



# ***Worcester Controls High Pressure and High Temperature Ball Valves***

Series 4, Series H44, High-per Mizer, H71 Hydromizer



*Experience In Motion*



## Series 4 High-Pressure Ball Valves

*Lubetal™ seated high-performance ball valves capable of pressures to 3000 psi, temperatures to 180°F*

Worcestor Controls Series 4 is a rugged, three-piece valve designed to handle high-pressure applications beyond the capabilities of the Series 44 ball valve line, i.e., above ANSI Class 600. The unique seat design assures bi-directional tight shutoff and adjusts automatically for changing pressure and temperature variations and wear.

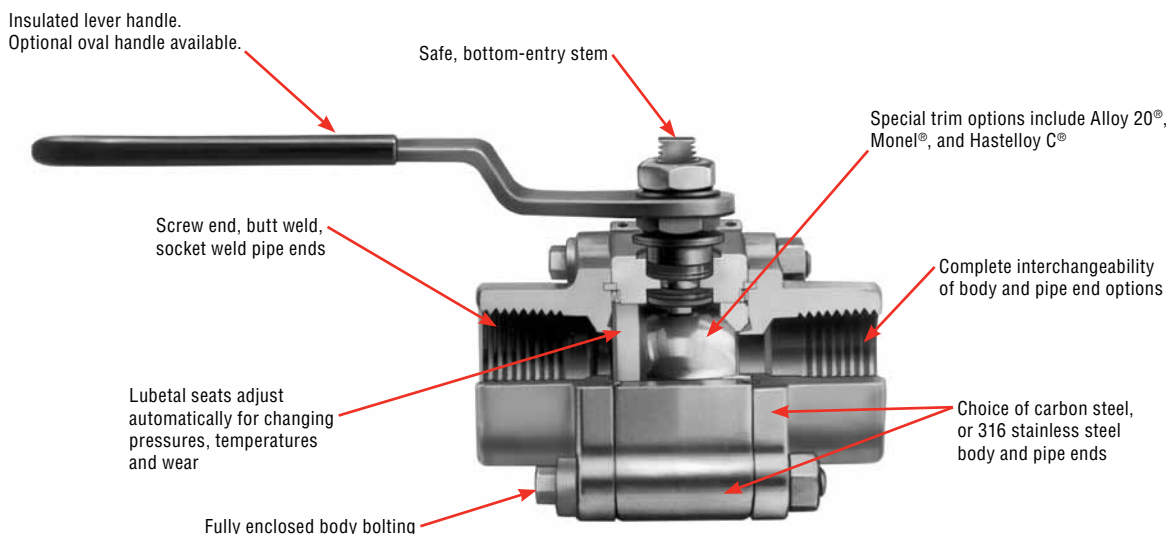
Available through a nationwide network of distributors, Series 4 quarter-turn ball valves and replacement parts are stocked and ready to be adapted to each application. Features that make this tough, reliable ball valve so unique

include tight shutoff; smooth, two-way flow; Lubetal seats; a variety of interchangeable end connections; swing-away three-piece construction; and a design based on automation.

### Automation

Where automation is required, Series 4 valves can be electrically or pneumatically automated for on/off applications.

Worcestor Controls unique stem seal package for the Series 4 is ideal for high-cycle, on/off applications. The control stem assembly greatly increases stem seal cycle life. For torque curves refer to the Actuator Sizing Manual.





### Specifications

|                                    |   |
|------------------------------------|---|
| <b>Valve Sizes</b>                 | 1/4", 3/8", 1/2", 3/4", 1", 1 1/4", 1 1/2", 2"  |
| <b>Valve Pressure Ratings</b>      | From 20 micron absolute to:<br>1/4"-3/4" – 3000 psi<br>1" – 2500 psi<br>1 1/4"-2" – 2000 psi  |
| <b>Body and Pipe End Materials</b> | Carbon Steel, Stainless Steel   |
| <b>Ball/Stem</b>                   | Stainless Steel, Monel, Alloy 20, Hastelloy C   |
| <b>Seats</b>                       | Lubetal (Delrin®)-Maximum temperature 180°F. Lubetal will handle the full range of pressure within the valves rating.   |
| <b>Thrust Bearing</b>              | Delrin  |
| <b>Stem Seals</b>                  | Polyfill® and PEEK  |
| <b>Body Seals</b>                  | Buna, Viton®, EPR, Neoprene   |
| <b>Valve Temperature Range</b>     | -20°F to 180°F  |
| <b>Seat/Seal Leakage</b>           | All valves 100% tested to bubbletight standards.  |
| <b>Design Specifications</b>       | ANSI B16.25 – Butt weld ends<br>ANSI B16.11 – Screw and socket weld end, socket diameter, depth and length only.<br>ANSI B1.20.1 – NPT pipe threads<br>MSS SP25 – Valve marking<br>NACE – MRO 1-75 1984 Rev. Category 3 |

### Flow Coefficient

| Size       | C <sub>v</sub> | Equivalent length of Sched. 40 pipe (feet) |
|------------|----------------|--|
| 1/4", 3/8" | 8              | 0.9  |
| 1/2"       | 8              | 3.1  |
| 3/4"       | 12             | 6.3  |
| 1"         | 32             | 3.1  |
| 1 1/4"     | 46             | 6.3  |
| 1 1/2"     | 82             | 4.3  |
| 2"         | 120            | 7.5  |

Note: For dimensions refer to brochure no. WCABR1008.

## Series H44 Dyn-O-Miser® for Higher P/T

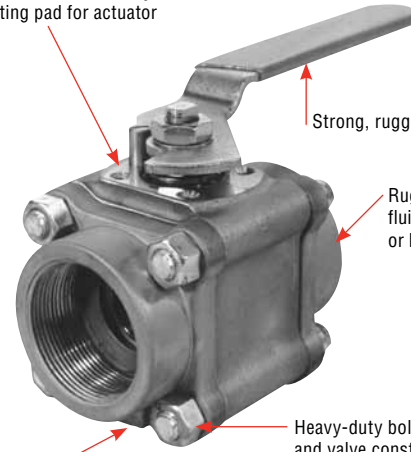
Resilient-seated high-performance ball valves capable of pressures to 5000 psi and temperatures to 450°F

Series H44, an advanced-design ball valve that can take the stress of hydraulic and other high-pressure systems.

Worcester Series H44 three-piece ball valve continues to be one of the most respected ball valve designs in the industry. With advanced sealing technology and top-mount actuator bracket design, this ball valve is very durable and can handle pressures to 5000 psi and temperatures to 450°F.



Standardized center body mounting pad for actuator



Strong, rugged handle design

Rugged, hydraulic fluid-safe Delrin AF or High-per Fill seats

Heavy-duty bolting and valve construction

Stainless steel nameplate to meet MSS SP-25

H44 Series valves feature two seat materials. One is Delrin® AF, a high-pressure material by Dupont, composed of an Acetal homopolomer filled with fluoropolymer and glass fiber. The other is High-per Fill®, made of PolyEtherEtherKetone (PEEK) filled with glass and graphite, recommended for high pressure systems with temperatures above 180°F.

### Top-Mounted Actuator Design

Actuators for Worcester's Series H44 three-piece valves are mounted on rigid, precisely machined, box style brackets bolted to the valve center section. This brings a number of advantages to the valve user:

- Actuator loads are on the valve body.
- Actuators and brackets can be removed for service without affecting valve or piping integrity.
- Easy access to stem seal adjustment.

