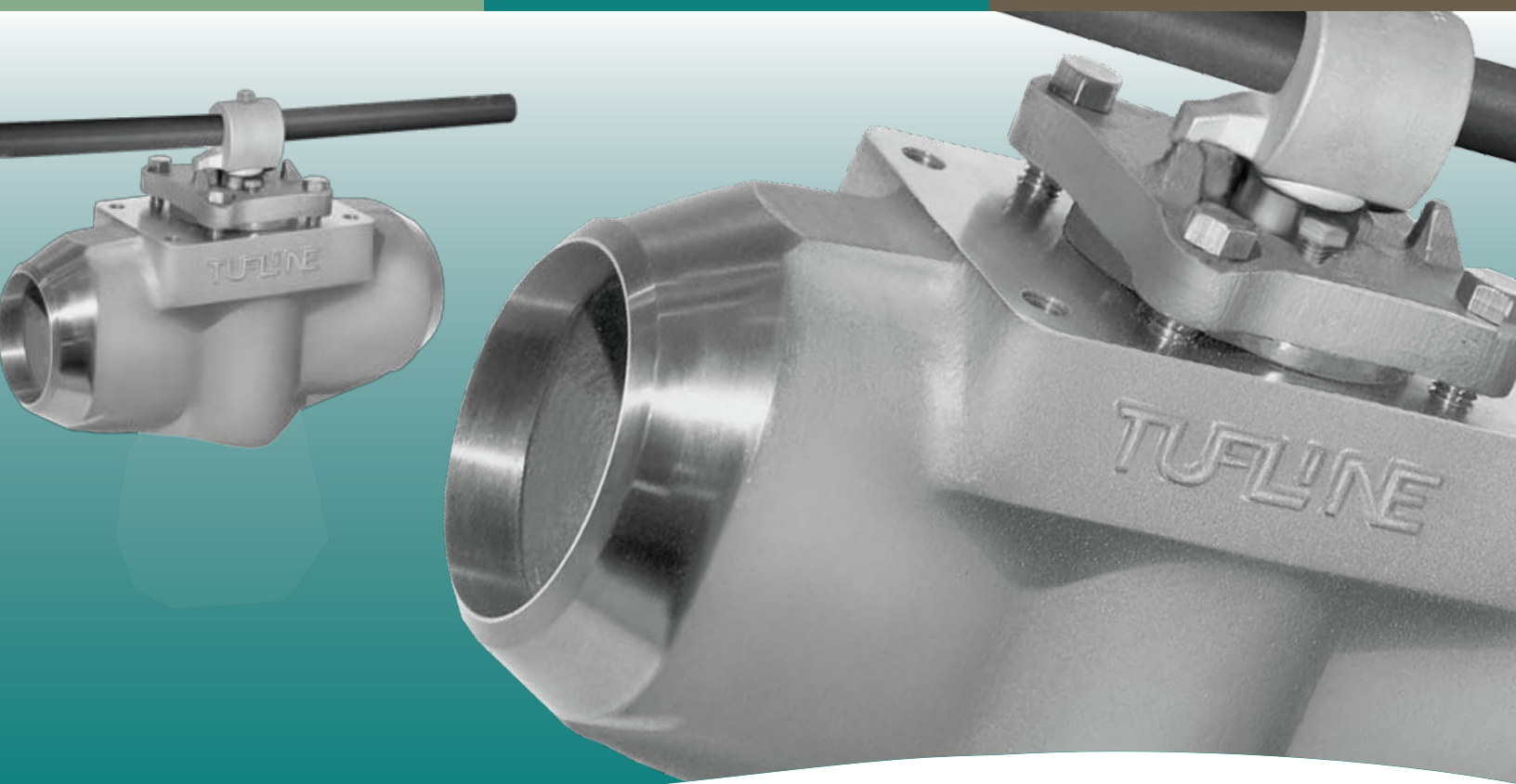


XOMOX[®]

brands you trust.



Tuflin[®] Sleeved Plug Weld End Valves

CRANE

ChemPharma Flow Solutions

www.cranepharmasolutions.com

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2 Unique and patented features	11 . . . Technical data	15 How to order
5 3-Way valves	12 . . . Materials	
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With Tufline® Sleeved Plug valves, design more economical, flexible, and compact fluid handling systems.

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

Superior, longer-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, or sleeve rotation and greatly minimized potential for blow out.

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

No seizing. No sticking.

As the plug rotates, the 360° 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. The cavity-free design also prevents sticking.

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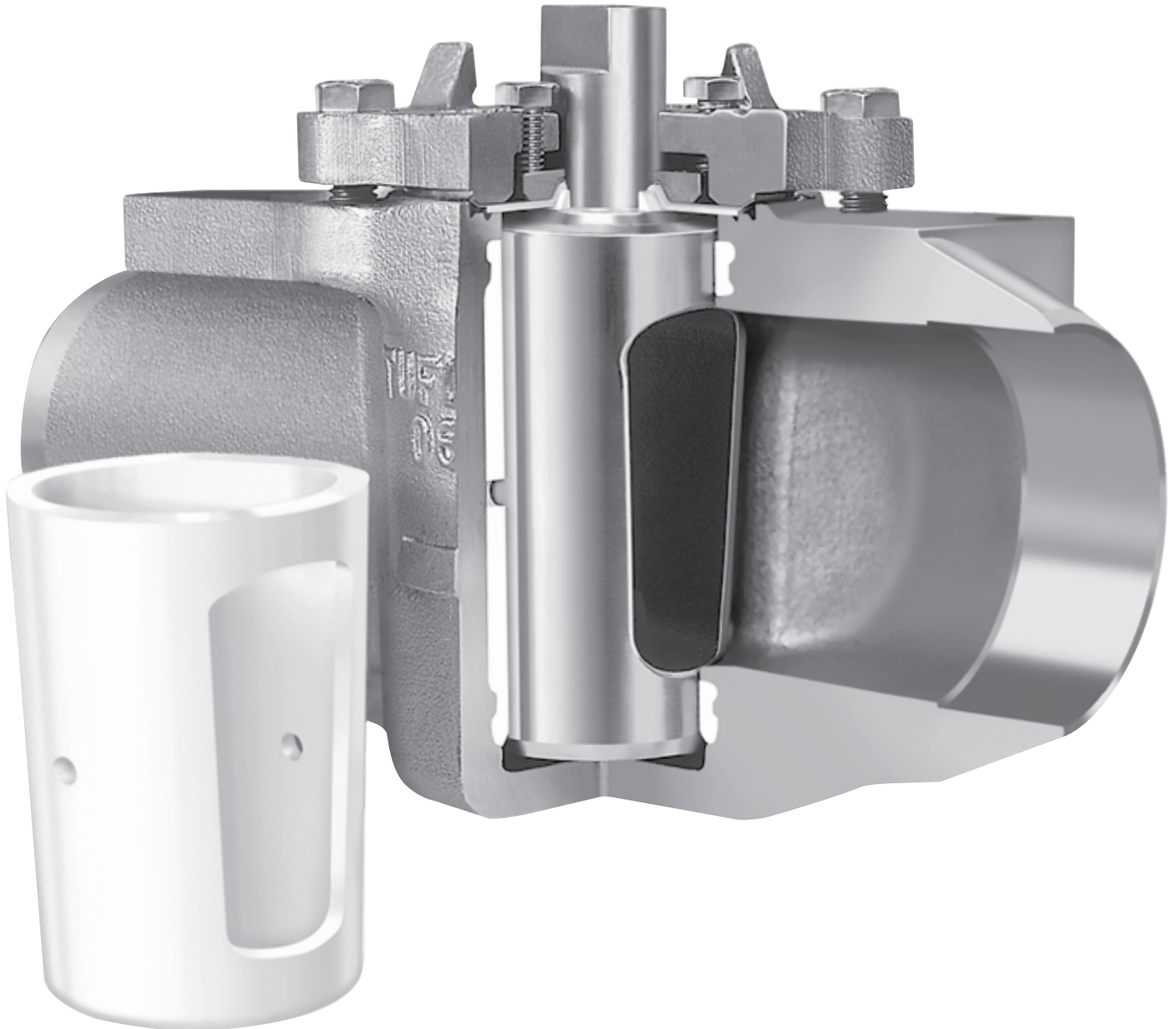
Eliminate unscheduled downtime and maintenance . . . plus get greatly extended service life.

