



# INDUSTRIAL APPLICATIONS GUIDE



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# SELECT A PRODUCT GUIDE

## INTRODUCTION:

This document has been published to share some of the most common questions and concerns we experience at Flo-Tite. We hope this guide helps you choose a value product that best suits your application.

## PURPOSE:

Our team has attempted to capture some of the most common applications and severe services where Flo-Tite products are used. Each section is specific regarding the selected subject. Each section provides characteristics of the subject media, and, where necessary, definitions to further clarify the subject.

Each Section will also include a listing of Flo-Tite products that are typically applied for the services.

**DISCLAIMER:** The contents of this document are thought to be the most current information available. The information is current with existing technology, and current in regard to how that information applies to the Flo-Tite products. The contents were gathered and reviewed only as they apply to Flo-Tite products, and should not be used to interpret other manufacturer's products and/or performance. If any of the contents within this document are questionable, please contact your Flo-Tite sales team. The information contained herein is general guidelines in nature. Consult our Engineering Department if you have other questions or require additional assistance.



F150



# Popular Seat Options

**Cryogenic Applications**



**kEL-F** **k**

**Radioactive Media/Abrasive Medias**



**UHMW**  
Tobacco Industry **U**

**Standard Seat in most FT Valves**



**Super-Tek-TFM** **F**

**Chemical & Heat Resistance**



**Super-Tek II** **X**

**High Pressure & Temperature**



**RPTFE** **R**

**Severe Services/High Pressure**



**Devlon** **V**

**High Temp\High Pressure  
Abrasive Services**



**PEEK** **P**

**High Pressure/Low & High Temps.**



**S-Tek 50/50**  
50% SS powder & 50% PTFE **S**

**Steam or Thermal Fluid Services**



**S-Tek III**  
75% TMF & 25% CARBON **Y**

**Severe Services/High Temp.**



**Metal Seat** **M**

# STANDARD SEAT SELECTIONS

Seat Code	Material	Technical Description	Color	Approx. Torque Adders to the standard seats indicated in catalog page
F	Super-Tek (TFM)	<b>Super-Tek, most popular seat material used by Flo-Tite.</b> Super-Tek (TFM) offers most all of the properties of PTFE with improved thermo-mechanical properties offering lower coefficient of friction for lower torques and less permeability, reduced cold flow deformation, and enhanced deformation recovery. <b>Temperature Range -50°F to 500°F.</b>	Off-White	Standard seats in most valves  Torques indicated in catalog pages.
K	Kel F (PCTFE)	This material is a fluorocarbon rubber. Kel F is a registered trademark of 3M Corp. <b>It can be used for cryogenic service at temperatures of -400°F up to 500°F at pressures up to 1500 psi.</b>	Translucent White	+50%
M	Metal	<b>Recommended for service with severe flashing or hydraulic shock, abrasive media or where possible trapped metal may exist.</b> Flo-Tite's metal seats are hand lapped to the ball as individually matched sets, assuring line contact between valve ball and seats, resulting in smooth operation and tight shut off class. Flo-Tite offers metal seats in different classes of Shut Off including Class IV, V and VI. Extreme series can reach temperature up to 1200°F.	Metallic	ANSI Class 150 +60% ANSI Class 300 +70% ANSI Class 600 +80%
P	Peek	This material offers a unique combination of chemical, mechanical, electrical, and thermal properties. <b>The only solvents which will attack Peek is concentrated nitric acid &amp; sulfuric acid. It will withstand temperatures up to 600°F and pressures up to 4500 psi.</b>	Black	+60%
Q	Cryo-Tek	<b>Cryo-Tek is a form of modified PTFE, which contains bronze and other cryogenic fillers, specially suitable for LOX service. Excellent seat material for difficult applications. Temperature Range -400°F to 400°F.</b>	Bronze	+30%
R	Reinforced TFE	This is produced by adding 15% fibrous glass or carbon to Virgin Teflon and <b>has a greater pressure temperature rating than Teflon up to 420°F. They also have a better cycle life than Teflon.</b>	Off-White	Standard as indicated in literature
S	Stainless Filled PTFE (S-Tek)	<b>S-Tek (stainless filled PTFE) combines the strength of metal with the lubricity of PTFE.</b> 50% 316 powder combined with 50% PTFE. Offers the abrasion resistance of metal with higher pressure and temperature ratings than RPTFE. <b>Temperature rating -20° to 550° / Steam rating 250 SWP.</b>	Dark Gray	+50%
T	Virgin TFE	<b>This is the most widely used seating material and is excellent for most services. It has excellent chemical resistance throughout valve industries and a low coefficient of friction. Temperature Range -50°F to 450°F.</b>	White	Standard as indicated in literature
U	UHMW Polyethylene	<b>UHMW polyethylene is used for highly radioactive materials where PTFE is not acceptable (&gt; 104 rads ) and is rated 2 x 10<sup>7</sup> rads. These seats also meet the requirements of the tobacco industry whenever PTFE is prohibited, and are especially well-suited for handling highly abrasive media. Temperature Range -70°F to 200°F, not suitable for steam.</b>	Opaque White	+40%
V	Devlon	Devlon material is one of the toughest and hardest wearing thermoplastics available. It provides wear resistance, impact strength, and moisture absorption properties. <b>Devlon is used in many valve seats which require a broad range of working temperatures, excellent corrosion resistance and outstanding resistance in high pressure applications. Temperature Range -50°F to 350°F.</b>	Yellow	+40% if not listed as standard material and indicated in literature
X	Super-Tek II	<b>Carbon/Graphite Filled TFM offers exceptional chemical &amp; heat resistance properties. It has a low coefficient of friction for lowering valve torque. It is good for service temperatures ranging from -320°F to 550°F</b>	Black	+10%
Y	Super-Tek III	This is a Teflon base filled with glass amorphous carbon powder and graphite. <b>It has lower thermal contraction-expansion rate than PTFE and is ideal for steam or thermal fluid applications up to 550°F. Super-Tek III is also good for Cryogenic applications as low as -300°F.</b>	Black	+40%
C/F	Cavity Filler	Designed to reduce the possibility of contamination by entrapment of process fluids in the void normally found behind the ball between the valve body in conventionally designed ball valves. <b>Ideal for application where cross contamination is a concern, such as paints or dyes. Available in most seating materials.</b>	White	+50%

# STANDARD SEAT SELECTIONS

Seat Code	Material	Technical Description	Color	Approx. Torque Adds to the standard seats indicated in catalog page
D	DELTRIN	This seat is very rigid and does not undergo cold flow. It can withstand pressures of up to <b>6000 psi</b> dependent on valve size and a temperature range of <b>-70°F to 180°F</b> . Delrin also withstands nuclear radiation at doses of up to <b>106 rads</b> . Do not use for oxygen service or steam.	White	+50%
N	Nylon	Special Nylon seats are offered for higher pressure and lower temperature service. It can be used in high-pressure air, oil and other gas media but are not suited for strong oxidizing agents. Temperature rating <b>-30°F to 200°F</b> .	Translucent White	+40%

# STANDARD SEAL SELECTIONS

Seal Code	Material	Technical Description	Color
G	GRAPHOIL	Usable from <b>-70° to 1000°F</b> on almost any media. It is the standard seal on all fire rated valves.	Black
R	Reinforced TFE	This is produced by adding 15% fibrous glass to Virgin Teflon and has a greater pressure temperature rating than Teflon. It also has a better cycle life than Teflon.	Off-White
S	Stainless Filled TFE	Combines the strength of metal with the lubricity of TFE. 50% 316 powder combined with 50% TFE. Offers the abrasion resistance of metal with higher pressure and temperature ratings than RPTFE. Temperature rating <b>-20°F to 550°F</b> / Steam rating 250 SWP.	Gray
T	Virgin TFE	Teflon is excellent at pressures below 1500 psi & at temperatures from <b>-20°F to 400°F</b> . It will not withstand temperature fluctuations in excess of 200°F & are not reusable. It has excellent resistance to a wide range of chemicals.	White
U	UHMW Polyethylene	This is rated to 1500 psi at temperatures from <b>-70° to 200°F</b> . This can be used in low to medium level radiation services and in applications where fluorocarbons can not be tolerated. Abrasion resistance is very good.	Opaque White
V	Viton	These body seals are excellent at all rated pressures with a temperature range of <b>-20° to 400°F</b> . Viton is the best elastomer seal for higher temperature applications, BUT IT SHOULD NOT BE USED ON STEAM.	Black
G	Spiral Wound Wire Graphite	Manufactured by spirally winding a preformed V shape SS316 metal strip and a graphite sealing filler in combination. This gasket has adequate flexibility and recovery to maintain a seal under variable and uneven loading, pressure, temperature fluctuation, bolt stress relaxation, and creep. Temperature range from <b>-320° to +1000°F</b> .	Black

New seat & seal materials and sealing techniques continuously become available through our dedicated research and development programs. For seat or seal application requirements not covered in this bulletin, please consult Flo-Tite. (910)738-8904

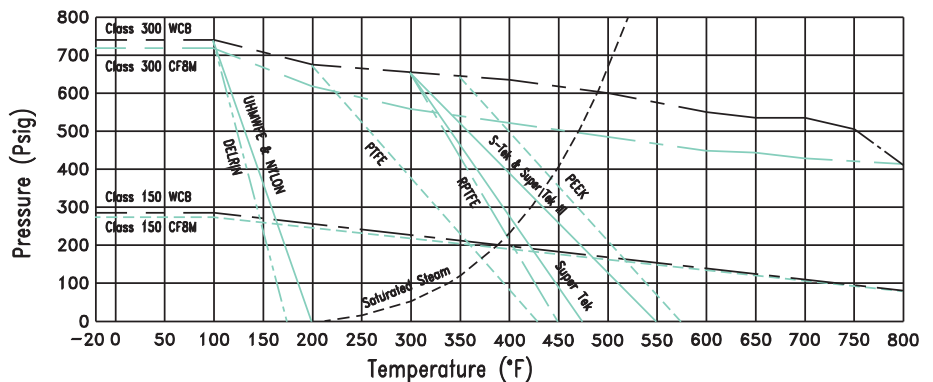
All products that contain plastics and elastomers comply with USP Biological Reactivity Test #87 & #88, Class VI plastics and FDA CFR21 Part 177.

## Pressure Relieving & Equalizing Seat Design



Specially designed seats allow equalization of pressure in the ball cavity which reduces operating torque and increases seat life.