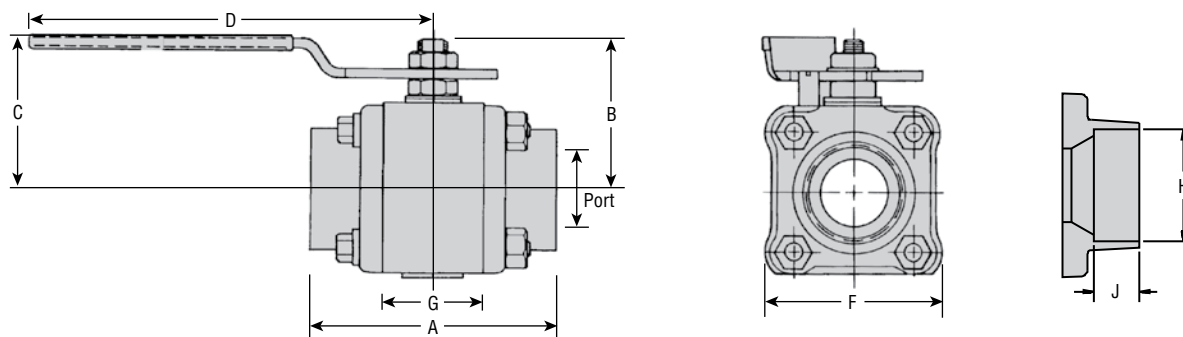
### Maximum Operating Pressure Body Rating (non-shock)

| Valve Size         | Valve and Pipe End Material | Maximum Pressure Rating |
|--------------------|-----------------------------|-------------------------|
| 1/4", 3/8", 1/2"   | Carbon and Stainless Steel  | Up to 5000 psi          |
| 3/4", 1"           | Carbon and Stainless Steel  | Up to 4500 psi          |
| 1 1/4", 1 1/2", 2" | Carbon and Stainless Steel  | Up to 4000 psi          |

### Specifications

|                                |   |
|--------------------------------|---|
| <b>Sizes</b>                   | 1/4", 3/8", 1/2", 3/4", 1", 1 1/4", 1 1/2", 2".                 |
| <b>Style</b>                   | Three-piece – Series H44.                                       |
| <b>Ratings</b>                 | Body and seat/seal ratings shown opposite.                      |
| <b>Body/Pipe End Materials</b> | Carbon steel or stainless steel.                                |
| <b>Ends</b>                    | Screwed or socket weld.   |
| <b>Operation</b>               | Manual lever handle. Electric or pneumatic actuators available. |

| Seats                              | Delrin AF      |              | High-per Fill  |              |
|------------------------------------|----------------|--------------|----------------|--------------|
| <b>Maximum Temp.</b>               | 180°F          |              | 450°F          |              |
| <b>Maximum Temp. of Body Seals</b> | <b>Seal</b>    | <b>Temp.</b> | <b>Seal</b>    | <b>Temp.</b> |
|                                    | Buna           | 300°F        | Viton          | 450°F        |
|                                    | EPR            | 350°F        | TFE            | 400°F        |
|                                    | Viton          | 450°F        | UHMWPE         | 200°F        |
|                                    | Neoprene       | 250°F        |                |              |
|                                    | UHMWPE         | 200°F        |                |              |
|                                    | TFE            | 400°F        |                |              |
| <b>Leakage Rate</b>                | Bubbletight    |              | Bubbletight    |              |
| <b>Thrust Bearing</b>              | Delrin         |              | PEEK           |              |
| <b>Stem Seal</b>                   | Reinforced TFE |              | Reinforced TFE |              |



## Dimensions

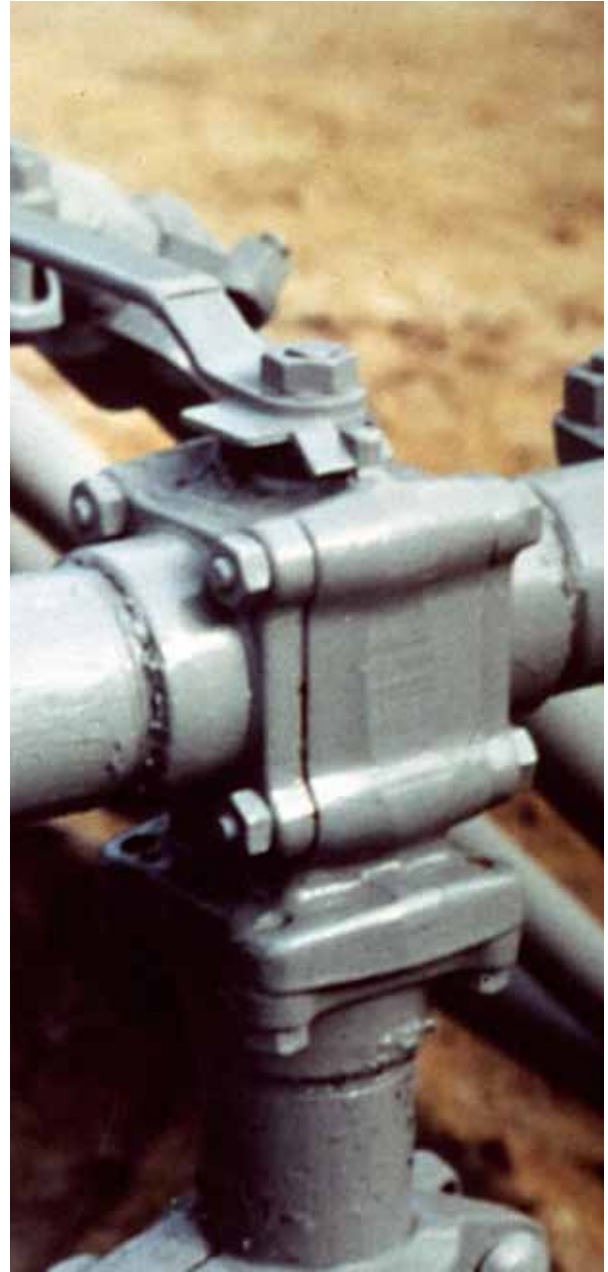
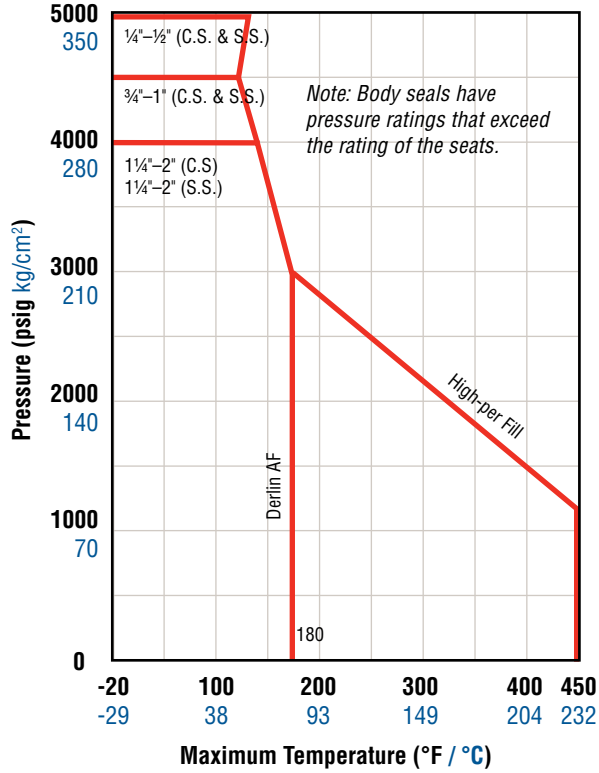
inches / millimeters

