Model 370/371 Control Valves

Technical Sales Bulletin

Figure 1 Model 370 Control Valve

The Model 370/371 control valve (Figure 1) is a heavy-duty globe style control valve. These valves are used in all kinds of demanding applications, including oil and gas production and chemical process industries.

Model 370/371 control valves are balanced cage guided, single port valves that can be used for either throttling or on-off control of either liquids or gasses.

Model 370/371 control valves are manufactured to a high level of quality specifications to ensure superior performance and customer satisfaction.

Features

Sour Service Capability
Available in standard configurations that comply with NACE MR0175/ISO 15156.

Versatility
A wide range of trim options including Low Noise and Anti-Cavitation make the 370/371 a versatile control valve.

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

Pressure Drop Capabilities
Model 370/371 control valves can shut off against inlet pressures equal to the ANSI/FCI 70.2 and IEC 60534-4 rating.

Industrial High Quality External Coatings
Our standard industrial high quality external coatings provide long lasting resistance to the harshest environments.

Emissions Reducing Packing
Help prevent the loss of process media and reduce packing maintenance with the use of Dyna-Flo's Live Loaded PTFE, graphite, and KALREZ® packing systems.

SPECIFICATIONS

Configurations

The Model 370/371 control valve is a high capacity single port, globe style valve, with a bolted type bonnet. The standard valve plug action is push down to close.

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

Sizes and Connection Styles

Models: 370 & 371
Size: 12", 14", and 16"
Rating: ASME 150 / 300 / 600
Connections: RF

Maximum Inlet Pressures and Temperatures

Flanged valves consistent with ASME Class rating as per ASME B16.34, unless limited by material, pressure or temperature limitations.

Maximum Pressure Drops

Maximum pressure drop is the same as maximum inlet pressure unless otherwise rated by a specific trim construction.

Standard Shut-off Classifications

In accordance with ANSI/FCI 70.2 and IEC 60534-4
Model 370 Metal Seat: Class V Standard. Class IV Optional.
Model 370 Anti-Cavitation 2 Stage: Class V Standard.
Model 371 Metal Seat: Class IV Standard.

Flow Direction

Flow Down (Standard)
Low-Noise Trim - Flow Up
Anti-Cavitation Trim - Flow Down

Dimensions

Valve Outline Dimension Diagram

Refer to Figure 2.

Valve Assembly Dimensions

Refer to Tables 3 & 4.

Approximate Valve Body and Actuator Weights

Refer to Table 2.

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 Tables 5 & 6 for typical construction materials.
Refer to Table 7 for trim selections.

Cross-Section of the Model 370/371 Control Valves

Refer to Figures 3 & 4.

Characteristics, Port Diameters, Stem and Yoke Boss

Refer to Table 1.

4 to 8 inch (102 to 203 mm) Available Plug Travel.

Packing Type and Examples

The Standard packing is PTFE V-ring. Live-loaded low emission, graphite and other packing arrangements are available. Refer to the Model Builder and Figure 5.

Valve Sizing Coefficients

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

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

Table 1

Port Diameters, Stem and Yoke Boss Diameters

Valve Size	Characteristic	Port Diameter		Standard Yoke Boss Diameter (YBD)			
				Stem		YBD	
		Inch	mm	Inch	mm	Inch	mm
12	Equal Percentage / Linear / Anti-Cavitation / Low Noise III	11.00	279	1.25	31.8	5.00	127
14	Equal Percentage / Linear / Anti-Cavitation / Low Noise III	11.00	279	1.25	31.8	5.00	127
16	Equal Percentage / Linear / Anti-Cavitation / Low Noise III	11.00	279	1.25	31.8	5.00	127

Table 2

Approximate Valve Weights

Valve Size (inch)	End Connection	lb	Kg
12	RF	3,100	1,410
14	RF	3,450	1,565
16	RF	3,800	1,720

Table 3

Valve Assembly Dimensions A & B

Inches (mm) (Refer to Figure 2)

Valve Size (inch)	End Connection	A			B
		CL150	CL300	CL600	
12	RF	29.00 (737)	30.50 (775)	32.25 (819)	13.00 (330)
14	RF	35.00 (889)	36.50 (927)	38.25 (972)	13.00 (330)
16	RF	40.00 (1016)	41.62 (1057)	43.62 (1108)	13.00 (330)

Table 4

Valve Assembly Dimensions C

Inches (mm) (Refer to Figure 2)

