



***Vogt Valves***  
*The Connection Bulletin for*  
*HF Alkylation Service Valve Applications*  
*Forged Steel Alkylation Valves*

*CB 21*

# HF Alkylation Service Valve Applications



## WHAT IS AN ALKYLATION PROCESS?

A refining process used to enhance gasoline octane rating. Inherent in several of these process systems is the use of hydrofluoric (HF) acid.

## SPECIAL QA REQUIREMENTS?

Yes. Vogt Alkylation valves are constructed on a Certified ISO 9001 QA Program to assure that all design, materials, quality, inspection and manufacturing details are met.

## SPECIAL TEST REQUIREMENTS?

We test hydrofluoric acid (HF) valves with a test medium of kerosene to avoid the potential for water entrapment. Water entrapment when combined with HF acid could cause accelerated corrosion in service.



SW42241HF2



SW43211HF2



13363MMP

***Vogt is an approved manufacturer of HF Alkylation valves for the UOP ALKY process. Vogt ALKY valves are listed in Phillips Petroleum Company's HF Alkylation Process Design Specification Manual.***



# HF Alkylation Service Valve Applications

Per Specification of Phillips Petroleum or UOP							VALVE SIZE	WEIGHT (LBS.)	BODY END TO END	CL. TO TOP OPEN	CL. TO TOP CLOSED	MIN. SEAT DIA.	HANDWHEEL ACROSS KNOBS	MIN. SOCKET DEPTH
SPECIFICATION	DESCRIPTION	PRESSURE/SIZE DESIGNATION	MATERIAL		SERIES NUMBER									
			Body/Bonnet	Trim	Threaded	Socket Weld								
Phillips Petroleum	Full Port Gate Valve Bolted Bonnet	Class 600 1480 psi @ 100°F Sizes: 1/2" - 1"	Carbon Steel	Monel	43111MMP	...	1/2	5.00	3.38	6.38	5.75	.50	4.00	
							3/4	8.30	4.00	8.31	7.38	.75	4.75	
							1	12.11	4.38	9.56	8.38	1.00	5.75	
Phillips Petroleum	Full Port Flanged Gate Valve Bolted Bonnet	Class 300 740 psi @ 100°F Sizes 2" Only	Carbon Steel	Monel	13363MMP	...	2	57.5	8.50	14.09	11.81	2.00	8.00	
Phillips Petroleum	Full Port Flanged Gate Valve Bolted Bonnet	Class 600 1480 psi @ 100°F Sizes 2" Only	Carbon Steel	Monel	13373MMP	...	2	60.5	11.50	14.09	11.81	2.00	8.00	
Phillips Petroleum	Full Port Globe Valve Bolted Bonnet Removable Seat	Class 600 1480 psi @ 100°F Sizes 3/4" Only	Carbon Steel	Monel/ Teflon	43241MTP	...	3/4	9.10	4.62	8.44	8.06	.66	4.75	
Phillips Petroleum	Full Port Globe Valve Bolted Bonnet Removable Seat	Class 600 1480 psi @ 100°F Sizes 1/2" & 1"	Carbon Steel	Monel	43241MMP	...	1/2 1	5.10 21.40	4.00 6.25	6.62 10.38	6.31 9.88	.39 .97	4.00 5.75	
UOP HF 2	Full Port Gate Valve Bolted Bonnet Double Packing Grease Injector	Class 800 1975 psi @ 100°F Sizes 1/2" - 1"	Carbon Steel	Monel	...	SW43211HF2	1/2 3/4 1	5.77 9.79 17.60	3.38 4.00 4.38	8.16 10.28 11.38	7.56 9.36 10.16	.50 .75 1.00	4.00 4.75 5.75	.38 .50 .50
UOP HF 4 HF 5	Full Port Gate Valve Bolted Bonnet	Class 800 1975 psi @ 100°F Sizes 1/2" - 2"	Carbon Steel	Monel	...	SW13111HF4 SW13111HF5	1/2 3/4 1 1 1/2 2	4.61 8.30 12.10 22.80 42.80	3.38 4.00 4.38 5.25 7.00	6.38 8.31 9.56 11.10 14.09	5.75 7.38 8.38 9.41 11.81	.50 .75 1.00 1.50 2.00	4.00 4.75 5.75 7.00 8.00	.38 .50 .50 .50 .62
UOP HF 6 HF 7	Conventional Port Gate Valve Bolted Bonnet	Class 800 1975 psi @ 100°F Sizes 1/2" - 2"	Carbon Steel	13-CR*	...	SW12111HF6 SW12111HF7	1/2 3/4 1 1 1/2 2	4.60 4.90 8.29 16.02 21.85	3.38 3.38 4.00 4.75 5.25	6.38 6.38 8.31 10.12 11.10	5.75 5.75 7.38 8.69 9.41	.50 .50 .75 1.25 1.50	4.00 4.00 4.75 5.75 7.00	.38 .50 .50 .50 .62



