

**SERIES M4**

# SEVERE SERVICE METAL SEATED BALL VALVES

NPS ½ - 4 | DN 15-100 • ASME Limited and Standard Class 1700, 3100, 4500



[BRAY.COM/FLOW-TEK](http://BRAY.COM/FLOW-TEK)

**Flow-Tek**<sup>®</sup>  
Subsidiary of BRAY INTERNATIONAL, Inc.

## M4 - SPECIFICATIONS

|                              |                                                                                  |                                                       |
|------------------------------|----------------------------------------------------------------------------------|-------------------------------------------------------|
| Size Range                   | NPS ½ - 2½ SW or BW<br>DN 15 - 65                                                |                                                       |
|                              | NPS 3 & 4 BW<br>DN 80 & 100                                                      |                                                       |
| Bore Sizes                   | 0.63"<br>1.03"<br>1.56"                                                          |                                                       |
| Body Materials <sup>1</sup>  | A105<br>A182-F22 Cl.3<br>A182-F91                                                |                                                       |
| Ball Materials               | 410 SS/HVOF Chromium Carbide <sup>2</sup><br>Inconel® 718/Fused Chromium Carbide |                                                       |
| Seat Materials               | 410 SS/HVOF Chromium Carbide <sup>2</sup><br>Inconel® 718/HVOF Chromium Carbide  |                                                       |
| Pressure Ratings             | 1700                                                                             | ½" thru 2½" Limited Class<br>3" and 4" Standard Class |
|                              | 3100                                                                             |                                                       |
|                              | 4500                                                                             |                                                       |
| Temperature                  | Up to 1100°F (593°C)                                                             |                                                       |
| End Connections <sup>3</sup> | SW per ASME B16.11                                                               |                                                       |
|                              | BW per ASME B16.25                                                               |                                                       |
| Design Standards             | ASME B16.34<br>Bore sizes per ASME TDP-1                                         |                                                       |
| Test Standards               | Meets and exceeds API 598,<br>or per customer request                            |                                                       |
| Characteristics              | On/Off, Zero Leakage                                                             |                                                       |

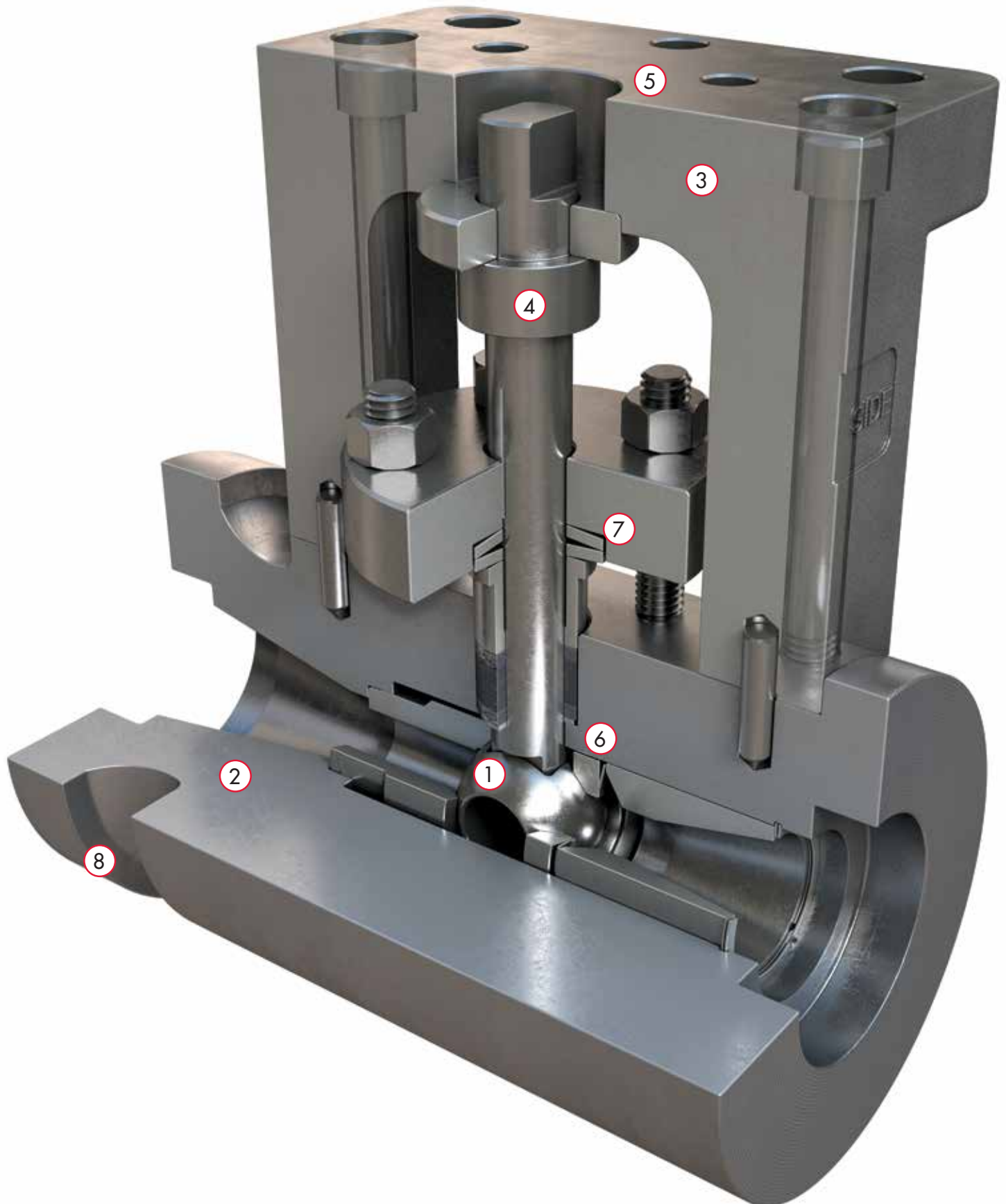
<sup>1</sup>Other materials available on request.