## Pressure Temperature Chart



THREADED VALVES	INDUSTRIAL SEGMENTS	
<p><b>FUSION SERIES</b> T23/S23</p>	<p>General purpose ball valves commonly used in smaller pipelines under 3" sizes. These valves tend to be used in more permanent applications where maintenance is seldom required.</p> <p>Chemical Process General Industry Ethanol Plants Mining</p>	<p>Power Generation Gas Processes Refining</p> 
<p><b>OMNI SERIES</b> T12</p>	<p>Chemical Process General Industry Ethanol Plants Mining</p>	<p>Power Generation Gas Processes Refining</p> 
<p><b>T70 SERIES</b></p>	<p>Chemical Process Ethanol Plants Gas Processes General Industry</p>	<p>Mining Pharmaceutical Power Generation Refining</p> 
<p><b>FLOTRON SERIES</b> T3000/S3000</p>	<p>Chemical Process Gas Processes General Industry Mining</p>	<p>Power Generation Pulp &amp; Paper Refining</p> 
<p><b>FLOTRON II SERIES</b> T6000/S6000</p>	<p>Chemical Process General Industry Mineral Slurry Mining Power Generation</p>	<p>Pulp &amp; Paper Refining Scrubbers Wall Board Plants</p> 
<p><b>DM80 SS</b></p>	<p>Most Industrial Applications</p>	
<p><b>1 PIECE THREADED VALVES</b> S23, S3000, S6000, T12</p> <p><b>2 PIECE THREADED VALVES</b> T23, T3000, T6000, T12, DM51/DM52, DM80SS,</p> <p><b>3 PIECE THREADED VALVES</b> ST336</p>	<p><b>FULL PORT:</b> S23, T23, S3000(EXCEPT 2"), S6000(EXCEPT 2"), ST336, DM80SS, DM51/52</p> <p><b>STANDARD PORT:</b> T70, T12,</p>	

DIRECT MOUNT VALVES	INDUSTRIAL SEGMENTS	
<p><b>The DM Series provides a unique design which allows easy adjustment of the stem packing even when direct mounting of an actuator is applied.</b></p> <p><b>ECONOFLO SERIES</b> DM85</p>	<p><b>Ideal design for Low Profile, Cost Effective industrial applications requiring actuation or instrumental mounting.</b></p> <p>Chemical Process General Industry Ethanol Plants Mining</p>	<p>Power Generation Gas Processes Refining</p> 
<p><b>ECONOFLO</b> DM300</p>	<p>Chemical Process General Industry Ethanol Plants Mining</p>	<p>Power Generation Gas Processes Refining</p> 
<p><b>FLANGED END ECONOFLO</b> DMF15</p>	<p>Chemical Process Ethanol Plants Gas Processes General Industry</p>	<p>Mining Pharmaceutical Power Generation Refining</p> 
<p><b>DM V60-SS</b></p>	<p>Chemical Process Gas Processes General Industry Mining</p>	<p>Power Generation Pulp &amp; Paper Refining</p> 
<p><b>DIRECT CONNECT SERIES</b> DM2000-SS</p>	<p>Chemical Process General Industry Mineral Slurry Mining Power Generation</p>	<p>Pulp &amp; Paper Refining Scrubbers Wall Board Plants</p> 
<p><b>2 PIECE DM SERIES</b> DM52 JOJ</p>	<p>Most Industrial Applications</p> 	
<p><b>1 PIECE DM VALVES</b> DMW150, <b>2 PIECE DM VALVES</b> DM52,DM80,DM85SS,DM2000,DM2000, DMV60,DMF15, <b>3 PIECE DM VALVES</b> DM110,DM300</p>	<p><b>FULL PORT VALVES:</b> DM52, DM80SS, DM85, DM110/120, DM300, DMV60, DMF15, DM2000, DMW150</p>	



DIRECT MOUNT VALVES	INDUSTRIAL SEGMENTS		
<b>DIRECT CONNECT</b> DM110	Chemical Process General Industry Ethanol Plants Mining	Power Generation Gas Processes Refining	
<b>DM KOMPACT SERIES</b> DMW150	Chemical Process General Industry Ethanol Plants Mining	Power Generation Gas Processes Refining	
<b>DM MPT 200</b>	Chemical Process Ethanol Plants Gas Processes General Industry	Mining Pharmaceutical Power Generation Refining	
<b>MPT 355 BZ</b>	Chemical Process Gas Processes General Industry Mining	Power Generation Pulp & Paper Refining	 <small>Model: 1 For mpt-355-BZ-T04-031 (For MPT-355-BZ-T10-031)</small>
<b>DM80 SS</b>	Chemical Process General Industry Mineral Slurry Mining Power Generation	Pulp & Paper Refining Scrubbers Wall Board Plants	
<b>1 PIECE DM VALVES</b> DMW150,  <b>2 PIECE DM VALVES</b> DM52,DM80,DM85SS,DM2000,DM2000,DMV60,DMF15,  <b>3 PIECE DM VALVES</b> DM110,DM300	<b>FULL PORT VALVES:</b> DM52, DM80SS, DM85, DM110/120, DM300, DMV60, DMF15, DM2000, DMW150		



ECONOMY VALVES	INDUSTRIAL SEGMENTS	
<p><b>ECONOFLO SERIES</b> T45</p>	<p>General purpose valve which offers exceptional economical and proven performance in plant-wide applications. Designed for the economical OEM and industrial markets.</p>	<p>Chemical Process      Power Generation General Industry      Refining</p> 
<p><b>ECONOFLO SERIES</b> T80 SS</p>	<p>General Purpose valve for many industrial applications.</p>	
<p><b>T82 SERIES</b></p>	<p>Chemical Process      Pharmaceutical General Industry      Power Generation Refining</p>	
<p><b>T91/92JOBZ SERIES</b></p>	<p>Cost Effective General Purpose Valve, Water, Food, Applications are common</p>	<p>Model: 91.92-TT-LL 92.92 with SS trim</p> 
<p><b>T91/92RBBZ SERIES</b></p>	<p>Cost Effective General Purpose Valve, Water, Food, Applications are common</p>	
<p><b>ECONOCHEM SERIES</b> 110,120,130,190</p>	<p>Ideal for applications requiring an economical 3-piece stainless steel ball valve.</p>	
<p><b>1 PIECE VALVES</b> T45, T91/92BZ,</p> <p><b>2 PIECE VALVES</b> T80SS, T82</p> <p><b>3 PIECE VALVES</b> 110,120,130,190</p>	<p><b>FULL PORT:</b> T80SS,T82, T91/92BZ, 110,120,130,190</p> <p><b>REDUCED PORT:</b> T45</p>	

3 PIECE VALVES	INDUSTRIAL SEGMENTS
<p><b>TRI-STAR SERIES</b> 410,420,510,520</p>	<p>Three piece body valves are multi-purpose ball valves. They tend to be used in more demanding applications where maintenance will be required on a more frequent basis than 2 piece valves. The 3 body's center section can be removed to allow the valve end caps to be welded without the possibility of damaging the valve seats. Any combination of end connections can be supplied to meet your requirements.</p> 
<p><b>MULTI-CHOICE SERIES</b> 310,320,330,340 210,220,230,240</p>	<p>Ideal valve for many applications requiring a low pressure, cost effective valve, and makes installation and maintenance easier being able to change your end caps.</p> <p>Chemical Process    General    Power Generation    Gas Industry    Ethanol Plants    Processes    Refining</p> 
<p><b>MULTI-CHOICE WELD-IN-PLACE SERIES</b> 325,335,225,235</p>	<p>Ideal valve when welded ball valves are required, eliminating valve disassembly.</p> <p>Chemical Process    Mining Ethanol Plants    Pharmaceutical Gas Processes    Power Generation General Industry    Refining</p> 
<p><b>PRO-MAX SERIES</b> 361,362</p>	<p>Designed for Fire Safe Applications at Economical Prices</p> <p>Chemical Process    Power Generation Gas Processes    Pulp &amp; Paper General Industry    Refining Mining</p> 
<p><b>TRI-PRO HPF/HPS SERIES</b> HPF51,HPF52,HPF53,HPF56 HPF41,HPF42,HPF43,HPF46 HPS41,HPS42,HPS43,HPS51 HPS52,HPS53</p>	<p>High Performance Fire Safe Valve Applications</p> <p>Rocket Engines    Oil and Gas Power Generation    Pulp &amp; Paper Chemical Process    Refining Mineral Slurry    Mining</p> 
<p><b>HPF 3000 SERIES</b> HPF61,HPF71,HPF62,HPF72</p>	<p>HPF-3000 is a variant of the standard Tri-Pro Series. The burst pressure of these valves is approx. 4500psi</p> <p>Rocket Engines    Oil and Gas Power Generation    Pulp &amp; Paper Refining Chemical Process    Mining Mineral Slurry</p> 
<p><b>3 PIECE VALVES</b> 410, 420, 510, 520,310,320,330,340 210,220,230,240,325,335,225,235, 325,335,225,235,361,362 HPF61,HPF71,HPF62,HPF72</p>	<p><b>FULL PORT:</b> 410, 420, 510, 520,310,320,330,340 210,220,230,240,325,335,225,235 325,335,225,235,361,362,HPF51,HPF52,HPF53,HPF56 HPF41,HPF42,HPF43,HPF46 HPF61,HPF71,HPF62,HPF72</p> <p><b>REDUCED PORT:</b> HPS41,HPS42,HPS43,HPS51,HPS52,HPS53</p>



