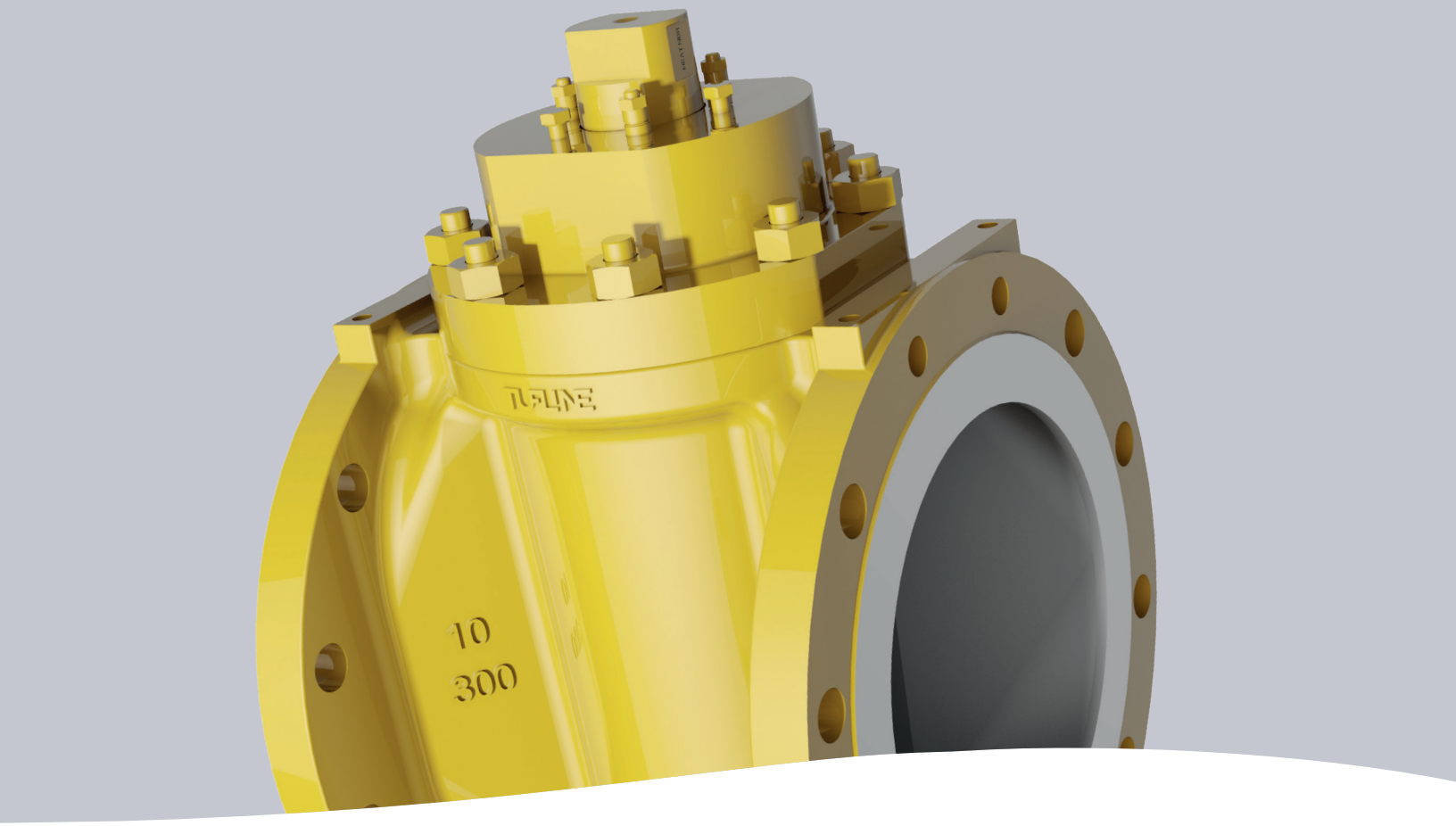
XOMOX®

brands you trust.



XOMOX® Sleeved Plug Valves
Hydrofluoric Alkylation (HF) Valves

CRANE®

Crane ChemPharma & Energy

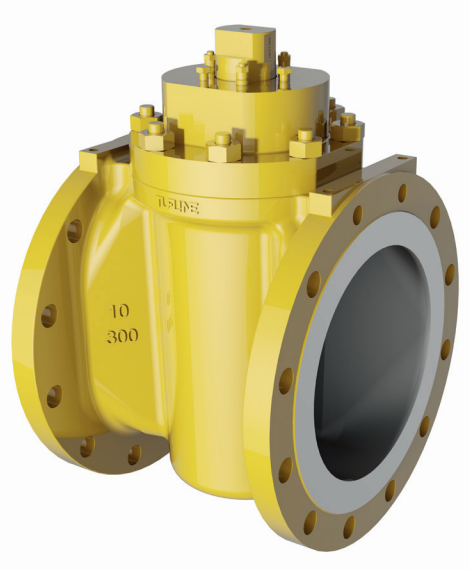
www.cranecpe.com

XOMOX® Hydrofluoric Alkylation Valves

XOMOX® Tufline® Sleeved Plug Valves (SPV)

XOMOX® Tufline® SPV HF valves have a long and successful history in HF refineries around the world. Tight and secure in-line sealing, cavity freeness and self-cleaning characteristics have enabled successful performance throughout the years.

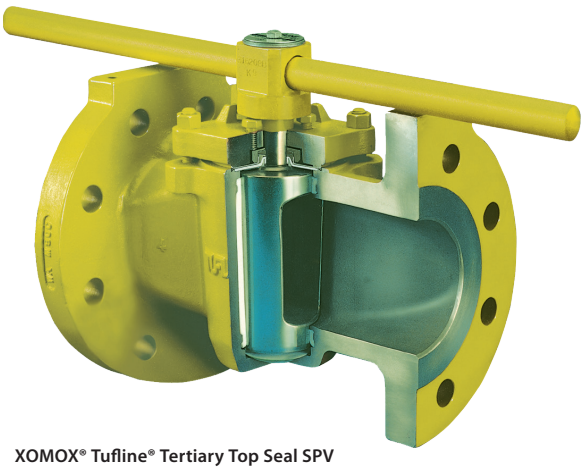
Along with our existing XOMOX® Tufline® Tertiary Top Seal design our latest XOMOX® HF4D Low Emission SPV provides higher and more reliable emissions performance for these demanding applications.



XOMOX® HF4D Low Emission SPV

XOMOX® HF4D Low Emission SPV meets the highest emission standards in the industry for HF applications:

- API 641 Class B & E certified under 100 ppm
- ISO 15848-1 BH CO3 392°F/200°C SSA 0



XOMOX® Tufline® Tertiary Top Seal SPV

XOMOX® Tufline® Tertiary Top SPVs

Are listed in UOP & ConocoPhillips Petroleum Company's HF Alkylation Process Design Specification Manual. This Top Seal design meets EPA Method 21

ISO 15848 Standard Introduction

International Organization for Standardization

INTERNATIONAL ..... ISO
STANDARD 15848-1

ISO 15848-1 is an International standard for fugitive emissions issued by the ISO Organization. It contains both dynamic life cycles and thermal cycles and is considered one of the most demanding fugitive emission standards for soft seated valves. This standard contains different levels of acceptance based on the number of thermal and mechanical cycles, temperature, and number of adjustments. The objective of ISO 15848-1 is to enable classification of performance in different designs and constructions of valves to reduce fugitive emissions.

Example Description Tables

(200°C)

ISO 15848 – 1 BH CO3 392°F – SSA 0

Part Composition	
Part 1: Design • **System of classification and procedures of qualification for the tests of the valve type**	Part 2: Industrial (Production) • Acceptance tests in production of the valves • Non-destructive

Number of Adjustments
0 / 1 / 2 / 3

Temperature Classes				
(T -196 °C)	**(T -40 °C)**	**(T RT)**	**(T 200 °C)**	**(T 400 °C)**
-320°F	-40°F	Room temperature, °F	**392°F**	752°F
-196°C	-40°C	Room temperature, °C	**200°C**	400°C

Class	Measured Leak Rate [a] mg s^{-1} m^{-1}	Remarks
A[b]	$\leq 10^{-6}$	Typically achieved with bellow seals or and equivalent stem (shaft) sealing system for quarter turn valves
B	**$\leq 10^{-4}$**	**Typically achieved with PTFE based packings or elastomeric seals**
C	$\leq 10^{-2}$	Typically achieved with flexible graphite based packings

[a] Expressed in mg s-1 m-1 measured with total leakage method
[b] Class A can be measured only with helium using the vacuum method

Classification	Minimum number of mechanical cycles
C01	500 cycles, with two thermal cycles (except for RT)
C02	1,500 cycles, with three thermal cycles
C03	**2,500 cycles, with four thermal cycles**

Test Fluid	Class
H - Helium	**AH, BH, CH**
M - Methane	BM, CM

When the test fluid is **helium**, classes are identified as **AH, BH** and **CH**.
When the test fluid is **methane**, classes are identified as **BM** and **CM**.

