

# XOMOX<sup>®</sup>

brands you trust.



Solutions for  
Pulp and Paper Industries  
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# Chemical Pulp Processing: Digester & Liquor Recovery

## Designed with pulp and paper in mind.

Xomox Tuflin Sleeved Plug Valves are designed for handling causticized green liquor and heavy black liquor in the kraft process. Knowledgeable plant personnel at sulfite and kraft mills depend on their reliable, proven performance.

## For the most economical, flexible, and compact fluid handling systems.

Bi-directional flow, simple actuation, lightweight, compact design, and multiport configurations all facilitate improved system design.

## Superior, long-lasting in-line sealing.

The inert PTFE sleeve completely surrounds the plug. The sleeve provides a large, circumferential sealing surface from port to port. Open, closed, or rotating, the seal is assured. No ball or gate valve can match this sealing power.

## Secure sealing with no cold-flow, deformation, blow-out, or rotation of the sleeve.

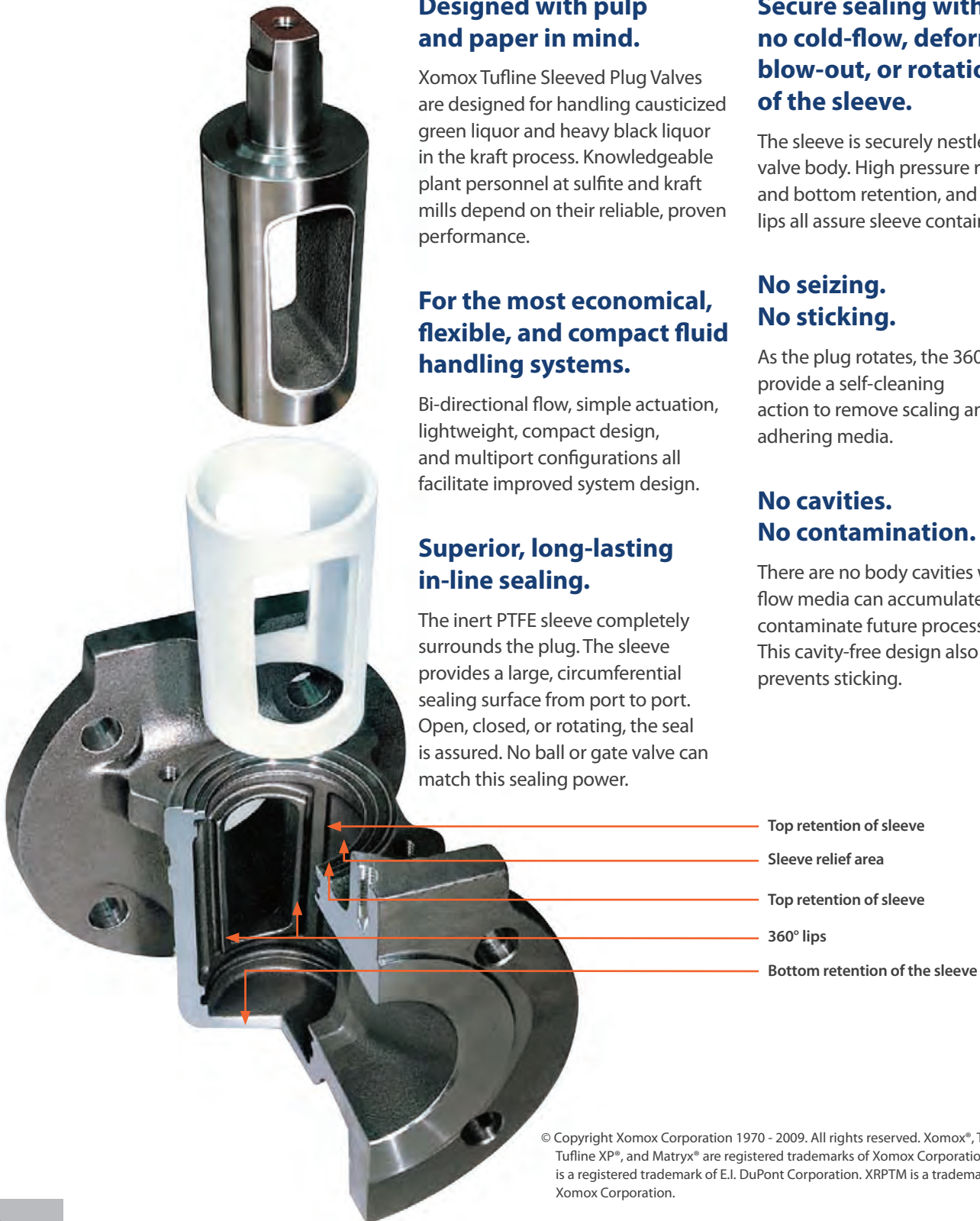
The sleeve is securely nestled in the valve body. High pressure ribs, top and bottom retention, and 360° port lips all assure sleeve containment.

