

# Model 380/381 Control Valves

## Technical Sales Bulletin



**Figure 1** Model 380 Control Valve with DFC Actuator

The Dyna-Flo 380 series of valves are heavy duty globe style control valves designed for high pressure applications. These valves are used in all kinds of demanding applications, including oil and gas production and chemical process.

Both Models 380 and 381 are cage guided control valves with balanced plugs. Model 380 control valves are capable of Class V shutoff at process temperatures below 450°F (232°C). Model 381 control valves are well suited for general applications that do not require tight shutoff.

380 Series control valves can be used in either snap on/off acting or throttling applications of either liquids or gasses. A bolted bonnet is standard and a typical actuator is a Dyna-Flo Model DFC or DFO linear actuator.

### Features

#### High Quality Construction

Dyna-Flo uses only materials that have been proven to provide superior, trouble free performance. All materials comply with ASME and ASTM specifications.

#### Versatility

A wide range of trim options including Low Noise and Anti-Cavitation make the 380 a highly versatile control valve.

#### Field Service Friendly

No special tools are required to change or inspect trim. Top access makes in-line service easy.

#### Industrial High Quality External Coatings

Our standard industrial high quality external coatings provide long lasting resistance to the harshest environments.

#### Pressure Drop Capabilities

The Model 380 can shut off against inlet pressure equal to ASME B16.34 rating.

#### Sour Gas Service Capability

The 380 Series can be constructed out of materials that comply with the recommendations of the National Association of Corrosion Engineers (NACE) MR-0175.

#### Shut Off Classification

Seat leakage options range from ANSI/FCI 70.2 and IEC 60534-4 Class II to Class V.

#### Emissions Reducing Packing

Help prevent the loss of process media and reduce packing maintenance with the use of Dyna-Flo's Live Loaded PTFE packing systems.



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### SPECIFICATIONS

#### Configurations

Refer to Table 1.

Consult your Dyna-Flo sales office for other available configurations.

#### Sizes and Connection Styles

Models: 380 & 381  
Size: 3" & 4"x3"  
Rating: ASME 2500  
Connections: RF / RTJ / BWE

#### Maximum Inlet Pressures and Temperatures

Consistent with ASME class rating as per ASME B16.34, unless limited by either material, pressure or temperature limitations. For pressure / temperature charts refer to Figure 8.

#### Maximum Pressure Drops

Same as maximum inlet pressure unless otherwise rated by specific trim construction.

#### Standard Seat Leakage Classifications

Refer to Table 1.

#### Dimensions

Valve Dimensions  
Refer to Tables 4 & 5.

Valve Dimensions  
Refer to Figure 2.

#### Approximate Valve Body Weights

Refer to Table 2.

#### Valve Body to Bonnet Bolting

Refer to Table 7.

#### Characteristics

- Equal Percentage (Standard)
- Modified Equal Percentage
- Linear

#### Flow Direction

- Model 380 - Flow Down
- Model 381 - Flow Down

#### Packing Type and Example

The standard packing is PTFE V-Ring. Live loaded low emission, graphite and other packing arrangements are also available. Refer to Figure 8.

#### Valve Sizing Coefficients

For standard coefficients at maximum travel, refer to Table 9. For full list of coefficients refer to document P-CVSM.

#### Valve Travel and Yoke Boss Sizes

Refer to Table 3.

#### Materials

Body and bonnet material options include:

LCC (A350-LF2 optional\* bonnet material)

WCC (A350-LF2 optional\* bonnet material)

CF8M (A182-F316 optional\* bonnet material)

**\*NOTE:** Dyna-Flo reserves the right to substitute a cast material with the forged bar equivalent in the event a casting is not available.

Refer to Figure 8. Refer to Tables 6 & 7 for typical construction materials. Refer to Table 8 for trim selections.

For more information and other options contact your Dyna-Flo sales office.

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**Table 1**

### Valve Design Configurations

(\*in accordance with ANSI/FCI 70.2 and IEC 60534-4)

Valve Model	Size (inch)	Shut Off Class Capability*	Valve Plug	Guide	Seat
380	3 & 4x3	IV Standard	Balanced	Cage	Metal
	3 & 4x3	V Optional Standard For Anti-Cavitation Trim	Balanced	Cage	Metal
381	3	II Standard	Balanced	Cage	Metal
	3	III Optional	Balanced	Cage	Metal
	4x3	V Standard	Balanced	Cage	Metal

**Table 2**

### Approximate Weights lb (kg)

Valve Size (inch)	Class	Flanged Body	Buttweld (BWE) Body
3	2500	492 (223)	359 (163)
4x3	2500	585 (265)	357 (162)

**Table 3**

### Model 380 Port Diameters, Valve Plug Travel and Yoke Boss Diameter

Valve Size Inch	Port Diameter Inch (mm)	Max Valve Travel Inch (mm)	Yoke Boss Diameter Inch (mm)	
			Stem	Valve
3" & 4"x3" Linear & Mod. Equal Percent	2-5/16 (58.7)	1-1/2 (38.1)	1/2 (12.7)	2-13/16 (71.4)
			3/4 (19.1)*	3-9/16 (90.5)*
			1 (25.4)	5 (127)
3" & 4"x3" Equal Percent	2-5/16 (58.7)	1-1/8 (28.6)	1/2 (12.7)	2-13/16 (71.4)
			3/4 (19.1)*	3-9/16 (90.5)*
			1 (25.4)	5 (127)