<sup>2</sup>410 SS/HVOF not recommended for applications with ΔT above 700°F (371°C).

<sup>3</sup>Other end connections available on request.

## FEATURES AND BENEFITS

- Utilizing the same material and coating composition for the ball and seat, both parts expand at the same rate during thermal cycling, ensuring reliable tight shutoff.
  - The ball and seat are 360° mate-lapped to create a truly spherical interface, eliminating irregularities found with traditional mate-lapping techniques.
  - Wider sealing surfaces reduce dynamic cycling stresses promoting extended valve life and tight shutoff.
- Forged heavy walled unibody construction eliminates the body joint and any potential for shell leakage.
  - CNC machined for utmost accuracy.
  - Transitioning angles maximize flow rates.
- Cast steel bracket with increased thickness for superior rigidity.
  - CNC machined to fully align the body, bracket, and stem, eliminating side to side motion.
  - Permanently attached bracket.
- High strength one piece stem with upper bearing ring.
  - Ensures proper alignment.
  - Extends valve life and maximizes stem sealing by limiting stem side loading.
  - Prevents stem blow-out.
- Robust ISO 5211 mounting flange supports direct mounting of high temperature actuators or conventional adaptation for standard actuators.
- Inconel® 718 Belleville spring exerts continuous force onto the ball and seat maintaining the seal throughout operating temperatures.
- Set of Inconel® 718 Belleville springs live load the stem packing for low maintenance leak prevention.
- External body groove effectively dissipates conductive heat during the postweld heat treatment (PWHT) process.



Specifically engineered for the most demanding high pressure and temperature steam applications, Flow-Tek's Series M4 is the culmination of advanced technology, rigorous testing, and decades of industry experience. Designed with long term performance and zero leakage in mind, the Series M4 is equipped with a robust drivetrain, a 360° mate-lapped ball and seat set, and the most advanced materials.