Manufacturing valves will be subjected to the ISO 15848-2 test as described in the norm. This is a non-destructive test that intends to address the performance of the valves (Please refer to ISO 15848 norm).

XOMOX

API 641 Standard Introduction

energy API
AMERICAN PETROLEUM INSTITUTE

API 641 standard specifies the requirements and acceptance criteria for fugitive emission type testing of quarter-turn valves, issued by API Organization. Type testing requirements contained are based on elements of EPA Method 21.

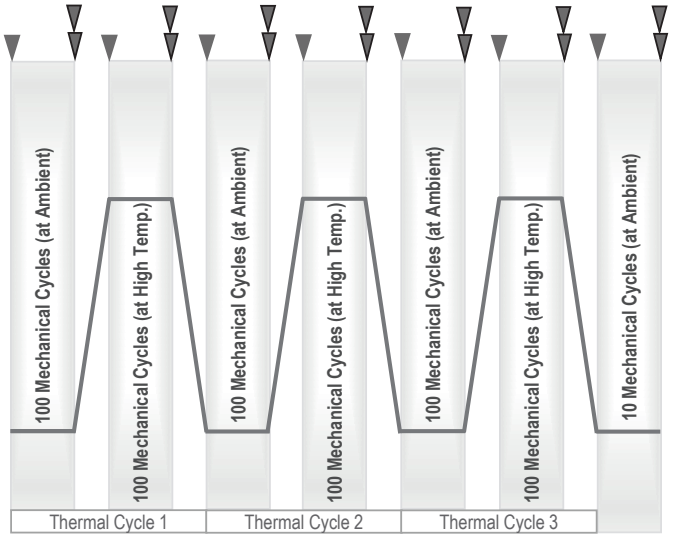
API 641 Class B & E

Class A	Valve pressure rating at 260° C (500° F) is ≥ 41.1 barg (600psig)	Valve Temperature Rating ≥ 260° C (500° F)
Class B	**Valve pressure rating at 260° C (500° F) is < 41.1 barg (600 psig) and ≥ 6.89 barg (100 psig)**	
Class C	Valve with a temperature rating ≥ 260° C (500° F) and does not comply with the requirements of Group A or Group B	
NOTE Valves with a pressure rating less than 6.89 barg (100 psig) at ambient temperature are outside the scope of this standard		

Class D	Valve pressure rating at its maximum-rated temperature is ≥ 41.1 barg (600 psig)	Valve Temperature Rating < 260° C (500° F)
Class E	**Valve pressure rating at its maximum-rated temperature is < 41.1 barg (600 psig) and ≥ 6.89 barg (100 psig)**	
Class F	Valve with temperature rating < 260° C (500° F) and does not comply with the requirements of Group D or Group E	
NOTE Valves with a pressure rating less than 6.89 barg (100 psig) at ambient temperature are outside the scope of this standard		

API 641 will always consider cycles:

- Valves shall be subjected to a total of 610 mechanical cycles and 3 thermal cycles
- Mechanical and thermal cycling shall begin with the valve at ambient level.
- Test has been performed by using Methane as the test medium.



XOMOX® Tufline® HF4D
Low Emission Sleeved Plug Valves (SPV)

The first Sleeved Plug Valve for HF applications capable of passing four (4) thermal cycles with ZERO packing adjustments.

Key Features & Benefits

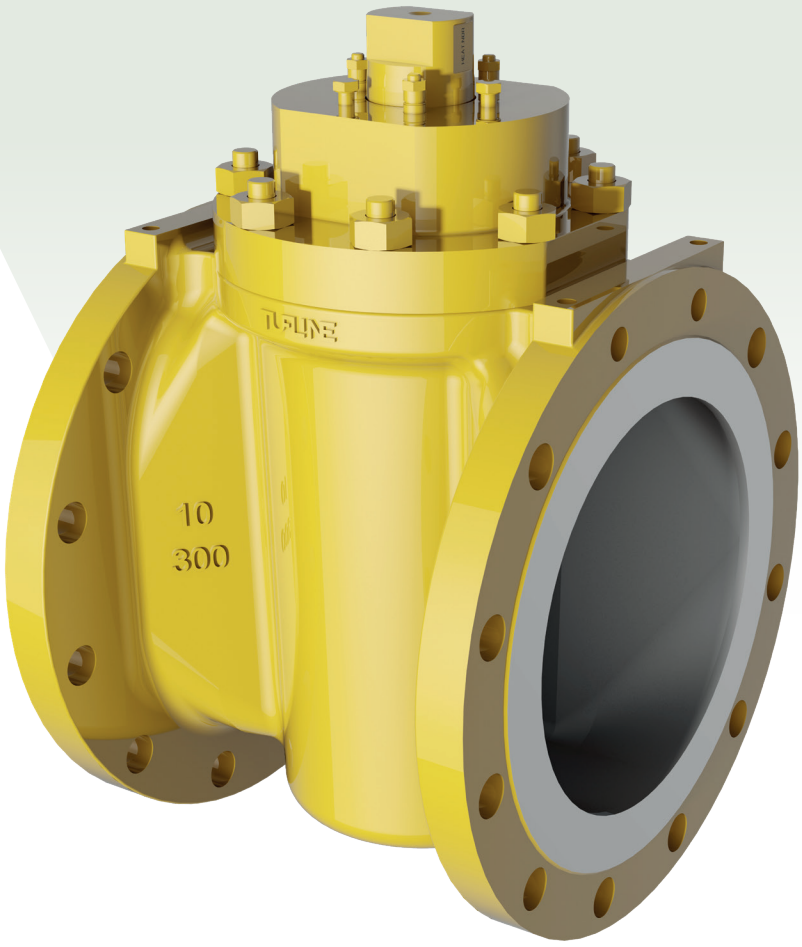
1. Innovative stem seal design permits best in class FUGITIVE EMISSIONS CONTROL (ISO 15848-1 BH CO3 392°F or 200°C SSA 0).
2. Live-loaded design optimizes sealing performance (self-adjusted) and extended service life with ZERO PACKING ADJUSTMENTS through thermal cycling.
3. MAINTENANCE and CAVITY FREE: No costly lubrication, no sticking, and no contamination of process media.
4. ADDITIONAL 4D STEM PACKING ensures manual adjustment capabilities on the 4th sealing barrier to atmosphere.

XOMOX® HF4D LIVE-LOADED STEM CARTRIDGE SEAL

The new XOMOX® HF4D Soft Seated Sleeved Plug Valve incorporates a Live-loaded Stem Cartridge which enables to meet the most stringent emissions standards in the industry.

Options:

- All current XOMOX® sleeve material options are available – PTFE, Tufline-475, XeniTh.
- Full port configuration available.
- Firetest according to API 607 7th edition.
- HF4D is certified to API 641 Class B and E and ISO 15848-1 BH CO3 392°F/200°C SSA 0 .



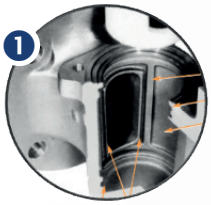
XOMOX® Tufline® HF4D
Low Emission SPV Features and Benefits

HF4D Sleeved Plug Valves are the first valves capable to pass all four thermal cycles without any packing adjustments, while meeting the ISO 15848-1 standard at the BH CO3 392°F/200°C SSA 0. The XOMOX® HF4D Sleeved Plug Valves contain the same live loaded stem cartridge as the XP3 design, while also adding fourth adjustable stem seal. This additional set of packing allows for a manual override of the seal to atmosphere which can be achieved with the adjustable 4D stem seal adjustment studs and nuts at the cover.

The HF4D design incorporates the same features and benefits of the standard XOMOX® Sleeve Plug Valve by being maintenance and cavity-free. These valves require no costly lubrication and prevent accumulation or contamination of process media, reducing maintenance costs and the cost of ownership over time.