### Model 381 Port Diameters, Valve Plug Travel and Yoke Boss Diameter

Valve Size Inch	Port Diameter Inch (mm)	Max Valve Travel Inch (mm)	Yoke Boss Diameter Inch (mm)	
			Stem	Valve
3" & 4"x3" Linear & Mod. Equal Percent	2-5/16 (58.7)	1-1/2 (38.1)	1/2 (12.7)	2-13/16 (71.4)
			3/4 (19.1)*	3-9/16 (90.5)*
			1 (25.4)	5 (127)
3" & 4"x3" Equal Percent	2-5/16 (58.7)	1-1/8 (28.6)	1/2 (12.7)	2-13/16 (71.4)
			3/4 (19.1)*	3-9/16 (90.5)*
			1 (25.4)	5 (127)

**NOTE:** \* - Standard Dimensions



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**Table 4**

### Standard Valve Dimensions

Inches (mm) (Refer to Figure 2)

Valve Size	ASME Class	Dimension	
		A	B
3"	2500 <b>RF</b>	19.62 (498)	5.69 (145)
	2500 <b>RTJ</b>	19.88 (505)	5.69 (145)
	2500 <b>BWE</b>	19.62 (498)	5.69 (145)
4"x3"	2500 <b>RF</b>	20.38 (518)	5.69 (145)
	2500 <b>RTJ</b>	20.75 (527)	5.69 (145)
	2500 <b>BWE</b>	19.62 (498)	5.69 (145)

**Table 5**

### Dimension C for Standard Bonnet Diameters

Inches (mm) (Refer to Figure 2)

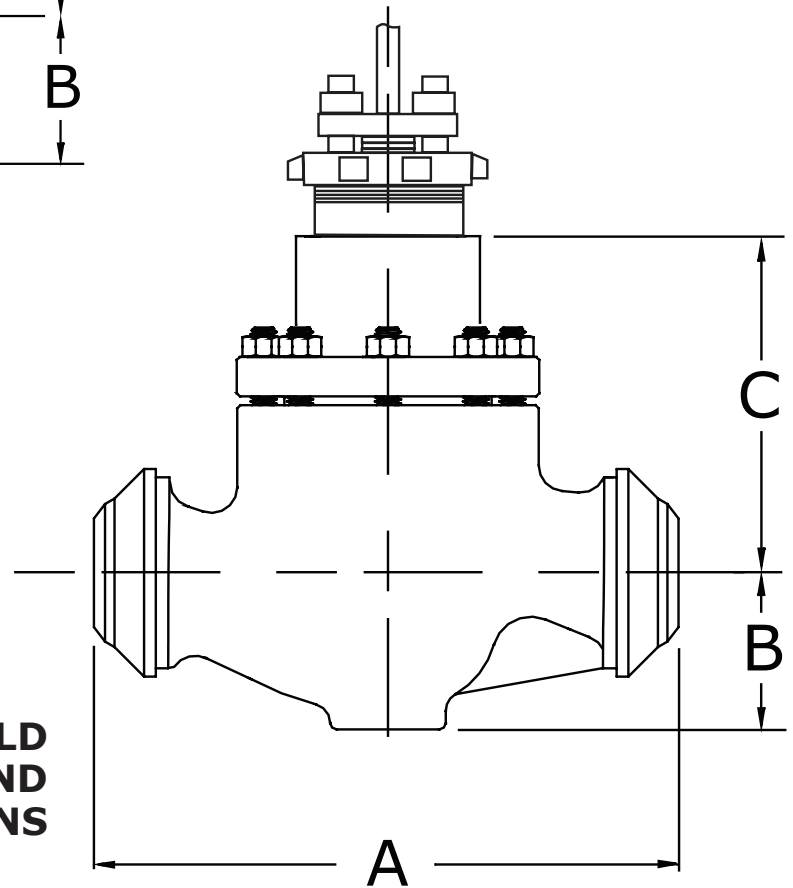
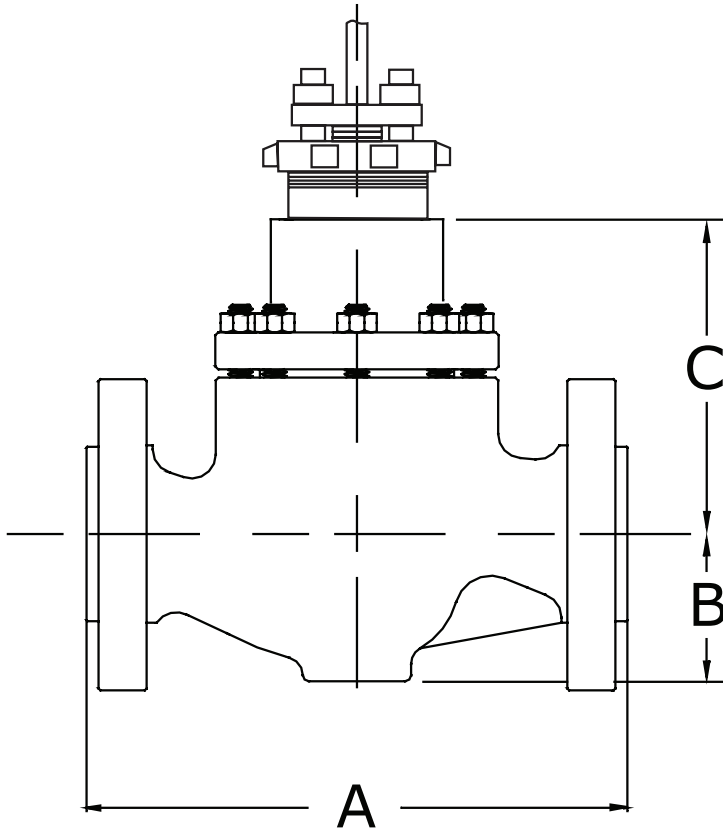
Valve Size (Inch)	Dimension C		
	2-13/16 (71) Yoke Boss Diameter 1/2 (12.7) Stem Diameter	3-9/16 (90) Yoke Boss Diameter 3/4 (19.1) Stem Diameter	5 (127) Yoke Boss Diameter 1 (25.4) Stem Diameter
3	13.19 (335)	13.19 (335)	14.62 (371)
4x3	13.19 (335)	13.19 (335)	14.62 (371)