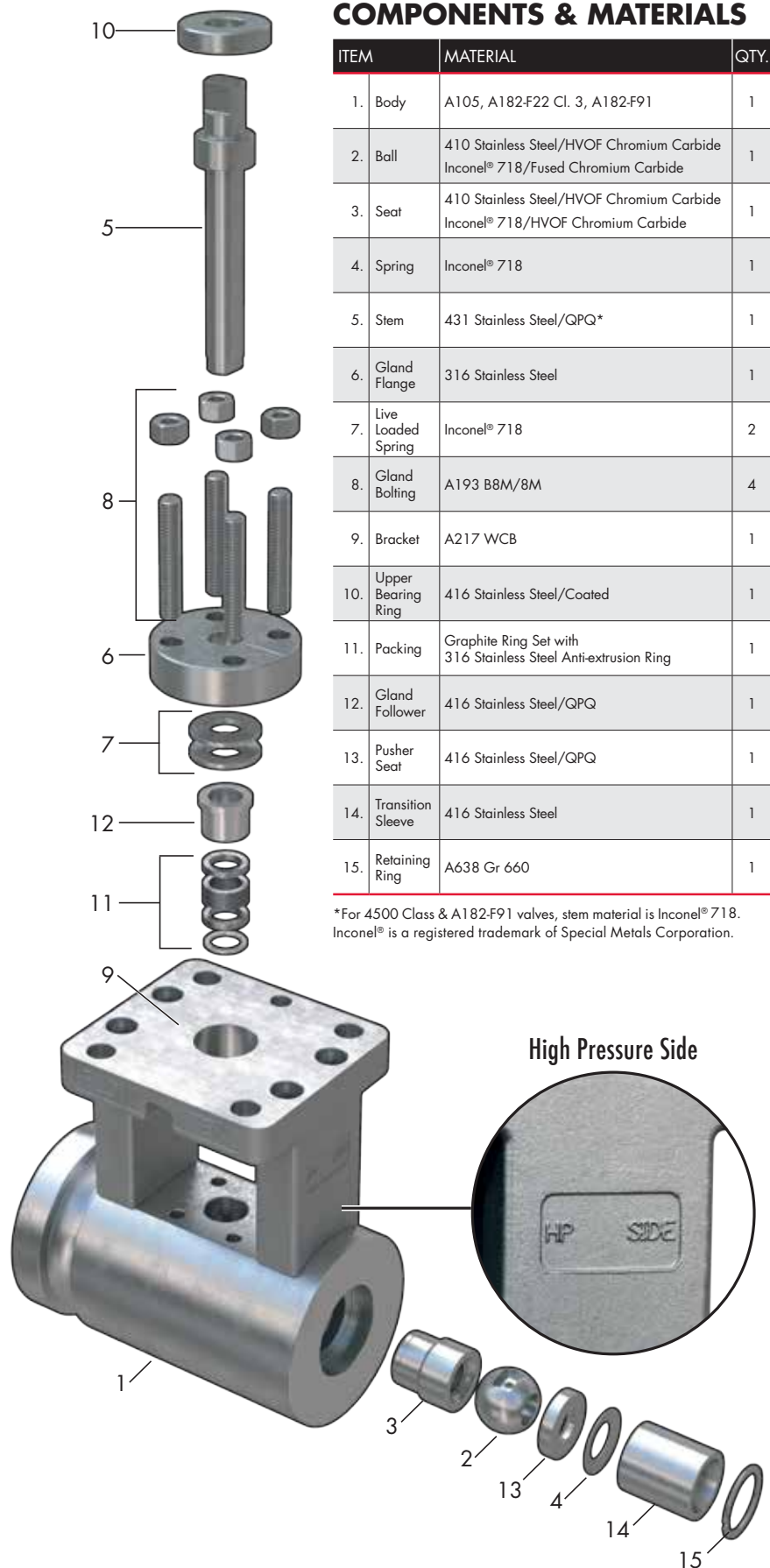
Coupled with Bray's exclusive range of actuation, solenoids, and limit switches, the Series M4 is available fully automated direct from any of our global locations. This maximizes value and quality for our customers.

Flow-Tek is dedicated to continuous improvement and innovation within our engineering, supply chain, and customer service processes. Our global presence allows us to provide the quality Bray products our customers have come to expect, worldwide.

## QUALITY, SAFETY AND CERTIFICATION

- **Standard 4 year performance warranty.\***
- As a result of our continual commitment to quality, our facilities have achieved ISO 9001:2008 for the design and manufacture of severe service valves.
- We recognize that the safety of our product is critical to our customers, therefore, all pressure containing components are fully traceable.
- Our severe service products are certified to the requirements of Annex III, Module H of PED 2014/68/EU, TSG, and CRN.

\*Refer to Terms and Conditions for full details.