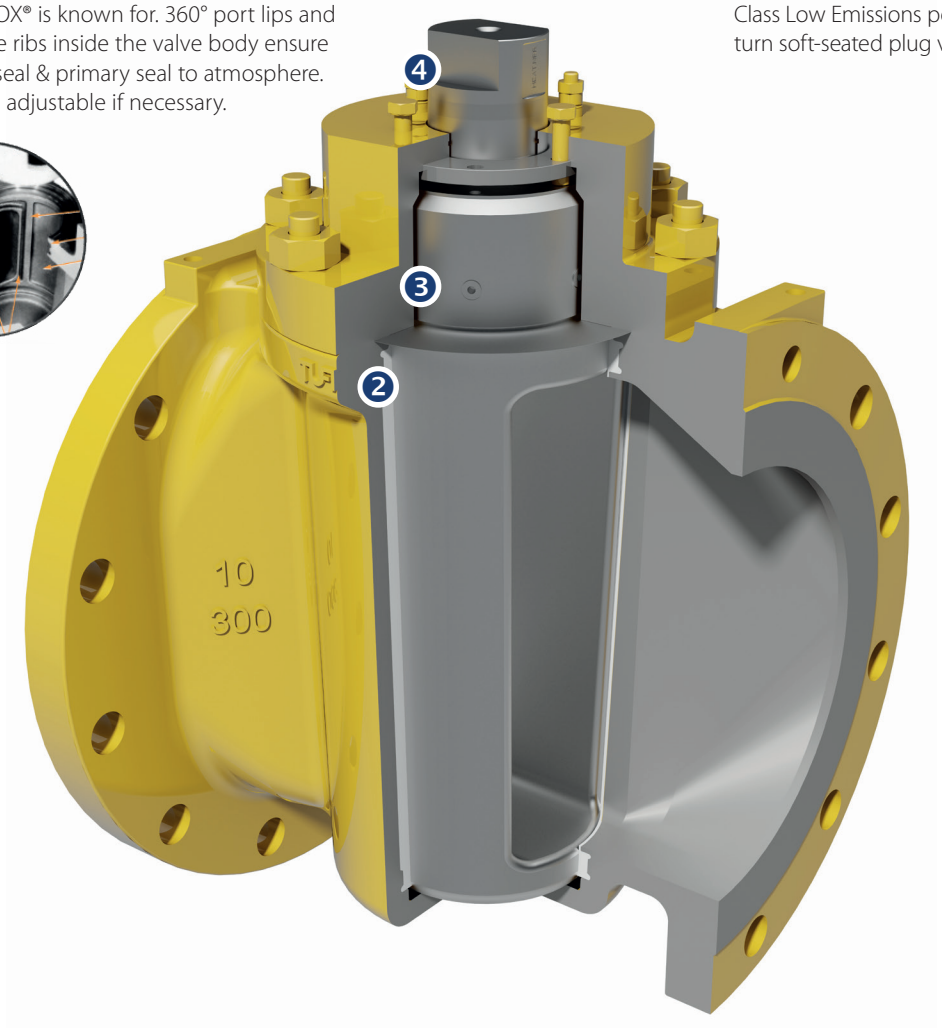
1 Primary Seal to Atmosphere

The HF4D utilizes the same proven sleeve & body design XOMOX® is known for. 360° port lips and high pressure ribs inside the valve body ensure tight in-line seal & primary seal to atmosphere. Plug remains adjustable if necessary.



3 Tertiary Seal to Atmosphere

NEW Live-Loaded Stem Cartridge delivers World Class Low Emissions performance in a quarter-turn soft-seated plug valve.



2 Secondary Seal to Atmosphere

NEW Reinforced spiral wound gasket together with the wedge ring & plastic diaphragm, that are in place on our existing product, ensure another layer of protection to stem seal and body cover joint.

4 4D Stem Seal

NEW Manual override for atmospheric sealing. 4D Stem Seal is to answer some customer requirements in the industry.

XOMOX® Tufline® HF4D
Low Emission SPV Features and Benefits

5 Patented live-loaded stem cartridge design

Optimizes sealing integrity to atmosphere and extended service life. 4D stem packing design for manual override capabilities

HF4D maintains all design features of current XOMOX® Tufline® SPV

- Re-inforced body cover joint gasket for emissions-proof valves.
- 360° port lips on body prevent cold flow and deformation of the sleeve, eliminating the chances that the sleeve will rotate during thermal cycling.
- End connection options available – flanged, threaded or socket weld end.
- All sleeve materials are available.

MEETING BEST IN CLASS FUGITIVE EMISSION STANDARDS

ISO 15848-1 BH CO3 200°C/392°F

- Tightness class BH (<0-4 mg/(s x m))
- Endurance class CO3
- Temperature class RT to 200°C/392°F
- Adjustments: SSA 0 (zero packing adjustments)

ISO International Organization for Standardization

Option:
API 641 Class B and E
(200°C/392°F) (260°C/ 500°F)

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AMERICAN PETROLEUM INSTITUTE

XOMOX® Tufline® HF4D
Low Emission SPV for every HF Application

XOMOX® HF4D valves can be ordered with different options, such as end connections or in full port, depending on your applications.

HF4D is offered in Monel which is particularly designed for HF application requirements.

Standard Materials of Construction

Part	Material	Additional Material Notes
4D Packing Adjustment Studs / Nuts	ASTM B164 Monel 400 / ASTM B164 Monel 405	
Plug Adjusting Bolts	ASTM B164 Monel 400	
Cover	ASTM A216, Grade WCB w/ S16 supplemental requirements	Radiography per ASTM E446 & ASTM E186. Impact Tested at -29°C
Cover Bolts / Studs & Nuts	ASTM A193, Grade B7M / ASTM A194, Grade 2HM	100% Indentation Hardness Tested
Weatherseals	EPDM	
Live Loaded Device	AISI 6150 (1.8159) with Geomet 321 Coating	
Fire Tested Cartridges	ASTM A494, Grade M-35-1 / (2.4360.10 & N04400)	
Metal Diaphragm	(Monel) Alloy 400	
Stem Seal Ring	Braided Graphite	
Formed Diaphragm	Virgin PTFE	
Wedge Ring	Virgin PTFE	
Body-Cover Joint Gasket	Graphite/PTFE Blend with (Monel) Alloy 400 Trim Band	
Plug	ASTM A494, Grade M-35-1	Liquid Penetrant Examination per ASTM A165
Sleeve	All XOMOX® sleeve materials	
Body	ASTM A494, Grade M-35-1	Radiography per ASTM E446 and ASTM E186
Paint	HF Acid Detection Paint	
Tag	304 Stainless Steel	
Plastic Cable Tie	Plastic	
Mounting Kit	Painted Carbon Steel	
Stem Drive Compensators / Adaptors	Carbon Steel	
Hub / Wrench	ASTM A216, Grade WCB / Painted C.R.S.	

XOMOX® SPV HF4D –
Valve components view

Reference of Available Configurations*

Size (in.)	ASME Class	Figure Number	Flanged End	Threaded End
1/2 to 12	300	0367HF4D	x	
1/2 to 1	300	0366HF4D-SE		x
2 to 12	300	20367HF4D	x	