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## FLANGED END CONNECTIONS

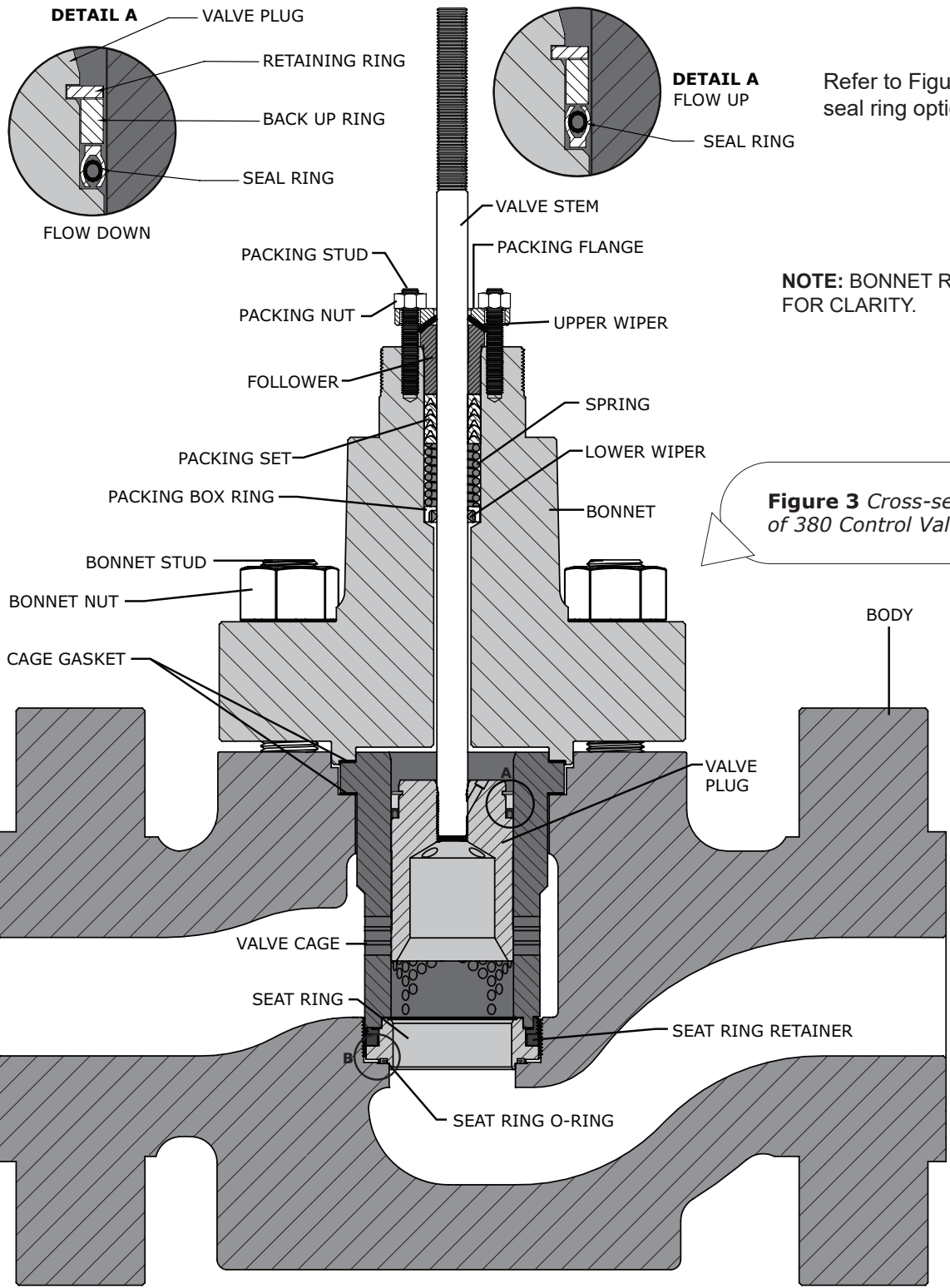


## BUTTWELD (BWE) END CONNECTIONS

**Figure 2** Typical Valve Dimension Diagram

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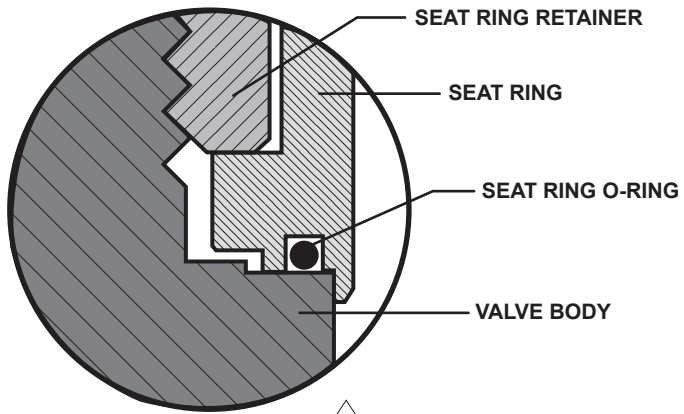
Refer to Figure 6 for other seal ring options.