## COMPONENTS & MATERIALS

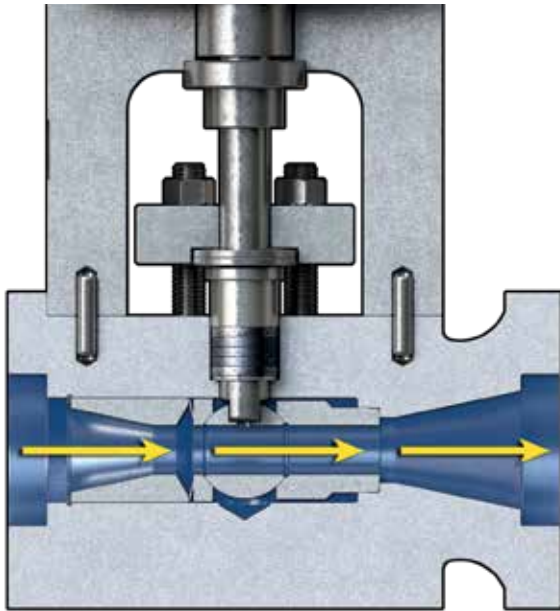
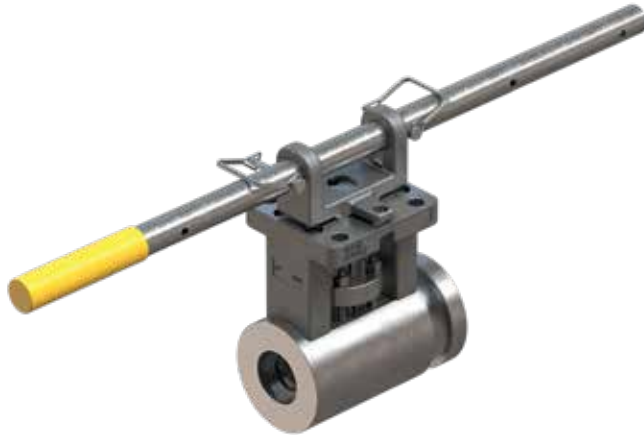
| ITEM                   | MATERIAL                                                                         | QTY. |
|------------------------|----------------------------------------------------------------------------------|------|
| 1. Body                | A105, A182-F22 Cl. 3, A182-F91                                                   | 1    |
| 2. Ball                | 410 Stainless Steel/HVOF Chromium Carbide<br>Inconel® 718/Fused Chromium Carbide | 1    |
| 3. Seat                | 410 Stainless Steel/HVOF Chromium Carbide<br>Inconel® 718/HVOF Chromium Carbide  | 1    |
| 4. Spring              | Inconel® 718                                                                     | 1    |
| 5. Stem                | 431 Stainless Steel/QPQ*                                                         | 1    |
| 6. Gland Flange        | 316 Stainless Steel                                                              | 1    |
| 7. Live Loaded Spring  | Inconel® 718                                                                     | 2    |
| 8. Gland Bolting       | A193 B8M/8M                                                                      | 4    |
| 9. Bracket             | A217 WCB                                                                         | 1    |
| 10. Upper Bearing Ring | 416 Stainless Steel/Coated                                                       | 1    |
| 11. Packing            | Graphite Ring Set with<br>316 Stainless Steel Anti-extrusion Ring                | 1    |
| 12. Gland Follower     | 416 Stainless Steel/QPQ                                                          | 1    |
| 13. Pusher Seat        | 416 Stainless Steel/QPQ                                                          | 1    |
| 14. Transition Sleeve  | 416 Stainless Steel                                                              | 1    |
| 15. Retaining Ring     | A638 Gr 660                                                                      | 1    |

\*For 4500 Class & A182-F91 valves, stem material is Inconel® 718. Inconel® is a registered trademark of Special Metals Corporation.

## BALL VALVE

VS

## GLOBE VALVE

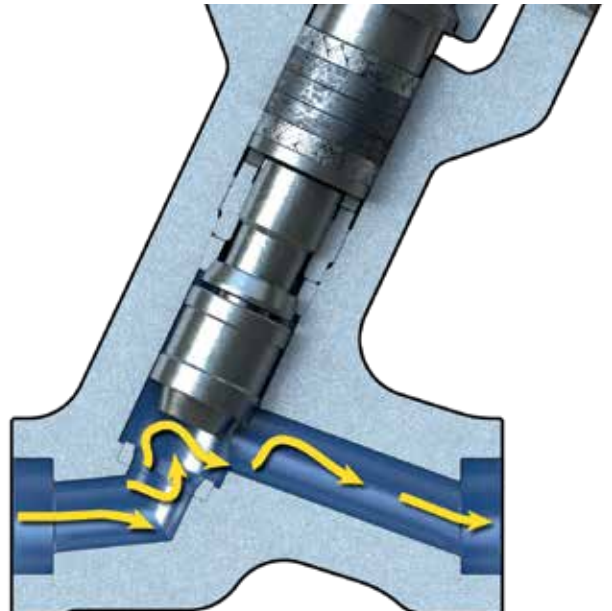


Spring and pressure assisted zero leakage shutoff occurs on a perfectly mated-lapped surface, ensuring repeatability over thousands of cycles.

Straight flow path increases the Cv while protecting the sealing surfaces from the flow, extending the valve's life.

Quarter turn stem rotation provides smooth operation and minimizes packing wear.

Quarter turn actuation is simple, compact, and easy to setup and maintain.



Valve closure relies solely on thrust or torque to press the disc into the seat, contributing to the continuous degradation of the sealing surfaces.

Turbulent flow path and constant exposure of sealing surfaces severely shortens the valve's life.

Stem travels through the entire packing in both directions, causing increased packing wear and the potential for leakage.

Linear actuators are typically larger, and often utilize complex exposed linkages requiring specialized calibration.

## CONFIGURATIONS

### SOCKET WELD



### FLANGED



### BUTT WELD



## APPLICATIONS

Series M4 valves are ideally suited for high pressure/temperature steam lines in power plants and are commonly specified for use in Turbine Water Induction Prevention (TWIP) applications. These valves are an excellent fit for the following locations:

- Inlet/Outlet Drains
- Main Steam Stop Valve Before/After Seat Drains
- Economizer Drains
- Evaporator Drains
- Superheater Drains
- Condenser Drains
- Turbine Drains
- Crossover Drains
- Startup Drains
- Low Point Boiler Drains
- High Point Boiler Vents
- Boiler Blowdown Isolation