Many processors experience dramatic cost reductions when they switch from ball and gate valves.

A simple turn of the top adjustment bolts keeps the sleeve sealing tightly and the valve in service far longer.

Two independent sealing systems provide double protection against atmosphere leakage.

Turn the page for details about this valve's superior double stem seal . . .



Trouble-free sealing is provided by the large, full-circumferential PTFE sleeve. No ball or gate valve can match this sealing capacity.

Sleeves are easily replaced inline.

The PTFE sleeve has a low coefficient of friction. It acts as a lubricant. Ease of operation is assured, even when the valve is left open or closed for extended periods.

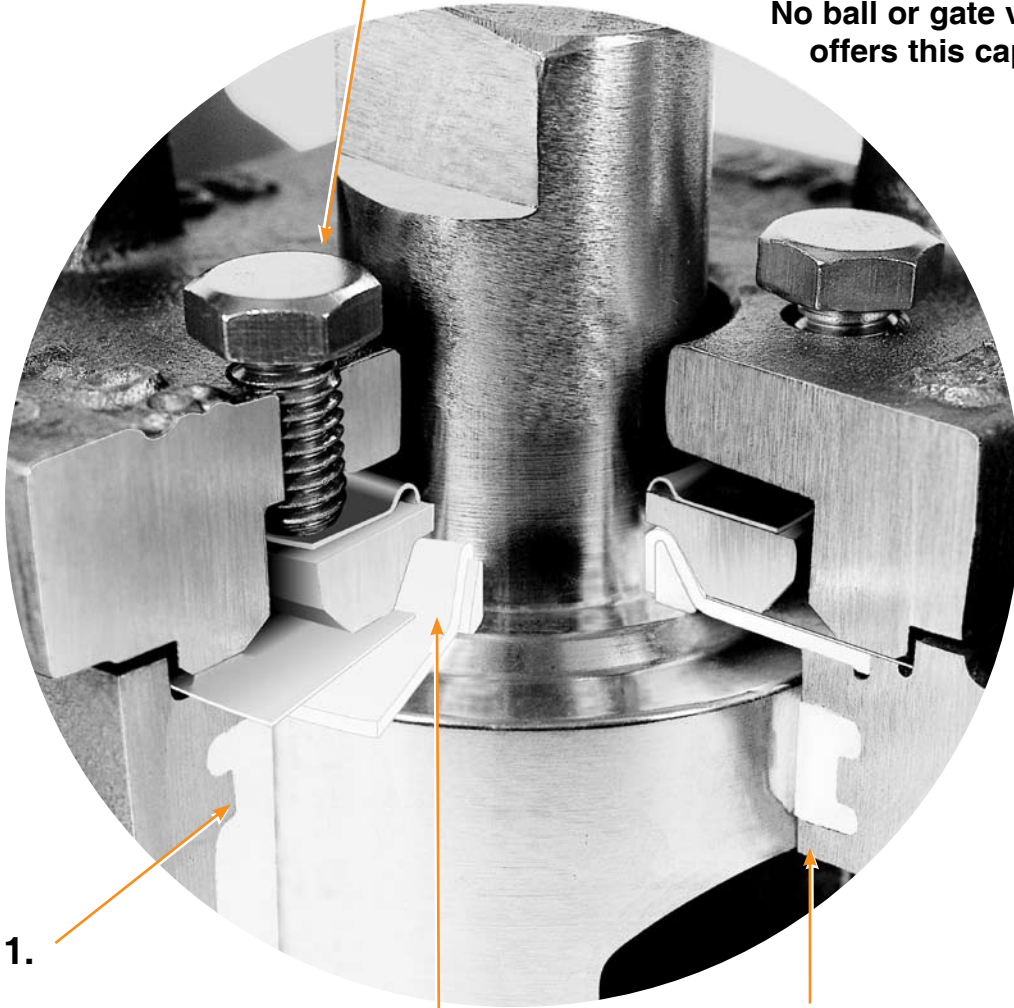
Standard cost and greatly extended service life assure exceptionally low, long-term cost-of-ownership.

The Tufline® sleeved plug valve pays for itself many times over with more up-time and greatly extended service life.

There's a fully adjustable in-line seal and dual stem seal.

Bolts in the top cover provide quick and easy adjustment. Adjust out in-line leakage between shutdowns. Adjust out potential stem leakage.

No ball or gate valve offers this capability.



Stem Seal 1.

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

There are two independent environmental seals.

You get double seal protection at no extra cost.

Stem Seal 2.

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

Unmatched stem sealing.

Tufline's standard dual stem seal is clearly superior to those of gate valves, ball valves, other plug valves, and many expensive valves with extended auxiliary packing.

360° lips.

Port defining lip were developed and patented by Tufline. The lips surround the ports.

The lips improve valve performance and extend service life by:

- Preventing sleeve cold flow and deformation.
- Eliminating sleeve rotation.
- Breaking up and removing adhering, scaly deposits from the outer surface of the plug as it rotates.