**NOTE:** BONNET ROTATED 90° FOR CLARITY.

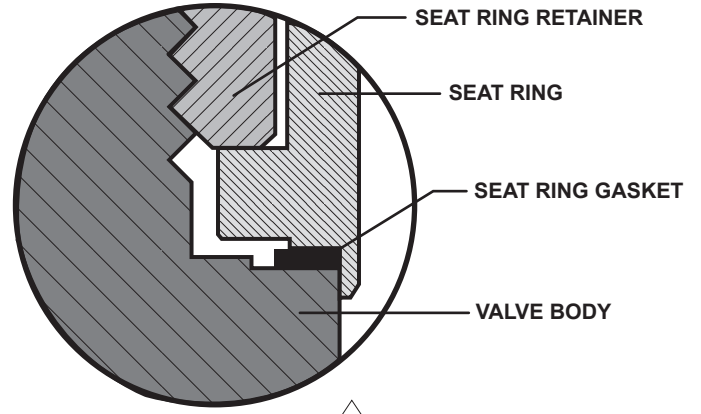
**Figure 3** Cross-section of 380 Control Valve

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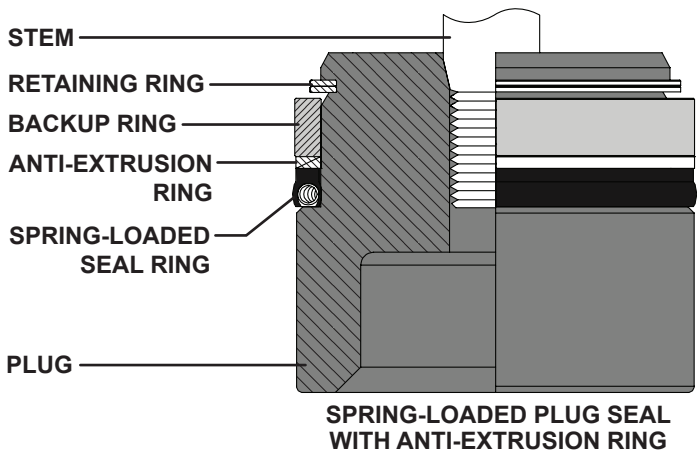
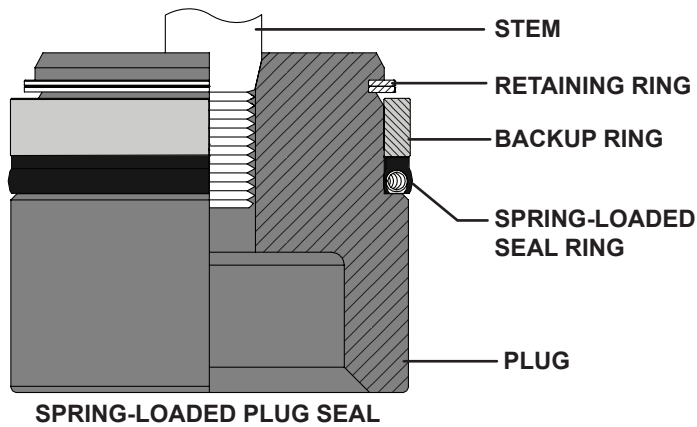
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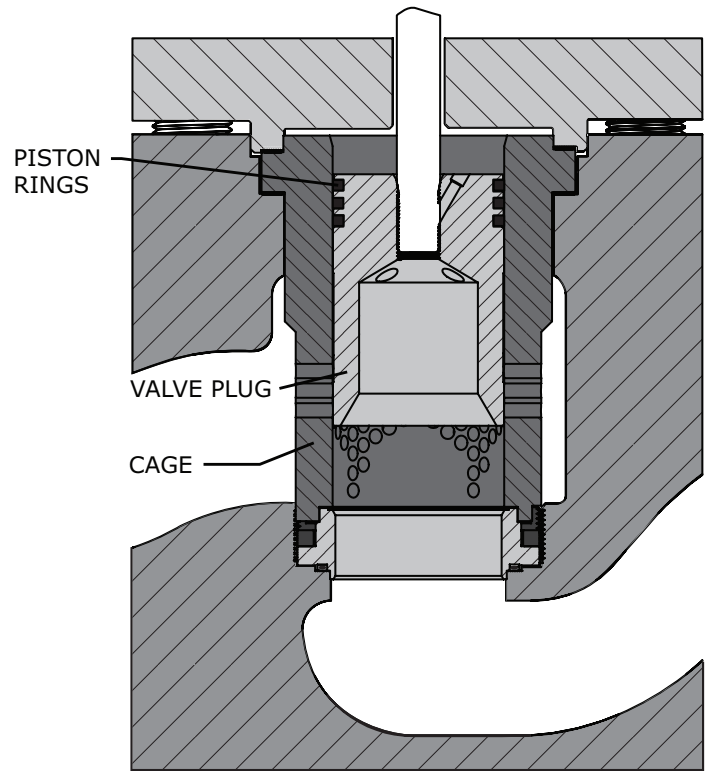
**Figure 4** Detail B - Seat Ring O-Ring