## FLOW COEFFICIENTS

| Pipe                                                                                                                                                     |     |              | Bore (inches) – C <sub>v</sub>                                                                                                                      |      |      | Bore (mm) – K <sub>v</sub> |      |       |
|----------------------------------------------------------------------------------------------------------------------------------------------------------|-----|--------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|------|------|----------------------------|------|-------|
| C <sub>v</sub> is the volume (in US gallons) of water at 60°F that will flow per minute through a valve with a pressure drop of one psi across the valve |     |              | K <sub>v</sub> is the rate of flow of cold water in cubic meters per hour at a pressure drop of one kilogram per square centimeter across the valve |      |      |                            |      |       |
| NPS                                                                                                                                                      | DN  | Schedule No. | 0.63                                                                                                                                                | 1.03 | 1.56 | 16                         | 26   | 40    |
| ½                                                                                                                                                        | 15  | STD/40       | 20                                                                                                                                                  | -    | -    | 17.2                       | -    | -     |
|                                                                                                                                                          |     | XS/80        | 14                                                                                                                                                  | -    | -    | 12.1                       | -    | -     |
|                                                                                                                                                          |     | 160          | -                                                                                                                                                   | -    | -    | -                          | -    | -     |
|                                                                                                                                                          |     | XXS          | -                                                                                                                                                   | -    | -    | -                          | -    | -     |
| ¾                                                                                                                                                        | 20  | STD/40       | 20                                                                                                                                                  | -    | -    | 17.2                       | -    | -     |
|                                                                                                                                                          |     | XS/80        | 22                                                                                                                                                  | -    | -    | 19.0                       | -    | -     |
|                                                                                                                                                          |     | 160          | 19                                                                                                                                                  | -    | -    | 16.4                       | -    | -     |
|                                                                                                                                                          |     | XXS          | 8                                                                                                                                                   | -    | -    | 6.9                        | -    | -     |
| 1                                                                                                                                                        | 25  | STD/40       | 17                                                                                                                                                  | 71   | -    | 14.7                       | 61.2 | -     |
|                                                                                                                                                          |     | XS/80        | 18                                                                                                                                                  | 63   | -    | 15.5                       | 54.3 | -     |
|                                                                                                                                                          |     | 160          | 21                                                                                                                                                  | 39   | -    | 18.1                       | 33.6 | -     |
|                                                                                                                                                          |     | XXS          | 18                                                                                                                                                  | 18   | -    | 15.5                       | 15.5 | -     |
| 1-½                                                                                                                                                      | 40  | STD/40       | 14                                                                                                                                                  | 48   | 191  | 12.1                       | 41.4 | 164.6 |
|                                                                                                                                                          |     | XS/80        | 14                                                                                                                                                  | 51   | 188  | 12.1                       | 44.0 | 162.1 |
|                                                                                                                                                          |     | 160          | 15                                                                                                                                                  | 58   | 143  | 12.9                       | 50.0 | 123.3 |
|                                                                                                                                                          |     | XXS          | 16                                                                                                                                                  | 71   | 71   | 13.8                       | 61.2 | 61.2  |
| 2                                                                                                                                                        | 50  | STD/40       | -                                                                                                                                                   | 41   | 135  | -                          | 35.3 | 116.4 |
|                                                                                                                                                          |     | XS/80        | -                                                                                                                                                   | 42   | 148  | -                          | 36.2 | 127.6 |
|                                                                                                                                                          |     | 160          | 14                                                                                                                                                  | 46   | 183  | 12.1                       | 39.7 | 157.7 |
|                                                                                                                                                          |     | XXS          | 14                                                                                                                                                  | 51   | 189  | 12.1                       | 44.0 | 162.9 |
| 2-½                                                                                                                                                      | 65  | STD/40       | -                                                                                                                                                   | -    | 111  | -                          | -    | 95.7  |
|                                                                                                                                                          |     | XS/80        | -                                                                                                                                                   | -    | 117  | -                          | -    | 100.9 |
|                                                                                                                                                          |     | 160          | -                                                                                                                                                   | -    | 130  | -                          | -    | 112.1 |
|                                                                                                                                                          |     | XXS          | -                                                                                                                                                   | -    | 170  | -                          | -    | 146.5 |
| 3                                                                                                                                                        | 80  | STD/40       | -                                                                                                                                                   | -    | 96   | -                          | -    | 82.8  |
|                                                                                                                                                          |     | XS/80        | -                                                                                                                                                   | -    | 99   | -                          | -    | 85.3  |
|                                                                                                                                                          |     | 160          | -                                                                                                                                                   | -    | 105  | -                          | -    | 90.5  |
|                                                                                                                                                          |     | XXS          | -                                                                                                                                                   | -    | 119  | -                          | -    | 102.6 |
| 4                                                                                                                                                        | 100 | STD/40       | -                                                                                                                                                   | -    | 86   | -                          | -    | 74.4  |
|                                                                                                                                                          |     | XS/80        | -                                                                                                                                                   | -    | 87   | -                          | -    | 75.3  |
|                                                                                                                                                          |     | 160          | -                                                                                                                                                   | -    | 91   | -                          | -    | 78.5  |
|                                                                                                                                                          |     | XXS          | -                                                                                                                                                   | -    | 94   | -                          | -    | 81.3  |