3-Way port arrangements.

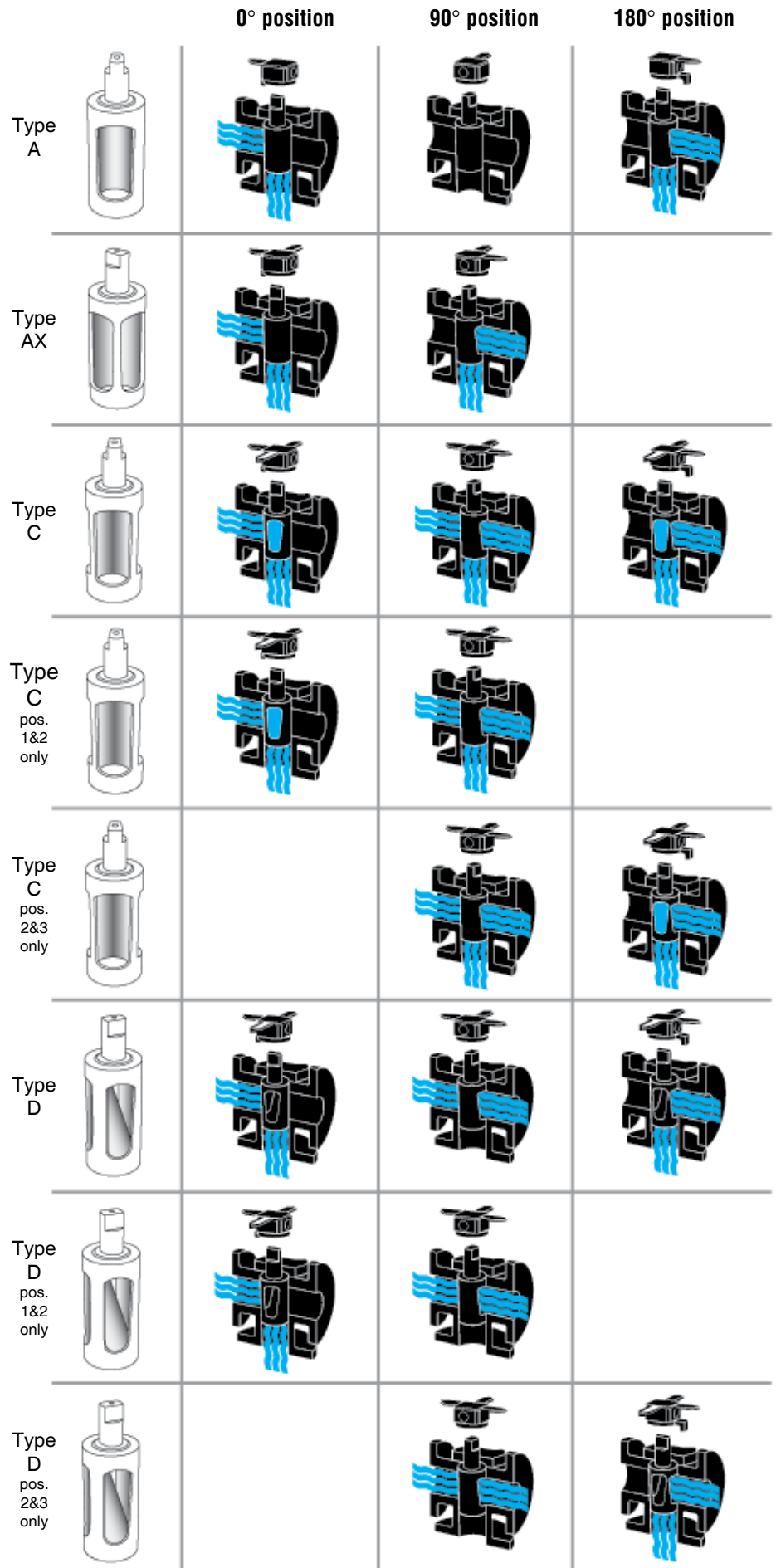
Tufline 3-Way Weld End valves bring economy, flexibility, and more compact system design to thousands of applications.

Bi-directional flow for more flexibility.

In the diagrams the color indicates the path of fluid flow. Bi-directional flow provides more system design options.

Shutoff.

Only the Type A plug will shut off the flow. With Type AX, C, and D plugs, there is always flow between two or more ports.