Valve Size (inch)	STANDARD BONNET	
	C	MAX. TRAVEL
12	23.31 (592)	5.50 (140)
	29.31 (745)	8.00 (203)
14	23.31 (592)	5.50 (140)
	29.31 (745)	8.00 (203)
16	23.31 (592)	5.50 (140)
	29.31 (745)	8.00 (203)

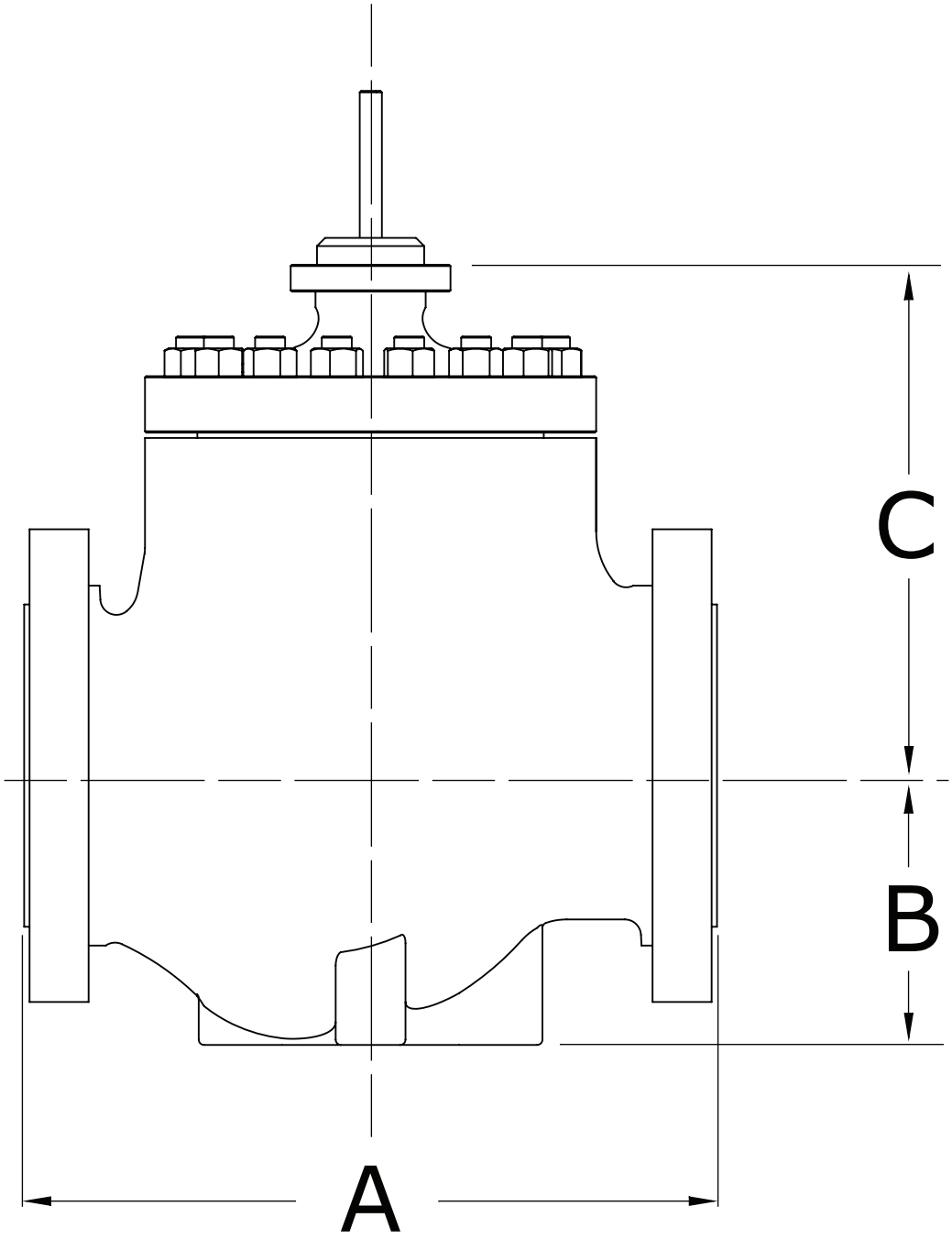

Figure 2 *Valve Assembly Dimensions*

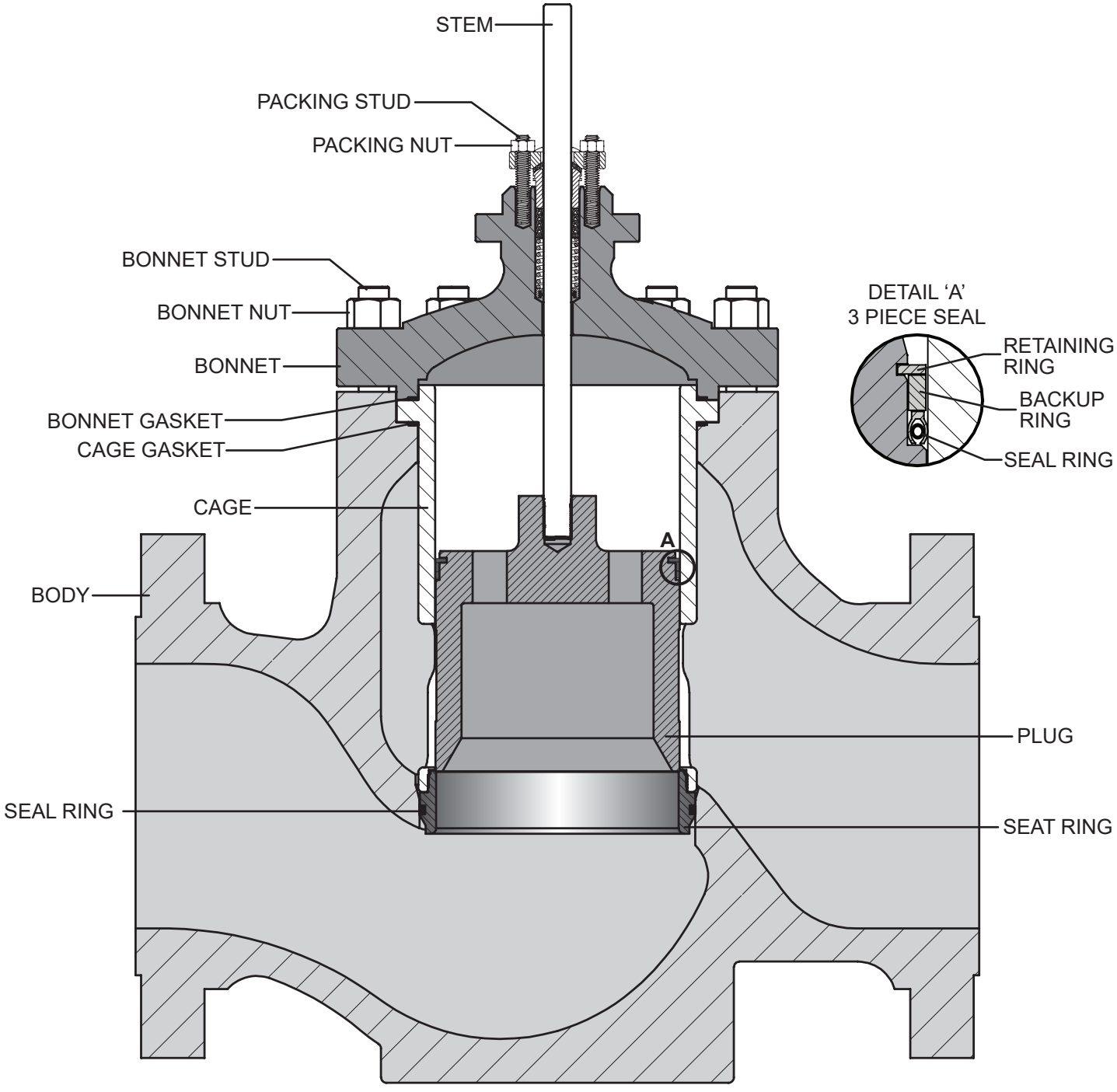

Figure 3 *Cross-section of 370 Control Valve*

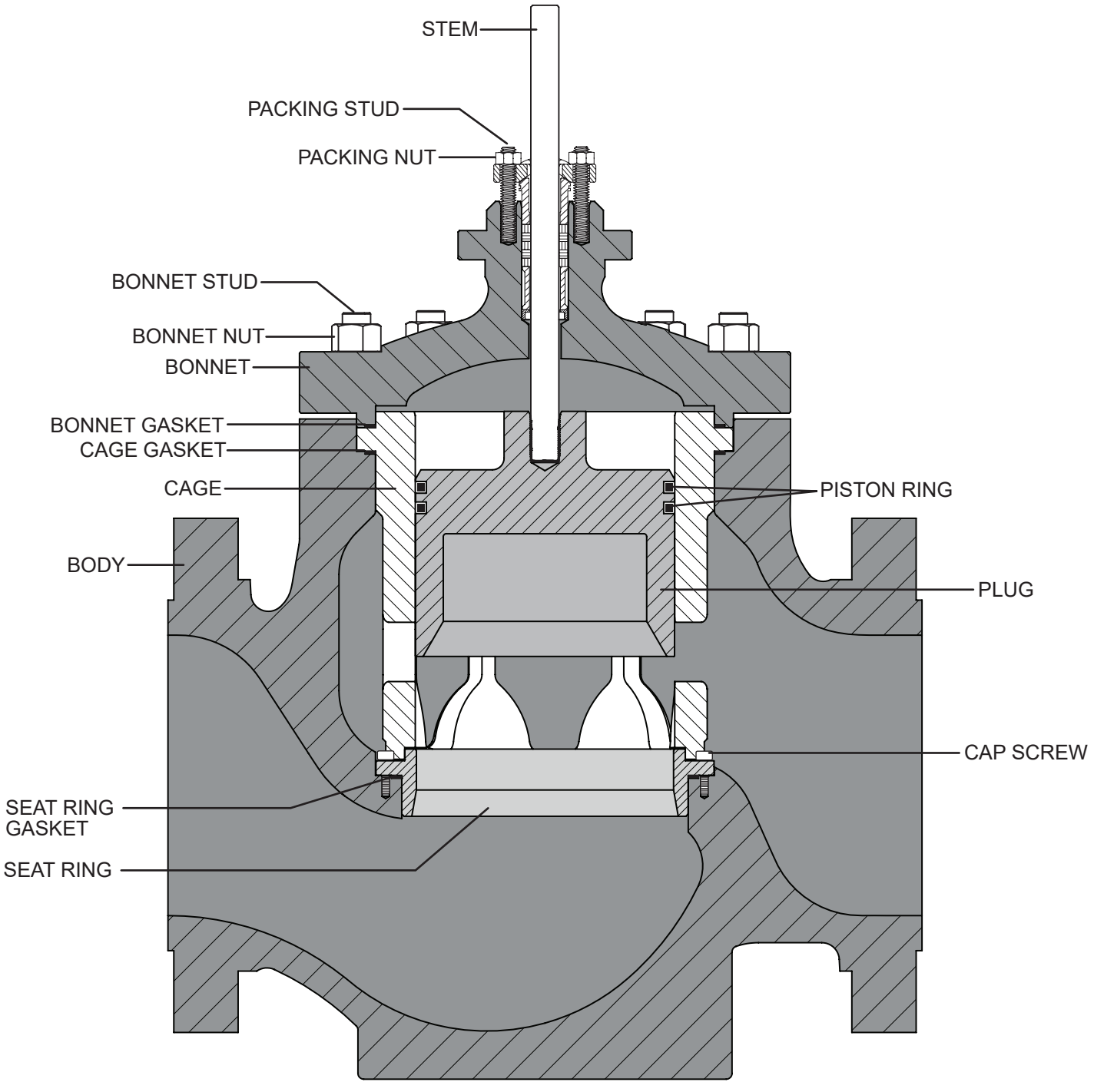