## INDUSTRIAL BALL VALVE GUIDE

3 PIECE VALVES	INDUSTRIAL SEGMENTS										
<p><b>TITAN SERIES</b> 1541, 1542, 1543, 1548 1551, 1552, 1553, 1558</p>	<p>High Pressure, Severe Service Applications</p> <table border="0"> <tr> <td>Oil and Gas</td> <td>Power Generation</td> </tr> <tr> <td>Chemical Process</td> <td>Gas Processes</td> </tr> <tr> <td>General Industry</td> <td>Refining</td> </tr> <tr> <td>Ethanol Plants</td> <td></td> </tr> <tr> <td>Mining</td> <td></td> </tr> </table> 	Oil and Gas	Power Generation	Chemical Process	Gas Processes	General Industry	Refining	Ethanol Plants		Mining	
Oil and Gas	Power Generation										
Chemical Process	Gas Processes										
General Industry	Refining										
Ethanol Plants											
Mining											
<p><b>ECONO-GROOVE SERIES</b> 190,390</p>	<p>HVAC, Plumbing, Fire Protection, Mining, Waste Water, Oil Field, Power Plants, Military, Marine, and Chemical, and Process Industries</p> <p>Used to quickly join mechanical pipes together.</p> 										
<p><b>MULTI-CHOICE SANITARY SERIES</b> 350,370</p>	<p>Designed specifically for the Sanitary Market</p> <table border="0"> <tr> <td>Food</td> <td>Pharmaceutical</td> </tr> <tr> <td>Beverage</td> <td>Distilleries</td> </tr> <tr> <td>Biomedical</td> <td>Breweries</td> </tr> <tr> <td>Dairy Farms</td> <td></td> </tr> </table> 	Food	Pharmaceutical	Beverage	Distilleries	Biomedical	Breweries	Dairy Farms			
Food	Pharmaceutical										
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<p><b>3 PIECE VALVES:</b> 1541, 1542, 1543, 1548 1551, 1552, 1553, 1558 190,390 350,370</p>	<p><b>FULL PORT:</b> 1541, 1542, 1543, 1548 1551, 1552, 1553, 1558 190,390 350,370</p>										
<p><b>FLANGED VALVES</b></p>	<p><b>INDUSTRIAL SEGMENTS</b></p>										
<p><b>EC SERIES</b> F15, F30</p>	<p>A conventional design ball valve, made to be easily installed or removed from the pipeline. It is one of a few ball valves where its end-to-end or face-to-face dimensions is controlled by ANSI. Most all manufactures conform to ANSI Guidelines. <i>Ideal Valve for Commercial Process and Petrochemical Applications</i></p> 										
<p><b>2 PIECE VALVES:</b> F15, F30</p>	<p><b>FULL PORT:</b> F15, F30</p>										

FLANGED VALVES	INDUSTRIAL SEGMENTS	
<p><b>FULL-FLO SERIES</b> F150,F300</p> <p><b>UNI-FLO SERIES</b> SF150,SF300</p>	<p>Ideal Design for Process and Petrochemical Applications</p> <p>Chemical Process    Oil and Gas General Industry    Power Generation Ethanol Plants      Gas Processes Mining                 Refining</p>	
<p><b>SENTINEL SERIES</b> RV150, RV300, RV600</p>	<p>Ideal Valve for Severe Service Applications where Precise Control is Required. Ideal for Clean or Dirty Liquids, Gases, and Fibrous Suspension Applications.</p> <p>Pulp and Paper plants    Ethanol Plants Power Plants                Scrubbers Mining                        Power Generation</p>	
<p><b>PETRO SERIES</b> F60</p>	<p>Ideal valve for high pressure, low temperature applications.</p> <p>Chemical Process      Mining Ethanol Plants         Power Generation Gas Processes         Refining General Industry</p>	
<p><b>EZ SERIES</b> RF15, RF30</p>	<p>Ideal valve choice for applications that require easy to repair, reduced port flanged end ball valves.</p> <p>Power plants, Power Generation, Chemical Process, Gas Processes, General Industry</p>	
<p><b>TRUNNION SERIES</b> TM150, TM300, TM600</p>	<p>Natural Gas Storage      Desalination Gas Transmission        Petrochemical Dryer Service              Plants LNG, HRSG                CO2 Service Measurement Skids      Pipeline Sub Sea, Oil Refinery    Power Generation Natural Gas Compressor Stations</p>	
		
<p><b>1 PIECE FLANGED VALVES</b> SF150, SF300, TM150, TM300, TM600, RV150, RV300, RV600</p> <p><b>2 PIECE FLANGED VALVES</b> F150, F300, F60 RF15, RF30, TM150, TM300, TM600</p> <p><b>3 PIECE FLANGED VALVES</b> TM150, TM300, TM600</p>	<p><b>FULL PORT:</b> F150, F300 F60</p> <p><b>STANDARD PORT:</b> SF150, SF300</p> <p><b>REDUCED PORT:</b> RV150, RV300, RV600, RF15, RF30, TM150, TM300, TM600</p>	



## INDUSTRIAL BALL VALVE GUIDE

MULTI-PORT VALVES	INDUSTRIAL SEGMENTS
<p><b>TRANSFLO SERIES</b> MPF15, MPF30, MPF60</p>	<p>Multi-Port Ball Valves will lower overall cost by allowing the replacement of two or three conventional straight line valves, thus eliminating or reducing pipe fitting and expensive automation equipment.</p> <p>Flow Diversion or Mixing      Power Generation Gas Processes Chemical Process General      Refining Industry Ethanol Plants Mining</p> 
<p><b>MULTI-PORT SERIES</b> MPT100, MPT104</p>	<p>3Way and 4Way valves reduce the number of valves required in a piping system and increase efficiency.</p> <p>Paint Plants      Concrete Plants Power Generation      Chemical Process Gas Processes      Ethanol Plants Refining</p> 
<p><b>BOTTOM ENTRY MULTI-PORT SERIES</b> MPF155</p>	<p>Ideal valve to replace plug valves and the one-piece design minimizes potential leakage.</p> <p>Chemical Process      Mining Ethanol Plants      Pharmaceutical Gas Processes      Power Generation General Industry      Refining</p> 
<p><b>TRI-PRO BOTTOM FLOW 3WAY SERIES</b> 3WHPF51,3WHPF52,3WHPF53 3WHPF41,3WHPF42,3WHPF43</p>	<p>Provides engineers greater design flexibility making the Flo-Tite Valve a valuable choice for a multitude of applications that need high-pressure, fire-safe Valves.</p> <p>Chemical Process      Oil and Gas Gas Processes      Power Generation General Industry      Pulp &amp; Paper Mining      Refining</p> 
<p><b>DIRECT MT MULTI-PORT SERIES</b> DM MPT100-S4</p>	<p>Ideal Valve to Compete with Most Stainless Steel Valves. 3 WAY VALVES REDUCE THE NUMBER OF VALVES IN PIPING SYSTEMS AND INCREASE EFFICIENCY.</p> 
<p><b>MPT 355/365</b></p>	<p>Pottable Water      Refining Pharmaceutical      Waste Water Food      General Industry Beverage</p> 
<p><b>1 PIECE VALVES</b> MPF15,MPF30,MPF60, MPT 355/365 MPT100, MPT104, MPT155</p> <p><b>3 PIECE VALVES</b> 3WHPF51,3WHPF52,3WHPF53 3WHPF41,3WHPF42,3WHPF43</p>	<p><b>FULL PORT:</b> MPF15,MPF30,MPF60 3WHPF51,3WHPF52,3WHPF53</p> <p><b>STANDARD PORT:</b> MPT100, MPT104, MPT155,DM MPT100-S4,MPT 355/365</p> <p><b>REDUCED PORT:</b> 3WHPF41,3WHPF42,3WHPF43</p>



## BASIC APPLICATIONS

### AIR & GAS

Any of the core industrial products will work in typical air service. Some industrial gases (vapors) can be very corrosive, so material selection for the valve becomes critical. If handling fuel gases there may be requirements for compliance to various standards and/or customer specification requirements.

### CHEMICAL

Because of the broad offering of material Flo-Tite produces, most core industrial products are capable of meeting the needs of the chemical segment. Potential corrosive and erosive applications.

### PETROLEUM

Most petroleum installations are typically concerned with materials-of-construction. As an example, sour gas ( $H_2S$ ) requires special consideration for the application and can affect trim and fastener material selections. Potential corrosive and erosive applications.

### SLURRY

These applications require a proper combination of body, seat and ball material selection. Slurry applications also require a valve that is easy to repair, in-line or out-of-line. Critical to the proper selection of a valve for slurry service are pipeline velocity, solid particle size and percentage of solids in the slurry.

### WATER

Any of the core Industrial products will work in water services. The metallurgy of the Body and Trim components may change based on the type of water (sea water, heavy water, de-ionized water, borated water, etc. ...). Remember, potable water must be lead free.





## WATER BASED APPLICATIONS

### APPLICATION SYNOPSIS

Ball valves (due to their design characteristic to withstand high pressure, temperature and velocity flows) are ideal valves for all types of water based applications ranging from controlling and throttling dirty sea or river water to highly purified water for medical and pharmaceutical systems.

Ball valve body and trim materials selection are major factors to consider when choosing the correct product for the water service systems.

***Always remember the media being used in the application, pressure requirements, and temperature will be the key factors to choosing the right Flo-Tite Valve.***



### CATEGORIES

- Ambient
- Brine
- Chilled
- Deionized
- Heavy
- Hot
- Light
- Raw Water
- Sea Water

### INDUSTRIAL CONSUMERS

- Agriculture
- Automotive
- Aviation
- City Water Supply
- Desalination Plants
- Household Water Systems
- HVAC
- Iron and Steel Works
- Non-Potable Water
- Nuclear
- Oil and Gas
- Pharmaceuticals
- Potable Water
- Power Generation
- Textiles
- Water Treatment

### FLO-TITE VALVE OFFERINGS

DIRECT CONNECT SERIES		ECONOMY SERIES		3 PIECE SERIES	
MODEL	BODY MATERIAL	MODEL	BODY MATERIAL	MODEL	BODY MATERIAL
DM 2000	CS/SS	S23/T23	CS/SS	110/120/130/190	SS
DM 110	SS	S3000/ T3000	CS/SS	410/510	CS/SS
DMF15	SS	S6000/ T3000	CS/SS	200/300	CS/SS/A20
DMW150	CS/SS	T70	SS	360	CS/SS
DMMPT100/DMMPT200	SS	T12	CS/SS	HPF40/50	CS/SS
DM51/52	BRASS	T45	SS	1540/1550	CS/SS
DMMPT355/366	BRASS	T80/ T82	SS	350/370	SL
DM85	CS/SS	T91/T92	BRASS	190/390	SS
DM300	SS				

FLANGED SERIES		MULTI PORT SERIES		SPECIALTY PRODUCTS	
MODEL	BODY MATERIAL	MODEL	BODY MATERIAL	MODEL	BODY MATERIAL
F150/F300	SCS/SS/A20	MPF15/MPF30/MPF60	CS/SS	PFA LINED SERIES F15	DI/ SS
SF150/SF300	CS/SS	MPF155	SS	TANK BOTTOM TK300	SS
RF15/RF150	CS/SS	3WHPF	CS/SS	KOMPACT SERIES	CS/SS
RF30/RF300	CS/SS	MPT100/104	SS		
RV150/300/600	CS/SS	DMPT100	SS		
F60/F600	CS/SS				
TM150/300/600/900	CS/SS				

#### NOTE

***Please check soft part materials for the process fluid chemical compatibility***





## STEAM BASED APPLICATIONS

### APPLICATION SYNOPSIS

Ball valves are extensively used to control and modulate the flow of steam and heated water vapor based applications. Industrial applications of steam applications include powering turbines for electricity generation, food and chemical processing, cleaning, heating and humidification.