**Figure 5** Detail B - Seat Ring Gasket



**Figure 6** Detail A - Model 380 Plug Seal Options

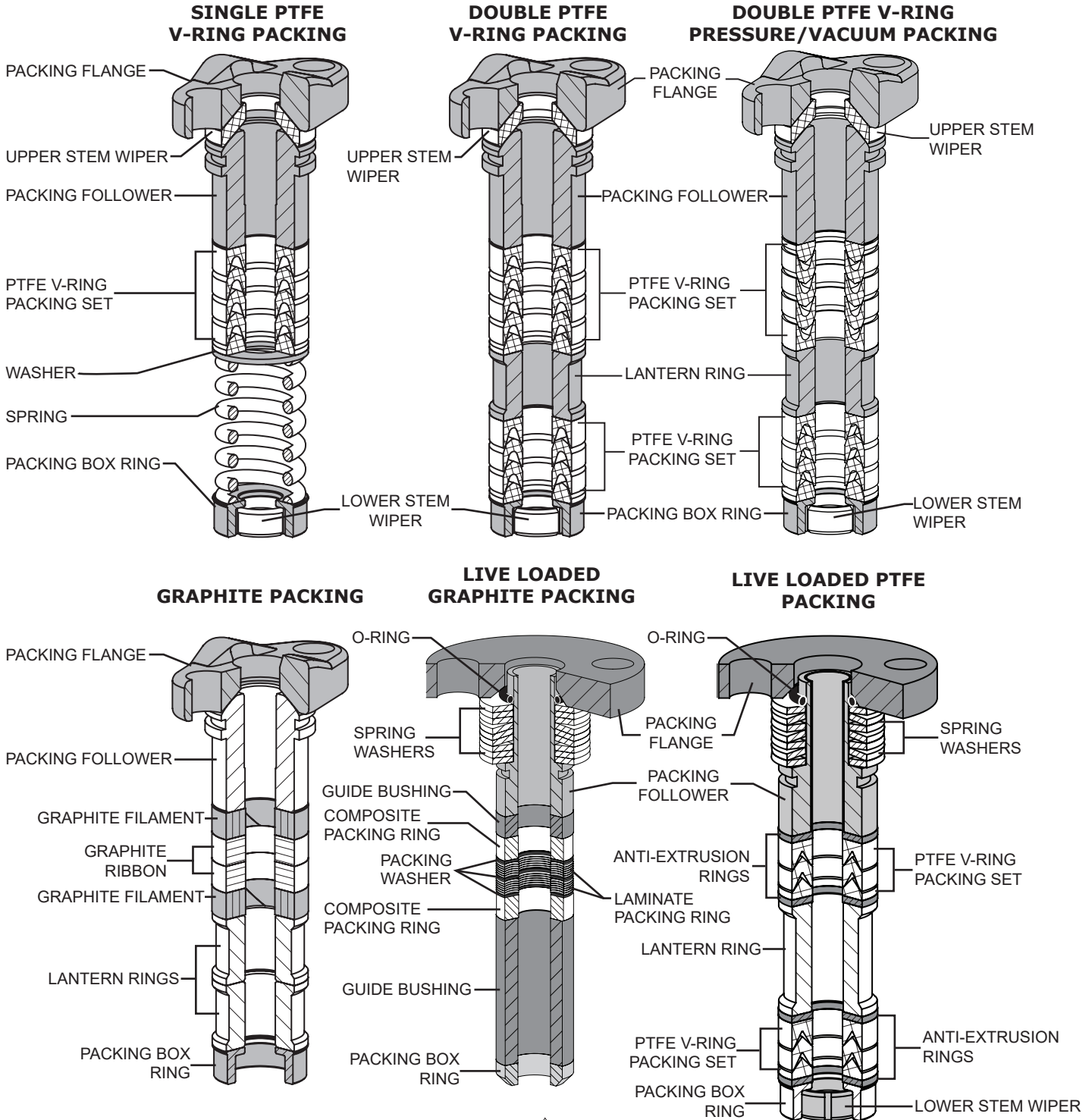


**Figure 7** Model 381 Plug and Cage Design



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**Figure 8** Typical Packing Arrangements