Figure 4 *Cross-section of 371 Control Valve*

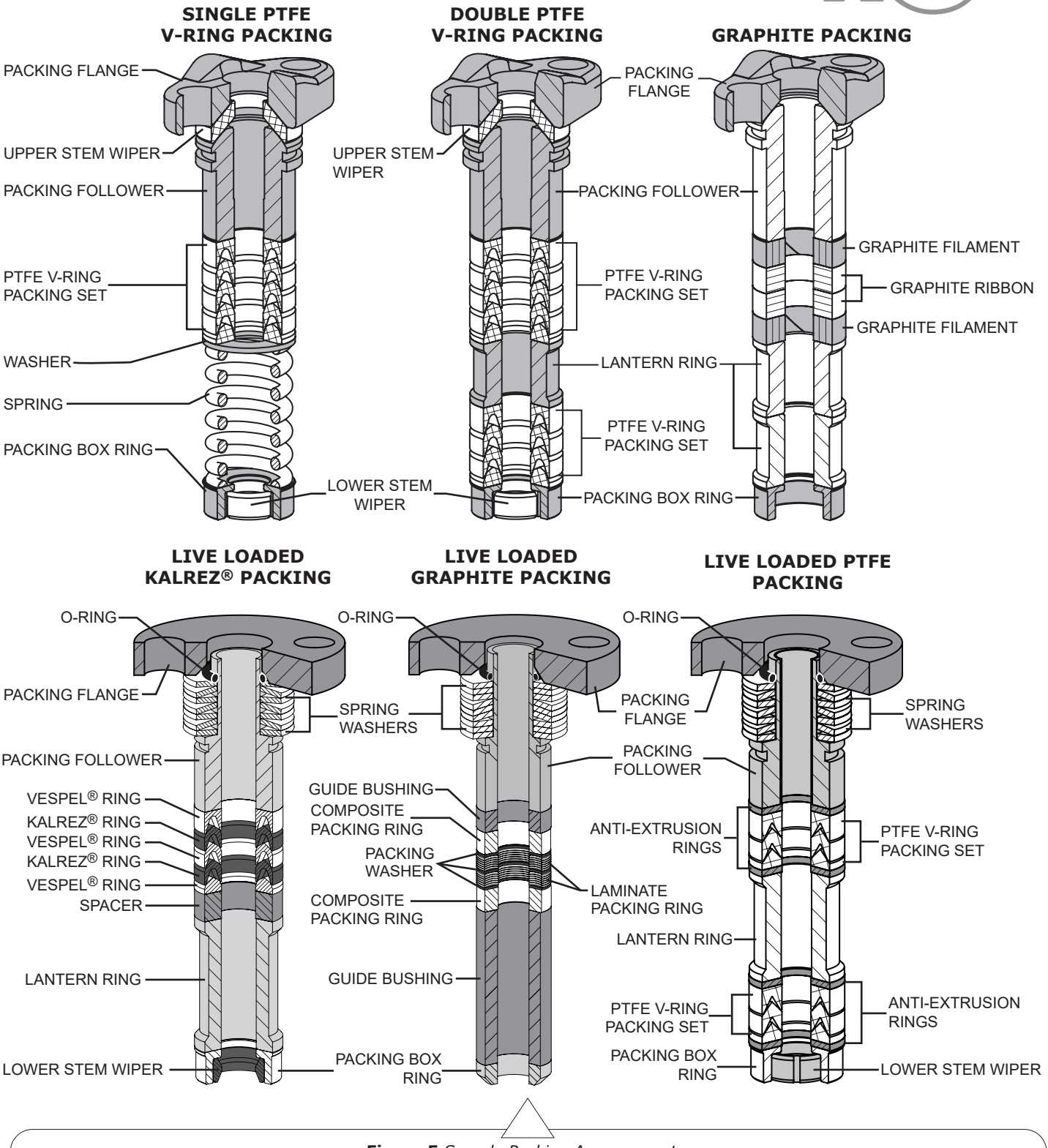

Figure 5 *Sample Packing Arrangements*

Table 5

Typical Construction Materials and Temperature Limitations

Part Description	Standard Construction Material	Temperature Limitation	
		°F	°C
Body / Bonnet	LCC (A350-LF2 Optional Bonnet)	-50 to 650	-46 to 343
	CF8M (A350-LF2 Optional Bonnet)	-325 to 1000	-198 to 593
	WCC (A182-F316 Optional Bonnet)	-20 to 800(1)	-29 to 427(1)
Bonnet Gasket	N06600 / Graphite	-325 to 800	-198 to 427
Backup Ring	S31600*	Not Limiting Factors	
Cage Gasket	N06600 / Graphite	-325 to 800	-198 to 427
Lantern Ring	S31600*	Not Limiting Factors	
Packing (Standard Bonnet)	PTFE	-50 to 450	-46 to 232
	Graphite	-325 to 1000(2)	-198 to 538(2)
Packing Box Ring	S31600*	-325 to 1100	-198 to 593
Packing Follower	S31600*	Not Limiting Factors	
Packing Flange	1018 / Plated	-20 to 400	-29 to 204
Packing Stud	B8M	-325 to 1100	-198 to 593
Packing Nut	8M	-325 to 1100	-198 to 593
Retaining Ring	S31600	Not Limiting Factors	
Seal Ring	Glass / Moly filled PTFE / N10276	-50 to 450	-46 to 232
Piston Ring	Graphite	Not Limiting Factors(3)	
Spring	S30400	Not Limiting Factors	

*** All S31600 barstock is dual grade S31600/S31603 (316/316L).**

For temperatures above or below these standard temperatures consult Dyna-Flo.