| Valve Size | A    | B    | C    | D    | F    | G    | Socket Weld SW |      | Port | Approx. Weight lb. / kg |
|------------|------|------|------|------|------|------|----------------|------|------|-------------------------|
|            |      |      |      |      |      |      | H              | J    |      |                         |
| 1/4"       | 2.54 | 1.55 | 1.76 | 5.53 | 1.75 | .813 | .555           | .44  | .44  | 1.10                    |
|            | 64.5 | 39.4 | 44.7 | 140  | 44.5 | 20.7 | 14.1           | 11.2 | 11.2 | .50                     |
| 3/8"       | 2.54 | 1.55 | 1.76 | 5.53 | 1.75 | .813 | .690           | .44  | .44  | 1.10                    |
|            | 64.5 | 39.4 | 44.7 | 140  | 44.5 | 20.7 | 17.5           | 11.2 | 11.2 | .50                     |
| 1/2"       | 2.54 | 1.55 | 1.76 | 5.53 | 1.75 | .813 | .855           | .44  | .44  | 1.10                    |
|            | 64.5 | 39.4 | 44.7 | 140  | 44.5 | 20.7 | 21.7           | 11.2 | 11.2 | .50                     |
| 3/4"       | 2.76 | 1.64 | 1.86 | 5.53 | 2.00 | .969 | 1.065          | .56  | .56  | 1.75                    |
|            | 70.1 | 41.7 | 47.2 | 140  | 50.8 | 24.6 | 27.1           | 14.2 | 14.2 | .79                     |
| 1"         | 3.66 | 2.19 | 2.28 | 6.53 | 2.38 | 1.25 | 1.330          | .72  | .81  | 3.10                    |
|            | 93.0 | 55.6 | 57.9 | 166  | 60.5 | 31.8 | 33.8           | 18.3 | 20.6 | 2.04                    |
| 1 1/4"     | 4.16 | 2.38 | 2.47 | 6.53 | 2.70 | 1.63 | 1.675          | .72  | 1.00 | 4.50                    |
|            | 105  | 60.5 | 62.7 | 166  | 68.6 | 41.3 | 42.5           | 18.3 | 25.4 | 2.82                    |
| 1 1/2"     | 4.50 | 2.88 | 2.83 | 8.03 | 3.16 | 1.91 | 1.915          | .72  | 1.25 | 6.20                    |
|            | 114  | 73.2 | 71.9 | 204  | 80.3 | 48.4 | 48.6           | 18.3 | 31.8 | 2.04                    |
| 2"         | 4.94 | 3.06 | 3.02 | 8.03 | 3.56 | 2.22 | 2.406          | .84  | 1.50 | 9.50                    |
|            | 126  | 77.7 | 76.7 | 204  | 90.4 | 56.3 | 61.1           | 21.3 | 38.1 | 4.31                    |



## Series H44 Dyn-O-Miser® for Higher P/T

### Pressure/Temperature Ratings



### Flow Coefficient

*C<sub>v</sub>* Values (USGPM)

| Valve Size | <i>C<sub>v</sub></i> |
|------------|----------------------|
| 1/4"       | 8                    |
| 3/8"       | 8                    |
| 1/2"       | 8                    |
| 3/4"       | 12                   |
| 1"         | 32                   |
| 1 1/4"     | 46                   |
| 1 1/2"     | 82                   |
| 2"         | 120                  |

## High-Per Mizer

*A High-Durability Ball Valve for Superheated Steam, High-Temperature and Abrasive Fluid Applications*

High-Per Mizer advantages include:

- Ability to handle pressure and temperature shock.
- Ability to withstand high pressure drops.
- Ability to handle slurries, resist abrasion and wear.
- Bubbletight sealing to 600°F.
- Bubbletight sealing to 1440 psi.
- Ability to handle superheated steam.
- Offers leaktight integrity on thermal fluid services.
- Ability to handle a wide range of corrosives.
- Long-life operation.

### Metal-Seated Versions

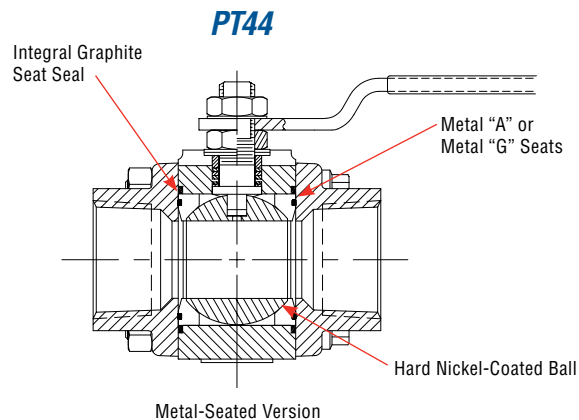
Metal-seated versions feature a unique seat sealing design, which incorporates an alloy stainless steel seat impregnated with self-lubricating fillers. The rigid metal seat construction is strong, highly wear and corrosion resistant, and eliminates fracturing common to graphite-based seats.

The 316 stainless steel ball is nickel-coated. The coating makes the ball surface harder, as well as acting as a lubricant to prevent the metal seats and ball from galling as they cycle.

**Metal "A" seated versions** feature a TFE impregnated stainless steel seat with integral graphite seat seal and offer temperature capability to 600°F and pressures to 1000 psi.

**Metal "G" seated versions** feature a graphite impregnated stainless steel seat with integral graphite seat seal and offer temperature capability to 650°F and 1000 psi.

For temperatures between 650°F and 800°F, refer to Series 94, brochure WCABR1023. For temperatures to 1000°F consult Flowserve.



### Resilient-Seated Versions

Resilient-seated versions feature High-Per Fill® seat. Proprietary to Flowserve Worcester Controls, High-Per Fill is a blend of polyetheretherketone, glass and graphite fillers. This blend strengthens, provides thermal resistance even at high pressures, prolongs cycle life and reduces operating torque. High-Per Fill is chemically inert, has a broad corrosion compatibility and is a non-halogen (no TFE) material.

High-Per Fill can be used in certain food, drug, tobacco and radiation services where TFE is inappropriate. The radiation resistance of High-Per Fill is 2 x 10<sup>9</sup> rads.

High-Per Fill will handle up to 500 psi saturated steam, temperatures to 600°F and pressure to 1440 psi, while offering bubbletight sealing.

### Automation

Flowserve Worcester Controls offers a complete line of pneumatic and electric automation packages for the High-Per Mizer Valve. Refer to Brochure WCABR1014 for Series 75 Electric Actuators and Brochure WCABR1003 for Series 39 Pneumatic Actuators.