Steam for process heating is the ideal choice for plant process design engineers. Low pressure steam is often used in complex chemical processes due to its greater latent heat that results in increased thermal efficiencies.

**Always remember the media being used in the application, pressure requirements, and temperature will be the key factors to choosing the right Flo-Tite Valve.**

### CATEGORIES

- Saturated (Dry)
- Unsaturated (Wet)
- Superheated

### INDUSTRIAL CONSUMERS

- Automotive
- Aviation
- Fertilizers
- Food & Beverage
- Iron & Steel Works
- Marine
- Nuclear
- Oil & Gas
- Petrochemicals
- Pharmaceuticals
- Power Generation
- Pulp & Paper
- Rice Processing Plants
- Sugar Processing Plants
- Textile



### FLO-TITE VALVE OFFERINGS

DIRECT CONNECT SERIES		ECONOMY SERIES		3 PIECE SERIES	
MODEL	BODY MATERIAL	MODEL	BODY MATERIAL	MODEL	BODY MATERIAL
DM 2000	CS/SS	S23/T23	CS/SS	110/120/130/190	SS
DM 110	SS	S3000/ T3000	CS/SS	410/510	CS/SS
DMF15	SS	S6000/ T3000	CS/SS	200/300	CS/SS/A20
DMW150	CS/SS	T70	SS	360	CS/SS
DMMPT100/DMMPT200	SS	T12	CS/SS	HPF40/50	CS/SS
DM51/52	BRASS	T80/ T82	SS	1540/1550	CS/SS
DM85	CS/SS	T91/T92	BRASS	350/370	SL
DM300	SS			190/390	SS

FLANGED SERIES		MULTI PORT SERIES		SPECIALTY PRODUCTS	
MODEL	BODY MATERIAL	MODEL	BODY MATERIAL	MODEL	BODY MATERIAL
F150/F300	CS/SS/A20	MPF15/MPF30/MPF60	CS/SS	TANK BOTTOM TK300	SS
SF150/SF300	CS/SS	MPF155	SS	KOMPACT SERIES	CS/SS
RF15/RF150	CS/SS	3WHPF	CS/SS		
RF30/RF300	CS/SS	MPT100/104	SS		
RV150/300/600	CS/SS	DMPT100	SS		
F60/F600	CS/SS				
TM150/300/600/900	CS/SS				

#### NOTE

Please check soft part materials for the process fluid chemical compatibility

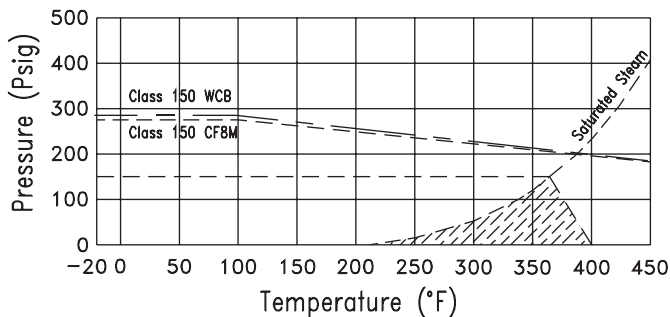
# STEAM APPLICATION TECHNICAL DATA

Steam is damaging to valve parts at the moment of opening and closing or when throttling. High velocity of steam can erode the seat and metal parts. High speed steam may carry water droplets, dissolved gases, and other suspended solids, resulting in severe erosion and corrosion. In addition, steam systems will often go through a thermal cycle of start-up and shut down. This thermal cycle presents a special challenge to the sealing capability of the valves in steam service. Ball valves are well suitable for steam service if the material selection and valve design are properly selected. However, like all other valves, ball valves are generally rated at a lower pressure for steam service than for liquid or dry gaseous service.

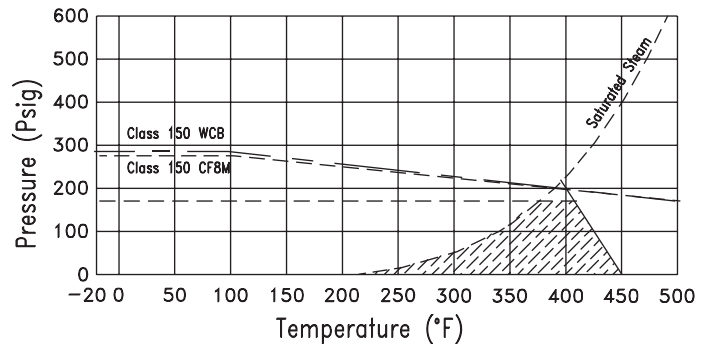
**Flo-Tite Ball Valves are an excellent choice for a wide range of steam services. Graphite body seals are completely encapsulated and contained. Stem packings are live-loaded for all sizes. Live-loaded stem packing will compensate for thermal cycling and well-contained body seals will prevent extrusion into crevices during thermal cycle. Our standard design valves are provided with a 1/8" hole drilled in the stem tang slot. This feature is critical for steam service since it prevents excessive pressure build-up in the cavity from trapped liquid when the valve is in the open position. Flo-Tite ball valves are supplied with stainless steel balls and stems as standard. This is especially suitable for steam service since aggressive steam attacks coated carbon steel trims.**

As a standard, Flo-Tite designs valves with stainless steel trim and Super-Tek TFM seats. These are good for 150 psig saturated steam. When equipped with S-Tek or Super-Tek III seats, Flo-Tite valves are good for 250 psig saturated steam. Other seat options will bring Flo-Tite valves to higher steam pressure rating. See chart below.

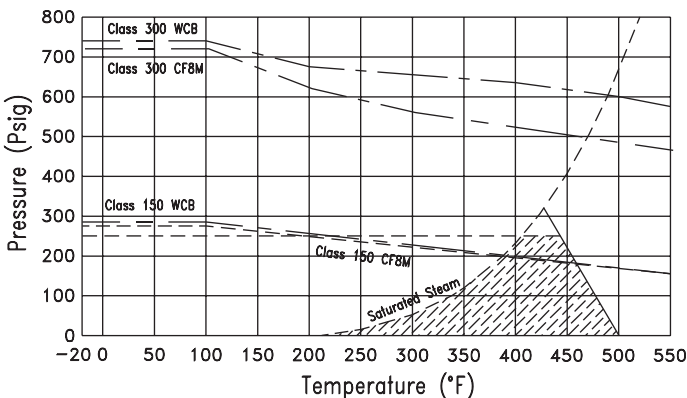
Service Pressure	Corresponding Saturated Steam Temperature	Seat	Stem Seal	Body Seal
Pressure Steam up to 150 psi	Maximum 366 °F	PTFE or Super-Tek	TFM	Graphite
Pressure Steam up to 170 psi	Maximum 375 °F	RPTFE	Graphite	Graphite
Pressure Steam up to 250 psi	Maximum 406 °F	S-Tek or Super Tek III	Graphite	Graphite
Pressure Steam up to 300 psi	Maximum 422 °F	Peek	Graphite	Graphite
Pressure Steam above 300 psi	Higher than 422 °F	Metal	Graphite	Graphite



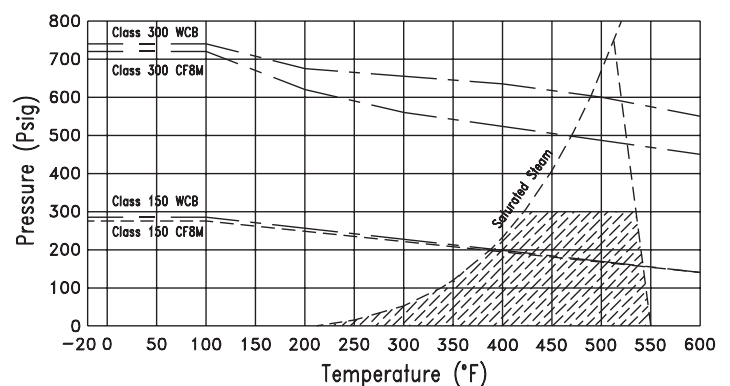
Steam Rating (PTFE & SuperTek)



Steam Rating (RPTFE)



Steam Rating (S-Tek & SuperTek III)



Steam Rating (PEEK), 6" & smaller



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Due to continuous development & improvement of our product range, we reserve the right to alter the dimensions and technical data included in this brochure.



## CRYOGENIC BASED APPLICATIONS

### APPLICATION SYNOPSIS

Piping systems designed for handling cryogenics (liquids with a normal boiling point below -2400F) such as liquid nitrogen, oxygen, ammonia, carbon dioxide, LNG, etc. require cryogenic valves. Ball valves lead the way for cryogenic services as they can handle low temperatures and high pressure fluids quite effectively. Some common industrial gases are usually transported, handled and stored in their cryogenic state. Cryogenic ball valves allow a vapor space for gasification below the stem packing to prevent it from freezing (localized icing).

**Only SS and Low Carbon Steel Valves recommended for Cryogenic Applications.**

**Always remember the media being used in the application, pressure requirements, and temperature will be the key factors to choosing the right Flo-Tite Valve.**



### CATEGORIES

- Ammonia
- Carbon Dioxide
- Ethylene
- Fluorine
- Freon
- Methane
- Nitrogen
- Oxygen

### INDUSTRIAL CONSUMERS

- Aerospace
- Automotive
- Biosystems
- Food & Beverage
- Industrial Electronics
- Marine
- Medical Device
- Metal Works
- Pharmaceutical Research
- Radio Astronomy
- Scientific Instruments
- Specialty Gas Manufacturing

### FLOTITE VALVE OFFERINGS

3 PIECE SERIES		FLANGED SERIES		MULTI PORT SERIES	
MODEL	BODY MATERIAL	MODEL	BODY MATERIAL	MODEL	BODY MATERIAL
HPF40/50	SS	F150/F300	SS/A20	3WHPF	SS
1540/1550	SS	SF150/SF300	SS		
		RF15/RF150	SS		
		RF30/RF300	SS		
		F60/F600	SS		
		TM150/300/600/900	SS		

**NOTE**

*Please check soft part materials for the process fluid chemical compatibility*



Flo-Tite has One of the Largest Inventories of V Balls and Slotted Balls.