# HF Alkylation Service Valve Applications

Per Specification of Phillips Petroleum or UOP							VALVE SIZE	WEIGHT (LBS.)	BODY END TO END	CL TO TOP OPEN	CL TO TOP CLOSED	MIN. SEAT DIA.	HANDWHEEL ACROSS KNOBS	MIN. SOCKET DEPTH
SPECIFICATION	DESCRIPTION	PRESSURE/SIZE DESIGNATION	MATERIAL		SERIES NUMBER									
			Body/Bonnet	Trim	Threaded	Socket Weld								
UOP HF 2	Conventional Port <b>Globe Valve</b> Bolted Bonnet Double Packing Grease Injector Teflon Inserted Disc Removable Seat	Class 800 1975 psi @ 100°F Sizes 1/2 - 1"	Carbon Steel	Monel/Teflon	...	*SW42241HF2	1/2	5.90	3.75	8.28	8.00	.39	4.00	.38
							3/4	6.65	4.00	8.28	8.00	.39	4.00	.50
							1	10.20	4.62	9.75	9.75	.66	4.75	.50
UOP HF 4 HF 5	Conventional Port <b>Globe Valve</b> Bolted Bonnet Removable Seat	Class 800 1975 psi @ 100°F Sizes 1/2 - 2"	Carbon Steel	Monel	...	SW23141HF4 SW23141HF5	1/2	5.09	4.00	6.62	6.34	.39	4.00	.38
							3/4	9.05	4.62	8.44	8.06	.66	4.75	.50
							1	21.38	6.25	10.38	9.81	.97	5.75	.50
							1 1/2	20.56	7.75	10.88	10.19	1.44	7.00	.50
2	29.94	9.00	13.06	12.19	1.88	8.00	.62							
UOP HF 6 HF 7	Conventional Port <b>Globe Valve</b> Bolted Bonnet Integral Seat (HF)	Class 800 1975 psi @ 100°F Sizes 1/2 - 2"	Carbon Steel	13-CR*	...	SW12141HF6 SW12141HF7	1/2	4.30	3.75	6.62	6.19	.50	4.00	.38
							3/4	5.04	4.00	6.62	6.19	.50	4.00	.50
							1	8.73	4.62	8.44	7.81	.75	4.75	.50
							1 1/2	20.90	6.25	10.38	9.47	1.28	5.75	.50
2	29.88	7.75	10.88	9.81	1.53	7.00	.62							
UOP HF 2 HF 4 HF 5	Conventional Port <b>Ball Check Valve</b> Horizontal Type Bolted Bonnet Removable Seat	Class 800 1975 psi @ 100°F *Sizes 1/2 - 1" Sizes 1/2" - 2"	Carbon Steel	Monel	...	SWB43721HF2 SWB43721HF4 SWB43721HF5	1/2	3.52	4.00		2.56	.39		.38
							3/4	6.46	4.62		3.06	.59		.50
							1	17.46	6.25		4.50	.97		.50
							1 1/2	25.80	7.75		4.88	1.44		.50
2	47.40	9.00		5.94	1.88		.62							
UOP HF 6 HF 7	Conventional Port <b>Ball Check Valve</b> Horizontal Type Bolted Bonnet Integral Seat (HF)	Class 800 1975 psi @ 100°F Sizes 1/2" - 2"	Carbon Steel	18-CR*	...	SWB701HF6 SWB701HF7	1/2	3.37	3.75		2.56	.50		.38
							3/4	3.47	4.00		2.56	.50		.50
							1	6.16	4.62		3.06	.75		.50
							1 1/2	17.60	6.25		4.50	1.28		.50
2	26.10	7.75		4.94	1.53		.62							

