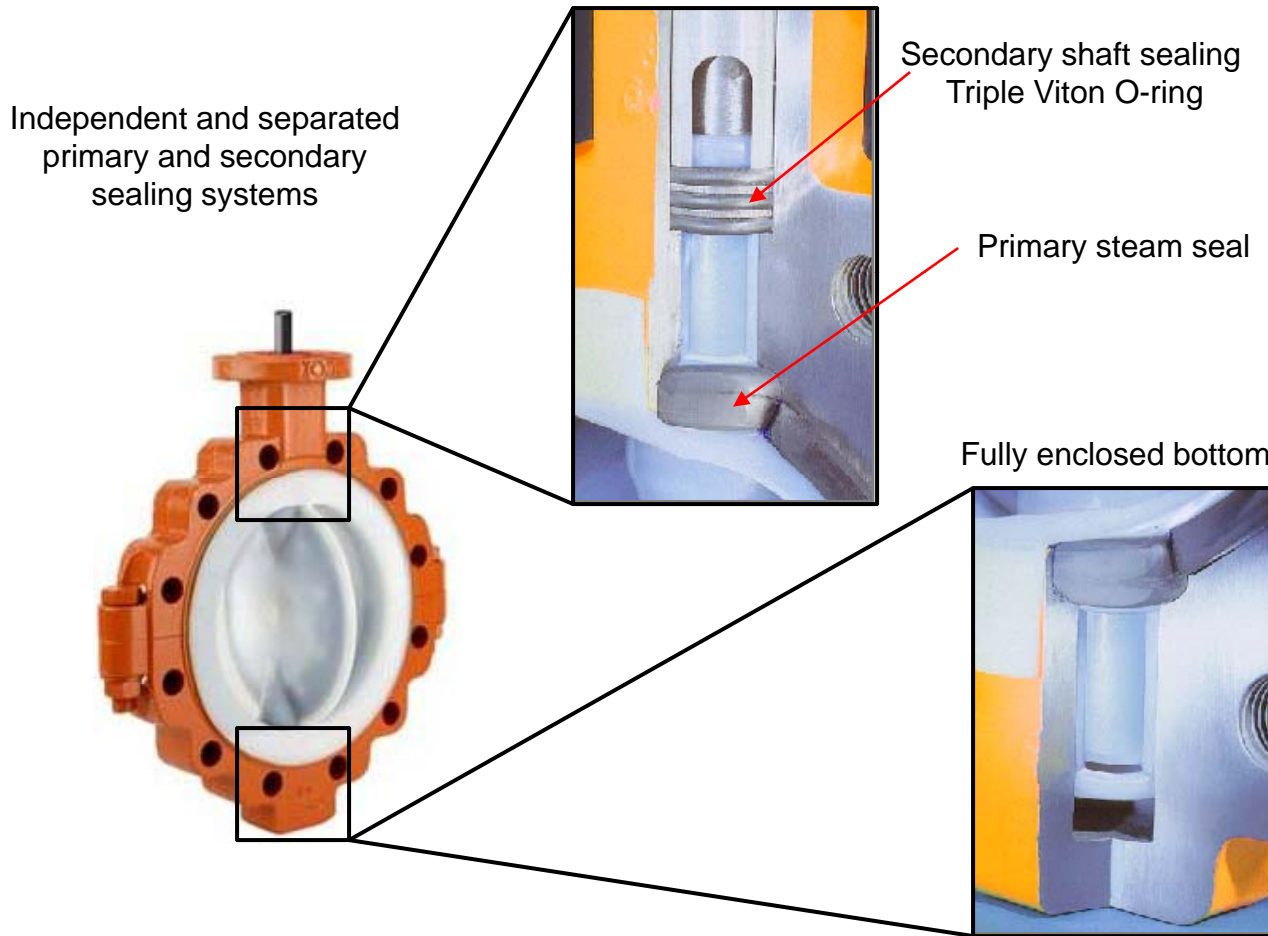


The **secondary stem seal** system provides a wide comprehensive seal along the top edge of the plug and the stem