*Consult factory for additional configurations

XOMOX® HF4D
Full Port

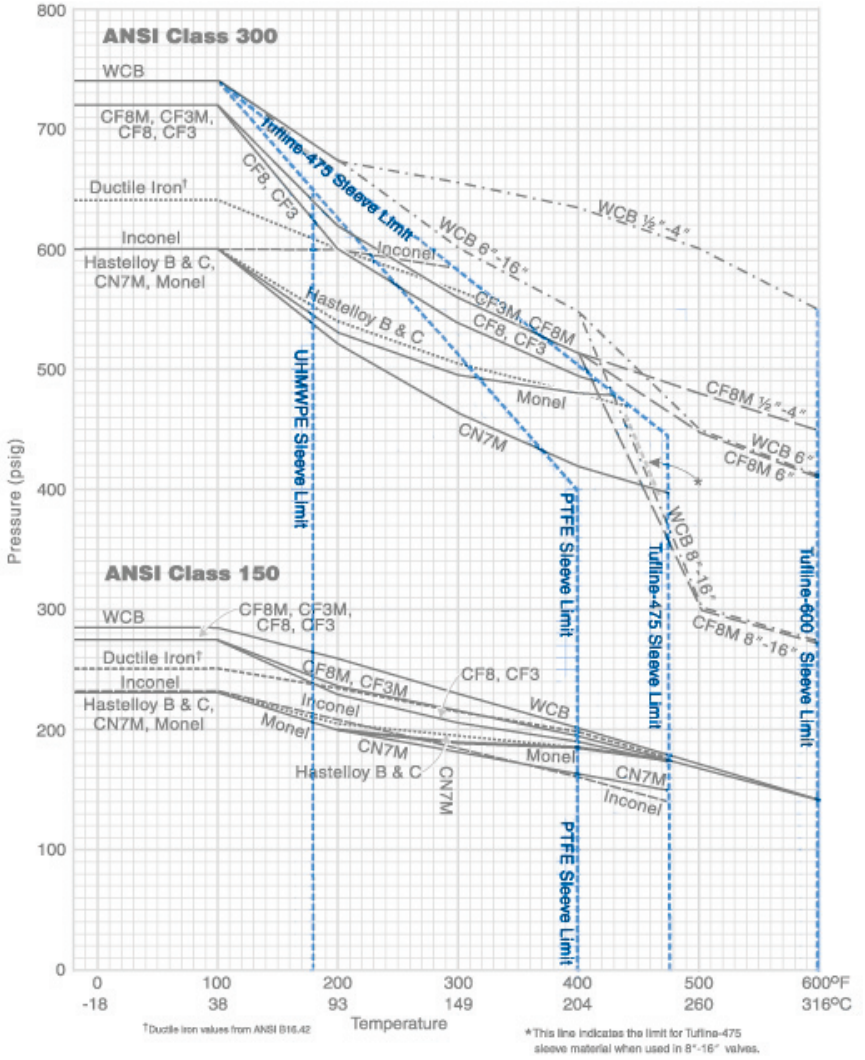
XOMOX® HF4D
Threaded End

XOMOX® Tufline® HF4D
Low Emission SPV Properties and Characteristics

HF4D Break Torque - Class 300 [in*lbs]

Size	PTFE/PTFEX		%R-PTFE Sleeve		PTFEXC/XeniTh Sleeve		UHMWPE/PFA Sleeve	
	Std	Built Dry	Std	Built Dry	Std	Built Dry	Std	Built Dry
½" & ¾"	163	244	204	305	214	326	326	478
1"	458	692	580	865	621	936	916	1384
1 ½"	916	1384	1150	1730	1242	1863	1842	2758
2"	1262	1893	1578	2372	1710	2565	2534	3797
3"	1384	2066	1730	2585	1863	2799	2758	4143
4"	2758	4143	3450	5181	3725	5588	5517	8285
6"	5751	8621	7186	10779	7766	11644	11502	17252
8"	8967	13456	11217	16815	12112	18168	17944	26912
10"	16560	24845	20703	31054	22352	33538	33120	49681
12"	24153	36225	30189	45284	32601	48907	48296	72450

If any additional information is required, please contact your sales representative or customer service.



XOMOX® Tufline® HF4D
Low Emission SPV Dimensional Data

Bare Stem Operated

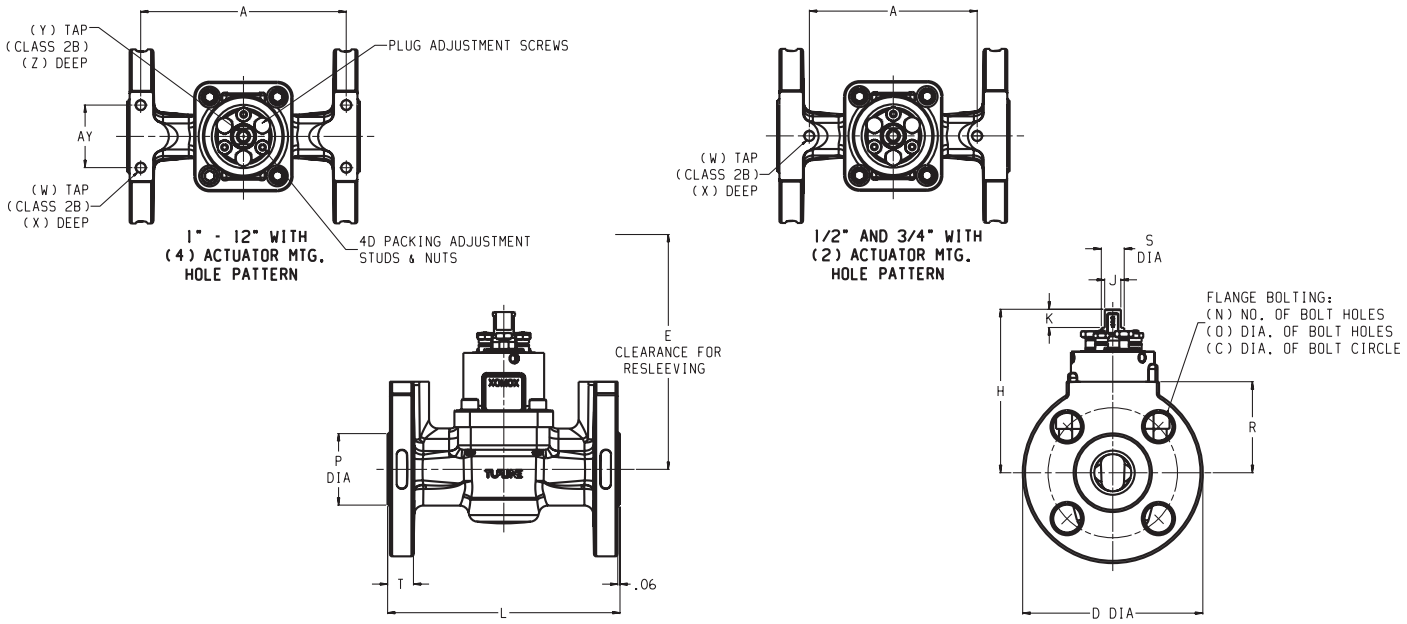


Figure 0367HF4D Class 300

SIZE	L	D	T	R	N	O	C	W
1/2"	5.50	3.75	.56	1.88	4	.63	2.63	6.6
3/4"	6.00	4.63	.63	2.31	4	.75	3.25	9.9
1"	6.50	4.88	.69	2.44	4	.75	3.50	12
1-1/2"	7.50	6.13	.81	3.06	4	.88	4.50	22
2"	8.50	6.50	.88	3.25	8	.75	5.00	29
3"	11.13	8.25	1.13	4.13	8	.88	6.63	40
4"	12.00	10.00	1.25	5.13	8	.88	7.88	84
6"	15.88	12.50	1.44	6.25	12	.88	10.63	170
8"	16.50	15.00	1.63	7.50	12	1.00	13.00	275
10"	18.00	17.50	1.88	8.75	16	1.13	15.25	407
12"	19.75	20.50	2.00	10.25	16	1.25	17.75	556

(4) ACT. MTG. HOLE PATT.			
A	AY	W	X
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5.570	1.750	5/16 - 18	.38
6.625	1.150	5/16 - 18	.47
7.563	2.250	5/16 - 18	.47
9.938	3.500	3/8 - 16	.56
10.688	4.000	7/16 - 14	.63
14.000	4.000	7/16 - 14	.63
14.625	6.000	1/2 - 13	.63
15.688	6.000	1/2 - 13	.63
17.375	6.000	1/2 - 13	.63

(2) ACT. MTG. HOLE PATT.		
A	W	X
4.375	5/16 - 18	.47
3.750	5/16 - 18	.47
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Figure 0367HF4D Class 300

SIZE	H	S	J	K	P	E	Y	Z
1/2"	4.591	.537	.437	.500	1.38	8.68	1/4 - 20	.91
3/4"	4.591	.537	.437	.500	1.69	8.68	1/4 - 20	.91
1"	4.433	.620	.437	.500	2.00	8.93	1/4 - 20	.91
1-1/2"	5.456	.848	.563	.530	2.88	10.43	5/16 - 18	.91
2"	6.067	1.102	.755	.748	3.63	11.63	5/16 - 18	.91
3"	6.598	1.102	.755	.748	3.63	11.63	5/16 - 18	.91
4"	8.054	1.260	.880	1.000	6.19	24.83	5/16 - 18	.91
6"	9.590	2.008	1.398	1.000	10.63	30.47	5/16 - 18	.91
8"	11.795	2.008	1.398	1.000	10.63	30.47	5/16 - 18	.91
10"	13.291	2.500	1.673	1.000	12.75	31.47	1/2 - 13	.91
12"	14.315	2.992	1.968	1.000	15.00	37.53	1/2 - 13	.91

All dimensions in inches. Weight of valve in pounds. All weights are estimated.