## PETROLEUM (OIL & GAS) BASED APPLICATIONS

### APPLICATION SYNOPSIS

Ball valves are a vital element of piping systems in the oil and gas industry, from drilling and extraction sites to refining processes to distribution. These valves are widely used to control flow and isolate downstream processing equipment. The reason quarter-turn ball valves fit many applications in this industry is their design versatility for handling high pressure liquids and gases with minimal pressure drop in addition to low operating torques, bubble tight shut-off, and easy maintenance.

***Always remember the media being used in the application, pressure requirements, and temperature will be the key factors to choosing the right Flo-Tite Valve.***



Weld-In-Place HPS Series



F150 Series

### CATEGORIES

- Asphalt
- Benzene
- Bitumen
- Butane
- Crude Oil
- Diesel
- Ethylene
- Gasoline
- Hydrocarbons
- Jet Fuels
- Kerosene
- LNG
- LPG
- Lubricants
- Methane
- Naphtha
- Petroleum Coke
- Propane
- Propylene
- Solvents
- Sulfur
- Toluene

### INDUSTRIAL CONSUMERS

- Agriculture
- Automotive
- Construction & Infrastructure
- Electronics
- Fertilizers
- Household Goods Manufacturing
- Marine
- Medical Devices
- Petrochemicals
- Pharmaceuticals
- Plastics
- Power Generation
- Refinery
- Textiles

### FLO-TITE VALVE OFFERINGS

DIRECT CONNECT SERIES		ECONOMY SERIES		3 PIECE SERIES	
MODEL	BODY MATERIAL	MODEL	BODY MATERIAL	MODEL	BODY MATERIAL
DM 2000	CS/SS	S23/T23	CS/SS	110/120/130/190	SS
DM 110	SS	S3000/ T3000	CS/SS	410/510	CS/SS
DMF15	SS	S6000/ T3000	CS/SS	200/300	CS/SS/A20
DMW150	CS/SS	T70	SS	360	CS/SS
DMMPT100/DMMPT200	SS	T12	CS/SS	HPF40/50	CS/SS
DM85	CS/SS	T45	SS	1540/1550	CS/SS
DM300	SS	T80/ T82	SS	350/370	SL
				190/390	SS

FLANGE SERIES		MULTI PORT SERIES		SPECIALTY PRODUCTS	
MODEL	BODY MATERIAL	MODEL	BODY MATERIAL	MODEL	BODY MATERIAL
F150/F300	CS/SS/A20	MPF15/MPF30/MPF60	CS/SS	TANK BOTTOM TK300	SS
SF150/SF300	CS/SS	MPF155	SS	KOMPACT SERIES	CS/SS
RF15/RF150	CS/SS	3WHPF	CS/SS		
RF30/RF300	CS/SS	MPT100/104	SS		
RV150/300/600	CS/SS	DMPT100	SS		
F60/F600	CS/SS				
TM150/300/600/900	CS/SS				

#### NOTE

***Please check soft part materials for the process fluid chemical compatibility***



## CHLORINE BASED APPLICATIONS

### APPLICATION SYNOPSIS

Chlorine in its liquid or gaseous state is highly reactive and therefore requires extreme precaution for its safe handling and use. Chlorine being extremely corrosive in nature requires special alloys to avoid failure and safety hazards for plant personnel. Industrial applications deal with elemental chlorine, its inorganic derivatives and aromatic derivatives, chlorinated polymers, chlorinated solvents, polyurethanes, etc.

**Always remember the media being used in the application, pressure requirements, and temperature will be the key factors to choosing the right Flo-Tite Valve.**



**ceramic  
Valves**



**300 Series with  
different End Caps**



**DMMPT 200 Series**

### CATEGORIES

- Chlorine Dioxide
- Dry Chlorine
- Wet Chlorine

### INDUSTRIAL CONSUMERS

- Fibers
- Herbicides
- Household Cleaning Products
- Industrial Waste Treatment
- Pesticides
- Plastics
- Polymers Manufacturing
- Propellants
- Pulp & Paper
- Refrigerants
- Sewage Treatment & Sanitation
- Solvents Manufacturing
- Synthetic Rubber Production
- Textile
- Water Treatment

### FLO-TITE VALVE OFFERINGS

DIRECT CONNECT SERIES		ECONOMY SERIES		3 PIECE SERIES	
MODEL	BODY MATERIAL	MODEL	BODY MATERIAL	MODEL	BODY MATERIAL
DM 2000	CS/SS	S23/T23	CS/SS	110/120/130/190	SS
DM 110	SS	S3000/ T3000	CS/SS	410/510	CS/SS
DMF15	SS	S6000/ T3000	CS/SS	200/300	CS/SS/A20
DMW150	CS/SS	T70	SS	360	CS/SS
DMMPT100/DMMPT200	SS	T12	CS/SS	HPF40/50	CS/SS
DM85	CS/SS	T80/ T82	SS	1540/1550	CS/SS
DM300	SS			350/370	SL
				190/390	SS

FLANGED SERIES		MULTI PORT SERIES		SPECIALTY PRODUCTS	
MODEL	BODY MATERIAL	MODEL	BODY MATERIAL	MODEL	BODY MATERIAL
F150/F300	CS/SS/A20	MPF15/MPF30/MPF60	CS/SS	TANK BOTTOM TK300	SS
SF150/SF300	CS/SS	MPF155	SS	KOMPACT SERIES	CS/SS
RF15/RF150	CS/SS	3WHPF	CS/SS		
RF30/RF300	CS/SS	MPT100/104	SS		
RV150/300/600	CS/SS	DMPT100	SS		
F60/F600	CS/SS				
TM150/300/600/900	CS/SS				

#### NOTE

*Please check soft part materials for the process fluid chemical compatibility*



## LIQUOR BASED APPLICATIONS

### APPLICATION SYNOPSIS

The pulping liquors processes, from evaporation and incineration of black liquor - green liquor formation - causticizing of green liquor with lime for the formation of white liquor, etc., require valves that can withstand severe service conditions due to the presence of abrasive slurries and scaling process fluids. Ball valves with the right metallurgy and wetted trim are therefore a critical selection factor for the reliable handling of liquor based systems.

***Always remember the media being used in the application, pressure requirements, and temperature will be the key factors to choosing the right Flo-Tite Valve.***

### CATEGORIES

- Black Liquor
- Green Liquor
- Red Liquor
- Sulfate Liquor
- Tall Oil

### INDUSTRIAL CONSUMERS

- Biofuel Systems
- Pulp & Paper



**Eccentric Control Valve**



**Segmented Control Valve**



DM 2000

### FLO-TITE VALVE OFFERINGS

DIRECT CONNECT SERIES		ECONOMY SERIES		3 PIECE SERIES	
MODEL	BODY MATERIAL	MODEL	BODY MATERIAL	MODEL	BODY MATERIAL
DM 2000	CS/SS	S23/T23	CS/SS	200/300	CS/SS/A20
DM 110	SS	S3000/ T3000	CS/SS	HPF40/50	CS/SS
DMF15	SS	S6000/ T3000	CS/SS	1540/1550	CS/SS
DMW150	CS/SS				
DMMPT100/DMMPT200	SS				

FLANGED SERIES		MULTI PORT SERIES		SPECIALTY PRODUCTS	
MODEL	BODY MATERIAL	MODEL	BODY MATERIAL	MODEL	BODY MATERIAL
F150/F300	CS/SS/A20	MPF15/MPF30/MPF60	CS/SS	TANK BOTTOM TK300	SS
SF150/SF300	CS/SS	MPF155	SS	KOMPACT SERIES	CS/SS
RF15/RF150	CS/SS	3WHPF	CS/SS		
RF30/RF300	CS/SS	MPT100/104	SS		
RV150/300/600	CS/SS				
F60/F600	CS/SS				
TM150/300/600/900	CS/SS				

#### NOTE

*Please check soft part materials for the process fluid chemical compatibility*



## HYDROGEN PEROXIDE BASED APPLICATIONS

### APPLICATION SYNOPSIS

Hydrogen Peroxide systems are commercially furnished in concentrations ranging from 27.5% through 98%. Hydrogen Peroxide concentrations that are above 52% are regarded as High Strength. This compound is a strong oxidizer and may cause explosion and combustion.

Hydrogen Peroxide is commonly used as an oxidizing agent during chemical syntheses, in aseptic processing and packaging, sugar bleaching, cleaning and disinfecting products and water treatment systems.

Ball valves meant for handling hydrogen peroxide service need to be thoroughly cleaned and the material of valve construction carefully selected.

***Always remember the media being used in the application, pressure requirements, and temperature will be the key factors to choosing the right Flo-Tite Valve.***



**TK 300 Series**



**MPT 104 Series**



Titanium V-ball control valve

### CATEGORIES

- 3% H<sub>2</sub>O<sub>2</sub>
- 6% ~ 10% H<sub>2</sub>O<sub>2</sub>
- 90% H<sub>2</sub>O<sub>2</sub>

### INDUSTRIAL CONSUMERS

- Aerospace
- Agriculture
- Chemical
- Medical
- Oil & Gas
- Petrochemical
- Pharmaceuticals
- Power Generation
- Pulp & Paper
- Waste Water Treatment

### FLO-TITE VALVE OFFERINGS

DIRECT CONNECT SERIES		ECONOMY SERIES		3 PIECE SERIES	
MODEL	BODY MATERIAL	MODEL	BODY MATERIAL	MODEL	BODY MATERIAL
DM 2000	CS/SS	S23/T23	CS/SS	110/120/130/190	SS
DM 110	SS	S3000/ T3000	CS/SS	410/510	CS/SS
DMF15	SS	S6000/ T3000	CS/SS	200/300	CS/SS/A20
DMW150	CS/SS	T70	SS	360	CS/SS
DMMPT100/DMMPT200	SS	T12	CS/SS	HPF40/50	CS/SS
DM85	CS/SS	T45	SS	1540/1550	CS/SS
DM300	SS	T80/ T82	SS	350/370	SL
				190/390	SS

FLANGED SERIES		MULTI PORT SERIES		SPECIALTY PRODUCTS	
MODEL	BODY MATERIAL	MODEL	BODY MATERIAL	MODEL	BODY MATERIAL
F150/F300	CS/SS/A20	MPF15/MPF30/MPF60	CS/SS	TANK BOTTOM TK300	SS
SF150/SF300	CS/SS	MPF155	SS	KOMPACT SERIES	CS/SS
RF15/RF150	CS/SS	3WHPF	CS/SS		
RF30/RF300	CS/SS	MPT100/104	SS		
RV150/300/600	CS/SS	DMPT100	SS		
F60/F600	CS/SS				
TM150/300/600/900	CS/SS				

#### NOTE

***Please check soft part materials for the process fluid chemical compatibility***



## AMMONIA BASED APPLICATIONS

### APPLICATION SYNOPSIS

Ammonia is widely used in industrial applications like fertilizer manufacturing, waste water treatment, leather, rubber, paper, food and beverage production operations, cold storage and refrigeration systems and pharmaceutical production processes. Industrial ammonia is usually available as ammonia liquor or as pressurized/refrigerated anhydrous liquid ammonia.