## No seizing. No sticking.

As the plug rotates, the 360° port lips provide a self-cleaning action to remove scaling and adhering media.

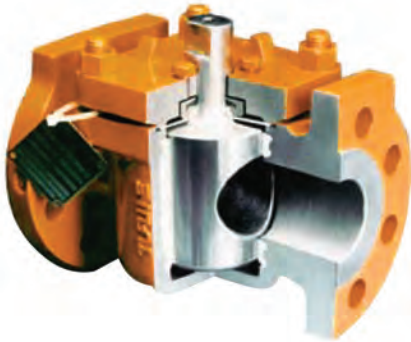
## No cavities. No contamination.

There are no body cavities where flow media can accumulate and contaminate future processing. This cavity-free design also prevents sticking.



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# Chemical Pulp Processing: Digester & Liquor Recovery



Above: Full-Port Sleeved Plug Valve.

## Valve freezing is virtually eliminated.

Other types of valves placed in causticized green liquor service often stick or “freeze”. This is due to sediment which collects and solidifies in the body cavities.

Tuflin Sleeved Plug Valves have no cavities to collect liquor residues, so sticking and freezing are unlikely.

## Scaling problems are easily overcome.

Scale build-up deteriorates gate valves and causes seat scoring in ball valves.

Scale build-up is prevented in Tuflin Sleeved Plug Valves by metal lips. These lips completely surround the port areas of the valve.

Any scale that collects on the plug while in the closed position is broken up by the lips when the valve is opened. The plug is wiped clean with each rotation of the plug.

Since scale is not a problem, Tuflin Sleeved Plug Valves perform well in lime mud applications. They are also excellent in caustic green liquor and black liquor services from evaporation to the recovery boiler.

## 360° lips assure superior steam purge service.

Most other sleeved plug valves have only partial lips at the port edges. These partial lips allow the PTFE sleeve to extrude into the flow path. Media flow is blocked and sleeve edges are eroded.

The exposed sealing area of ball valves is also vulnerable to extrusion and erosion.

## Handling higher pressures and temperatures.

In applications such as digester liquor feed, liquor recirculation, liquor sampling, vent, and digester gas-off, the Tuflin locked-in sleeve easily withstands higher pressures and temperatures. For applications with service temperatures up to 600°F, Tuflin XeniTh valves utilizing Tuflin-600 sleeves and seals are the proven choice.



In throttling applications, caged plug models assure soft seat protection from erosion. Turbulence is also reduced.



Above: Reduced-port 3-way valve.

Below: Full-port 3-way valve.



## Versatile and adaptable.

Tuflin Multiport Sleeved Plug Valves facilitate more efficient, economical, and flexible system design.

Tuflin Sleeved Plug Valves are available in 3-way, 4-way, and 5-way configurations. These are especially useful in bypass, coating, diverter, and weak-wash systems.