The **primary stem seal** is around the circumference of the plug. Flow media is prevented from reaching the stem

	Chlorine	
Hydrochloric Acid		Hydrogen

XOMOX Lined Butterfly Valve

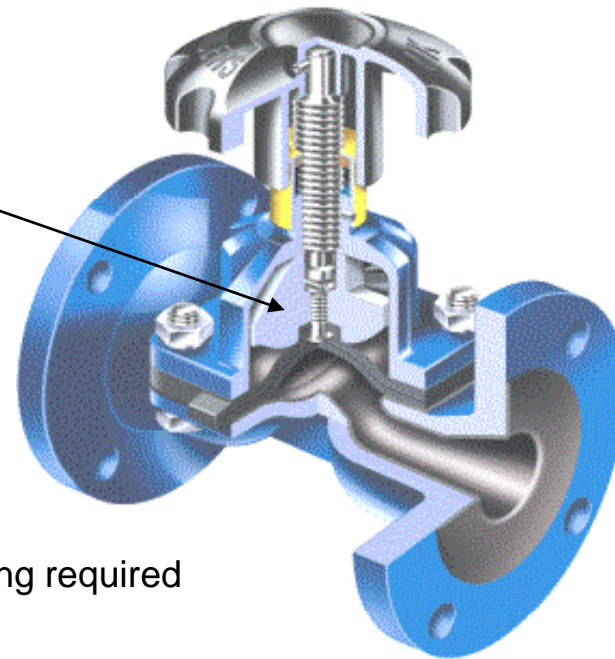


Live loaded secondary sealing

← Back to "Sealing Systems" page. | Forward to Additional Product Solutions →

Saunders Diaphragm Valves

One of few valve types classed as
“emissionless by design”



Isolated working parts so no packing required



Back to “Sealing Systems” page. | Forward to Additional Product Solutions



Resistoflex Lined Pipe

- Lining thickness meets or exceeds ASTM F1545 standards

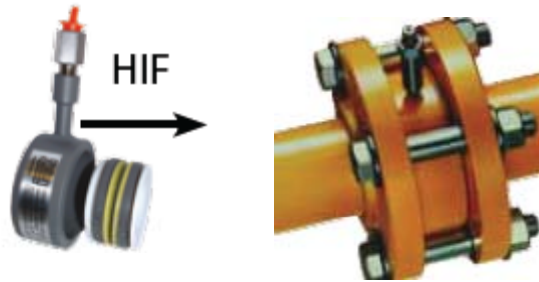
- Custom shapes and branches to **reduce potential leak points**



- Up to 3 bends possible per spool which **reduces flanges**



Resistoflex Flange Solutions



- High Integrity Flange (HIF) allows a virtually leak-free joint to be installed between any section of piping
- Eliminates the need to re-torque (virtually maintenance free)

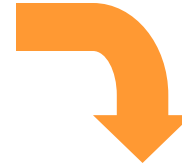


- CONQUEST® coupling connections allow for flangeless pipe

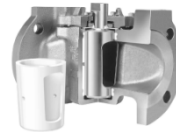
Deposits / Scaling (downstream leakage)

Solids deposits prevent valves from achieving complete closure.