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**Table 6**

### Common Valve Parts Typical Construction Materials and Temperature Limitations

Part	Material	Temperature Limitations				
		Min. °F	Max. °F	Min. °C	Max. °C	
Valve Stem	S20910	NLF <sup>(1)</sup>	NLF <sup>(1)</sup>	NLF <sup>(1)</sup>	NLF <sup>(1)</sup>	
Cage Gasket	N04400	NLF <sup>(1)</sup>	NLF <sup>(1)</sup>	NLF <sup>(1)</sup>	NLF <sup>(1)</sup>	
Spring-Loaded (Three-Piece) Valve Plug Seal (Model 380 Only)	Backup Ring	S31600/S31603 Dual Grade	NLF <sup>(1)</sup>	NLF <sup>(1)</sup>	NLF <sup>(1)</sup>	NLF <sup>(1)</sup>
	Seal Ring	PTFE / Elgiloy	-100	450	-73	232
	Retaining Ring	S31600	NLF <sup>(1)</sup>	NLF <sup>(1)</sup>	NLF <sup>(1)</sup>	NLF <sup>(1)</sup>
Spring-Loaded (Three-Piece) Valve Plug Seal with Anti-Extrusion Rings (Model 380 Only)	Anti-Extrusion Ring	PolyEtherEtherKetone (PEEK)	NLF <sup>(1)</sup>	NLF <sup>(1)</sup>	NLF <sup>(1)</sup>	NLF <sup>(1)</sup>
	Backup Ring	S31600/S31603 Dual Grade	NLF <sup>(1)</sup>	NLF <sup>(1)</sup>	NLF <sup>(1)</sup>	NLF <sup>(1)</sup>
	Seal Ring	PTFE / Elgiloy	-100	600	-73	319
	Retaining Ring	S31600	NLF <sup>(1)</sup>	NLF <sup>(1)</sup>	NLF <sup>(1)</sup>	NLF <sup>(1)</sup>
Piston Ring (Model 381 Only)	Graphite	NLF <sup>(1)</sup>	1100 <sup>(4)</sup>	NLF <sup>(1)</sup>	593 <sup>(4)</sup>	
Seat Ring O-Ring	Viton <sup>(2)</sup>	-10	400	-23	204	
	Nitrile (NACE)	-20	225	-29	107	
	Ethylene-Propylene (EPDM) (Anti-Cavitation, NACE)	-40	450	-40	232	
Seat Ring Gasket	N04400	NLF <sup>(1)</sup>	NLF <sup>(1)</sup>	NLF <sup>(1)</sup>	NLF <sup>(1)</sup>	
Packing	PTFE V-Ring	-40	450	-40	232	
	Graphite (Ribbon/Filament) <sup>(3)</sup>	-425	1000	-254	538	

**NOTES:**

- 1 - NLF - This Material is Not A Limiting Factor. For the temperature limitation refer to the valve body material temperature limit.
- 2 - Standard option, not for water or steam service.
- 3 - Oxidizing service limited to 700°F (371°C).
- 4 - Oxidizing service limited to 1000°F (538°C).