NOTES:

1 - Flanged valve bodies are limited to 700°F (354°C).
2 - Oxidizing service limited to 700°F (371°C).
3 - Oxidizing service limited to -50 to 1000°F (-46 to 538°C).

Table 6

Maximum Pressure / Temperature Ratings Psig (barg)

Valve Body Material	ASME Class	Material Pressure / Temperature Limitations		
		-50ºF (-46ºC)	-20ºF (-29ºC)	450ºF (232ºC)
LCC	150	290 (20.0)	290 (20.0)	185 (12.8)
	300	750 (51.7)	750 (51.7)	685 (47.2)
	600	1,500 (103)	1,500 (103)	1,367 (94.5)
CF8M	150	275 (19.0)	—	183 (12.6)
	300	720 (49.6)	—	498 (34.3)
	600	1,440 (99.3)	—	990 (68.3)
WCC	150	—	290 (20.0)	185 (12.8)
	300	—	750 (51.7)	685 (47.2)
	600	—	1,500 (103)	1,367 (94.3)

Table 7

Trim Option and Temperature Limitations

Trim	Valve Plug	Stem	Cage	Seat Ring	Temperature Limitation[3]	
					Minimum	Maximum
L1	S41000	S20910	S17400 H1075	S17400 H1075	-20ºF (-29ºC)	800ºF (427ºC)
L2[2]	S31600[1] / Alloy 6 Seat & Guide	S20910	S31600[1] / Chrome Plated	S31600[1] / Alloy 6 Hard Face	-325ºF (-198ºC)	650ºF (343ºC)

NOTES:

(1) - All S31600 barstock is dual grade S31600/S31603 (316/316L).

(2) - Metal trim parts compatible with NACE MR0175/ISO 15156. Environmental restrictions may apply.

(3) - Refer to Body Material Temperature Limitations.

Table 8

Body to Bonnet Bolting Temperature Limitations

Body Material	ASME Class	Bolt/Nut Material	Temperature Limitations			
			Min. ºF	Max. ºF	Min. ºC	Max. ºC
LCC	150/300/600	B7/2H(1)(2)	-50	650	-46	343
		B7M/2HM(3)	-50	650	-46	343
WCC	150/300/600	B7/2H(1)(2)	-20	800	-29	427
		B7M/2HM(3)	-20	800	-29	427
CF8M	150/300/600	B7 Fluorokote #1 / 2H Fluorokote #1 (Standard)(2)	-50	500	-46	260
		B8M/8M(1)(2)	-325	800	-198	427
		B7M Fluorokote #1/ 2HM Fluorokote #1(3)	-50	500	-46	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).

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%
12	11 (279)	5.50 (140)	C_V	1380
14	11 (279)	5.50 (140)	C_V	1397
16	11 (279)	5.50 (140)	C_V	1595

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

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Model 370/371 Control Valves

MODEL NUMBERING SYSTEM

SAMPLE PART NUMBER: 370-BAFL-14P5-GE4

VALVE MODEL								**370**
370	370	**371**	371					
FLANGE SIZE X VALVE SIZE								**B**
B	12 X 12 INCH	**C**	14 X 12 INCH	**D**	16 X 12 INCH			
ASME RATING								**A**
A	150	**B**	300	**C**	600			
END CONNECTION								**F**
F	RF							
BODY MATERIAL								**L**
L	LCC	**W**	WCC	**M**	CF8M			
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								**1**
1	L1	**2**	L2					
TRAVEL								**4**
4	4 INCH	**5**	5.5 INCH	**8**	8 INCH			
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)			**K**	LIVE LOADED KALREZ®			
YOKE BOSS SIZE								**5**
H	5H (1-1/4" STEM)							
SEAL RING / PISTON RING								**G**
C	GLASS / MOLY FILLED PTFE / N10276 SEAL RING (MODEL 370)							
G	GRAPHITE PISTON RING (MODEL 371)							
CHARACTERISTIC								**E**
E	EQUAL PERCENT	**L**	LINEAR	**A**	ANTI-CAVITATION 1 STAGE			
W	LOW-NOISE III A1	**G**	LOW-NOISE III A3	**B**	LOW-NOISE III B1	**H**	LOW-NOISE III B3	
C	LOW-NOISE III C1	**J**	LOW-NOISE III C3					
SHUTOFF CLASS								**4**
4	CLASS IV	**5**	CLASS V					