## PRESSURE/TEMPERATURE RATINGS – IMPERIAL

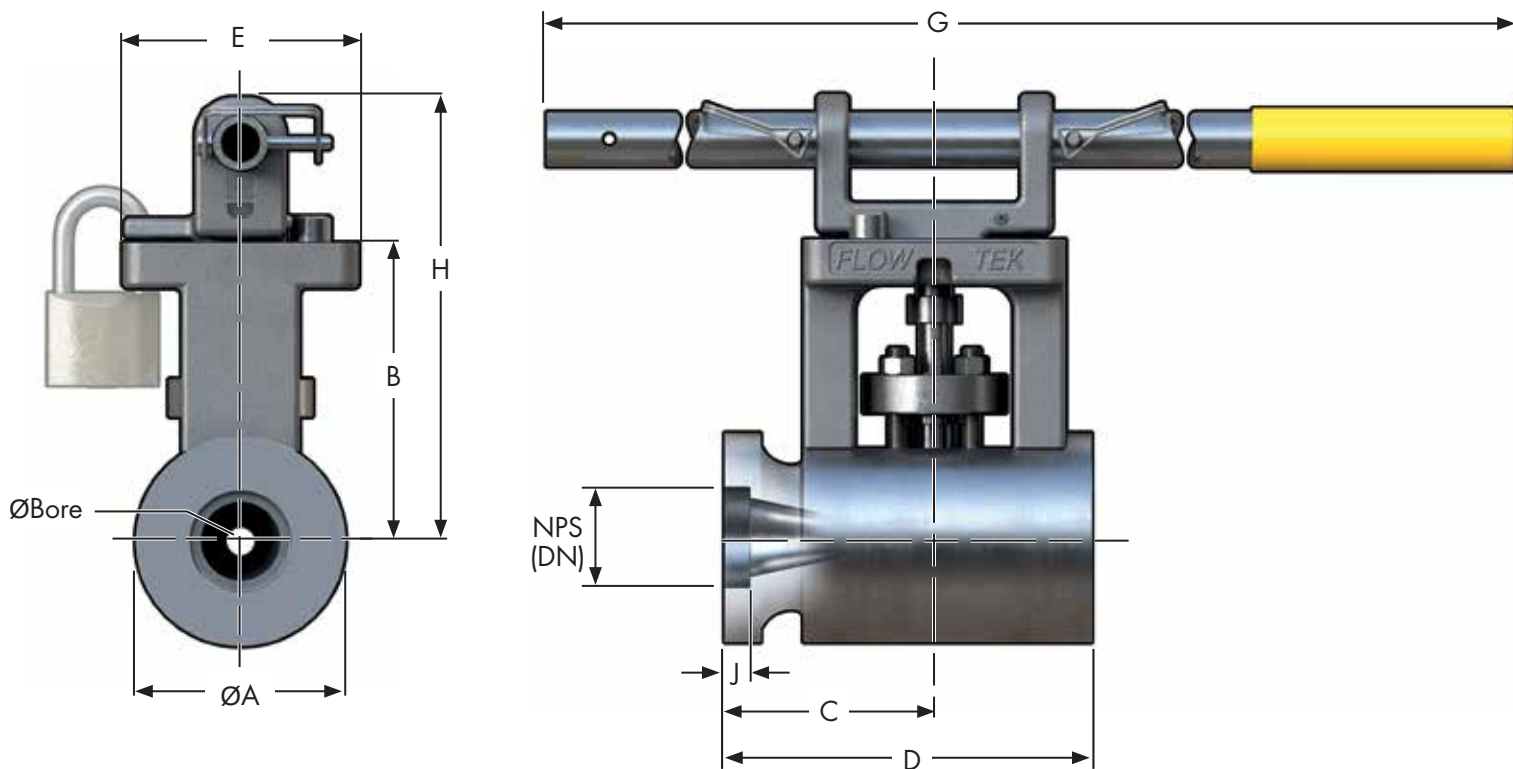
NPS ½ - 2½ PER ASME B16.34 LIMITED CLASS (2013 EDITION)