Dimensions

2-Way Valves

Socket Weld / ANSI Class 150 / Sizes 1/2" through 2" / Figure: **166SW**

Socket Weld / ANSI Class 300 / Sizes 1/2" through 2" / Figure: **1366SW**

Socket Weld / ANSI Class 600 / Sizes 1/2" through 3/4" / Figure: **1666SW**

Butt Weld / ANSI Class 150 / Sizes 1/2" through 12" / Figure: **166BW**

Butt Weld / ANSI Class 300 / Sizes 1/2" through 12" / Figure: **1366BW**

Butt Weld / ANSI Class 600 / Sizes 1/2" through 3/4" / Figure: **1666BW**

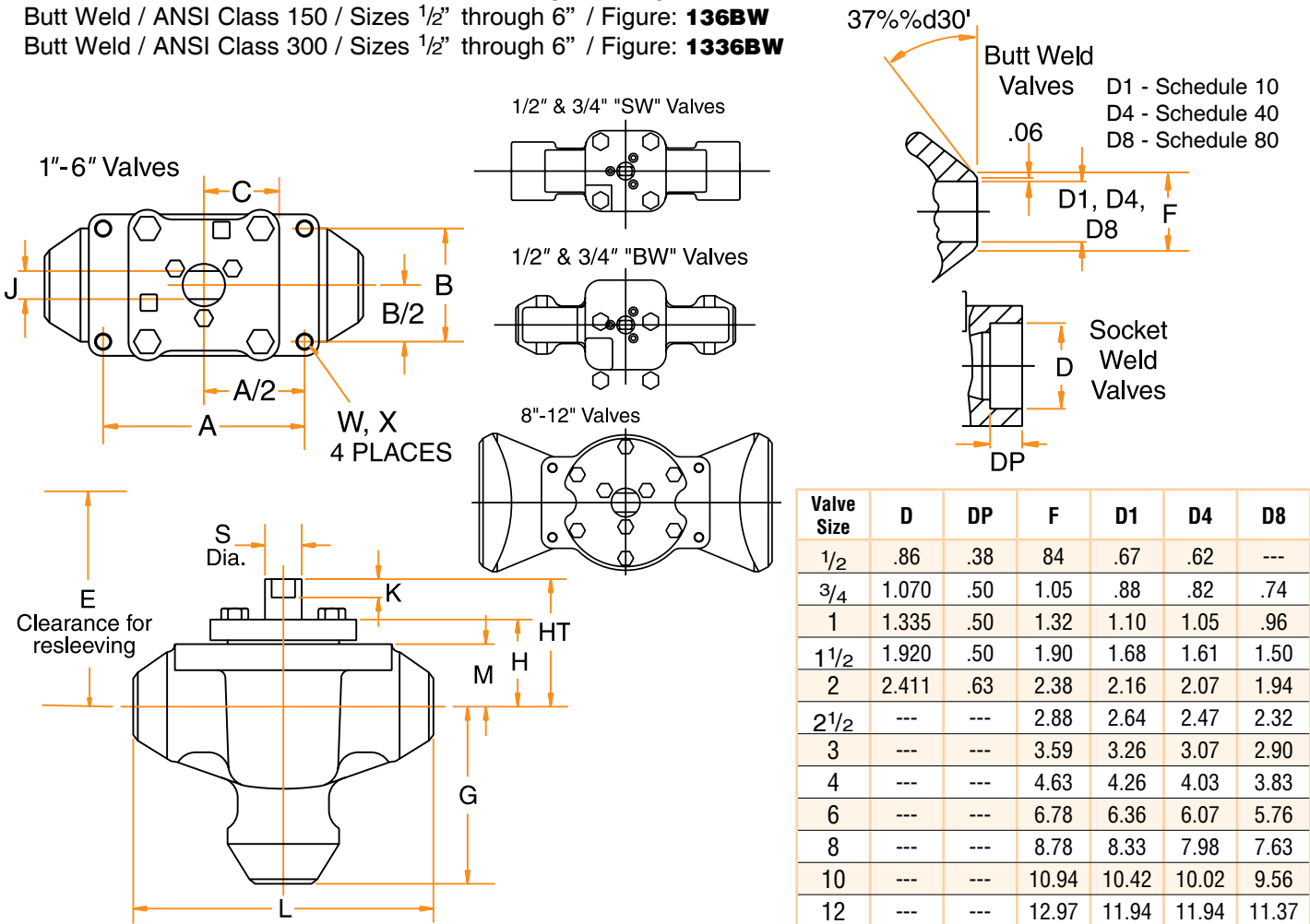
3-Way Valves

Socket Weld / ANSI Class 150 / Sizes 1/2" through 2" / Figure: **136SW**

Socket Weld / ANSI Class 300 / Sizes 1/2" through 2" / Figure: **1336SW**

Butt Weld / ANSI Class 150 / Sizes 1/2" through 6" / Figure: **136BW**

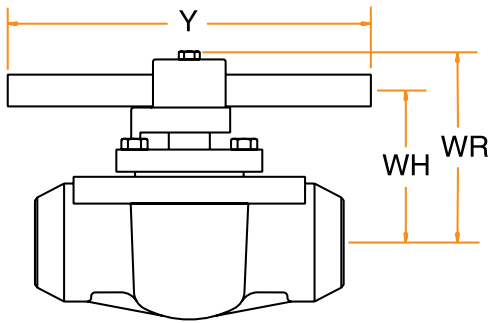
Butt Weld / ANSI Class 300 / Sizes 1/2" through 6" / Figure: **1336BW**



SW = Socket Weld BW = Butt Weld WT2: Weight of 2-way (pounds) WT3: Weight 3-way (pounds)

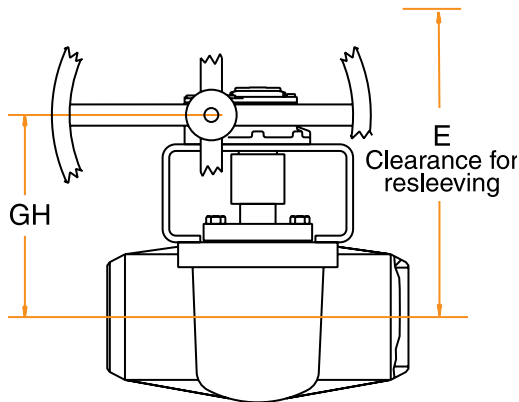
Valve Size	L(SW)	L(BW)	HT	H	A	B	S	J	K	W	X	M	C	E	WT2	G(SW)	G(BW)	WT3
1/2	6.50	6.25	2.14	---	---	---	.50	.250	.66	---	---	---	1.15	6.00	5	3.25	3.13	8
3/4	6.50	6.25	2.14	---	---	---	.50	.250	.66	---	---	---	1.15	6.00	5	3.25	3.13	8
1	6.50	6.50	2.50	1.66	3.90	2.21	.63	.438	.32	3/8-16	Thru	1.16	1.38	7.00	8	3.25	3.25	11
1 1/2	7.50	7.50	3.06	2.09	4.25	2.33	.88	.562	.44	3/8-16	.75	1.50	1.56	8.00	12	3.94	3.94	15
2	8.50	8.50	3.56	2.56	5.38	3.02	1.13	.750	.53	7/16-14	.75	1.81	2.00	9.13	20	4.75	4.75	23
2 1/2	12.00	12.00	4.35	3.35	5.38	3.02	1.13	.750	.53	7/16-14	.88	2.69	2.00	10.35	39	6.75	6.75	45
3	12.00	12.00	4.13	3.13	5.38	3.02	1.13	.750	.53	7/16-14	.88	2.47	2.00	10.13	39	6.75	6.75	45
4	14.00	14.00	5.22	3.94	6.50	4.00	1.25	.875	.78	1/2-13	.94	3.03	2.50	22.00	55	7.50	7.50	64
6	17.00	17.00	7.35	5.26	7.75	4.25	2.00	1.398	1.00	5/8-11	1.13	4.22	3.06	25.00	110	10.00	10.00	128
8	20.00	20.00	9.32	7.19	10.00	4.75	2.00	1.398	1.00	5/8-11	.75	6.19	4.12	28.00	210	---	---	---
10	23.00	23.00	10.81	8.63	10.75	4.75	2.50	1.673	1.00	5/8-11	.94	7.63	4.50	29.00	330	---	---	---
12	26.00	26.00	11.81	9.80	13.25	4.75	3.00	1.968	1.00	3/4-10	.94	8.63	5.31	35.00	400	---	---	---