Optional sleeve materials include glass filled PTFE, Tuflin-475, and Tuflin-600 which can be used in steam purge lines.

Optional plug designs meet a broad range of control valve requirements.

Valves are available in ANSI Classes 150, 300, and 600.

Select from a wide variety of materials ranging from ductile iron to titanium.

# Bleach Plant

For improved operating economy, Tuflin Lined Valves replace costly high-alloy valves. This is especially true in bleach plant operations.

## Performance proven in mill service.

Tuflin Lined Valves are designed to handle chlorine, sodium hypochlorite, and chlorine dioxide.

Unique sealing characteristics provide reliable and safe performance far more economically in bleach plant applications.

Bleach plant equipment manufacturers consistently recommend Tuflin Lined Valves.

## Compare performance.

Excellent in both wet and dry chlorine services, Tuflin Lined Valves are unaffected by the moisture pickup that destroys carbon steel/monel trimmed valves in chlorine unloading applications.

The PFA lining is chemically inert. Variations in chemical concentration and temperature that can destroy alloy valves usually have no effect on the PFA lining.

## Locked in liners.

Linings are locked into the valve body with dovetail recesses. Tuflin Lined Valves are used in high pressure and vacuum applications without fear of liner blowout, collapse, shrinkage, or stress cracking at the flanges.

## Choose from a variety of valving options for your specific requirements.

Two-way Tuflin Lined Plug Valves are available in ANSI Classes 150 and 300. For control valve applications, they are available with optional plug designs.

Three-way models with appropriate plug configurations are ideal for by pass and blending applications. Three-way valves are available in ANSI Class 150.

ANSI Class 150 Tuflin Lined Ball Valves are available in both standard port and full port designs.

Tuflin Lined Butterfly Valves are available in ANSI Class 150.



PTFE at only 2,000X magnification.



PFA at 10,000X magnification.

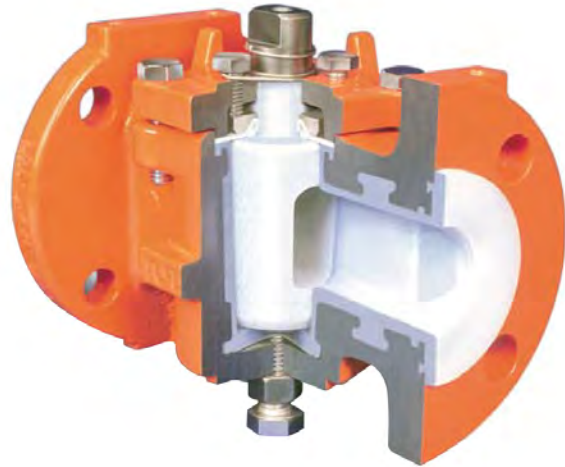
## PFA vs. PTFE linings.

When PTFE is used to line valves, problems often occur because of porosity. Microscopic pores are present in PTFE due to imperfect particle fusion during PTFE processing.

PFA linings show no porosity, even at 10,000X magnification.

## Xomox Lined Products

Tufline Lined Plug Valves are an economical alternative to high alloy valves. They are proven performers in corrosive applications. In many applications they also provide much longer service life than alloy valves. The liner is locked in to prevent blowout under pressure or collapse under vacuum.



For superior assured sealing, the metal-to-metal body joint of the Tufline Lined Ball Valve controls compression of the liner. To resist heat and stress cracking, the lining material is unpigmented, chemically-inert, virgin PFA or PVDF. Our innovative "pressure assisted" SX seal device provides the highest protection from fugitive emissions. Both standard port and full-port models are available.

Tufline Lined Butterfly Valves are used in various acid, chlorine, brine, and filtrate services. They have a continuous disc/shaft lining and a body lining that extends well beyond the secondary seal area. The triple FKM-ring stem sealing components are all isolated from the media. They are located behind the extended lining.

Unlike many other lined butterfly valves, the bottom of the shaft is completely enclosed by the lining. At the bottom of the shaft there are no springs, seals, or washers to corrode or fail. Leakage to atmosphere is avoided.