XOMOX® Tufline® HF4D
Low Emission SPV Dimensional Data

Wrench Operated

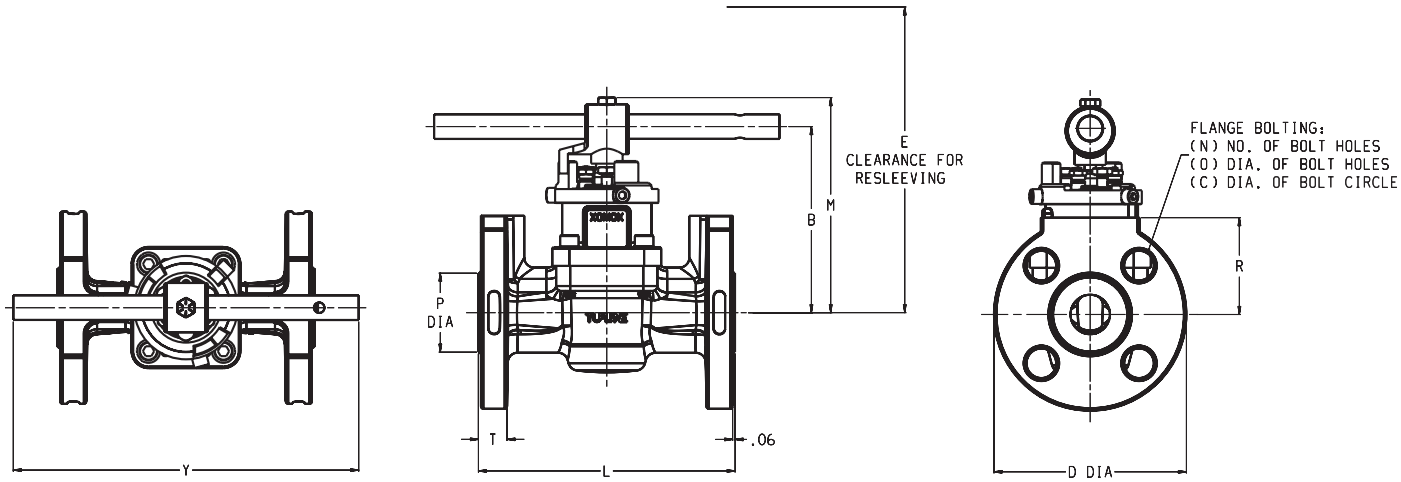


Figure 0367HF4D Class 300

SIZE	L	D	T	P	R	N	O	C	E	M	B	Y	W
1/2"	5.50	3.75	.56	1.38	1.88	4	.63	2.63	8.68	5.61	4.89	8.75	8.6
3/4"	6.00	4.63	.63	1.69	2.31	4	.75	3.25	8.68	5.61	4.89	8.75	12
1"	6.50	4.88	.69	2.00	2.44	4	.75	3.50	8.93	5.45	4.73	8.75	14
1-1/2"	7.50	6.13	.81	2.88	3.06	4	.88	4.50	10.43	6.62	5.79	12.50	25
2"	8.50	6.50	.88	3.63	3.25	8	.88	5.00	11.63	7.44	6.61	18.00	32
3"	11.13	8.25	1.13	5.00	4.13	8	.88	6.63	12.63	7.96	7.13	24.00	44
4"	12.00	10.00	1.25	6.19	5.13	8	.88	7.88	24.83	9.76	8.68	30.00	92

All dimensions in inches. Weight of valve in pounds. All weights are estimated.

XOMOX® Tufline® HF4D
Low Emission SPV Dimensional Data

Gear Operated

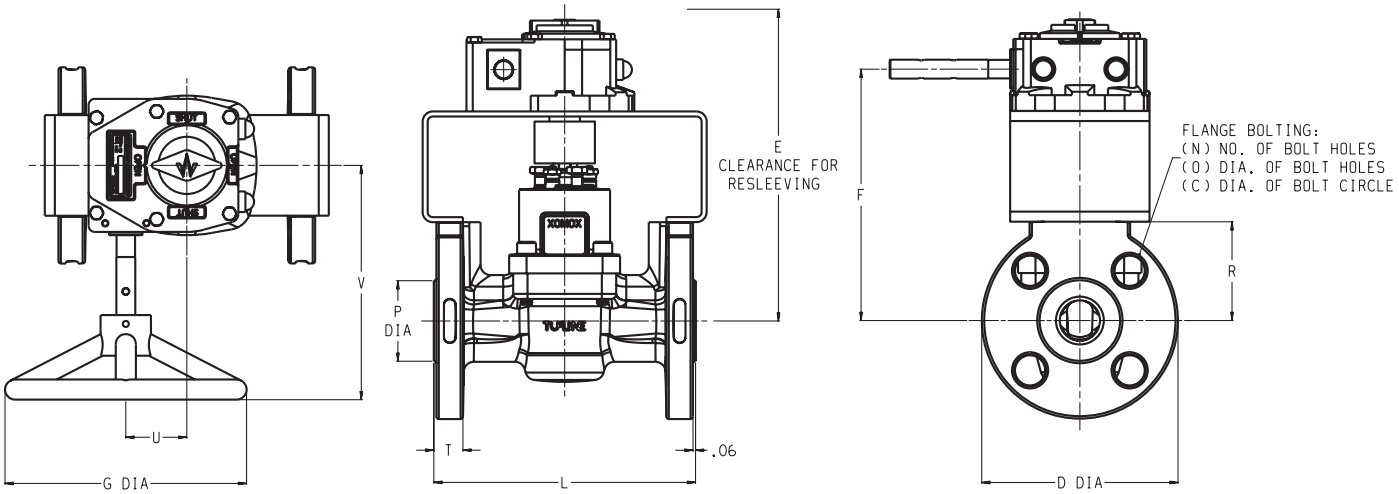


Figure 0367HF4D Class 300

SIZE	L	D	T	P	R	N	O	C	E	F	G	U	V	W
3"	11.13	8.25	1.13	5.00	4.13	8	.88	6.63	12.63	10.38	12.00	2.05	7.77	64
4"	12.00	10.00	1.25	6.19	5.13	8	.88	7.88	24.83	11.57	12.00	2.05	7.77	110
6"	15.88	12.50	1.44	8.50	6.25	12	.88	10.63	27.25	13.78	18.00	2.53	10.30	218
8"	16.50	15.00	1.63	10.63	7.50	12	1.00	13.00	30.47	16.03	18.00	3.53	10.96	349
10"	18.00	17.50	1.88	12.75	8.75	16	1.13	15.25	31.47	17.78	24.00	4.84	14.26	515
12"	19.75	20.50	2.00	15.00	10.25	16	1.25	17.75	37.53	18.78	30.00	4.84	15.76	674

All dimensions in inches. Weight of valve in pounds. All weights are estimated.