**Electric Control**



**Pneumatic Control**

## Flow Coefficient

PT44 and PT59

| Valve Size  | C <sub>v</sub> |      | Equivalent length of Schedule 40 pipe (feet) |      |
|-------------|----------------|------|--|------|
|             | PT44           | PT59 | PT44   | PT59 |
| 1/4" – 3/8" | 8              | 8    | 0.9  | 0.9  |
| 1/2"        | 8              | 32   | 3.1  | 1.4  |
| 3/4"        | 12             | 54   | 6.3  | 1.0  |
| 1"          | 32             | 105  | 3.1  | 1.9  |
| 1 1/4"      | 46             | 170  | 6.3  | 2.1  |
| 1 1/2"      | 82             | 275  | 4.3  | 2.1  |
| 2"          | 120            | 460  | 7.5  | 2.1  |
| 3"          |                | 1330 |  | 3.0  |
| 4"          |                | 2420 |  | 2.7  |

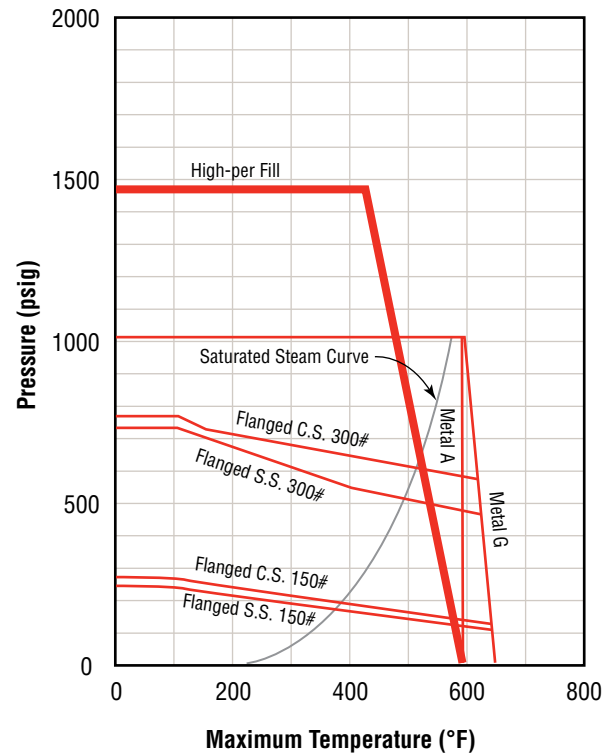
PT45

| Valve Size | C <sub>v</sub> | Equivalent length of Schedule 40 pipe (feet) |
|------------|----------------|--|
| 2 1/2"     | 240            | 5.0  |
| 3"         | 320            | 8.3  |
| 4"         | 580            | 10.4   |
| 6"         | 1020           | 20.4   |

PT51/52 and PT44 151/301

| Valve Size | C <sub>v</sub> | Equivalent length of Schedule 40 pipe (feet) |
|------------|----------------|--|
| 1/2"       | 8              | 3.9  |
| 3/4"       | 12             | 8.7  |
| 1"         | 32             | 3.6  |
| 1 1/2"     | 82             | 3.7  |
| 2"         | 120            | 6.5  |
| 3"         | 350            | 7.1  |
| 4"         | 720            | 6.9  |
| 6"         | 1020           | 20.4   |

## Pressure/Temperature Ratings



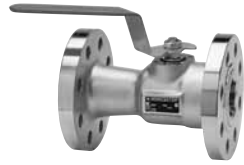
**High-Per Mizer  
Resilient Seat**

## Specifications



**PT44/PT59**

¼"-2"



**PT51/PT52**

½"-2"



**PT51/PT52**

3"-6"



**PT44 151/301**

3"-6"



**PT45**

2½"-6"

**PT59**

2"-4"

|               |   |
|---------------|---|
| <b>Sizes</b>  | ¼"-6" (depending on style)                        |
| <b>Styles</b> | Three-piece – Series PT44                         |
|               | ¼", ⅜", ½", ¾", 1", 1¼", 1½", 2"                  |
|               | Three-piece – Series PT45                         |
|               | 2½", 3", 4", 6"                                   |
|               | Three-piece – Full-Port Series PT59               |
|               | ¼", ⅜", ½", ¾", 1", 1¼", 1½", 2", 3", 4"          |
|               | Flanged – Series PT51 and PT52                    |
|               | ½", ¾", 1", 1½", 2", 3", 4", 6"                   |
| <b>*Body</b>  | Wafer – Series PT44 151/301                       |
|               | 3", 4", 6"  |
|               | Series PT44–1440 psi Class 600 ANSI               |
|               | Series PT59–1440 psi ¼"-2"; Class 300 – 3" and 4" |
|               | Series PT51–Class 150 ANSI                        |
|               | Series PT52–Class 300 ANSI                        |
|               | Series PT44 151–Class 150 ANSI                    |
|               | Series PT44 301–Class 300 ANSI                    |
|               | Series PT45–Class 300                             |

|                   |  |
|-------------------|--|
| <b>Ends</b>       | Screwed, Socket Weld, Flanged ANSI 150#  |
|                   | Flanged ANSI 300#, between 150# or 300# flanges  |
| <b>Body</b>       | Carbon Steel, 316 Stainless Steel  |
| <b>Stem</b>       | ¼"-2" 17-4 pH Stainless Steel  |
|                   | 3"-6" 316 Stainless Steel  |
| <b>Standards</b>  | For fire-safe versions, refer to brochure WCABR1029.   |
|                   | SE valves meet ANSI B1.20.1  |
|                   | Flanged valves meet ANSI B16.5, B16.10   |
|                   | Flanged and ¼"-2" three-piece valves meet ANSI B16.34 (600# class) when hydro test is specified.                                   |
| <b>Operation</b>  | Manual lever handle. Electric or pneumatic actuator available.   |
| <b>Dimensions</b> | Refer to individual product catalogs; WCABR1009, WCABR1010, WCABR1011, WCABR1013, WCABR1041, or dimensional sheets WCASS0013-0016. |

|                        | Metal-Seated  | Metal-Seated  | Resilient-Seated  |
|------------------------|---|---|---|
| <b>Seats:</b>          | <b>Metal "A"</b>  | <b>Metal "G"</b>  | <b>High-Per Fill "X"</b>  |
|                        | TFE impregnated stainless steel with integral graphite seat seal  | Graphite impregnated stainless steel with integral graphite seat seal | Proprietary blend of PolyEtherEtherKetone, glass and graphite fillers |
| <b>Body Seals:</b>     | Refer to How to Order Table   | Refer to How to Order Table   | Refer to How to Order Table   |
| <b>Stem Seal(s):</b>   | Polyfill/PEEK   | Polyfill/PEEK   | Graphite/PEEK   |
| <b>Thrust Bearing:</b> | Polyfill/PEEK   | Polyfill/PEEK   | PEEK  |
| <b>Ball:</b>           | 316 Stainless Steel Nickel-coated   | 316 Stainless Steel Nickel-coated                                     | 316 Stainless Steel   |
| <b>Max. Temp:</b>      | 600°F   | 650°F   | 600°F   |
|                        | 1000 psi  | 1000 psi  | 1440 psi  |
| <b>Leakage Rate:</b>   | Bubbletight   | ANSI Class VI   | Bubbletight   |
| <b>Steam Service:</b>  | For steam service, refer to Worcester Controls Steam Service Data Sheet for ratings. This data sheet is found in the Engineering section of the general catalog binder. |   |   |
| <b>High-Temp:</b>      | For applications to 1000°F, contact Flowserve.  |   |   |

\*Refer to body ratings, seat and seal ratings and pressure/temperature ratings to determine maximum safe pressure and temperature for the High-Per Mizer valve.

NOTE: Standard Worcester Controls valves are assembled with silicone-based break-in lubricant. For other options consult your distributor or Flowserve.