Ammonia is one of the most commonly manufactured and demanded substances in the world. Due to its toxic and flammable nature, proper selection of ball valve construction and trim materials is critical for a reliable life cycle.

*Ammonia applications have to be viton free and the ball has to be vented.*

**Always remember the media being used in the application, pressure requirements, and temperature will be the key factors to choosing the right Flo-Tite Valve.**



### CATEGORIES

- Total Ammonia (NH<sub>3</sub>)
- Free Ammonia (NH<sub>4</sub><sup>+</sup>)
- Ammonium (NH<sub>3</sub>)

### INDUSTRIAL CONSUMERS

- Agriculture
- Chemical
- Food & Beverage
- HVAC
- Pesticides
- Pharmaceuticals
- Plastics
- Textiles
- Water Treatment

### FLO-TITE VALVE OFFERINGS

DIRECT CONNECT SERIES		ECONOMY SERIES		3 PIECE SERIES	
MODEL	BODY MATERIAL	MODEL	BODY MATERIAL	MODEL	BODY MATERIAL
DM 2000	CS/SS	T23	CS/SS	110/120/130/190	SS
DM 110	SS	T3000	CS/SS	410/510	CS/SS
DMF15	SS	T3000	CS/SS	200/300	CS/SS/A20
DMW150	CS/SS	T70	SS	360	CS/SS
DMMPT100/DMMPT200	SS	T12	CS/SS	HPF40/50	CS/SS
DM85	CS/SS	T80/ T82	SS	1540/1550	CS/SS
DM300	SS			350/370	SL
				190/390	SS

FLANGE SERIES		MULTI PORT SERIES		SPECIALTY PRODUCTS	
MODEL	BODY MATERIAL	MODEL	BODY MATERIAL	MODEL	BODY MATERIAL
F150/F300	CS/SS/A20			TANK BOTTOM TK300	SS
		MPF155	SS	KOMPACT SERIES	CS/SS
RF15/RF150	CS/SS	3WHPF	CS/SS		
RF30/RF300	CS/SS	MPT100/104	SS		
		DMPT100	SS		
F60/F600	CS/SS				

**NOTE**

*Please check soft part materials for the process fluid chemical compatibility*





## ETHYLENE OXIDE BASED APPLICATIONS

### APPLICATION SYNOPSIS

Ethylene oxide is used mainly as a chemical intermediate in the manufacture of ethylene glycol (antifreeze), textiles, detergents, polyurethane foam, solvents, medicine, adhesives, and other products.

Small amounts of ethylene oxide are used as a fumigant, as a sterilant for food (spices) and cosmetics, and in hospital sterilization of surgical equipment and plastic devices that cannot be sterilized by steam.

Ethylene Oxide is considered a carcinogen and its exposure to human through inhalation can result in severe medical conditions. Ball valves are therefore an ideal choice for this chemical due to their tight shut-off characteristics.

***Always remember the media being used in the application, pressure requirements, and temperature will be the key factors to choosing the right Flo-Tite Valve.***



### INDUSTRIAL CONSUMERS

- Adhesives Production
- Antifreeze Manufacturing
- Cosmetics Production
- Detergents Manufacturing
- Fumigation
- Medical
- Pharmaceuticals
- Solvents Manufacturing
- Textiles



### FLO-TITE VALVE OFFERINGS

DIRECT CONNECT SERIES		ECONOMY SERIES		3 PIECE SERIES	
MODEL	BODY MATERIAL	MODEL	BODY MATERIAL	MODEL	BODY MATERIAL
DM 2000	CS/SS	S23/T23	CS/SS	110/120/130/190	SS
DM 110	SS	S3000/ T3000	CS/SS	410/510	CS/SS
DMF15	SS	S6000/ T3000	CS/SS	200/300	CS/SS/A20
DMW150	CS/SS	T70	SS	360	CS/SS
DMMPT100/DMMPT200	SS	T12	CS/SS	HPF40/50	CS/SS
DM85	CS/SS	T45	SS	1540/1550	CS/SS
DM300	SS	T80/ T82	SS	350/370	SL
				190/390	SS

FLANGED SERIES		MULTI PORT SERIES		SPECIALTY PRODUCTS	
MODEL	BODY MATERIAL	MODEL	BODY MATERIAL	MODEL	BODY MATERIAL
F150/F300	CS/SS/A20	MPF15/MPF30/MPF60	CS/SS	PFA LINED SERIES F15	DI/ SS
SF150/SF300	CS/SS	MPF155	SS	TANK BOTTOM TK300	SS
RF15/RF150	CS/SS	3WHPF	CS/SS	KOMPACT SERIES	CS/SS
RF30/RF300	CS/SS	MPT100/104	SS		
RV150/300/600	CS/SS	DMPT100	SS		
F60/F600	CS/SS				
TM150/300/600/900	CS/SS				

#### NOTE

***Please check soft part materials for the process fluid chemical compatibility***



## SLURRY BASED APPLICATIONS

### APPLICATION SYNOPSIS

Slurry is a thick, viscous and semi-liquid mixture of various minerals. Some slurries are the settling type while others are non-settling type (particle size less than 200microns). The liquid component of the slurry is called carrier fluid that can be water, acid solution, hydro-carbon, etc.

When not handled properly, slurries can cause blockages and equipment failures. The following factors must be carefully reviewed for the right selection of ball valves for slurry based systems: construction material, fluid velocity, fluid abrasion, particle size and percentage of solids in the slurry.

***Always remember the media being used in the application, pressure requirements, and temperature will be the key factors to choosing the right Flo-Tite Valve.***



### CATEGORIES

- Cement
- Gypsum Mud
- Magnesium
- Oligomers
- Oil Filtration
- Paint
- Phosphates
- Raw Water
- Saturated Steam
- Sulfur

### INDUSTRIAL CONSUMERS

- Asphalt
- Chemical
- Construction
- Foundries
- Mining
- Paint Manufacturing
- Petrochemical
- Printing
- Power Generation
- Pulp & Paper
- Textiles
- Wastewater & Sewage Treatment

### FLO-TITE VALVE OFFERINGS

DIRECT CONNECT SERIES		ECONOMY SERIES		3 PIECE SERIES	
MODEL	BODY MATERIAL	MODEL	BODY MATERIAL	MODEL	BODY MATERIAL
DM 2000	CS/SS	S23/T23	CS/SS	200/300	CS/SS/A20
DM 110	SS	S3000/ T3000	CS/SS	HPF40/50	CS/SS
DMF15	SS	S6000/ T3000	CS/SS	1540/1550	CS/SS
DMW150	CS/SS				
DMMPT100/DMMPT200	SS				

FLANGED SERIES		MULTI PORT SERIES		SPECIALTY PRODUCTS	
MODEL	BODY MATERIAL	MODEL	BODY MATERIAL	MODEL	BODY MATERIAL
F150/F300	CS/SS/A20	MPF15/MPF30/MPF60	CS/SS	TANK BOTTOM TK300	SS
SF150/SF300	CS/SS	MPF155	SS	KOMPACT SERIES	CS/SS
RF15/RF150	CS/SS	3WHPF	CS/SS		
RF30/RF300	CS/SS	MPT100/104	SS		
RV150/300/600	CS/SS				
F60/F600	CS/SS				
TM150/300/600/900	CS/SS				

#### NOTE

***Please check soft part materials for the process fluid chemical compatibility***



### **ABSOLUTE PRESSURE**

Pressure measured relative to high vacuum and is referred to as pounds per square inch (absolute) or psia.

### **ACTUATOR**

An actuator is a mechanical device used to automatically operate a piece of equipment (valves in our case) either at the piece of equipment or remotely. Actuators generally operate using pneumatic gases, hydraulic fluids, or electric motors

### **AMBIENT TEMPERATURE**

Refers to surrounding temperature as with thermal conditions surrounding a piece of equipment, not the process temperature.

### **AMMONIA**

Commonly found as a gas, it is colorless, pungent and suffocating. It is highly water soluble. It is generally produced by the mixing of nitrogen and hydrogen gases. Terms like liquid ammonia, aqueous ammonia, and anhydrous ammonia are in common use. In systems where ammonia is used as a refrigerant (R717), brass or bronze valves should not be used. Carbon steel and stainless steel valves are more commonly used in ammonia refrigeration systems.

### **ANSI**

"American National Standards Institute"

### **API**

American Petroleum Institute" sets standards for products used in the Petroleum and Refining Industry, as well as serving as the information and public relations arm of the industry.

### **ASME**

American Society of Mechanical Engineers

### **ASTM**

American Society of Mechanical Engineers

### **AUTOMATION**

This means an automatic operation. See Actuator.

### **BALL VALVE**

The ball valve is similar in concept to the plug valve but uses a rotating ball (hence the name ball valve) with a hole through it that allows straight-through flow in the open position and shuts off flow when the ball is rotated 90 degrees to block the flow passage. It is used for on-off and some throttling services.

### **BLEACH**

See sodium hypochlorite. Household bleach has a typical concentration of less than 20%.

### **BUBBLE TIGHT**

Term used to indicate sealing capability of a valve. While from an engineering standpoint nothing is truly "zero leakage" the term means that there is no visible leakage during the test period where the test media is air or nitrogen.

### **BUTTERFLY VALVE**

The butterfly valve controls flow by using a circular disc or vane with its pivot axis at right angles to the direction of flow in the pipe. A butterfly valve requires a minimum of space and can be used both for on-off and throttling services.

### **BUTTWELD**

A connection between valves, pipe and / or fittings and any mixture of the three where the ends are placed or butted up against one another and then are welded together. The ends should be the same thickness or schedule. Thicker parts will have a tapered end so when the two components are placed together it creates a "V" that allows the welder to fill in and obtain a strong connection.

### **CAUSTIC**

A substance capable of destroying or eating away, by chemical action. A substance that burns or destroys organic tissue by chemical action It is corrosive. Caustic is an entire family of chemicals characterized by the hydroxyl radical. The family includes such common products as calcium hydroxide, potassium hydroxide (potash) and sodium hydroxide (caustic soda). Glass reinforced PTFE should not be used in these services.