Click on a solution
to view CRANE
product features



Saunders Diaphragm Valves



XOMOX Sleeved Plug

Problem found within

Brine Preparation

Caustic Soda



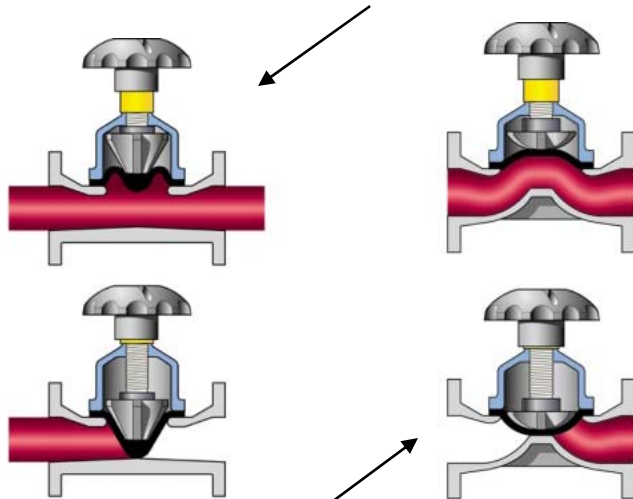
Click text above to return to a subprocess



Return to "All Problems" page.

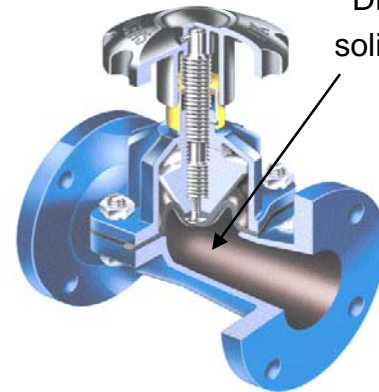
Saunders Diaphragm Valves

Straight Through valve can handle up to 100% solids



A type Weir valve typically handles up to 15% solids

Pocketless flow to avoid build up on sealing surfaces



Diaphragm seals around any solids to still give 100% shut off

Diaphragm movement breaks scale

XOMOX Sleeved Plug Valves

No body cavities where flow media can accumulate and damage sealing surfaces



360° lips provide a self-cleaning action to remove scaling



Back to "Deposits/Scaling" page.

Bi-directional Sealing (downstream leakage)

The material specification for wet chlorine and dry chlorine is critical. If one media reaches the pipeline of another, rapid pipe and valve deterioration can result.

Click on a solution
to view CRANE
product features



XOMOX Sleeved Plug Valve and Lined Plug Valve



XOMOX High Performance Butterfly Valve and Lined Butterfly Valve



Saunders Diaphragm Valve

Problem found within

Wet Chlorine Gas

Dry Chlorine Gas

Click text above to return to a subprocess

Return to "All Problems" page.

XOMOX Sleeved Plug Valves and Lined Plug Valves



Full circumferential in-line seal design provides upstream and downstream sealing