## Series H71 Ball Valves

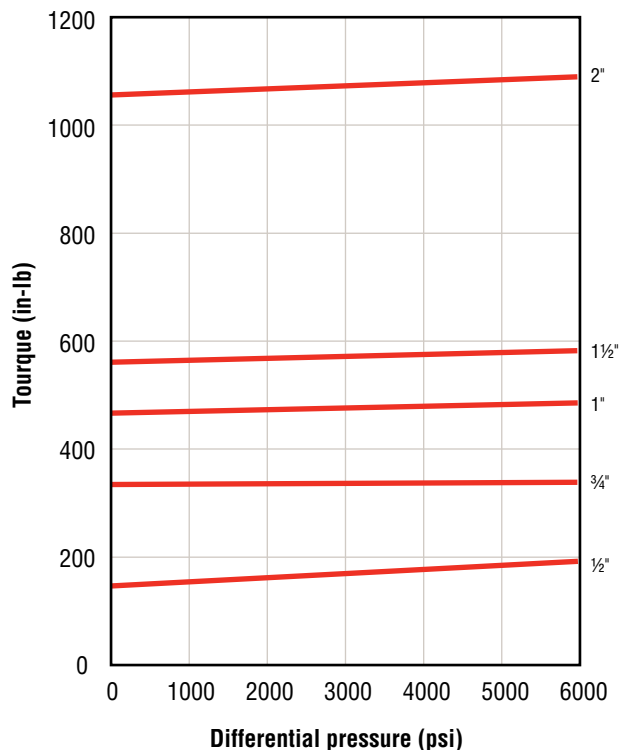
*Exceeding the High-Pressure Technology Requirements of Deep Sea Oil Production, Hydraulic and Compressed Natural Gas Processes*

Worchester Controls Series H71 is a line of safe, durable ball valves for high pressure fluids to 6000 psi. The three-piece design is compact with low torque quarter-turn operation, blowout proof stem and easy repair and maintenance. Series H71 is built for harsh environments, from seabed systems to corrosive chemicals.

### Applications

- High-pressure liquids, gasses, chemicals
- CO<sub>2</sub>/H<sub>2</sub>O injection
- Subsea hydraulic systems
- Production manifolds
- Chemical injections
- CNG storage and distribution
- Flare gas isolation
- Deepwater accumulator
- Shutoff and flushing operations

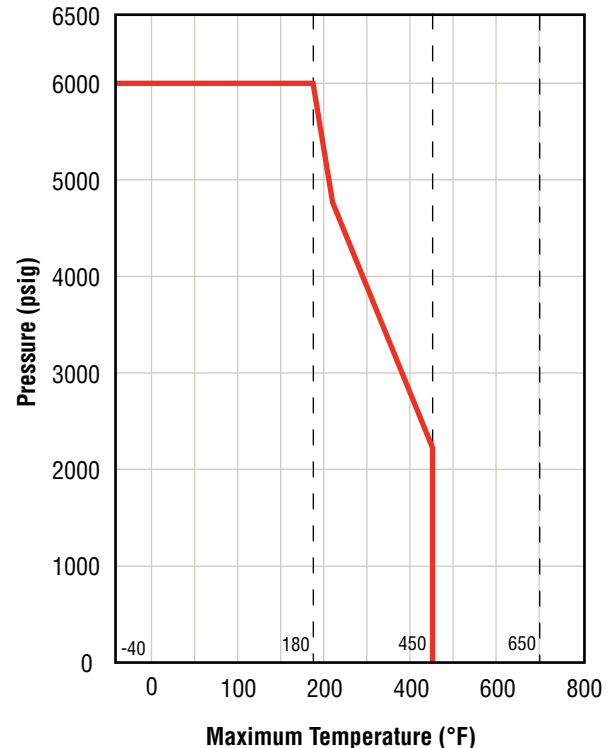
### Pressure Torque Curves



### Specifications

|   |  |
|---|--|
| <b>Sizes</b>  | 1/2", 3/4", 1", 1 1/2", 2"   |
|   | 1/2" and 3/4" are ANSI B16.34 Class 2500   |
|   | 1"-2" are ANSI B16.34 Class 1500 (Class 2500 available)                                |
|   | All are rated to 6000 psi  |
| <b>Material</b>   | Carbon steel, stainless steel  |
| <b>Port</b>   | Full-port design to schedule 160 pipe  |
| <b>Ends</b>   | N.P.T. screwed ends, socket weld, schedule 160 butt weld, SAE screwed ends (SAE J514F) |
| <b>Valve Temperature Rating</b>                                     | -40°F to 450°F   |
| <b>Documentation</b>  | CMTRs for pressure retaining parts upon request  |
| <b>Standards</b>  | ANSI B16.34, NACE construction   |
| Completely enclosed body seal allows external pressures to 5000 psi |  |
| <b>Flow Coefficient C<sub>v</sub></b>                               | 1/2"-23  |
|   | 3/4"-61  |
|   | 1"-73  |
|   | 1 1/2"-82  |
|   | 2"-150   |