Wrench Operator

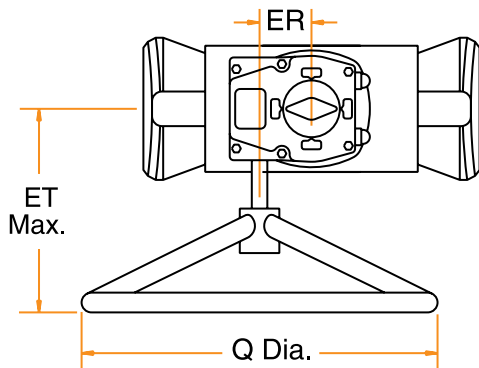


Sleeve material: PTFE or Tuflin-475, Glass filled PTFE				Sleeve material: Xomox-7, Tuflin-600, UHMWPE, or PFA			
Valve Size	WR	WH	Y	Valve Size	WR	WH	Y
1/2	---	4.25	6.38	1/2	---	4.25	6.38
3/4	---	4.25	6.38	3/4	---	4.25	6.38
1	3.81	2.88	8.75	1	3.81	2.88	11.00
1 1/2	4.56	3.63	12.50	1 1/2	4.56	3.63	24.00
2	5.13	4.00	18.00	2	5.13	4.00	28.00
2 1/2	5.91	4.85	24.00	2 1/2	5.91	4.85	31.00
3	5.69	4.63	24.00	3	5.69	4.63	31.00
4	7.06	5.75	30.00	4	---	---	---

Enclosed Gear Operator



Sleeve material: PTFE or Tuflin-475					Sleeve material: Glass Filled PTFE				
Valve Size	GH	ER	Q	ET	Valve Size	GH	ER	Q	ET
4	8.75	2.06	12.00	8.00	4	8.75	2.06	12.00	8.00
6	11.50	2.62	18.00	10.38	6	11.50	2.62	18.00	10.38
8	13.50	2.62	18.00	10.38	8	13.82	3.53	18.00	11.05
10	15.25	3.53	24.00	12.31	10	15.25	4.88	24.00	13.87
12	16.25	4.88	30.00	15.88	12	16.25	6.06	30.00	16.88



Sleeve material: Xomox-7 or Tuflin-600					Sleeve material: PFA or UHMWPE				
Valve Size	GH	ER	Q	ET	Valve Size	GH	ER	Q	ET
2 1/2	7.84	2.06	12.00	8.00	2 1/2	7.84	2.06	12.00	8.00
3	7.62	2.06	12.00	8.00	3	7.62	2.06	12.00	8.00
4	8.75	2.06	12.00	8.00	4	8.75	2.62	12.00	8.00
6	11.50	2.62	18.00	10.38	6	11.50	4.88	18.00	10.38
8	13.50	3.53	30.00	15.81	8	13.82	4.88	30.00	15.81
10	15.25	6.06	30.00	16.88	10	15.25	6.06	30.00	16.88
12	16.94	1.50	24.00	24.00	12	16.94	1.50	24.00	24.00

Dimensions

2-Way Valves

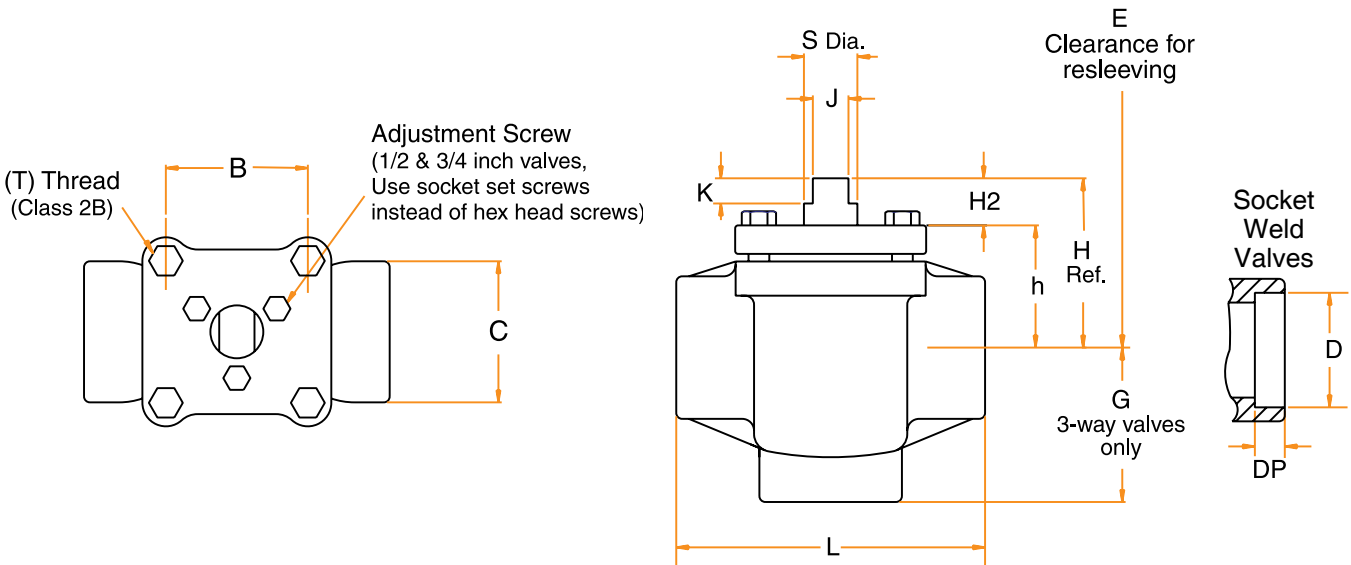
Socket Weld / ANSI Class 150 / Sizes 1/2" through 2" / Figure: **066SW**

Socket Weld / ANSI Class 300 / Sizes 1/2" through 2" / Figure: **0366SW**

3-Way Valves

Socket Weld / ANSI Class 150 / Sizes 1/2" through 2" / Figure: **036SW**

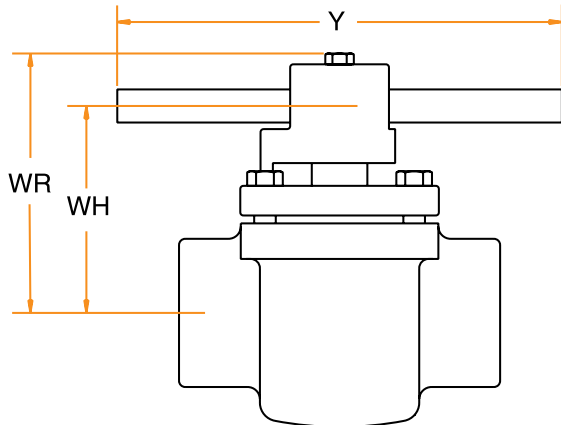
Socket Weld / ANSI Class 300 / Sizes 1/2" through 2" / Figure: **0336SW**



WT2: Weight of 2-way (pounds) WT3: Weight 3-way (pounds)