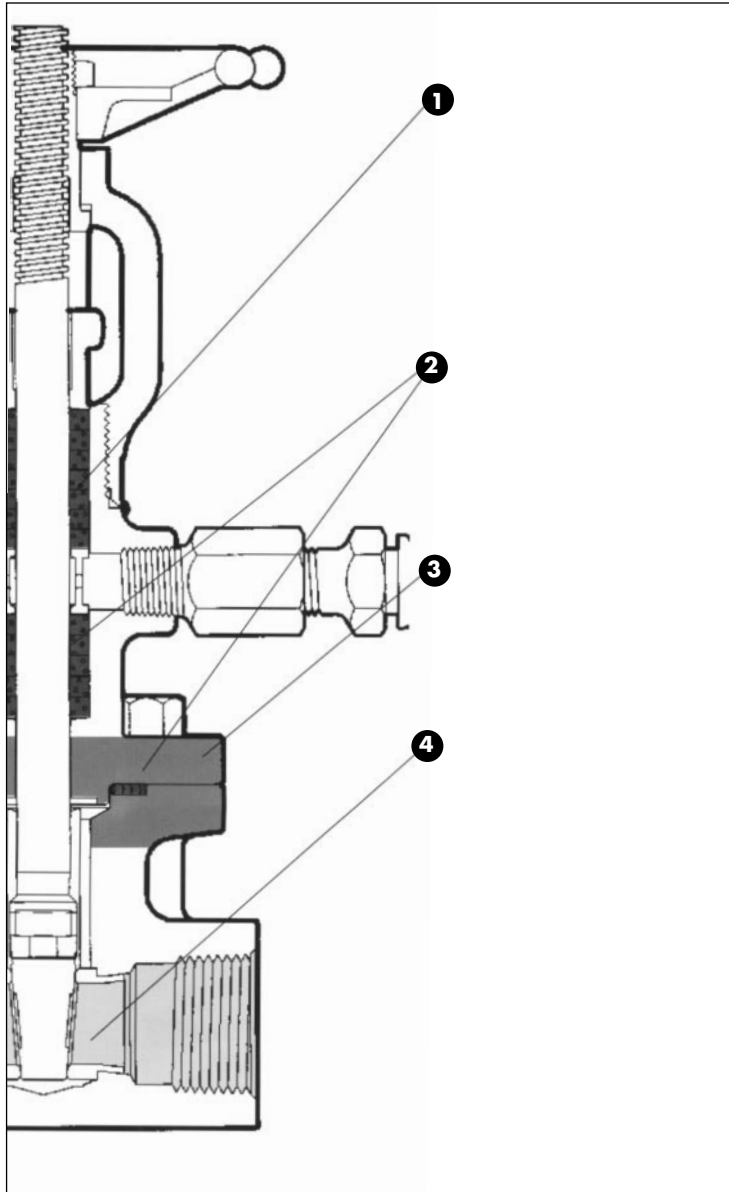
**Order by Size and Series Number.**

**Carbon Steel material to ASTM A105. \*Seats are hard faced. †Valves contain TEFLON - maximum temperature 500°F.**

Classification of system piping to handle fluids which have various levels of hydrofluoric acid unique to the UOP process generally as follows:

- HF 1** (Hot, Full Strength Hydrofluoric Acid)
- HF 2** (Cold, Full Strength Acid)
- HF 4 and HF 5** (Contain Traces of Acid)
- HF 6 and HF 7** (Non-Acid)

# Forged Steel Alkylation Valves



### 1. DOUBLE PACKING CHAMBER?

Some Systems Engineers specify a valve designed with a double packing chamber, lantern ring and grease injector particularly where hot or cold, full strength HF acid is the flowing medium. The grease injector provides for a means to insert a compatible lubricant at the center of the packing chamber to assure smooth operation of the valve stem while the lubricant also augments the seal between the operating fluid and the atmosphere.

### 2. PACKING AND GASKET FILLER MATERIALS?

Teflon and flexible graphite packing have been effectively used in HF valve applications. Teflon is usually preferred in HF valve applications where temperatures remain at or below 500°F. For temperatures above 500°F flexible graphite is suggested. Gaskets are spiral wound with filler material identical to the packing material having the same designation.

### 3. ACID DETECTING PAINT?

As an additional safety precaution some specifications require painting body/bonnet joint flange surfaces for the purpose of detecting acid leaks. This paint is usually a requirement only when traces of acid in the flow medium are present or when high acid concentration levels exist.

### 4. FULL PORT VALVES?

Hydrofluoric acid, in high concentration, actually forms a protective film on carbon steel internal surfaces. The use of a full port valve with its larger flow path minimizes fluid erosion of the "protective film" as the flow medium passes through the valve.

### OTHER APPLICATIONS?

Yes. Use this unique design of double packing chamber with grease sealant injector can be used when additional assurance against environmental emissions through valve packing is needed.



**Vogt Valves**

1511 Jefferson Street  
Sulphur Springs, TX 75482

**US Sales Offices**

Phone: 903-885-3151  
Fax: 903-439-3386

**Toll-Free Telephone Service**

1-800-225-6989

**Visit Our Website**

[www.flowserve.com](http://www.flowserve.com)

**After Hours Customer Service**

1-800-543-3927

Flowserve Corporation has established industry leadership in the design and manufacture of its products. When properly selected, this Flowserve product is designed to perform its intended function safely during its useful life. However, the purchaser or user of Flowserve products should be aware that Flowserve products might be used in numerous applications under a wide variety of industrial service conditions. Although Flowserve can (and often does) provide general guidelines, it cannot provide specific data and warnings for all possible applications. The purchaser/user must therefore assume the ultimate responsibility for the proper sizing and selection, installation, operation, and maintenance of Flowserve products. The purchaser/user should read and understand the Installation Operation Maintenance (IOM) instructions included with the product, and train its employees and contractors in the safe use of Flowserve products in connection with the specific application.

While the information and specifications contained in this literature are believed to be accurate, they are supplied for informative purposes only and should not be considered certified or as a guarantee of satisfactory results by reliance thereon. Nothing contained herein is to be construed as a warranty or guarantee, express or implied, regarding any matter with respect to this product. Because Flowserve is continually improving and upgrading its product design, the specifications, dimensions and information contained herein are subject to change without notice. Should any question arise concerning these provisions, the purchaser/user should contact Flowserve Corporation at any one of its worldwide operations or offices.

For more information about Flowserve Corporation, contact [www.flowserve.com](http://www.flowserve.com) or call USA 1-800-225-6989.

**FLOWSERVE CORPORATION**

**FLOW CONTROL DIVISION**

**Vogt Valves**

1511 Jefferson Street  
Sulphur Springs, TX 75482  
Phone: 903-885-3151  
Facsimile: 903-439-3386