| Material     | A105                                                          |       |       |       |       |        | A182 F22 Cl.3 |       |       |       |       |        | A182 F91 |       |       |       |       |        |
|--------------|---------------------------------------------------------------|-------|-------|-------|-------|--------|---------------|-------|-------|-------|-------|--------|----------|-------|-------|-------|-------|--------|
| Class        | 900                                                           | 1500  | 1700  | 2500  | 3100  | 4500   | 900           | 1500  | 1700  | 2500  | 3100  | 4500   | 900      | 1500  | 1700  | 2500  | 3100  | 4500   |
| Degrees °F   | psig                                                          |       |       |       |       |        | psig          |       |       |       |       |        | psig     |       |       |       |       |        |
| -20° to 100° | 2,250                                                         | 3,750 | 4,250 | 6,250 | 7,750 | 11,250 | 2,250         | 3,750 | 4,250 | 6,250 | 7,750 | 11,250 | 2,250    | 3,750 | 4,250 | 6,250 | 7,750 | 11,250 |
| 200°         | 2,250                                                         | 3,750 | 4,250 | 6,250 | 7,750 | 11,250 | 2,250         | 3,750 | 4,250 | 6,250 | 7,750 | 11,250 | 2,250    | 3,750 | 4,250 | 6,250 | 7,750 | 11,250 |
| 300°         | 2,250                                                         | 3,700 | 4,194 | 6,170 | 7,651 | 11,105 | 2,220         | 3,695 | 4,188 | 6,160 | 7,639 | 11,090 | 2,250    | 3,750 | 4,250 | 6,250 | 7,750 | 11,250 |
| 400°         | 2,200                                                         | 3,665 | 4,153 | 6,105 | 7,572 | 10,995 | 2,185         | 3,640 | 4,125 | 6,065 | 7,520 | 10,915 | 2,250    | 3,750 | 4,250 | 6,250 | 7,750 | 11,250 |
| 500°         | 2,200                                                         | 3,665 | 4,153 | 6,105 | 7,572 | 10,995 | 2,175         | 3,620 | 4,103 | 6,035 | 7,484 | 10,865 | 2,250    | 3,750 | 4,250 | 6,250 | 7,750 | 11,250 |
| 600°         | 2,200                                                         | 3,665 | 4,153 | 6,105 | 7,572 | 10,995 | 2,165         | 3,605 | 4,086 | 6,010 | 7,452 | 10,815 | 2,250    | 3,750 | 4,250 | 6,250 | 7,750 | 11,250 |
| 650°         | 2,145                                                         | 3,575 | 4,052 | 5,960 | 7,391 | 10,730 | 2,145         | 3,580 | 4,057 | 5,965 | 7,396 | 10,735 | 2,250    | 3,750 | 4,250 | 6,250 | 7,750 | 11,250 |
| 700°         | 2,075                                                         | 3,455 | 3,916 | 5,760 | 7,142 | 10,365 | 2,120         | 3,535 | 4,007 | 5,895 | 7,308 | 10,605 | 2,200    | 3,665 | 4,154 | 6,110 | 7,576 | 10,995 |
| 750°         | 1,905                                                         | 3,170 | 3,593 | 5,285 | 6,554 | 9,515  | 2,120         | 3,535 | 4,007 | 5,895 | 7,308 | 10,605 | 2,185    | 3,645 | 4,130 | 6,070 | 7,528 | 10,930 |
| 800°         | 1,545                                                         | 2,570 | 2,913 | 4,285 | 5,314 | 7,715  | 2,120         | 3,535 | 4,007 | 5,895 | 7,308 | 10,605 | 2,160    | 3,600 | 4,080 | 6,000 | 7,440 | 10,800 |
| 850°         | Permissible but not recommended for prolonged use above 800°F |       |       |       |       |        | 2,030         | 3,385 | 3,837 | 5,645 | 7,000 | 10,160 | 2,030    | 3,385 | 3,837 | 5,645 | 7,000 | 10,160 |
| 900°         |                                                               |       |       |       |       |        | 1,800         | 3,000 | 3,400 | 5,000 | 6,200 | 9,000  | 1,800    | 3,000 | 3,400 | 5,000 | 6,200 | 9,000  |
| 950°         |                                                               |       |       |       |       |        | 1,415         | 2,360 | 2,624 | 3,930 | 4,872 | 7,070  | 1,415    | 2,360 | 2,674 | 3,930 | 4,872 | 7,070  |
| 1000°        |                                                               |       |       |       |       |        | 1,045         | 1,785 | 2,042 | 3,119 | 3,983 | 6,213  | 1,260    | 2,105 | 2,385 | 3,505 | 4,347 | 6,310  |
| 1050°        |                                                               |       |       |       |       |        | 681           | 1,170 | 1,337 | 2,038 | 2,604 | 4,064  | 1,260    | 2,105 | 2,385 | 3,505 | 4,347 | 6,310  |
| 1100°        |                                                               |       |       |       |       |        | 426           | 732   | 838   | 1,282 | 1,635 | 2,546  | 1,175    | 2,015 | 2,284 | 3,360 | 4,166 | 6,045  |

## PRESSURE/TEMPERATURE RATINGS – METRIC

DN 15-65 PER ASME B16.34 LIMITED CLASS (2013 EDITION)