### **CE MARK**

This program is linked to the European Pressure Equipment Directive. Through a series of prescribed steps valves are identified, by means of applying the CE logo, as appropriate for import and use in the member countries of the European Union. It is applicable to valves larger than 1". At the time of this writing, when specified, we can provide CE marked product in our two piece valves, three piece valves, flange valves and top entry valves. They can be had in the following steel, alloy, and bronze materials (depending on design) to make CE compliant valves: ASME class valves in ASTM A216 WCB, ASTM A351 LCC, ASTM A351 CF8M, ASTM A351 CF3M, ASTM A351 CN7M, ASTM A494 CZ100, and ASTM A494 M35-1. In the bronze materials we can make CE compliant valves in the following materials: ASTM B61 C92200, ASTM B62 C83600, ASTM B584 C84400, & ASTM B584 C89836.

### **CGA**

Canadian Gas Association. This organization has been replaced by CSA who purchased rights to the CGA name and standards

### **CLASS IV LEAKAGE**

Fluid Control Institute has standards for defining allowable leak rates for control valves. The standard FCI 70-2-2003 tells us that Class IV leakage rates are based on tests conducted with water or air at pressures up to 60 psig. Hard seated ball valves, such as those with metal to metal, ceramic, PEEK or graphite are commonly promoted as having at least a Class IV rating. Allowable leakage is expressed as 0.01% of the valves rated flow capacity. For ball valves, we assume this "capacity" to be equal to the valve's Cv. =For a 1" full port top entry valve that allowable leakage rate would be 35.96 ml per minute of water.

### **CLASS V LEAKAGE**

Fluid Control Institute has standards for defining allowable leak rates for control valves. The standard FCI 70-2-2003 tells us that Class V leakage rates are based on tests conducted with water at any agreed pressure up to the valve's maximum rating. Hard seated ball valves, such as those with Metal to Metal, PEEK or graphite seats may achieve a Class V rating with special preparation, but most commonly are promoted as having a Class IV rating. Assuming a 1" full valve closed against 285 psig of water pressure, the allowable leakage rate under this classification would be 0.1425 ml/minute of water.



### CLASS VI LEAKAGE

Fluid Control Institute has standards for defining allowable leak rates for control valves. The standard FCI 70-2-2003 tells us that Class VI leakage rates are based on tests conducted with air or nitrogen at no more than 50 psig. Any new "soft seated" ball valve should achieve a Class VI rating. Assuming a 1" full port valve closed against 50 psig of air pressure, the allowable leakage rate under this classification would be 0.15 ml/minute of gas. Gas being a much smaller molecule than the liquids identified in class 4 and 5.

### CMTR

"Certified Material Test Report" documents the compliance of a material to specific published standards by the original material producer. All MTR's issued by Flo-Tite™ for our steel castings are in fact CMTR's. An MTR for bar stock or forged material issued on the original manufacturer's letterhead are CMTR's. Should those results be reproduced and distributed on Flo-Tite™ letterhead they would be referred to as MTR's.

### CSA.

Canadian Standards Association. Replaced the former AGA and CGA organizations.

### DIAPHRAGM VALVE

The diaphragm valve effects closure by means of flexible diaphragm attached to a compressor. When the compressor is lowered by the valve stem onto a weir, the diaphragm seals and cuts off flow. The diaphragm valve handles corrosive, erosive and dirty services. It is an easily maintained valve. These valves are generally a multi-turn operated product.

### DIELECTRIC UNION

Dielectric unions are required in some applications by code. In particular on water heaters, in the transition from black pipe to copper. The basis for their use is to prevent galvanic corrosion of the black iron pipe. Whether or not they are technically necessary depends largely on water chemistry. In applications with dissolved electrolytes their use would be beneficial.

### DIFFERENTIAL PRESSURE

The difference between one referenced pressure to another referenced pressure. Often referred to as psid.

### DOUBLE ACTING

This is referring to a pneumatic or hydraulic actuator where action or movement from any position to another is made through the transfer of energy through the use of a liquid gas.

### EROSION

To wear/abrade/wear away through friction and abrasion.

### ETHYLENE OXIDE

Ethylene oxide (Often referred to as EO or EtO) is a flammable, colorless gas at temperatures above 51.3 °F (10.7 °C) and smells like ether at toxic levels. Exposure over an 8 hour period should not exceed 1 ppm (part per million). EtO is found in the production of solvents, antifreeze, textiles, detergents, adhesives, polyurethane foam, and pharmaceuticals. Smaller amounts are present in fumigants, sterilizing agents for spices and cosmetics. Used for sterilization of surgical equipment as well because once it evaporates

there is no residuals leaving a clean surface. EO is extremely volatile and requires valves to be vented to allow for rapid media expansion.

### FIRE SAFE

See fire tested. By itself the term has no agreed meaning. Should be accompanied by reference to a specific standard.

### FIRE TESTED

The term should be used with reference to a specific standard. Several series of Flo-Tite™ ball valves are available as fire tested to API 607, 5th edition. This is always listed as an optional feature.

### FLOATING BALL

Flo-Tite™ manufactures only "floating ball" ball valve designs at time of writing. The term "floating ball" comes from the feature that the ball is suspended in the assembly solely by the valve seats. There are no other supporting structures, like trunnions. Once the seats wear or deform the ball literally "floats" between the valve seats. Floating ball valves are intended to seal on the downstream seat.

### GAGE PRESSURE

Pressure measured relative to ambient atmospheric pressure and is referred to as pounds per square inch (Gage) or psig.

### GATE VALVE

The Gate Valves is a general service valve used primarily for an on-off, non-throttling service. The valve is closed by a flat face, vertical disc or gate that slides down through the valve to block the flow.

### GLOBE VALVE

The Globe Valve effects closure by a plug with a flat or convex bottom lowered onto a matching horizontal seat location in the center of the valve. Raising the plug opens the valves to let flow through. The Globe Valve is used for on-off service and handles a clean service throttling applications.

### GROUNDING

Grounding implies a requirement for electrical continuity between the various components of a valve. Flo-Tite™ offers two types of grounding; option codes -02 and -60.

### HARD SEAT

Applicable to more than just ball valve seats, this general term is used to describe devices with rigid sealing elements, such as "metal to metal", PEEK, Carbon Graphite or Ceramic.





### HOT OIL JACKET

The jacket is a pressure vessel placed around a valve, pipe, pump, tank or another piece of equipment that is either in a bolt on or welded on configuration. The purpose of the jacket generally is to control temperatures of the valve, pipe, pump, tank and/or the internal process media in the case of a valve. It is done by circulating the oil or thermal fluids through the applied vessel allowing the transfer of heat or cold.

### HYDROGEN PEROXIDE

Valves intended for Hydrogen Peroxide service must be properly vented (-14 option) and cleaned (-57 option). Carbon steel valves are not generally acceptable in this application. Avoid Multi-fill seats and seals, including Multi-fill packing. Specify PTFE seats & seals (-35 option) if feasible.

### HYSTERESIS

The amount of excess movement associated between separate yet connected moving components as one transfers energy to the other.

### LIQUOR

A family of terms commonly used in the Pulp and Paper industry. Includes Black Liquor, Green Liquor and White liquor.

### LP GAS

LP Gas is a fuel gas formed by mixture of liquified petroleum gases, commonly propane and butane. LP gas is produced and frequently stored at reduced temperatures. Depending where a valve is installed in an LP gas system option -14 "Vented Ball" or "Vented Body" may be required. This is particularly important on valves which can undergo significant temperature changes. Some LP gas applications will require UL or CSA listed valves of which Flo-Tite offers several.

### MSDS SHEET

"Material Safety Data Sheet" is a document used to communicate hazards associated with a substance. Flo-Tite™ products meet the requirements under the definition of an "Article" and are considered exempt from the Hazard Communication Standard 29 CFR 1910.1200. OSHA's defines an "Article" as a manufactured item: (1) which is formed to a specific shape or design during manufacture (2) which has end use function(s) dependent in whole or in part upon its shape or design during end use; and (3) which does not release, or otherwise result in exposure to, a hazardous chemical under normal conditions of use.

### MSS

"Manufacturers Standardization Society of the Valve and Fitting Industry" is an organization of manufacturers that publishes specifications where no other specification exists.

### MTR

"Material Test Report" documents the compliance of a material to specific published standards. All MTR's issued by Flo-Tite™ for our castings are in fact CMTR's. MTR's issued for bar stock or forged materials on the original manufacturer's letterhead are CMTR's. Should those results be reproduced and distributed on Flo-Tite™ letterhead they would be referred to as MTR's. (See also CMTR.)

### NACE

"National Association of Corrosion Engineers" writes standards and recommended practices in regard to the use of materials and the condition of those materials for Oil Field and other applications. Flo-Tite™ ball valves can be manufactured to be compliant with NACE MR0175 2000 edition.

### NATURAL GAS

Natural Gas is a fuel gas formed from refined naturally occurring hydrocarbon gases, primarily Methane. Depending where a valve is installed in a gas system option -14 "Vented Ball" or "Vented Body" may be required. This is particularly important for valves which can undergo significant temperature changes. Some Natural Gas applications will require UL or CSA listed valves of which Flo-Tite offers several.

### NEEDLE VALVE

The Needle Valve is a volume control valve that restricts flow in small lines. The fluid going through the valve turns 90 degrees and passes through an orifice that is the seat for a rod with a cone-shaped tip. The size of the orifice is changed by positioning the cone in relation to the seat.

### NPT

National Pipe Thread is a US standard of tapered threads used on pipe, valves and fitting connections. FNPT or NPT(F) stands for "Female Pipe Thread" and refers to internal threads. MNPT, or NPT(M) stands for "Male Pipe Thread" and refers to external threads.

### NSF-61

Also known as NSF/ANSI Standard 61 - Drinking Water System Components. This standard is for products that come into contact with drinking water.

The general idea was to establish minimum requirements of materials in a product were leaking of said materials could cause potential adverse human health effects.

The standard includes criteria for testing and evaluating products to ensure they do not leak potentially dangerous contaminants into the water. These contaminants include those regulated by the United States Environmental Protection Agency (USEPA) and Health Canada, as well as any other non-regulated compounds that may be of concern. At the time of this writing the only foreseeable issue in an industrial environment would be if it was for potable water in an industrial facility.

### OPTION -01

Standard trim and seals for parallel seated Flo-Tite™ ball valves; this most frequently includes reinforced PTFE seats and seals and a lever handle.