**Table 7**

### Body to Bonnet Bolting Temperature Limitations

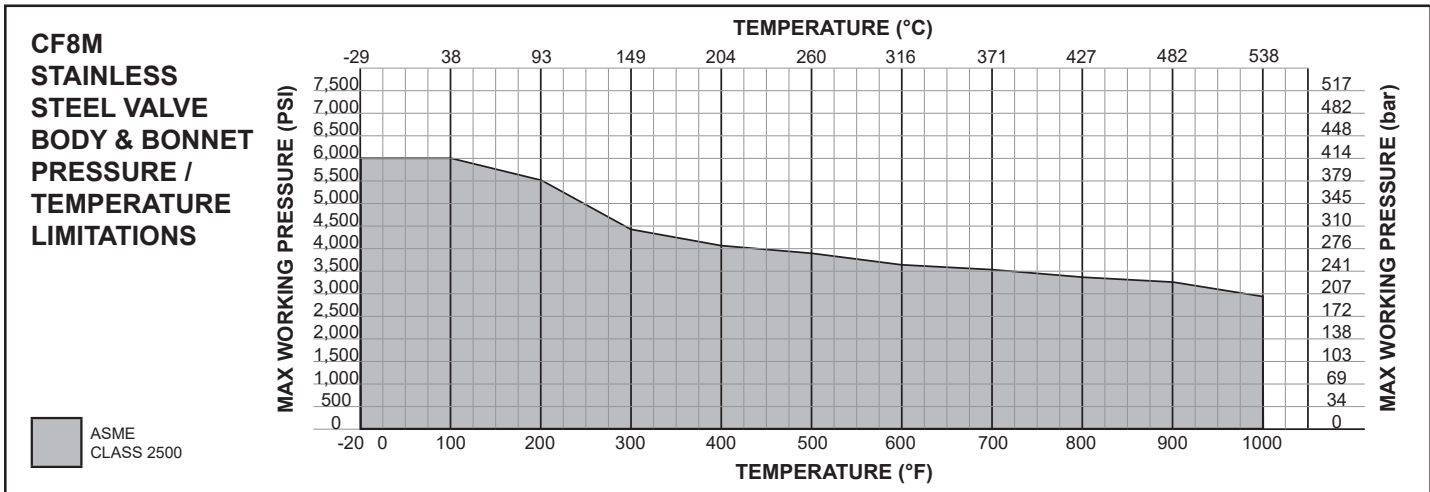
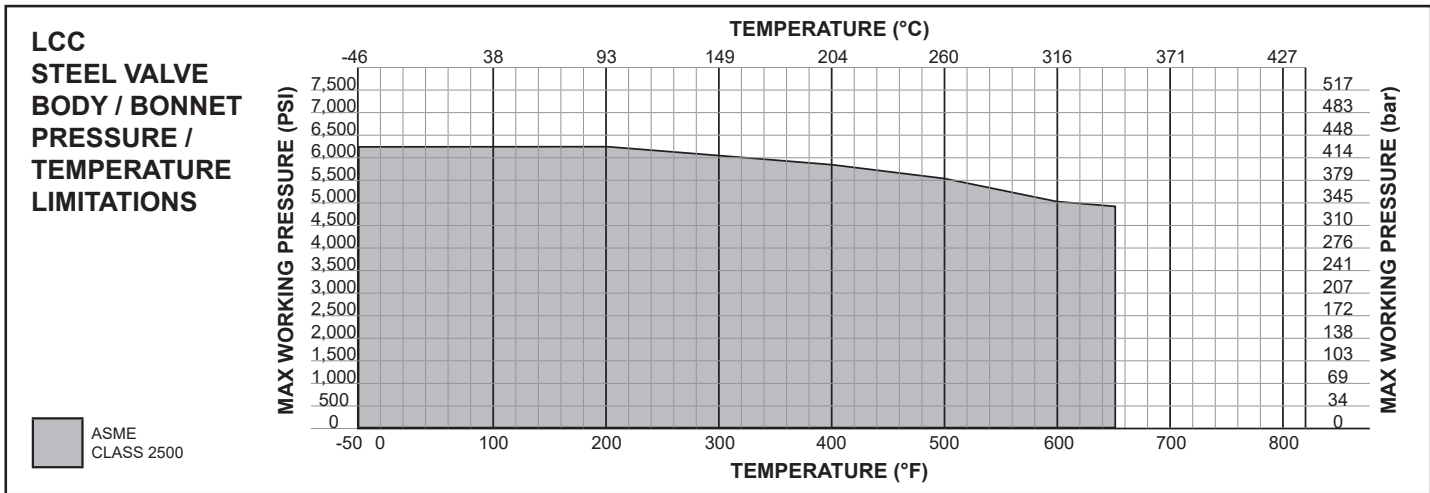
Body Material	ASME Class	Bolt/Nut Material	Temperature Limitations			
			Min. °F	Max. °F	Min. °C	Max. °C
LCC	150/300/600	B7/2H <sup>(1)(2)</sup>	-50	650	-46	343
		B7M/2HM <sup>(3)</sup>	-50	650	-46	343
WCC	150/300/600	B7/2H <sup>(1)(2)</sup>	-20	800	-29	427
		B7M/2HM <sup>(3)</sup>	-20	800	-29	427
CF8M	150/300/600	B7 Fluorokote #1 / 2H Fluorokote #1 (Standard) <sup>(2)</sup>	-20	500	-29	260
		B8M/8M <sup>(2)</sup>	-100	1000	-73	538
		B7M Fluorokote #1/ 2HM Fluorokote #1 <sup>(3)</sup>	-20	500	-29	260

**NOTES:**

- 1 - Standard non-NACE option.
- 2 - NACE MR0175/ISO15156 Non-Exposed Bolting option (Bolting that is not directly exposed to sour environments and is not to be buried, insulated, equipped with flange protectors, or otherwise denied direct atmospheric exposure).
- 3 - NACE MR0175/ISO15156 Exposed Bolting option (Bolting that will be exposed directly to the sour environment or that will be buried, insulated, equipped with flange protectors, or otherwise denied direct atmospheric exposure).

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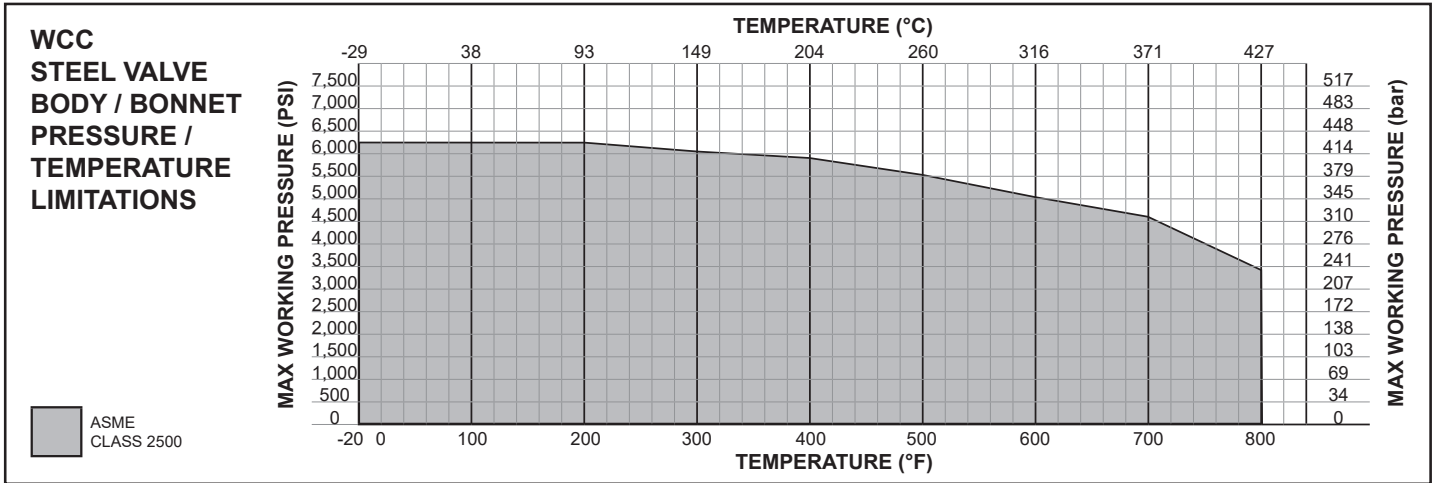
**Maximum Inlet Temperature and Pressures** - Valves consistent with ASME Class rating as per ASME B16.34, unless limited by either material, pressure or temperature limitations.