# Tufline Fully Lined Accessories

Tufline Fully Lined Accessories compliment and complete the Tufline family of lined valves. Described below are the three that are most prominently used in pulp and paper applications.

## Tufline Lined Wafer Swing Check Valves.

These lined valves are widely used on chlorination, hypo, and chlorine dioxide tower dilution circuits. They are far less expensive than (and often out last) high-alloy metal check valves.

They have a fully encapsulated disc and integral hinge pins. The hinge pins fit into a recess in the valve body liner. The liner is locked to the body to prevent collapse or blowout.



## Tufline Lined Ball Check Valves.

For clean corrosive liquids, these valves are ideal. Ball Check Valves are PFA lined. They provide tight shutoff when adequate back pressure is available.



## Piston Check Valves.

Lined, spring loaded Tufline Piston Check Valves assure tight shutoff under all back pressure conditions. They are especially suited for low differential back pressure.



## More Lined Accessories.

- Wafer Swing Check Valves
- Ball Check Valves
- Piston Check Valves
- Sight Flow Indicators
- Strainers
- Tank Bottom Valves
- Poppet Check Valves

# Pulp & Wash Water

For pulp handling, wash water, washer filtrate, and dilution control, Tufline High Performance Butterfly Valves provide more economical and dependable service than gate valves or other butterfly valves.

They have a wider flow path than gate valves. Unlike gate valves, they have no rising stem to carry media into the packing, causing scoring and leakage.

For white water applications and stock lines, these are the only valves that offer patented axially pliant sealing.

## The pressure assisted seal prevents dewatering.

The patented axially pliant seat design provides a tight seal which prevents dewatering and also prevents plugging of stock lines.

The seats of other butterfly valves “relax” and sag into the flow path when the valve is open. The seat is subjected to abrasion and erosion. The patented axially pliant seat does not sag into the flow path.

In addition, the eclipsing retainer ring further protects the seat.

## A butterfly valve for every requirement.

Choose from wafer or lug style bodies, ANSI Class 150, 300, or 600. Bodies and discs are available in a wide range of materials. Optional seats are available for steam applications and fire-tested requirements.



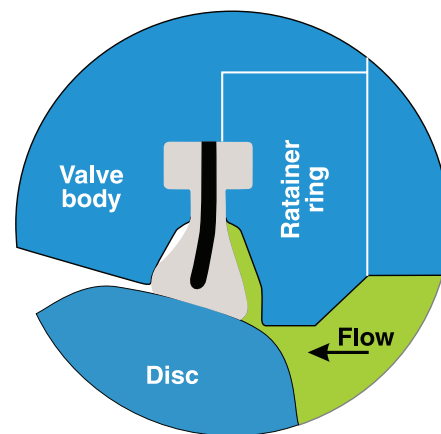
## Easy installation and maintenance.

Tufline High Performance Butterfly Valves are lighter and easier to install than gate valves. They require less space in the flow system.

Their quarter-turn operation means more economical actuation.

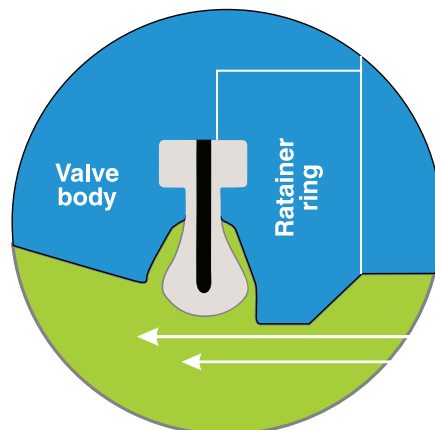
Other butterfly valves have complex springs, hoops, and/or O-rings that require frequent maintenance.

The Tufline seat is simple and symmetrical so replacement is mistake proof.