XOMOX® HF4D Full Port
Low Emission SPV Dimensional Data

Bare Stem Operated

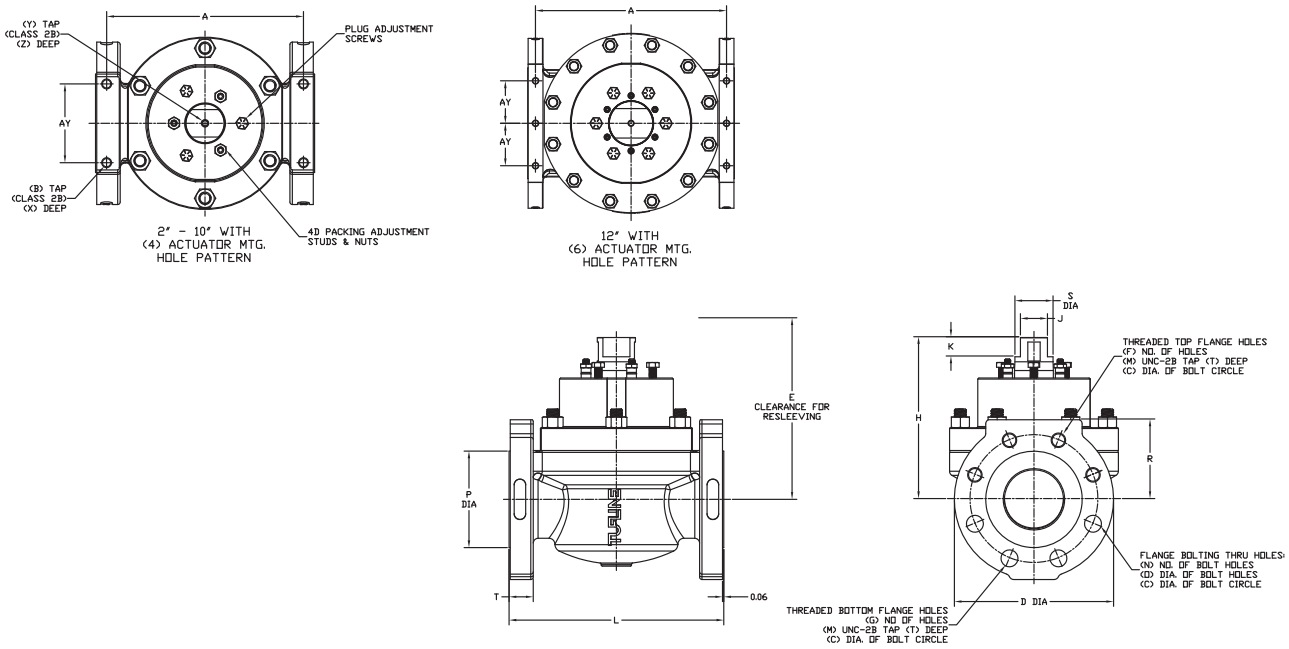


Figure 20367HF4D

SIZE	L	D	T	R	N	O	C	F	G	M	W
2"	8.50	6.50	.94	3.16	8	.75	5.00	—	—	—	60
3"	11.13	8.25	1.25	4.13	4	.88	6.63	4	0	3/4—10	134
4"	12.00	10.00	1.43	5.00	6	.88	7.88	2	0	3/4—10	207
6"	15.88	12.50	1.50	6.44	4	.88	10.63	4	4	3/4—10	443
8"	19.75	15.00	1.73	7.56	6	1.00	13.00	4	2	7/8—9	901
10"	22.38	17.50	2.03	8.84	8	1.13	15.25	6	2	1—8	1472
12"	28.00	23.00	2.06	11.56	8	1.25	17.75	4	4	1—1/4—8*	2834

* UN-8 THREAD

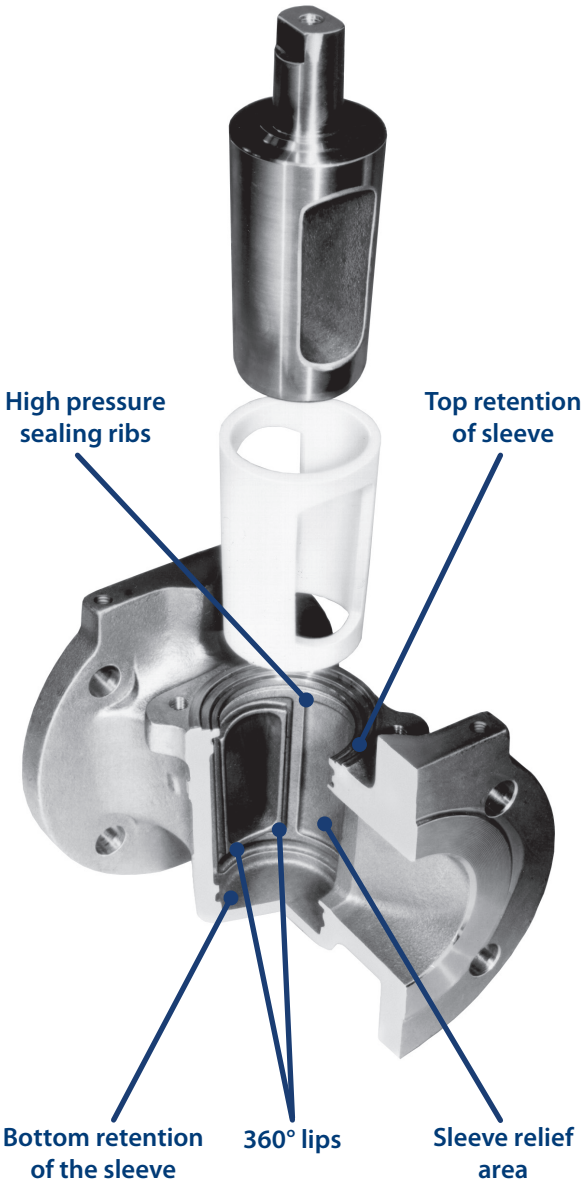
SIZE	H	S	J	K	P	E	Y	Z	A	AY	B	X
2"	7.414	1.258	.874	.984	3.63	11.38	5/16—18	.88	7.50	4.00	7/16—14	.69
3"	8.388	2.008	1.398	1.000	5.00	13.50	5/16—18	.88	10.00	4.00	1/2—13	.63
4"	8.956	2.500	1.673	1.000	6.19	15.38	1/2—13	.75	10.69	4.00	1/2—13	.63
6"	10.575	2.992	1.969	1.000	8.50	19.25	1/2—13	.75	14.38	5.50	5/8—11	1.00
8"	14.789	3.937	2.000	1.575	10.63	26.00	1/2—13	.75	18.06	8.00	3/4—10	1.13
10"	16.897	6.000	4.000	2.000	12.75	30.38	3/4—10	1.00	20.44	8.00	3/4—10	1.13
12"	18.221	6.000	4.000	2.000	15.00	24.25	3/4—10	1.00	25.88	5.75	7/8—9	1.31

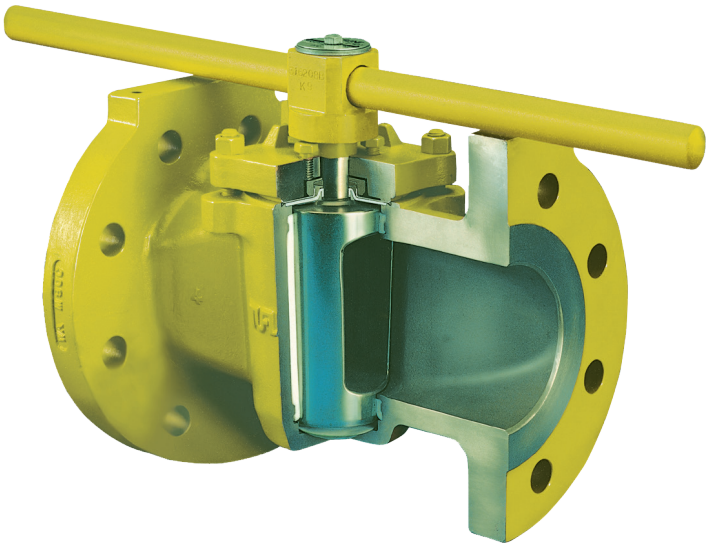
Notes:
1. All dimensions in inches.
2. Weight of valve in pounds. All weights are estimated.
3. 12" 20367HF4D uses bottom cover design.

XOMOX® Tufline® SPV Tertiary Top Seal Design Features & Benefits

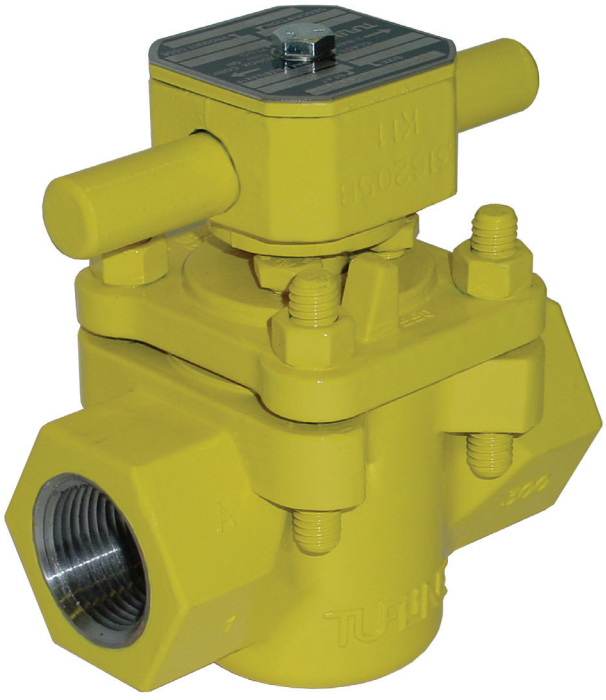
Features & Benefits

1. Superior, longer lasting in-line sealing
2. Secure sealing with no cold-flow, deformation, or rotation of the sleeve due to iron fluoride buildup
3. No cavities, reduced risk of contamination