Valve Size	L	H	h	H2	B	C	S	J	K	T	E	WT2	G	WT3	D	DP
1/2	3.25	1.92	1.06	86	1.43	1.68	50	.250	.66	5/16-18	6.00	1.5	1.69	1.75	.860	.38
3/4	3.25	1.92	1.06	86	1.43	1.68	50	.250	.66	5/16-18	6.00	1.5	1.80	1.75	1.070	.50
1	4.63	2.50	1.66	86	1.90	2.21	63	.438	.32	3/8-16	7.00	4	2.38	5	1.335	.50
1 1/2	5.50	3.06	2.09	97	2.33	2.33	88	.563	.44	3/8-16	8.00	10	2.88	11	1.920	.50
2	6.50	3.56	2.56	1.00	3.02	3.02	1.13	.750	.53	7/16-14	9.13	14	3.38	16	2.411	.63

Wrench Operator



Sleeve material: PTFE or Tufline-475 Glass filled PTFE				Sleeve material: Xomox-7, Tufline-600, UHMWPE, or PFA			
Valve Size	WR	WH	Y	Valve Size	WR	WH	Y
1/2	---	4.00	6.38	1/2	---	4.25	6.38
3/4	---	4.00	6.38	3/4	---	4.25	6.38
1	3.81	2.88	8.75	1	3.81	2.88	11.00
1 1/2	4.56	3.63	12.50	1 1/2	4.56	3.63	24.00
2	5.13	4.00	18.00	2	5.13	4.00	28.00

Technical information

Applications

Ash sluice service water systems
Breweries and distilleries
Chemical applications
Closed and open systems
Condensate polishing
Demineralizers
Emergency coolant
Etched disc filters
Evaporators
Fats, oils, fatty acid and detergents
Filter demineralizer
Food processing
Leaf type filters
Oil purification systems
Petrochemicals
Petroleum production
Pulp and paper
Raw river make-up water
Slurries
Standby generators
Textiles
Water treatment purification

Actuators

All valves can be supplied with a variety of manual, pneumatic or electric actuators. All 166, 1366, 1666, 136 and 1336 valves are drilled and tapped for actuator mounting.

Vacuum service

All weld end valves are satisfactory for vacuum service to as low as .01 microns in absolute pressure. However, special cleaning is required to achieve this rating. Vacuum ratings have been established by independent laboratories by helium leak tests on mass spectrometers.

API-607 Standards

Tufline Fire Tested Sleeved Plug Valves have been tested in accordance with API-607 - Fourth Edition - Section 4.2 - Specifications For External Leakage. These valves exceed the sealing requirements specified in those standards. A tight external seal was maintained even after the PTFE sleeve and sealing parts were totally destroyed by fire.

Oxygen and chlorine valves

Valves designated for oxygen or chlorine service are thoroughly cleaned, tested and dried per internal Xomox oxygen and chlorine standards. The ends are then sealed and the valves are packaged in plastic bags. Chlorine valves are in accordance with Chlorine Institute recommendations.

Control Fugitive emissions

This optional top seal package provides exceptional control of fugitive emissions. It meets or exceeds the most stringent current regulatory requirements. Tertiary sealing is provided at the stem by the encapsulated, flexible graphite stem seal and at the body/cover joint by the graphite cover seal ring.

No cavities

Tufline weld end valves have no pockets. The sleeve completely surrounds both ports as well as the top and bottom of the plug, eliminating any areas where contaminants could be trapped. Since the valves are double block valves and seat both upstream and down-stream, it is necessary to limit the differential pressure when the valves are opened and closed.

Special services

Tufline offers extensive engineering expertise and experience with the broadest range of industry requirements, and is therefore able to offer many special services and capabilities.

Tufline can also assure expertise in welding and fabricating products and assemblies from the broad range of materials in which their products are manufactured.

Custom designs and modifications

The products featured in this catalog may be obtained in other sizes and materials from the Tufline Special Products Group, which also offers design, engineering and manufacturing services for custom products and modifications.

CAUTION

When welding austenitic stainless steels, corrosion resistance will be affected in material adjacent to the weld joint due to sensitization.

Standard sleeve material maximum temperature ratings:

Sleeve Material	Max. Temp.
UHMWPE	180°F
Xomox 7	300°F
PTFE	400°F
Tufline-475	475°F
Tufline-600	600°F

Materials of construction

Standard body

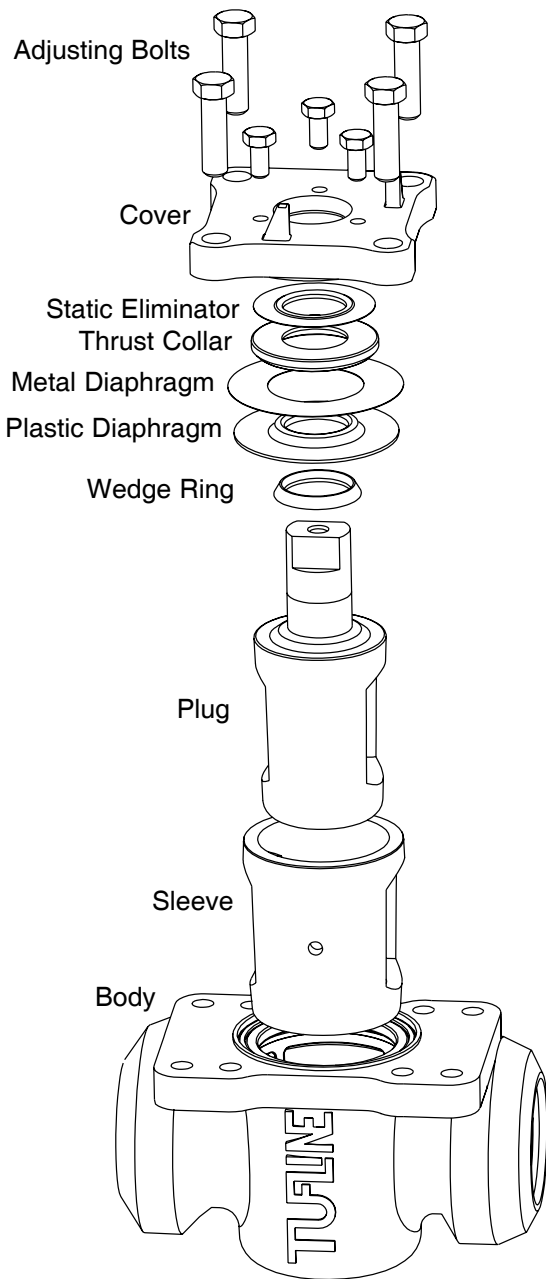
and plug materials:

316L stainless steel
(ASTM A351 GR CF3M)
Carbon steel
(ASTM A216 GR WCB)

Other materials

available including:

316 stainless steel
(ASTM A351 GR CF8M)
Alloy 20
(ASTM A351 GR CN7M)



Body and Plug ¹	316SS, Alloy 20 Hastelloy B & C	Carbon steel	Monel Nickel
Sleeve	PTFE, UHMWPE, Xomox-7, Tuflin-475, Tuflin-600 ⁴		
Adjusting Bolts ²	304SS / 316SS		
Cover	CF8 / CF8M	Carbon steel	CF8 / CF8M
Cover Bolts ³	304SS / 316SS	Steel	304SS / 316SS
Static Eliminator Thrust Collar		304SS	
Metal Diaphragm	304SS	304SS	Monel
Plastic Diaphragm	PTFE, UHMWPE, Xomox-7, Tuflin-475, Tuflin-600 ⁴		
Wedge Ring	PTFE, UHMWPE, Xomox-7, Tuflin-475, Tuflin-600 ⁴		

Notes:

1. Various combinations of body and plug materials are available.
2. Adjusting bolts will be either ASTM A 193 GR. B8 or B8M.
3. Cover bolts for carbon steel or ductile iron bodied valves will be ASTM A 193 Gr. B7.

Cover bolts for alloy bodied valves will be either ASTM A 193 Gr. B8 or B8M.

4. When specifying a Tuflin-600 sleeve, the plastic diaphragm and wedge ring are also Tuflin-600 material.

Valves with Tuflin-600 sleeves are supplied with a tertiary top seal as standard.

Note: Other materials are available for bolts, covers and some top seal components on customer request.

Cv factors for valve sizing.

Class 150 & 300

Size	2-Way	3-Way A,AX,C pos.	3-Way D pos. 0° & 180°	3-Way D pos. 90°
1/2	9	7	4	5
3/4	9	7	4	5
1	43	20	11	17
1 1/2	89	40	21	37
2	172	70	40	47
2 1/2	294	100	54	87
3	294	100	54	87
4	548	175	94	159
6	1075	350	210	255
8	1591	475	360	450
10	2159	---	---	---
12	3200	---	---	---

Operating torques.

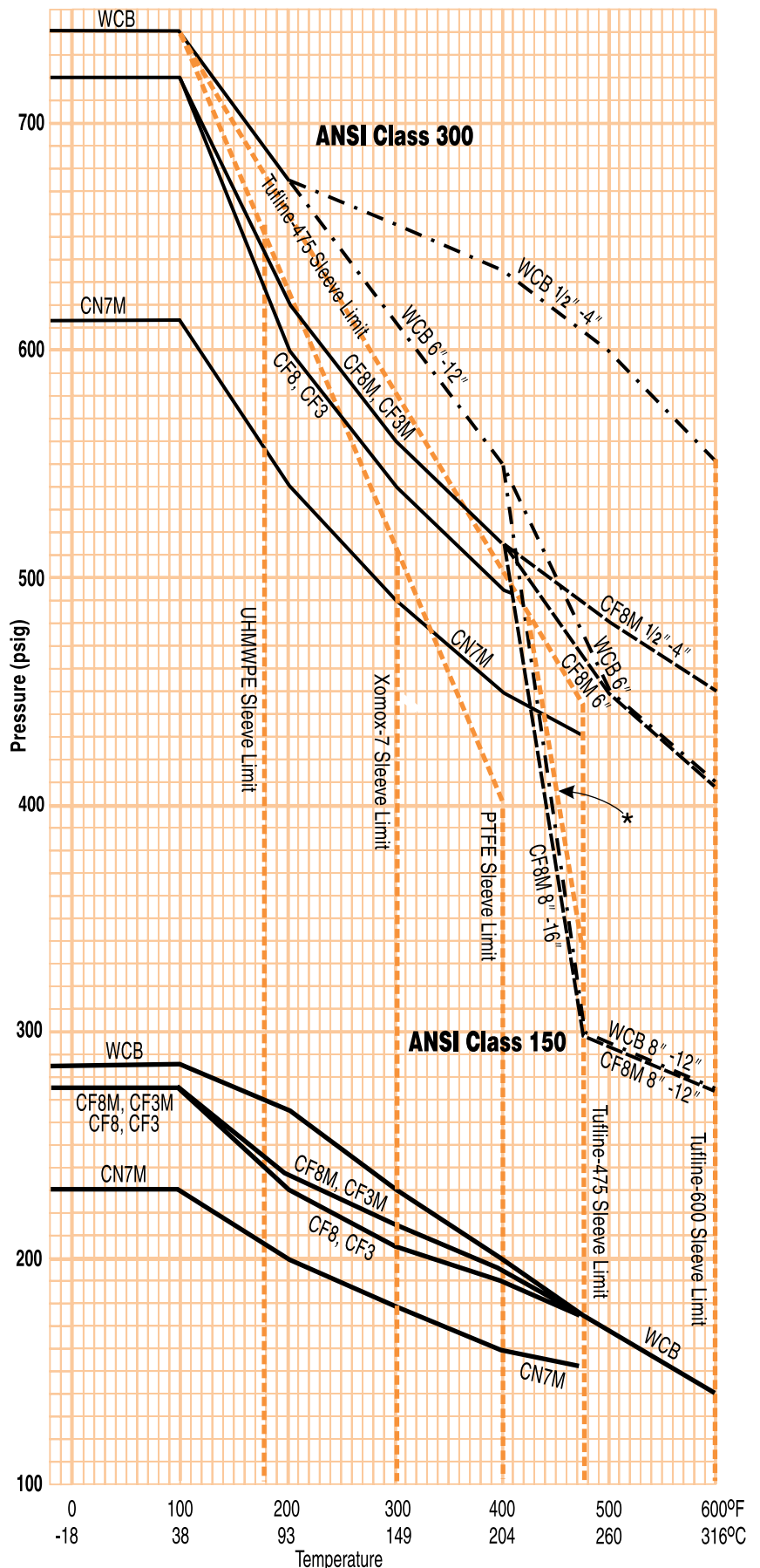
(Inch-Pounds)

Figures are for 2-Way valves with PTFE sleeves. Consult factory for torque adjustment factors for other sleeve materials.

Class 150 & 300

Size	Break torque	Seating torque	Running torque
1/2	140	80	70
3/4	140	80	70
1	400	250	200
1 1/2	800	500	400
2	1100	650	550
2 1/2	1200	700	600
3	1200	700	600
4	2400	1450	1200
6	5000	3000	2500
8	7800	4700	3900
10	14400	8600	7200
12	21000	12600	10500

Pressure-Temperature Ratings



Based on ASME B16.34a, 1996 and 1998 Editions.