**Above:** As the valve closes, the seat flexes “axially” against the disc to provide a tight seal. It is pressure assisted. As line pressure increases, the seal becomes even tighter.

**Below:** The seat’s internal pliant membrane (“memory core”) precludes radial deformation. Because the PTFE seat flexes axially, it relaxes inside the diameter of the retainer ring, out of the flow path. The retainer ring protects the tough, compact seat from erosion and abrasion.



Longer service life, less maintenance, and more economical operation are assured.

## Ball Valves | Severe Service Butterfly Valves



Their unique design makes Xomox Process Ball Valves an excellent choice for various applications in the digester, liquid recovery, bleach plant, stock preparation, and paper making.

The patented S2 stem sealing system assures superior sealing and extended service life.

They are available in both standard and full-port models.

Xomox process valves embody all the quality, performance, value, and safety features required in your process applications.



The Crane®FKX 9000 Triple Offset Butterfly Valve is designed for the harsh conditions of critical process applications, steam isolation, high cycle frequency, and temperature extremes.

The triple-offset metal-seat eliminates wear associated with sealing surface contact and maintains sealing integrity and high cycle life. This valve provides unmatched performance, reliability, and quality.

Available in sizes 3" to 24" and ANSI Classes 150 and 300. The valves operating temperature range is -320° to 1000° F. Standard materials of construction are carbon steel and stainless steel. Upon application, higher alloys are available.



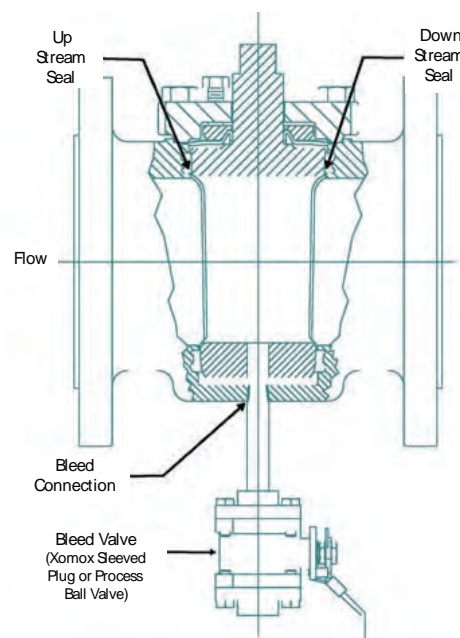
# To Reduce Fugitive Emissions

## Double Block and Bleed Valve

Today processors have a more cost effective alternate to the traditional multi-valve system - the Tufline Double Block and Bleed Valve. Unlike traditional double block and bleed systems, Xomox can isolate with the use of only one valve due to the inherent upstream and downstream sealing properties of the Tufline Sleeved Plug Valve. It will maintain both an upstream and downstream seal between the ports under pressure differentials across the valve in either direction or under pressure balanced conditions. The bleed off between the upstream and downstream seals is accomplished via a drain hole in the bottom of the plug and a corresponding drain connection in the bottom of the valve body.

Tufline double block and bleed valves are available in a wide variety of configurations.

- ANSI classes 150, 300, and 600
- Standard materials include carbon steel, stainless steels, and high nickel alloys to exotics such as titanium and zirconium
- Standard and XP design
- Reduced and full ported
- End connections include flanged, threaded, welded, RTJ, and quick clamp
- Temperatures from -20°F to +600°F
- With or without optional bleed valve

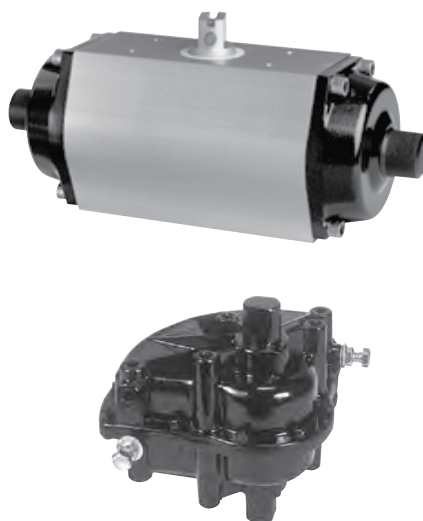


## Xomox & Matryx® Actuators

Xomox Valves are available as part of a complete valve package. Actuators are available in three models:

- Rack & pinion spring return
- Double acting vane
- Electric

Xomox automated valve packages assure you of single-source responsibility for flow control equipment. With Xomox valves, Xomox and Matryx actuators, Xomox control accessories, and Xomox problem solving expertise, you are assured of valve packages that will provide optimum performance in your application.



## Superior rack and pinion performance with greater economy.

Comprehensive side-by-side testing confirms that the Xomox and Matryx rack and pinion actuators provide longer service life with more consistent torque. Solid performance data means processors can size actuators with more of a confidence factor and less of a "fudge-factor". Initial cost, repair costs, replacement costs, and costly downtime can all be reduced.

# The Valves Of Choice For Pulp And Paper Applications

## Valves for specific pulp and paper applications.

The fold-out table provides a quick-reference to help you select the Xomox valves that are most appropriate for your specific pulp and paper applications.

## Problem-solver and cost-cutter valves.

In the most difficult pulp and paper applications, Xomox valves reduce downtime, cut maintenance costs, and provide longer service life. With Xomox valves, your long-term cost of ownership is dramatically reduced.

Through decades of difficult pulp and paper service, Xomox valves have handled high pressures and high temperatures while successfully resisting corrosion, abrasion, and seat erosion.

Xomox valves have successfully replaced thousands of valves of other types and brands, reducing downtime and cutting the long-term cost of ownership.

Pulp and paper mills also save because Xomox quarter-turn valves are more economical to actuate.

## Recommended by pulp and paper equipment suppliers.

Pulp and paper equipment manufacturers consistently recommend Xomox valves and actuators.

# The Valves Of Choice For Pulp And Paper Applications

This quick-reference table will help you select the Tufline valves that are most appropriate for specific pulp and paper applications.

## SLEEVED PLUG VALVES

PAGES 2 & 3  
 FIGURE NUMBERS:  
 067 - CL 150, REDUCED PORT  
 2067 - CL 150, FULL PORT  
 0367 - CL 300, REDUCED PORT  
 20367 - CL 300, FULL PORT  
 037 - CL 150, 3-WAY BOTTOM ENTRY  
 077 - CL 150, 3-WAY SIDE ENTRY

## FK PROCESS BALL VALVES

PAGE 8  
 FIGURE NUMBERS:  
 511R - CLASS 150 – 1 PIECE STD PORT  
 513R - CLASS 300 – 1 PIECE STD PORT  
 521F - CLASS 150 – 2 PIECE FULL PORT  
 523F - CLASS 300 – 2 PIECE FULL PORT  
 521R - CLASS 150 – 2 PIECE STD PORT  
 523R - CLASS 300 – 2 PIECE STD PORT

## LINED PLUG VALVE

PAGES 4 & 5  
 FIGURE NUMBER: 061

## HIGH PERFORMANCE BUTTERFLY VALVES

PAGE 7  
 FIGURE NUMBERS:  
 801 - WAFER  
 821 - LUG

## LINED ACCESSORIES

PAGE 6  
 FIGURE NUMBERS:  
 070 - SWING CHECK VALVE  
 071/XLC - BALL CHECK VALVE  
 C202 - PISTON CHECK VALVE  
 081 - SIGHT FLOW INDICATOR  
 Y102 - STRAINER  
 K202 - TANK BOTTOM VALVE  
 074/075 - POPPET CHECK VALVE