HF Flanged End Sleeved Plug Valve

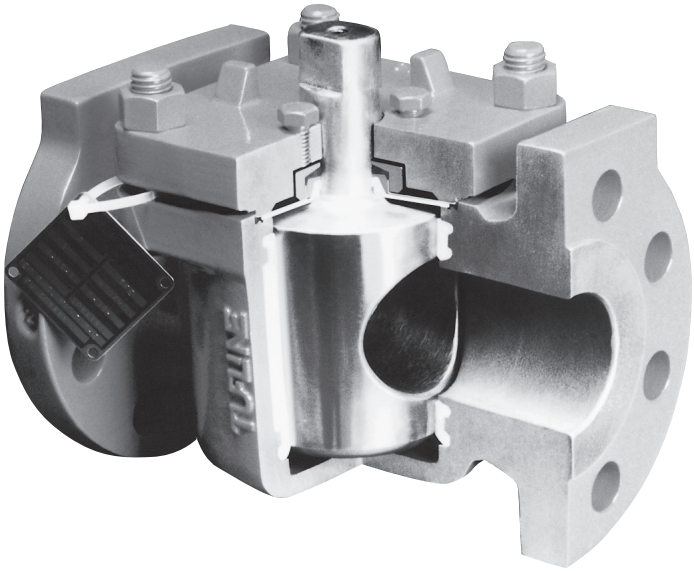


HF Screwed End Sleeved Plug Valve

XOMOX® Tufline® SPV Tertiary Top Seal Applications & Full Port Options

Two-Way Full Port Sleeved Plug Valves

Approved for the most demanding HF requirements
The UOP & ConocoPhillips Petroleum HF Alkylation Process Specifications provide the standards for valves being installed in most new alkylation systems, worldwide. Tufline valves manufactured for the UOP & ConocoPhillips HF processes are listed by UOP & ConocoPhillips Petroleum for use in their licensed systems. You can specify Tufline HF valves that meet these special UOP & ConocoPhillips Petroleum design and material requirements and testing criteria for your application.



Tufline valves for other HF applications and processes
Tufline HF valves are available to meet a variety of alternate design specifications. You can also choose from a number of optional features. These valves are designed to meet the requirements for commercial HF Alkylation processes and hydrofluoric acid applications.

Full port design advantages
With the full-area round port there is no diminished or constricted flow. Ideal wherever low pressure-drop and high-flow efficiency are important such as rapid evac systems. This is a true pipe bore full port. The CV values on average is 3-4 times that of a full area type design plug.

Self cleaning
Metal lips completely surround the valve ports. With each rotation of the valve, any scale which may have collected on the plug seal surface is broken up and wiped away.

UOP Approved!

XOMOX®

XOMOX® Tufline® SPV Tertiary Top Seal for Petroleum Alkylation Processes

Tufline HF Valves are listed in UOP & ConocoPhillips Petroleum Company's HF Alkylation Process Design Specification Manual and meet UOP specifications.

Tufline valves ordered for the UOP & ConocoPhillips Petroleum HF Alkylation process are manufactured in strict accordance with the approved assembly and testing procedures; with no deviation from material and design specifications.

Finish requirements

All finished valve assemblies, excluding actuator fasteners and actuator mounting hardware, are painted with one coat of HF acid detection paint.

Testing requirements

All valve body castings are subjected to 100% radiography of all critical areas of each casting. Each valve body is shell tested with Helium at 400 psig. Completed valve assemblies are hydrostatically shell tested with kerosene at 1 ½ times their rated working pressure, and seat tested at 80 psig air.

Ordering procedures

UOP & ConocoPhillips Valves must be ordered by drawing number. There can be no deviations from specifications and no other options are available. The following table references conventional sizes and figure numbers with the UOP & ConocoPhillips listed drawing numbers.

ASME Class 300

Size (in.)	Figure No.	Phillips Listed Drawing No.	UOP Approved Drawing No.
½	0366HF	FP0694-E	FP1238-E
¾	0366HF	FP0695-E	FP1238-E
1	0366HF	FP0696-E	FP1238-E
1½	0366HF	FP0697-E	FP1238-E
2	0367HF	FP0703-E	FP1243
3	0367HF	FP0704-E	FP1243
4	0367HF	FP0705-E	FP1243
4	0367EG-HF	FP0706-E	FP1244
6	0367EG-HF	FP0707-E	FP1244
8	0367EG-HF	FP0708-E	FP1244-E
10	0367EG-HF	FP0709-E	FP1244-E
12	0367EG-HF	FP0710-E	FP1244-E
14x12x14	0367EG-HF	FP1956-E	FP3709*
14x16x14	0367EG-HF	FP0711-E	FP1244-E
16x16x16	0367EG-HF	FP0712-E	FP1244-E
18x16x18	0367EG-HF	FP0713-E	FP1244-E
20x24x20	0367EG-HF	FP2110-E	FP3708*

ASME Class 600 DR

Size (in.)	Figure No.	Phillips Listed Drawing No.	UOP Approved Drawing No.
2	0667DR-HF	FP1091-E	FP3705*
3	0667DR-HF	FP1092-E	FP3706*
4	0667DR-HF	FP1093-E	FP3707*

ASME Class 300 Full Port

Size (in.)	Figure No.	Phillips Listed Drawing No.	UOP Approved Drawing No.
1	20367HF	FP1703	FP1912
1½	20367HF	FP1704	FP1912
2	20367HF	FP1705	FP1912
3	20367HF	FP1707	FP1913
4	20367HF	FP1708	FP1913
6	20367HF	FP1709	FP1913
8	20367HF	FP1710	FP1913
10	20367HF	FP1711	FP1913
12	20367HF	FP1712	FP1914

*At time of printing, drawing submitted for review but not currently approved or listed by UOP.

XOMOX® Tufline® SPV Tertiary Top Seal for Every HF Application

Valve Components

Adjusting bolts

Cover nut

Cover

Cover stud

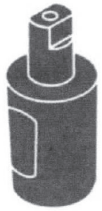
Fire tested cartridge

Formed PTFE diaphragm

PTFE wedge ring

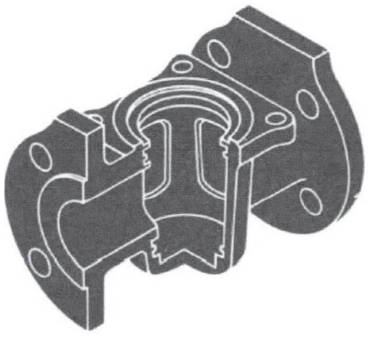
Cover seal ring

Plug



PTFE Sleeve

Body



For other HF acid processing applications. Tufline offers choices of body materials and design options. Tufiine HF valves can be ordered in the same sizes, end connections, and pressure classes that are available in standard Tufline plug valves.

Monel® or carbon steel bodies are available. (All carbon steel bodies are sprayed with fluorocarbon behind the sleeve to protect against the build-up of iron fluoride scale.)