### OPTION -02

Grounded (Stem Only). When "factory standard" grounding is specified, this is the option selected. This option is effective when there is a concern regarding static electricity discharge when contact is made with the valve handle. This is generally imposed with the general environmental conditions may contain explosive or flammable vapors or gases, that might be found in a chemical refinery.

### OPTION -04

2-1/4" stem extension. This option elevates the handle approximately 2-1/4" above its original position to typically allow clearance for insulating the pipe and valve.

### OPTION -05

Plain Ball – refers to a non-plated ball on brass and carbon steel trimmed ball valves.

### OPTION -07

Tee Handle – A "T" shaped lever generally used on 2" and smaller valves where limited space constraints can hinder operation with a traditional lever.

### OPTION -08

90° reversed stem – this stem locates a handle in the opposite location where it would normally sit to be considered open or closed.



### OPTION -10

Stainless Steel Lever – Suitable for valves installed in environments where added corrosion protection may be required. Generally the method of retaining the lever is also an SS component.

### OPTION -11

Therma-Seal™ handle – A polymer raised tee handle utilized with insulation to avoid sweating and potential mold growth that can be associated with metallic stem extension components.

### OPTION -14

Vented ball or internally vented body – a valve with the “-14” option has a hole drilled in one face of the ball, with the exception of the top entry valve which has an internally vented body. The top entry valve’s vent hole is drilled in the top of the body behind the seat face down into the flow port. It serves the same function as a side vented ball and is completely internal to the valve. The vent hole in the ball (or top entry valve body) is always installed on the high pressure side when the valve is closed. The -14 vent hole allows trapped media in a closed valve to vent should there be thermal expansion, flashing or sudden decomposition within the valve.

### OPTION -15

Round handle – A round operating device utilized where space constraints might be an issue. Also utilized as a safety feature where the traditional lever could become a tripping or snag hazard.

### OPTION -16

Chain lever (vertical) – A long lever that extends both directions from the stem at an angle off center-line of the valve. Each end of the lever will have a chain attached which will allow operation of a valve overhead and out of reach.

### OPTION -20

Slot venting - is standard on steel and alloy balls and optional on brass or bronze balls. The drilled hole is vertical and is located just under where the stem engages the ball and proceeds to the bore flow path of the ball. It is particularly critical to employ slot vented balls in steam applications. In a steam application, water condenses in the body cavity of a closed valve. Once open, and steam is flowing, the temperature of the valve rises quickly causing the water trapped in the area between the ball and the body to flash to steam. Without slot venting the sudden rise in pressure due to the rapid rise in temperature may cause extrusion-like damage to the seats or seals of the valve leading to premature failure.

### OPTION -27

Stainless steel latch lock lever & handle nut - This is a sliding latch lock device on a lever that allows the valve to be secured with a pad lock in the fully open or closed position.

### OPTION -32

Stainless steel high rise tee handle - An extended “T” shaped lever generally used on 2” and smaller valves where limited space constraints can hinder operation with a traditional lever. The taller profile makes it easier to operate while keeping an operator’s hands further away from the piping and process temperatures.

### OPTION -36

Stainless steel high rise round handle - A round operating device utilized where space constraints might be an issue. Also utilized as a safety feature where the traditional lever could become a tripping or snag hazard. An extended round handle is generally used on 2” and smaller valves where limited space constraints can hinder operation with a traditional lever. The taller profile makes it easier to operate while keeping hands further away from the piping and process temperatures.

### OPTION -39

Same as option -36 but with a locking device that allows the valve to be secured in the fully open or closed positions.

### OPTION -41

More appropriately this option should be called “Automatic-Venting” in lieu of “auto-drain”. The option in Flo-Tite ball valves is limited to bronze valves only. The valve is intended to vent the downstream pressure on a closed valve equipped with this option. It should be used only on either water or non-hazardous gases, such as air or nitrogen, as they vent to atmosphere. Valves with this option have limited service temperature and pressure ranges of + 50F to + 250F and 0 psig to 125 psig respectively.

### OPTION - 44

Seal weld – The two-piece valve’s retainer is welded to the body, which eliminates the body joint. (The retainer cannot accidentally be loosened and a potential leak path is permanently eliminated). Note: The retainer cannot be removed and the valve cannot be repaired. This option is available with certain carbon steel and stainless valves. Contact Technical Support if you have questions regarding this option.

### OPTION -60

Grounded (ball and stem). This option assures electrical continuity between all components of a valve. The most common application is in gaseous services. Dry gases flowing through a device at high velocities can generate significant static charges. A ball valve ball suspended between PTFE or other polymeric seats is normally isolated from ground. This option assures that the ball and stem both have continuous contact with the valve body. Without this feature the static charge generated on the ball may arc to ground causing an internal explosion.

### OPTION -80

Trade name multi-seal, this is the Flo-Tite offering for what has been referred to as “Super-PTFE”. Only available in the flanged valve series at the time of this writing, this material is based on Dyneon’s TFM-1600 resin. This material PTFE based containing a PFA modifier for improved properties including increased strength and increased resistance to “popcorning”.

### PED

See Pressure Equipment Directive.

### PINCH VALVE

The pinch valve finds wide application on slurries or liquids with large amounts of suspended solids. It seals by means of one or more flexible elements, such as a rubber tube, that can be pinched to shut off flow.

### PLUG VALVE

The plug valve is used primarily for on-off service and some throttling services. It controls flow by means of a cylindrical or tapered plug with a hole (generally somewhat rectangular in shape) in the center that lines up with the flow path of the valve to permit passage. A quarter turn of the handle/plug blocks the flow path. Used on wine casks.

### POP-CORNING

Phenomenon that occurs as with PTFE based seal material when utilized in styrene, butadiene, latex and vinyl chloride applications. Each of these chemicals has the ability to permeate the surface of the polymer and become trapped in tiny pores in the material. When they try to expand and escape they pop out through the surface leaving tiny craters and thus ruin sealing ability.



### **PRESSURE EQUIPMENT DIRECTIVE**

A legal document defining common requirements for valves and other devices intended for use within member states of the European Union.

### **PRESSURE VESSEL**

The over-all structure that contains pressure as defined by the Code.

### **PRESSURE CONTAINING COMPONENT**

For valves, this would refer to the Body.

### **PRESSURE RETAINING COMPONENTS**

This typically refers to the components that maintain the integrity of the Pressure Vessel. In the case of a valve this would include the Stem, the gland nut, or the gland, gland plate, the gland nuts and studs,. Some customers would include the ball, although it is already defined as a "wetted component".

### **PRESSURE VESSEL CODE**

See Boiler and Pressure Vessel Code.

### **PTA**

Purified terephthalic acid. Generally found in a powdered form. Used as a filler and reinforcing material in plastics and other materials.

### **REFRIGERANT**

A group of hydrocarbon gases with particularly advantageous thermodynamic properties. Among these are Freon (an entire family of materials in itself) and ammonia. In systems where ammonia is the refrigerant, brass or bronze valves should be used with caution. Carbon steel valves are more commonly used in ammonia refrigeration systems.

### **SELF-RELIEVING SEATS**

Defined by API 6D as seats that automatically depressurized in a closed valve's body cavity to atmospheric pressures if the trapped pressure exceeds 133% of the valves nominal rating. Trunnion mounted ball valves are capable of relieving trapped body cavity pressure to a safe predetermined level, but not necessarily atmospheric pressure. The concept of self-relieving seats in soft seated floating ball valves is largely a myth and none of the competitive valves tested have come close to meeting API 6D's. Flo-Tite's valve seats are not promoted as "self-relieving".

### **SOCKET WELD**

A connection larger than the OD of the mating pipe which allows the pipe to be permanently connected to a valve or fitting. The pipe is slid into a socket in the end of the valve or fitting (but not bottomed out) which makes a 90° angle that provides a good spot for the welder to fill in and achieve a good welded connection.

### **SOFT SEAT**

Applicable to more than just ball valve seats, this general term is used to describe devices with either elastomeric (rubber) or resilient polymer (flexible plastic) sealing elements. Flo-Tite™ soft seats are made from either PTFE, RPTFE, TFM, UHMWPE, Nylon or Acetal (Delrin).

### **SOLVENT**

A volatile hydrocarbon. Generally flammable to explosive. Frequently requires consideration of "fire tested" valves. Usually requires vented valves.

### **SPRING RETURN**

This can refer to a spring operated lever/handle that will allow a valve to open or close automatically (depending on how it is set up) if the operator holding the lever/handle releases it from the sprung position. It can also refer to a pneumatic or hydraulic actuator when action or movement is generated in one direction through the transfer of energy by use of a liquid or gas and in the other direction by springs.

### **STEAM JACKET**

The jacket is a pressure vessel placed around a valve, pipe, pump, tank or another piece of equipment that is either in a bolt on or welded on configuration. The purpose of the jacket generally is to control temperatures of the valve, pipe, pump, tank and/or the internal process media in the case of a valve. It is done by circulating steam through the applied vessel allowing the transfer of heat

### **TEFLON®**

A registered trademark of DuPont® . The word can only be used when specifically licensed to do so by DuPont and only in strict reference to materials produced by DuPont. Not to be used as a generic name for PTFE or PTFE bearing materials.

### **TRIM**

Also known as valve trim and refers to internal "wetted" parts of a valve. In the case of a ball valve the "wetted parts" would be the ball and stem, and although the body is "wetted" it is/can be considered pressure retaining or containing by the customer.

### **TRUNNION MOUNTED**

As opposed to a "floating ball", the ball on a "trunnion" or "trunnion mounted" valve is supported by bearings within the valve body and the valve's seats are typically loaded against the ball. Trunnion mounted valves have a few unique capabilities; the valve seals on the upstream seat, the seats tend to be somewhat self-relieving and the valve is generally capable of double block and bleed, two characteristics not normally found in floating ball valves.

### **UL**

Underwriters Laboratories

### **UL GUIDE**

These are more properly called category codes.

### **UNION, DIELECTRIC**

Dielectric unions are required in some application by code. In particular on water heaters, in the transition from black pipe to copper. The basis for their use is to prevent galvanic corrosion of the black iron pipe. Whether or not they are technically necessary depends largely on water chemistry. In applications with dissolved electrolytes their use would be beneficial.

### **VACUUM**

A negative pressure relative to ambient atmospheric pressure and is often identified as psiv.

### **VALVE**

A valve is a device used to control flow of media through a pipe or tube.

### **VALVE BORE**

Referring to the flow passage through a valve.

### **VALVE TRIM**

See Trim.



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