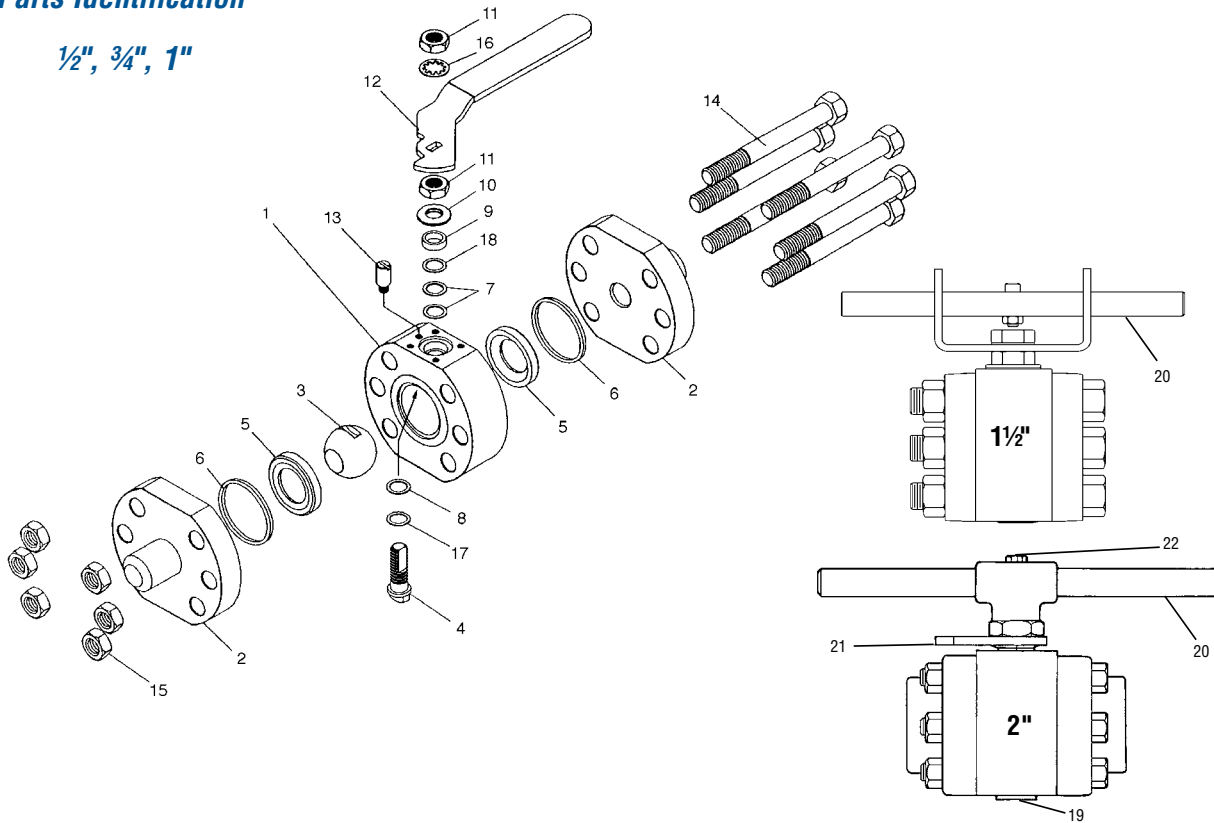
### Pressure/Temperature Ratings



*Note: For temperatures below -20°F use stainless steel valves.*

## Parts Identification

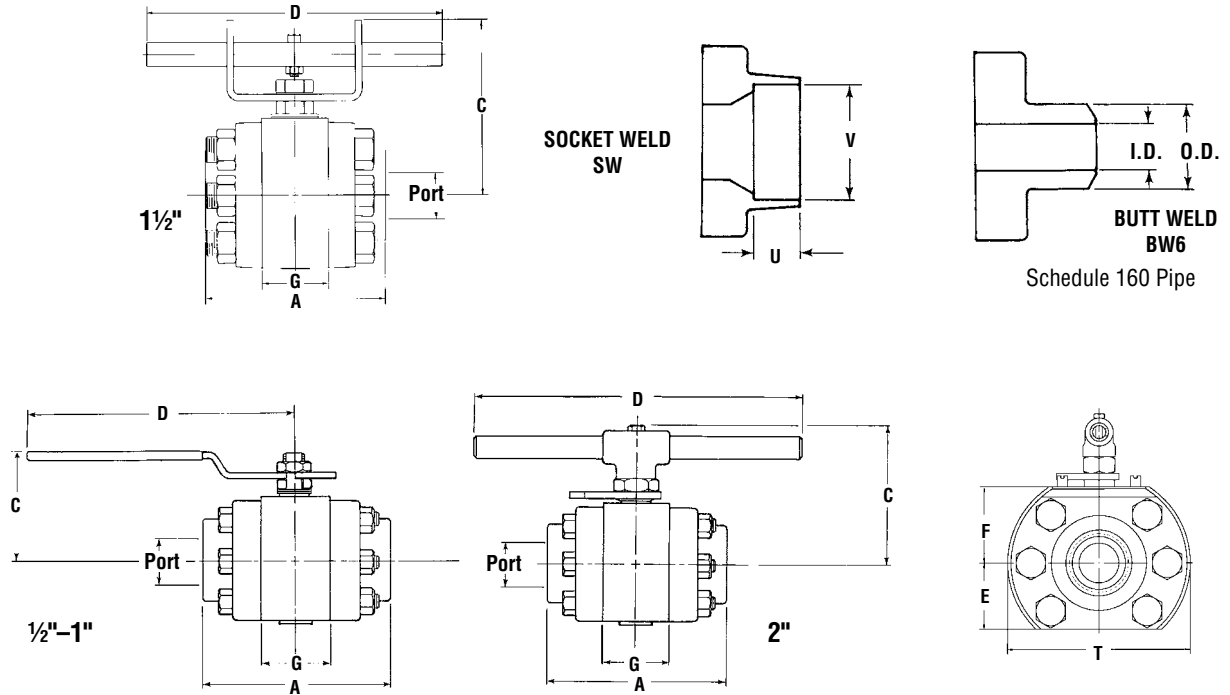
1/2", 3/4", 1"



| Part | Description                 | Qty.   | Material   |
|------|-----------------------------|--------|--|
| 1    | Body                        | 1      | Carbon Steel ASTM-A105 or A108<br>Stainless Steel ASTM A479-316<br>or ASTM A182-F316   |
| 2    | Pipe End                    | 2      | Carbon Steel ASTM-A105 or A108<br>Stainless Steel ASTM A479-316L<br>or ASTM A182-F316L |
| 3    | Ball                        | 1      | Stainless Steel ASTM A479-316 Cond. A<br>Electroless Nickel-Coated                     |
| 4    | Stem                        | 1      | Stainless Steel 17-4PH H11 50M<br>ASTM A564 Type 630 Cond. A                           |
| 5    | Seat                        | 2      | (Filled PEEK) High-per Fill®   |
| 6    | Body Seal                   | 2      | TFE, Viton®  |
| 7    | Stem Seal                   | 2<br>3 | 1/2"-1/2"<br>2" Polyfill®  |
| 8    | Thrust Bearing              | 1      | PEEK   |
| 9    | Follower                    | 1      | Stainless Steel ASTM A276-316 Cond A   |
| 10   | Belleve Washer (None on 2") | 2      | Carbon or Stainless Steel  |

| Part | Description          | Qty.   | Material  |
|------|----------------------|--------|---|
| 11   | Handle/Retaining Nut | 1 or 2 | Carbon or Stainless Steel AISI 303<br>Zinc-Plated                                       |
| 12   | Handle Assembly      | 1      | Carbon or Stainless Steel<br>Vinyl-Covered (1/2"-1")                                    |
| 13   | Stop Pin             | 1 or 2 | Carbon or Stainless Steel 300 Series  |
| 14   | Body Bolt            | 6      | Carbon Steel ASTM A193 GR B7 Zinc-Plated<br>Stainless Steel ASTM A193 GR B8 Zinc-Plated |
| 15   | Body Nut             | 6      | Carbon Steel ASTM A194 GR 2H Zinc-Plated<br>Stainless Steel ASTM A194 GR 8              |
| 16   | Lockwasher           | 1      | Carbon or Stainless Steel AISI 300 Series   |
| 17   | Thrust Bearing       | 1      | PEEK (1/2" to 1 1/2" only)  |
| 18   | Seal Protector       | 1      | PEEK  |
| 19   | Nameplate            | 1      | Stainless Steel AISI 304  |
| 20   | Handle Assembly      | 1      | Carbon or Stainless Steel (1 1/2", 2" only)   |
| 21   | Stop                 | 1      | Carbon or Stainless Steel (2" only)   |
| 22   | Handle Assembly Bolt | 1      | Stainless Steel (2" only)   |

## Dimensions



*inches / millimeters*

| Valve Size | A     | C    | D    | E    | F    | G    | T    | Socket Weld - SW |      | Butt Weld - BW6 |       | Port Dia. | Valve Weight |
|------------|-------|------|------|------|------|------|------|------------------|------|-----------------|-------|-----------|--------------|
|            |       |      |      |      |      |      |      | U                | V    | I.D.            | O.D.  |           | lb. / kg     |
| 1/2"       | 4.25  | 2.18 | 6.53 | 1.16 | 1.26 | 1.25 | 3.08 | .44              | .860 | .466            | .840  | .47       | 5.3          |
|            | 108   | 55.4 | 166  | 29.5 | 32   | 31.8 | 78.2 | 11.2             | 21.8 | 11.8            | 21.3  | 11.9      | 2.4          |
| 3/4"       | 4.75  | 2.52 | 6.53 | 1.56 | 1.50 | 1.25 | 4.08 | .56              | 1.07 | .614            | 1.050 | .61       | 10.9         |
|            | 121   | 64   | 166  | 39.6 | 38.1 | 31.8 | 104  | 14.2             | 27.2 | 15.6            | 26.7  | 15.6      | 4.9          |
| 1"         | 4.62  | 2.98 | 8.03 | 1.56 | 1.94 | 1.62 | 4.09 | .72              | 1.34 | .815            | 1.315 | .81       | 10.6         |
|            | 117.3 | 75.7 | 204  | 40.0 | 49.3 | 41.2 | 104  | 18.3             | 34.0 | 20.7            | 33.4  | 20.7      | 4.8          |
| 1 1/2"     | 5.14  | 4.98 | 18.0 | 2.08 | 2.20 | 1.90 | 5.38 | .72              | 1.92 | 1.338           | 1.900 | 1.10      | 21.5         |
|            | 131   | 127  | 457  | 52.8 | 55.9 | 48.3 | 137  | 18.3             | 48.8 | 34.0            | 48.3  | 27.9      | 9.8          |
| 2"         | 9.56  | 5.80 | 22.0 | 2.50 | 2.88 | 2.90 | 6.87 | .84              | 2.41 | 1.689           | 2.375 | 1.50      | 49           |
|            | 243   | 147  | 559  | 63.5 | 73.2 | 73.7 | 175  | 21.3             | 61.2 | 42.9            | 60.3  | 38.1      | 22.2         |