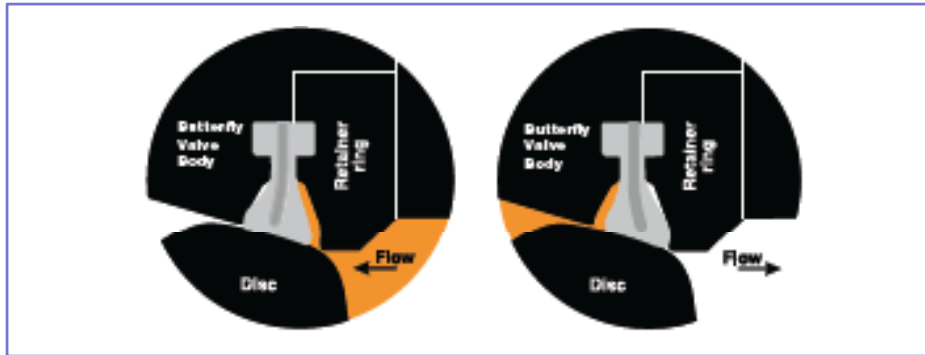


Severe Service Valve (SSV) has additional protection against external leakage

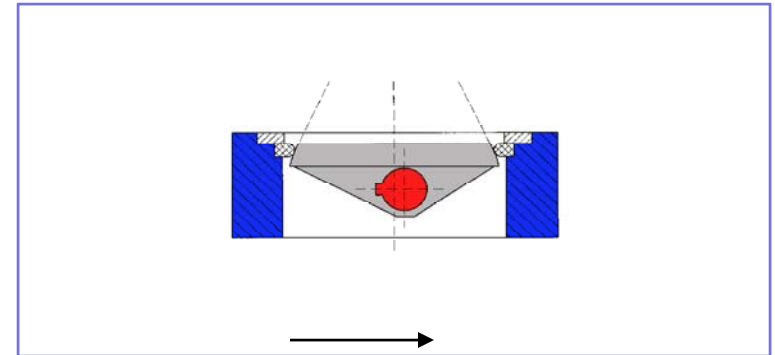
XOMOX High Performance Butterfly Valves



- Leakage protection is provided regardless of direction of flow



- Double eccentric design allows uninterrupted seal

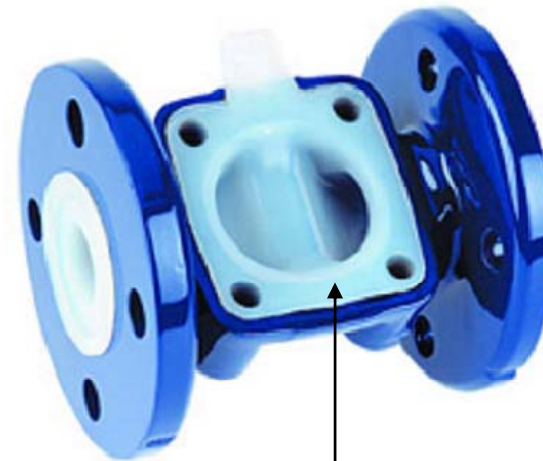


Saunders Diaphragm Valves

Diaphragm and lining
give bubble tight seal



Sealing ribs
on diaphragm
to aid sealing



Lining locked in
place to ensure
smooth even
sealing surface

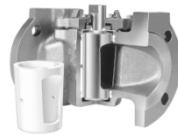


Back to "Bi-directional Sealing" page.

Seat Wear

Normal valve operation can wear the valve seat and reduce its sealing ability.

Click on a solution
to view CRANE
product features



XOMOX Sleeved Plug Valve

Problem found within

Liquid Chlorine

Hydrochloric Acid

Caustic Soda

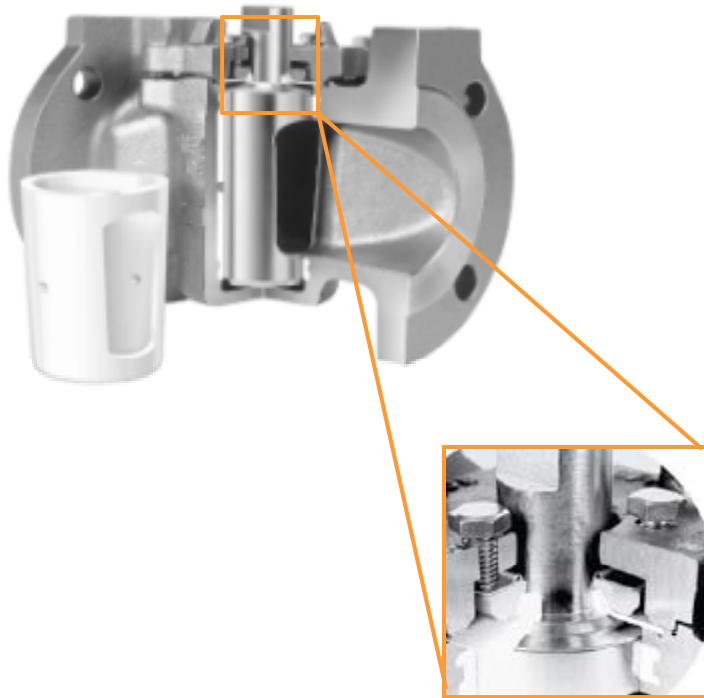


Click text above to return to a subprocess



Return to "All Problems" page.