**Figure 8** Pressure / Temperature Charts as per ASME B16.34 (Continued on Page 11)

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**Figure 8** Pressure / Temperature Charts as per ASME B16.34 (Continued from Page 10)

**Table 8**

**Common Trim Options and Temperature Ratings**

Trim Spec <sup>(2)</sup>	Valve Plug	Stem	Cage	Seat Ring	Seat Ring Retainer	Minimum <sup>(1)</sup> Temperature	Maximum <sup>(1)</sup> Temperature
						°F (°C)	°F (°C)
S	S41600 HT	S20910	S17400 H900	S41600 HT	S17400 H1150 CRPL	-20 (-29)	800 (427)
N	S31600 <sup>(3)</sup> / Alloy 6 Seat and Guide	S20910	S17400 DH1150	S31600 <sup>(3)</sup> / Alloy 6	S17400 H1150 CRPL	-50 (-46)	450 (232)
C	S31600 <sup>(3)</sup> / Alloy 6 Seat and Guide	S20910	S31600 <sup>(3)</sup> ENC	S31600 <sup>(3)</sup> / Alloy 6	S17400 H1150 CRPL	-325 (-198)	650 (343)

1 - Temperatures need to be considered when specifying trim materials for elevated temperatures in corrosive environments, consult factory for further information.  
 2 - Trim Specification relates to Model Numbering System on Page 12.  
 3 - All S31600 barstock is dual grade S31600/S31603 (316/316L).  
**NOTE:** CRPL = Chrome Plated.

**Table 9**

**Maximum Sizing Coefficients**  
**Full Port - Equal Percentage Characteristic**  
**Globe Body Valve - Flow Down**

Valve Size Inches	Port Inches (mm)	Travel Inches (mm)	Coefficient	Percentage of Valve Travel
				100%
3 & 4x3	7 (177.8)	3 (76.2)	C <sub>v</sub>	65.4

**NOTE:** For the complete list of sizing coefficients refer to catalogue P-CVSM.



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## MODEL NUMBERING SYSTEM

SAMPLE PART NUMBER: **380-3DFL-SVP2-CES4**

VALVE MODEL				380
380	380	381	381	
VALVE SIZE				3
3	3 INCH	43	4x3 INCH	
ASME RATING				D
D	2500			
END CONNECTION				F
F	RF	J	RTJ	
U	BUTTWELD (SCHEDULE 120)		P	BUTTWELD (SCHEDULE 160)
BODY MATERIAL				L
L	LCC	M	CF8M	
		W	WCC	
BOLTING				-
-	B7 / 2H (STANDARD)		A	B7M / 2HM
B	B8M / 8M		K	B7 FLUOROKOTE #1 / 2H FLUOROKOTE #1
L	B7M FLUOROKOTE #1 / 2HM FLUOROKOTE #1			
TRIM				S
S	TRIM SPEC S		C	TRIM SPEC C
N	TRIM SPEC N			
SEAT RING GASKET / O-RING				V
G	GASKET (N04400)		E	O-RING (EPDM)
N	O-RING (NITRILE)			V
			V	O-RING (VITON) STANDARD
PACKING STYLE				P
P	SINGLE PTFE V-RING (PRESSURE)		J	DOUBLE PTFE V-RING (PRESSURE)
G	SINGLE GRAPHITE (PRESSURE)		V	DOUBLE PTFE V-RING (VACUUM)
R	DOUBLE PTFE V-RING (VACUUM / PRESSURE)		L	LIVE LOADED PTFE V-RING (PRESSURE)
T	LIVE LOADED GRAPHITE (PRESSURE)		D	LIVE LOADED DUPLEX (PRESSURE)
K	LIVE LOADED KALREZ®			
YOKE BOSS SIZE / VALVE STEM DIAMETER				2
2	2-13/16" (71 mm) / 1/2" (12.7 mm)		3	3-9/16" (90 mm) / 3/4" (19.1 mm)
5	5" (127 mm) / 1" (25.4 mm)			
PAINT				-
-	DFPS-01 (STANDARD)		2	DFPS-02 (SEVERE SERVICE)
3	DFPS-03 (HIGH TEMPERATURE)			
BACKUP RING / PISTON RING				C
C	S31600 / PTFE-ELGILOY		R	S31600 / PTFE-ELGILOY WITH PEEK AE RINGS
P	PISTON RING - GRAPHITE (MODEL 381 ONLY)			
CHARACTERISTIC				E
E	EQUAL PERCENT	L	LINEAR	
		M	MODIFIED EQUAL PERCENT	
BONNET STYLE				S
S	STANDARD		T	STANDARD TAPPED
SHUTOFF CLASS				4
2	II	3	III	
		4	IV	
		5	V	

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