Consult factory for Class 600 ratings.

*This curve indicates the Limit for Tuffline-475 sleeve material when used in 8"-16" valves.

Quick Reference Selection Table

No. of Ports	Type	ANSI Class	Size Range	Sleeve Choices	Operator	Figure Number	Additional Information		
2	Socket Weld	150	1/2 - 2	PTFE Tuflin-475	*	066SW	* On 2 1/2 and 3 inch valves with Xomox-7 or UHMWPE sleeves enclosed gear operators are standard. On all 4 inch valves enclosed gears are standard. However, 2 1/2, 3, and 4 inch valves with PTFE or Tuflin-475 sleeves are available with wrench operators.		
		300				0366SW			
		150				166SW			
		300				1366SW			
		600				1666SW			
	Butt Weld	150	1/2 - 4	PTFE Tuflin-475 Xomox-7 UHMWPE		166BW			
		300				1366BW			
		600				1666BW			
		150				2 1/2 - 12		Enclosed Gear	166BWEG
									300
3	Socket Weld	150	1/2 - 2	PTFE Tuflin-475	*	036SW	* On 2 1/2 and 3 inch valves with Xomox-7 or UHMWPE sleeves enclosed gear operators are standard. On all 4 inch valves enclosed gears are standard. However, 2 1/2, 3, and 4 inch valves with PTFE or Tuflin-475 sleeves are available with wrench operators.		
		300				0336SW			
		150				136SW			
		300				1336SW			
	Butt Weld	150	1/2 - 4	PTFE Tuflin-475 Xomox-7 UHMWPE		136BW			
		300				1336BW			
		150				2 1/2 - 6		Enclosed Gear	136BWEG
									300

Materials

The following are ASTM designations for materials listed elsewhere in this catalog.

Carbon steel..... ASTM A216 WCB
 302 stainless steel..... ASTM A240 Type 302
 304 stainless steel..... ASTM A240 Type 304
 304 stainless steel..... ASTM A351 CF8
 304L stainless steel..... ASTM A351 CF3
 316 stainless steel..... ASTM A351 CF8M
 316L stainless steel..... ASTM A351 CF3M
 Alloy 20..... ASTM A351 CN7M
 Bronze..... ASTM B61

CD4MCu..... ASTM A351 CD4MCu
 Ductile Iron..... ASTM A395
 Hastelloy B..... ASTM A494 N7M
 Hastelloy C..... ASTM A494 CW6M
 Inconel..... ASTM A494 CY40
 Nickel..... ASTM A494 CZ-100
 Monel..... ASTM A494 M30-C
 Ni-Al Bronze..... ASTM B148 Gr.958
 Titanium..... ASTM B367 Gr. C-3
 Zirconium..... ASTM B752 Gr. 702

Other ferrous and non-ferrous materials are available upon application.

Socket Weld Ordering Example:

Size Figure No. Option Body Plug Sleeve Operator Service
1" - 066SW - XP - 6 - 6 - P1 - W - C

Butt Weld Ordering Example:

Size Figure No. Option Body Plug Sleeve Operator Service Pipe Schedule Prep. Design
1" - 166BW - FT - 6 - 6 - P1 - W - C - Schd. 40 pipe - ANSI B16.25

Size & Figure No.

See Quick Reference Selection Table on the previous page

Options

Fire Tested **FT**
 Tertiary Top Seal . . . **TS**
 Cage Control **CCV**
 Extended Packing . **XP**
 Partial Jacket **PJ**

Port Arrangements for 3-Way valves (See page 6)
 **A, AX, C, or D**

Valve specifications may include multiple options.

Body

Alloy 20 **0**
 Carbon Steel . . . **2**
 Monel **3**
 Nickel **5**
 316SS **6**
 Hastelloy B . . . **8**
 Hastelloy C **9**
 Inconel **40**
 Other (Specify) . **X**

Service

Chlorine . . **C**
 Oxygen . . **O**
 Vacuum . . **V**
 General Service . . . **Blank**
 Other** . . . **X**

Operator

Wrench **W**
 Wrench with locking device . **WY**
 Gear **G**
 Gear with locking device . **GZ**
 Actuator* **A**
 Less Operator . **N**

Sleeve

PTFE **P1**
 15% RPTFE . **P2**
 25% RPTFE . **P3**
 PFA **P6**
 Xomox-7 **P7**
 UHMWPE . . . **P8**
 Tufline-475 . **P16**
 Tufline-600 . **P20**
 Other (Specify) . . . **PX**

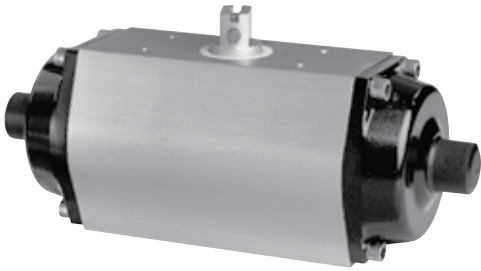
Plug

Alloy 20 **0**
 Ductile Iron **1**
 Carbon Steel . . . **2**
 Monel **3**
 304SS **4**
 Nickel **5**
 316SS **6**
 Hastelloy B . . . **8**
 Hastelloy C **9**
 Inconel **40**
 Other (Specify) . **X**

* Specify actuator type and available air supply.

** Consult your Xomox Sales Engineer for a wide variety of other available service options.

Xomox Actuators & Automation Accessories



Xomox XRP™ Actuators

The unique features of Xomox XRP Pneumatic Rack & Pinion Actuators include:

- A balanced pinion which does not require an external retaining clip to prevent the pinion from blowing out.
- Individual single point adjustment for both the CW and CCW directions.
- 98 degrees of total travel on the most popular sizes.
- Vertically aligned air passages allow increased air flow minimizing cycle time.



Matryx® Vane Actuators

Matryx Vane Actuators provide reliable and efficient remote control of any type of rotary operation. They are used for ball, plug, and butterfly valves as well as other mechanisms such as dampers, switches, and safety devices.

They are available up to 30,000 in-lbs of torque.

Xomox Limit Switches

A wide variety of switching options and other automation accessories are available.



Xomox Automation & Service Centers are located throughout the United States. They provide:

- Automated valve packages
- Valve modifications
- Valve repair
- Application assistance
- On-site inventories of valves, actuators, and accessories assure fast turn-around.
- A new-valve factory warranty backs every automated, modified, and repaired valve.



Xomox Sizing Program will help you design a more efficient and economical processing system and assure proper actuator size selection.