## LINED BUTTERFLY VALVES

PAGES 4 & 5  
 FIGURE NUMBERS:  
 XLD 11 - WAFER  
 XLD 21 - LUG

## LINED BALL VALVE

PAGES 4 & 5  
 FIGURE NUMBERS:  
 XLB 42A - STANDARD PORT  
 XLB 12A - FULL PORT

## FKX9000 TOV BUTTERFLY VALVE

PAGE 8  
 FIGURE NUMBERS:  
 9101/9103 - LUG  
 9321/9323 - DOUBLE FLANGED  
 9361/9363 - DOUBLE FLANGED

## REDUCING FUGITIVE EMISSIONS

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## XOMOX & MATRYX ACTUATORS

PAGE 9

# The Valves Of Choice For Pulp And Paper Applications

APPLICATION	APPROPRIATE XOMOX VALVES & FIGURE NUMBERS		CLASS	BODY MATERIAL	PLUG/DISC MATERIAL	SLEEVE MATERIAL	BALL & SEAT	OPTIONS
<b>DIGESTER &amp; PULP</b>								
DIGESTER LIQUOR FEED	SLEEVED PLUG 067 & 2067	FK PROCESS BALL VALVE 511 & 521	150	316SS	316SS	PTFE		
LIQUOR SAMPLING								CAGED PLUG
LIQUOR RECIRCULATION								
DIGESTER VENT								CAGED PLUG
WASH WATER	HIGH PERFORMANCE BUTTERFLY 801 & 821							
WASHER FILTRATE				WCB OR 316SS	WCB OR 316SS			
BROWN STOCK (UP TO 6% CONSISTENCY)								
TURPENTINE	SLEEVED PLUG 067	FK PROCESS BALL VALVE 511 & 521		316SS	316SS	PTFE	316SS TFM	GLASS FILLED PTFE SLEEVE

APPLICATION	APPROPRIATE XOMOX VALVES & FIGURE NUMBERS		CLASS	BODY MATERIAL	PLUG/DISC MATERIAL	SLEEVE MATERIAL	BALL & SEAT	OPTIONS	
<b>LIQUOR RECOVERY</b>									
WEAK BLACK LIQUOR	SLEEVED PLUG 067 & 2067	FK PROCESS BALL VALVE 511 & 521	150	316SS OR DI	316SS	PTFE	316SS TFM	DBB	
STRONG BLACK LIQUOR									GLASS FILLED PTFE SLEEVE
DISSOLVING TANK									
GREEN LIQUOR									DBB
CAUSTIC GREEN LIQUOR		FK PROCESS BALL VALVE 511 & 521						316SS TFM	GLASS FILLED PTFE SLEEVE
WHITE LIQUOR									
LIME MUD							316SS OR CD4	316SS OR CD4	
DREGS									CAGED PLUG
SOAP									
TALL OIL			FK PROCESS BALL VALVE 511 & 521						
NON-CONDENSABLE GAS	HIGH PERFORMANCE BUTTERFLY 801 & 821			316SS	316SS		316SS TFM	HIGH TEMP FIRE TESTED	
STEAM 125LB	XENITH SLEEVED PLUG	BUTTERFLY 801 & 821				XENITH TUFLINE 600			