## How to Order

### Series PT44 High-Per Mizer

| 1½"             | PT44                          | 6                                | 6                   | G   | G   | SE**   |
|-----------------|-------------------------------|----------------------------------|---------------------|---|---|--|
| Size            | Series                        | Body & Pipe Ends                 | Ball & Stem         | *Seats  | *Body Seals   | End Type   |
| ¼"-2"           | PT 44- three-piece            | 4 - Carbon Steel                 | 6 - Stainless Steel | G - Metal "G"                                       | G - Graphite 316 S.S. "S" gasket  | SE - Screw End Carbon Steel, 316 S.S.  |
| ¼"-1½"          | PT 59 - Full-port three-piece | 6 - 316 S.S.                     |                     | A - Metal "A"<br>X - High-Per Fill                  | G - Graphite-coated 316 S.S. "S" gasket<br>M - TFE-coated 316 S.S. "S" gasket | SW - Socket Weld Carbon Steel, 316L S.S.   |
| ½"-2"           | PT 51/PT52-Flanged 150#/300#  | 4 - Carbon Steel                 | 6 - Stainless Steel | A - Metal "A"                                       | M - TFE-coated 316 S.S. "S" gasket  | 150 - ANSI 150# flanges<br>300 - ANSI 300# flanges                                 |
|                 |                               | 6 - 316 S.S.                     |                     | G - Metal "G"<br>X - High-Per Fill                  | G - Graphite-coated 316 S.S. "S" gasket                                       |  |
| 2"              | PT 59 - Full-port three-piece | 4 - Carbon Steel<br>6 - 316 S.S. | 6 - Stainless Steel | A - Metal "A"<br>G - Metal "G"<br>X - High-Per Fill | Z - Graphite (4 bolt R3)  | SE - Screw End Carbon Steel, 316 S.S.<br>SW - Socket Weld Carbon Steel, 316L S.S.  |
| 3"-4"<br>2½"-6" | PT 59 - Full-port three-piece | 4 - Carbon Steel                 | 6 - Stainless Steel | A - Metal "A"                                       | G - Graphite-laminated 316 S.S. gasket  | SE - Screw End Carbon Steel, 316 S.S.<br>SW - Socket Weld Carbon Steel, 316L S.S.  |
|                 | PT 45 - three-piece           | 6 - 316 S.S.                     |                     | G - Metal "G"<br>X - High-Per Fill                  |   |  |
| 3"-6"           | PT 44 - 151/301               | 4 - Carbon Steel                 | 6 - Stainless Steel | A - Metal "A"<br>G - Metal "G"<br>X - High-Per Fill | T - TFE (PT44 with "A" seat only)<br>Z - Graphite                             | 151 - For use between 150# ANSI flanges<br>301 - For use between 300# ANSI flanges |
|                 |                               | 6 - 316 S.S.                     |                     |   |   | 150 - ANSI 150# flanges<br>300 - ANSI 300# flanges                                 |
| 3"-6"           | PT51/PT52- Flanged 150#/300#  |                                  |                     |   |   |  |

\*\*Variations (V-Numbered Options) are noted at the end of the order number if needed. Leave blank if no variations. See list below for details.

#### Variations (V-numbers): Listing of V-Number Descriptions

|   |                              |  |
|---|------------------------------|--|
| Leave blank if no variations.                                       | V48 - Extended Lever Handle  | V66 - Cert. of Compliance European Valve Orders                                  |
| V 3* - Upstream Relief Hole   | ¼"-2" PT 44, PT 51/52        |  |
| V 5 - Hydrostatic Testing   | ¼"-1½" PT 59 only            | V67*- Weld in-place Valves (3-piece valve only)                                  |
| V 6 - Source Inspection   | V51* - High Cycle Stem Build | V72 - Cert. of Compliance for European Pressure Equipment Directive Conformance. |
| V14 - Handleless Valve  | V58* - B16.34 Compliance     |  |
| V32 - Oval Handle   | V59 - Extended Oval Handle   |  |
| V36 - Cert. of Compliance   | ¼"-2" PT 44, PT 51/52        |  |
| V37 - Cert of Comp. and Hydro Testing                               | ¼"-1½" PT 59 only            |  |
| V46 - Silicon-Free Lubricant (not used with Metal "A" or "G" seats) | V60 - OSHA Lockout           |  |
|   | ¼"-2" PT 44                  |  |
|   | ¼"-1½" PT 59 only            |  |

#### VARIATION NOTES:

V3 - Not used with Metal "A" or "G" Seats.

V51 - Not used on ¼"-2" PT 44, ½"-2" PT 51/PT 52, ¼"-1½" PT 59, or 3"-6" PT 44, PT 51/PT 52 valves with metal "G" seats, or 2"-6" three-piece valves with "G" or "X" seats.

V58 - Not offered on 2"-4" PT 59, PT 45, or PT 44 151/301 valves.

V67 - Not used on 2"-4" PT 59 and 2½"-6" PT 45 with "X" seats.

S7 - Complete S.S. trim option for 3"-6" PT 44, PT 51/PT52 only. Wrench block and extension, hexhead bolt, retaining nut, stop, stop screw and Belleville washer(s) or spacer if used.

Ordering Example: ½" High-Per Mizer with Stainless Steel body, Screw ends, Ball and Stem, Metal "G" Seats and Graphite-coated Stainless Steel "S" gasket.

\*NOTE: AM Seat and Seal combination available for screw end only in sizes ¼"-2" three-piece valves.

## How to Order

### Series 4

| 1½"  | 4      | 6   | 6   | Y           | V  | SE  |
|------|--------|---|---|-------------|--|---|
| Size | Series | Body & Pipe Ends                            | Ball & Stem   | Seats       | Body Seals                                       | End Type  |
| ¼"   | 4      | 4 – Carbon Steel<br>6 – 316 Stainless Steel | 6 – 316 Stainless Steel<br>7 – Monel<br>C – Hastelloy C<br>A – Alloy 20 | Y – Lubetal | B – Buna<br>E – EPR<br>V – Viton<br>N – Neoprene | SE – Screwed Pipe Ends (NPT)  |
| ⅜"   |        |   |   |             |  | Any Sch. Pipe † Carbon Steel<br>Stainless Steel Butt Weld Ends                              |
| ½"   |        |   |   |             |  | BW4 – Carbon Steel, Sch. 40   |
| ¾"   |        |   |   |             |  | BW4 – Stainless Steel, Sch. 40  |
| 1"   |        |   |   |             |  | BW5 – Stainless Steel, Sch. 50<br>(½"–2" only)  |
| 1¼"  |        |   |   |             |  | BW8 – Stainless Steel, Sch. 80  |
| 1½"  |        |   |   |             |  | SW – Socket Weld Ends, Any Sch.<br>Pipe † Carbon Steel Stainless<br>Steel                   |
| 2"   |        |   |   |             |  | SWO – Socket Weld Ends, O.D.<br>Tube (not available in ¼" and<br>⅜" sizes). Stainless Steel |

\*\*Variations (V-Numbered Options) are noted at the end of the order number if needed. Leave blank if no variations. See list below for details.