XOMOX Sleeved Plug Valves



- Seating surfaces are protected by the plug when the valve is in the open or closed position
- Bolts in the top cover provide quick and easy adjustment to secure the seat seal
- Two independent sealing systems provide double protection against in-line leakage

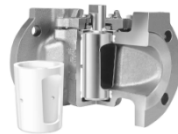


Back to "Seat Wear" page.

Leak Monitoring

Leak detection is a key aspect of emissions prevention.

Click on a solution to view CRANE product features



XOMOX Sleeved Plug Valve



XOMOX High Performance Butterfly Valve

Problem found within

Chlorine

Hydrochloric Acid

Click text above to return to a subprocess

Return to "All Problems" page.



Chlorine
Hydrochloric Acid

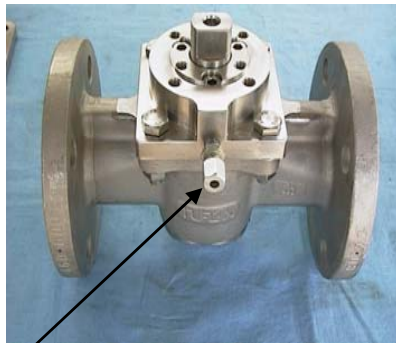
XOMOX Sleeved Plug Valves

XP Design

Severe Service Valve

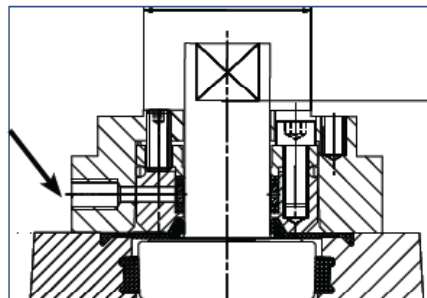


3D Design



3DL Design

Optional monitoring port



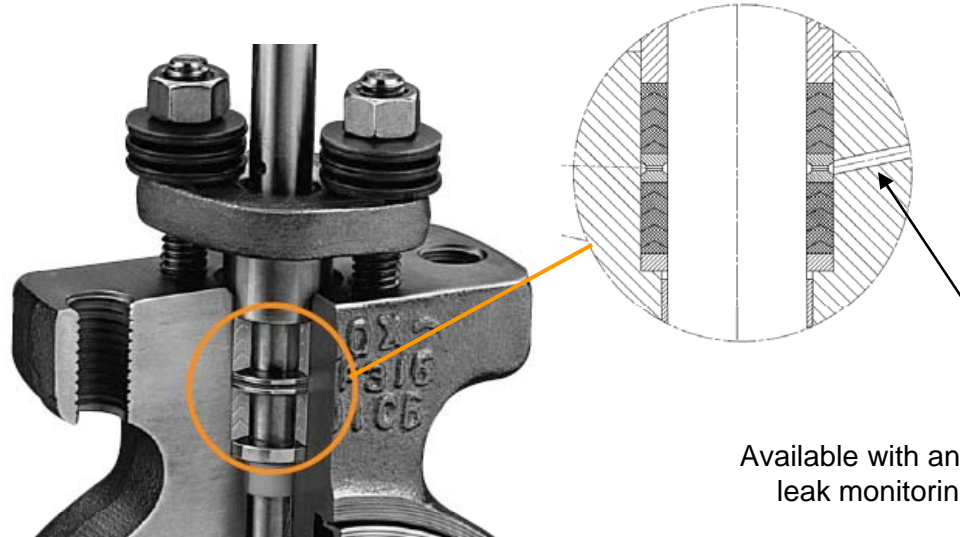
Optional leak monitoring port can detect leakage before it reaches the atmosphere



Back to "Leak Monitoring" page. | Forward to Additional Product Solutions



XOMOX High Performance Butterfly Valve



Available with an optional
leak monitoring port