# The Valves Of Choice For Pulp And Paper Applications

APPLICATION	APPROPRIATE XOMOX VALVES & FIGURE NUMBERS				CLASS	BODY MATERIAL	PLUG/DISC MATERIAL	BALL & SEAT	OPTIONS
<b>BLEACH PLANT</b>									
CHLORINE, DRY UNLOADING	SLEEVED PLUG 067 & 2067		FK PROCESS BALL VALVE 511 & 521		150 300	WCB	MO	PTFE	MO TFM
	LINED PLUG – 061		XLD LINED BUTTERFLY 008 & 009			DI/PFA	DI/PFA		
CHLORINE WET	LINED PLUG – 061	XLD LINED BUTTERFLY 008 & 009	XLB LINED BALL 911		150	DI/FEP DI/PFA	DI/FEP DI/PFA		
CHLORINE DIOXIDE									
CHLORINE HYPOCHLORITE									
CHLORINE DIOXIDE REACTORS	SLEEVED PLUG 067					TITANIUM	TITANIUM	PTFE	
SODIUM HYDROXIDE			FK PROCESS BALL VALVE 511 & 521						
SULFURIC ACID (CONCENTRATE)						DI OR A20	A20		
SULFURIC ACID (DILUTE)	LINED PLUG 061	XLD LINED BUTTERFLY 008 & 009	XLB LINED BALL 911		150	DI/FEP DI/PFA	DI/FEP DI/PFA		
SULFUR DIOXIDE									
SPENT ACID									
SODIUM CHLORATE	FK PROCESS BALL VALVE 511 & 521					316SS			316SS TFM
WASH WATER (FRESH)	HIGH PERFORMANCE BUTTERFLY 801 & 821		FK PROCESS BALL VALVE 511 & 521			WCB	316SS		
WASHER FILTRATE (CHLORINATED)	XLD LINED BUTTERFLY 008 & 009					DI/TFA	DI/TFA		
BLEACH TOWER DILUTION	LINED WAFER SWING CHEK								
CHLORINATED STOCK	HIGH PERFORMANCE BUTTERFLY – 801 & 821					316SS OR 317SS	316SS OR 317SS		
CAUSTIC STAGE STOCK						316SS	316SS		
SALT CAKE SLURRY	SLEEVED PLUG 067					TITANIUM	TITANIUM	PTFE	
HYDROGEN PEROXIDE			FK PROCESS BALL VALVE 511 & 521			316SS	316SS		
OXYGEN									
STEAM	XENITH SLEEVED PLUG	BUTTERFLY 801 & 821	FK PROCESS BALL VALVE 511 & 521	SERIES 9000 TOV BUTTERFLY				XENITH TUFLINE 600	

# The Valves Of Choice For Pulp And Paper Applications

APPLICATION	APPROPRIATE XOMOX VALVES & FIGURE NUMBERS			CLASS	BODY MATERIAL	PLUG/DISC MATERIAL	SLEEVE MATERIAL	BALL & SEAT	OPTIONS	
<b>STOCK PREPARATION &amp; PAPER MAKING</b>										
WHITE WATER	HIGH PERFORMANCE BUTTERFLY 801 & 821	FK PROCESS BALL VALVE 511 & 521		150	WCB OR 316SS	3126SS		316SS TFM		
BROWN WATER					WCB					
BLEACHED STOCK					316SS					
REFINER BYPASS (3-WAY)	3-WAY SLEEVED PLUG – 037 & 077				DI OR 316SS	DI OR 316SS				
STARCH, RAW	SLEEVED PLUG 067 & 2067	HIGH PERFORMANCE BUTTERFLY 801 & 821	FK PROCESS BALL VALVE 511 & 521		316SS	316SS		316SS TFM		
STARCH, COOKED										
ROSIN	SLEEVED PLUG 067 & 2067		FK PROCESS BALL VALVE 511 & 521		316SS OR CD4	316SS OR CD4		316SS OR CD4	CAGED PLUG	
CLAY				150						
TITANIUM DIOXIDE										
ALUM										
DYE										
AMMONIA										
COATING SYSTEMS	2-WAY & 3-WAY SLEEVED PLUG 067, 037 & 077				316SS	316SS		316SS OR CD4		
FILLING SYSTEMS										
ADHESIVES	SLEEVED PLUG 067 & 2067									
STEAM	XENITH SLEEVED PLUG	BUTTERFLY 801 & 821	FK PROCESS BALL VALVE 511 & 521				XENITH TUFLINE 600			
			SERIES 9000 TOV BUTTERFLY							



# CRANE®

Crane ChemPharma & Energy  
4526 Research Forest Drive, Suite 400  
The Woodlands  
Texas 77381, U.S.A.  
Tel: +1 936 271 6500  
Fax: +1 1 (936) 271 6510  
[www.cranecpe.com](http://www.cranecpe.com)



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