UOP & ConocoPhillips HF Valves Materials of Construction

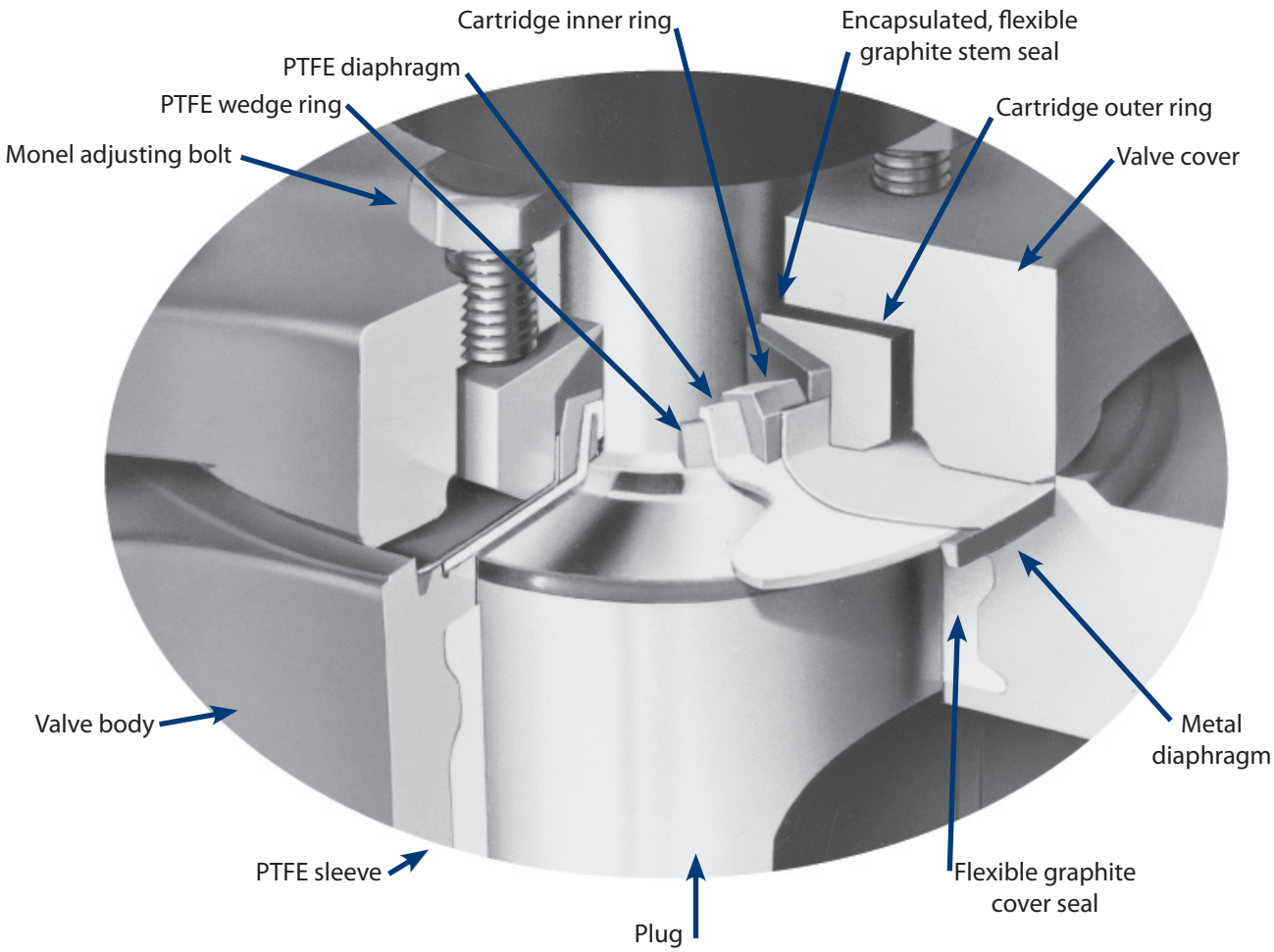
Part	Material
Adjusting Bolts	ASTM B164. Monel
Cover	ASTM A216, Grade WCB Carbon Steel
Cover Nut	ASTM A194, Grade 2HM Carbon Steel
Cover Stud	ASTM A193. Grade B7M Carbon Steel
Fire Tested Cartridges	ASTM B127, Monel
Stem Seal Ring	Flexible Graphite
Formed Diaphragm	Virgin PTFE
Wedge Ring	Virgin PTFE
Cover Seal Ring	Flexible Graphite
Plug	ASTM A494, Grade M-35-1
Sleeve	Virgin PTFE
Body	ASTM A494, Grade M-35-1
Paint	HF Acid Detection Paint
Tag	304 Stainless Steel
Plastic Cable Tie	Plastic

During the assembly process the plug is coated with HF lubricant.

Quick reference of available configurations

Size (in.)	ASME Class	Figure Number	Screwed End	Flanged End
½ to 2	150	066HF	X	
½ to 2	300	0366HF	X	
½ to 4	150	067HF		X
½ to 4	300	0367HF		X
4 to 24	150	067EG-HF		X
4 to 20	300	0367EG-HF		X
½ to 16	600DR	0667/DR-HF		X

XOMOX® Tufline® SPV Tertiary Top Seal
Isolate HF Processes



Control fugitive emissions

This top seal package provides exceptional control of fugitive emissions. It meets or exceeds the most stringent current regulatory requirements EPA Method 21.

Triple sealed for extra protection

Under normal conditions, there are three active seals between the flow media and the atmosphere. Primary sealing is provided by the interaction of the plug, sleeve, and body. Secondary sealing is provided by the PTFE and metal diaphragms. 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.

This Simple system assures stem sealing

This simple, compact, design harnesses complex dynamic forces to assure effective sealing to atmosphere. The metallic cartridge totally encapsulates the flexible graphite tertiary dynamic stem seal. At its outer edge, the metal diaphragm overlaps the graphite static seal ring to reinforce the tertiary seal at the body-to-cover joint. The PTFE wedge ring concentrates the sealing force of the PTFE diaphragm radially against the valve stem for more reliable prevention of external leakage at this secondary seal.

API-607 Standards

The Tufline Tertiary Top Seal Sleeved Plug valve exceeds API-607 - Third Edition Section 4.2 - Specifications for External Leakage. It is available in a broader range of sizes than the standard fire tested model.

XOMOX® Tufline® Sleeved Plug Valves
Tufline-475 & XeniTh for Higher Temperatures

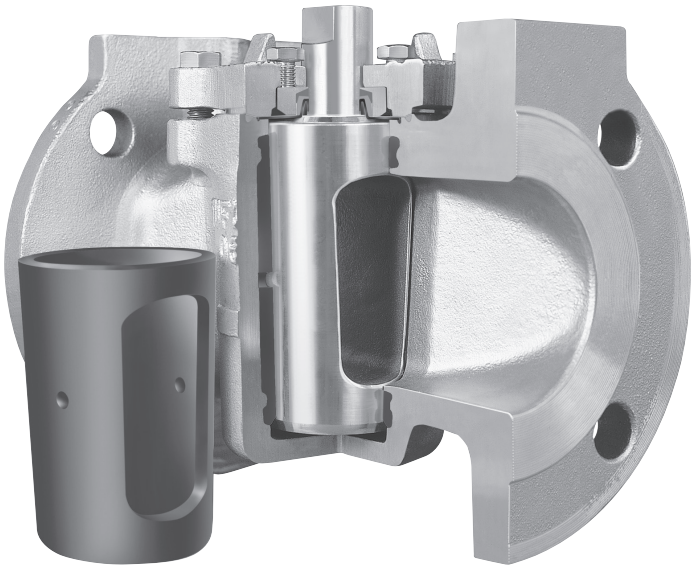
Tufline-475 and XeniTh High Temperature Sleeved Plug Valves provide a higher performance alternative to traditional PTFE sleeves.

Tufline-475 High Temperature Sleeved Plug Valve greatly extends the pressure/temperature range of sleeved plug valves. It even exceeds the operating range of glass-filled PTFE. This greater pressure/temperature operating range is the result of improved thermo-mechanical properties, improved cold-flow properties and improved toughness.

The XeniTh High Temperature Sleeved Plug Valve offers bi-directional flow, simple actuation, and lightweight and compact design in a variety of 2-way and multi-port configurations. This versatility expands the range of possibilities when designing a new processing system or improving an existing system.

Features & Benefits

1. A greater range of operating pressures and temperatures enables use of the more reliable and preferred sleeved plug valve in more applications
   - Tufline-475 up to 475°F
   - XeniTh up to 600°F
2. Reduced cold-flow at elevated temperatures
3. Greater stability helps reduce down-time
4. A smoother surface means better sealing
5. Lower porosity and greater density assure sleeve integrity
6. Enhanced strength and resistance to abrasion and wear



XeniTh Sleeved Plug Valve

Difficulties with other alternative sleeve materials

There are other resins which also work well at elevated temperatures, but they sacrifice sealing capability.

Alternative sleeve materials also dramatically increase torque.

They do not offer the exceptional sealing characteristics and low torque ratings of Tufline-475.

XOMOX®

Crane ChemPharma & Energy, XOMOX®
4444 Cooper Rd.
Cincinnati, OH 45242, USA
Phone: +1 513 745 6000
Fax: +1 513 745 6086

www.cranecpe.com

CRANE®

Xomox International GmbH & Co. OHG
Von-Behring-Str. 15
88131 Lindau, Germany
Tel.: +49 8232 709-0
Fax: +49 8232 709-144

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ELRO® DUO-CHEK® FLOWSEAL® SINCE 1864 JENKINS® FK® KROMBACH ARMATUREN
NOZ-CHEK® PACIFIC VALVES® RESISTOFLEX® revo® Saunders® the science inside
STOCKHAM® UNI-CHEK® WESTLOCK CONTROLS® w.t.a.® XOMOX®

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