†All IPS schedules of stainless, carbon and alloy steel pipe.

**Example:** 1½" Series 4 with 316 stainless steel body, 316 S.S. ball and stem, Lubetal seats, Viton body seals and screwed pipe ends.

Externals, including handles, are normally constructed of zinc-plated carbon steel. Handles are vinyl-coated. When required, the body bolts, nuts, adjusting nut and handle nut, lock washer, stop pin and handle are also available in stainless steel by special order (S-7 suffix in order code), and come standard when ordering a 466 valve.

To order a Series 4 for use with:

Series 34 or 36 actuators, use prefix ordering code "A".  
Example: 1" A 446 YBSE

Series 39 or 75 actuators, use prefix ordering code "B".

#### Variations (V-numbers): Listing of V-Number Descriptions

(V-numbered options to be added to the end of part numbers)

|       |  |
|-------|--|
| Blank | No Variations                                    |
| V3    | Upstream Relief Hole                             |
| V5    | Hydrostatic Testing                              |
| V6    | Source Inspection                                |
| V32   | Oval Handle                                      |
| V36   | Certificate of Compliance                        |
| V37   | Certificate of Compliance and Hydro Testing      |
| V38   | Assemble without Lubricant                       |
| V46   | Silicon-Free Lubricant                           |
| V48   | Extended Lever Handle                            |
| V59   | Extended Oval Handle                             |
| V60   | OSHA Lockout                                     |
| V66   | Certificate of Compliance, European Valve Orders |

## Series H71

| 1"   |   | H71    | 6   | 6                                 | X               | V                    | SW                         |
|------|---|--------|---|-----------------------------------|-----------------|----------------------|----------------------------|
| Size | Options   | Series | Body & Pipe Ends                            | Ball & Stem                       | Seats           | Body Seals           | End Types                  |
| ½"   | Blank – Built with lever or "T" handle<br>E – No handle. Valve built for automation.<br>G – Stem grounding spring | H71    | 4 – Carbon Steel<br>6 – 316 Stainless Steel | 6 – Stainless Steel ball and stem | X – Filled PEEK | T – TFE<br>V – Viton | SE – Screwed End           |
| ¾"   |   |        |   |                                   |                 |                      | SW – Socket Weld           |
| 1"   |   |        |   |                                   |                 |                      | BW6 – Butt Weld (Sch. 160) |
| 1½"  |   |        |   |                                   |                 |                      | SAE – Screwed End          |
| 2"   |   |        |   |                                   |                 |                      | NP – No Pipe Ends          |

\*\*Variations (V-Numbered Options) are noted at the end of the order number if needed. Leave blank if no variations. See list below for details.

Note: Standard Worcester Controls valves are assembled with break-in lubricant. For other options, consult your distributor or Flowserve.

### Variations (V-numbers): Listing of V-Number Descriptions

Blank – No Variations  
V6 – Source Inspection  
V36 – Cert. of Compliance  
V46 – Silicone-Free Lubricant  
V66 – Cert. of Comp. European Valve orders

- a **CAUTION:** Ball valves can retain pressurized media in the body cavity when closed. Use care when disassembling. Always open valve to relieve pressure prior to disassembly. Due to continuous development of our product range, we reserve the right to alter the product specifications and information contained in this brochure as required.

## Series H44 Dyn-O-Miser

| 1"   |   | H44    | 4                                 | 6  | Y                 | B            | SE**                               |
|------|---|--------|-----------------------------------|--|-------------------|--------------|------------------------------------|
| Size | Options   | Series | Body & Pipe Ends                  | Ball & Stem  | Seats             | Body Seals   | End Type                           |
| ¼"   | Blank – Lever Handle<br>E – No handle, valve built for automation<br>G – Stem grounding | H44    | 4 – Carbon Steel<br>6* – 316 S.S. | 6 – Stainless Steel<br>Ball – 316 S.S.<br>Stem – 17-4ph S.S. | Y – Delrin AF     | B – Buna     | SE – Screw End<br>SW – Socket Weld |
| ⅜"   |   |        |                                   |  |                   | E – EPR      |                                    |
| ½"   |   |        |                                   |  |                   | N – Neoprene |                                    |
| ¾"   |   |        |                                   |  |                   | T – TFE      |                                    |
| 1"   |   |        |                                   |  | U – UHMWPE        |              |                                    |
| 1¼"  |   |        |                                   |  | V – Viton         |              |                                    |
| 1½"  |   |        |                                   |  | X – High-per Fill | T – TFE      |                                    |
| 2"   |   |        |                                   |  | U – UHMWPE        | V – Viton    |                                    |

\*\*Variations (V-Numbered Options) are noted at the end of the order number if needed. Leave blank if no variations. See list below for details.

\*Socket weld pipe ends of stainless steel are 316L.

Ordering example above: 1" Dyn-O-Miser with lever handle, carbon steel body and pipe ends, stainless ball and stem, Delrin AF seats, Buna body seals and screwed end connections.

NOTE: For high-pressure medias that are highly flammable, explosive, or toxic, consult Flowserve. Standard Worcester valves are assembled with silicon based break-in lubricant. For other options, consult your distributor or Flowserve.

### Variations (V-numbers): Listing of V-Number Descriptions

Blank – No Variations  
V3 – Upstream Relief Hole  
V5 – Hydrostatic Testing  
V6 – Source Inspection  
V32 – Oval Handle  
V36 – Cert. of Compliance  
V37 – Cert. of Compliance & Hydro Testing

V46 – Silicon Free Lubricant  
V48 – Extended Lever Handle  
V59 – Extended Oval Handle  
V60 – OSHA Lockout  
V66 – Cert. of Compliance for European Valve Orders  
V72 – Cert. of Compliance for European Pressure Equipment Directive Conformance



**United States**  
 Flowserve Corp.  
 Flow Control  
 1978 Foreman Drive  
 Cookeville, TN 38501 USA  
 Telephone: 931 432 4021  
 Telefax: 931 432 5518

FCD WCABR1051-01 Printed in USA.

***To find your local Flowserve representative:***

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

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

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

© 2011 Flowserve Corporation, Irving, Texas, USA. Flowserve is a registered trademark of Flowserve Corporation.

Viton® is a registered trademark of E.I. DuPont. Polyfill® is a registered trademark of Flowserve Corporation. Lubetal™ is a registered trademark of Garlock. Hastelloy® C is a registered trademark of Union Carbide Corporation. Alloy® 20 is a registered trademark of Carpenter Technology. Monel® is a registered trademark of Inco Alloys International. High-per Fill®, Polyfill®, Dyn-O-Miser and Hydro Miser™ are trademarks of Flowserve Corporation.