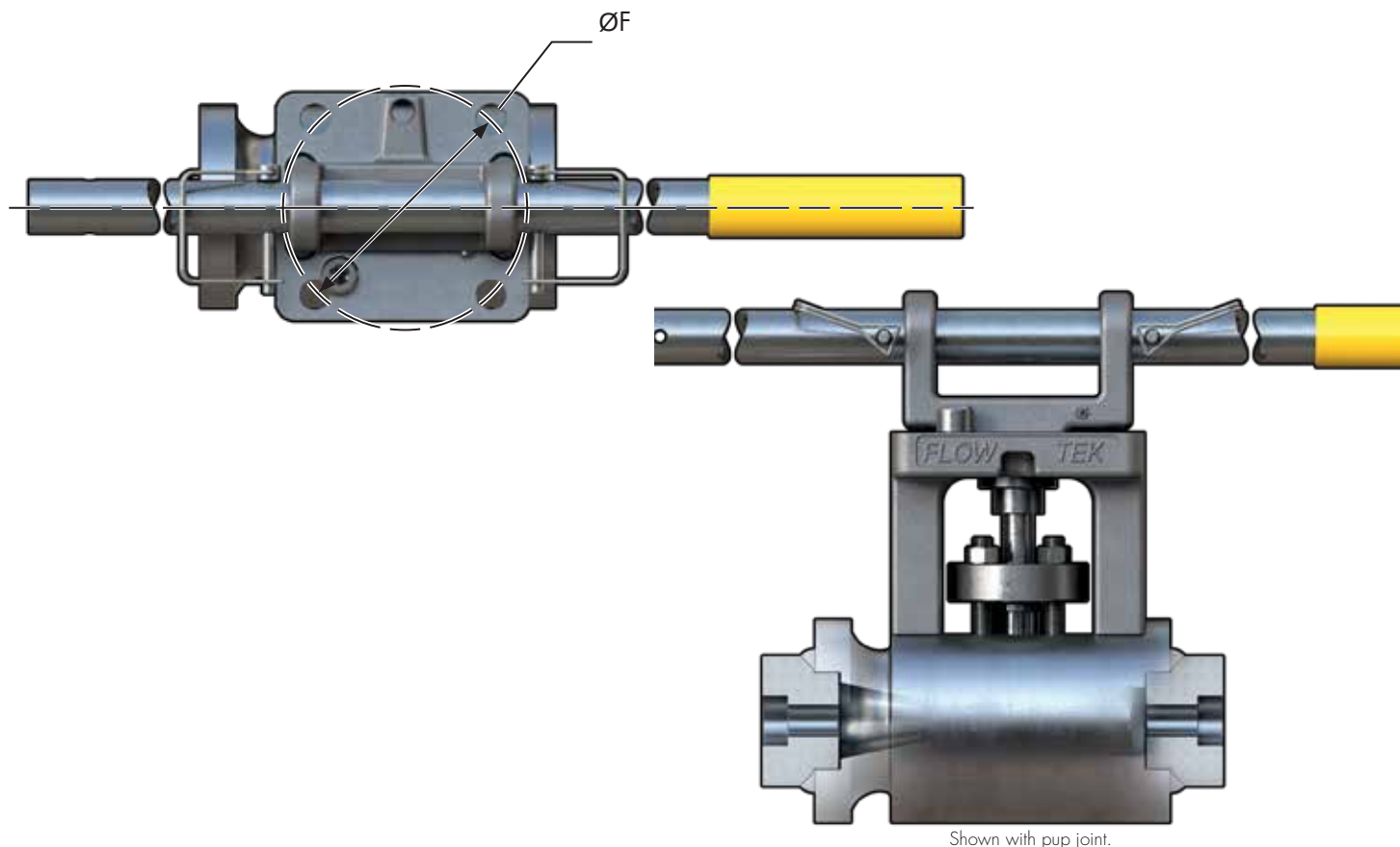
| Material    | A105                                                          |       |       |       |       |       | A182 F22 Cl.3 |       |       |       |       |       | A182 F91 |       |       |       |       |       |
|-------------|---------------------------------------------------------------|-------|-------|-------|-------|-------|---------------|-------|-------|-------|-------|-------|----------|-------|-------|-------|-------|-------|
| Class       | 900                                                           | 1500  | 1700  | 2500  | 3100  | 4500  | 900           | 1500  | 1700  | 2500  | 3100  | 4500  | 900      | 1500  | 1700  | 2500  | 3100  | 4500  |
| Degrees °C  | barg                                                          |       |       |       |       |       | barg          |       |       |       |       |       | barg     |       |       |       |       |       |
| -29° to 38° | 155.1                                                         | 258.6 | 293.1 | 430.9 | 534.3 | 775.7 | 155.1         | 258.6 | 293.1 | 430.9 | 534.3 | 775.7 | 155.1    | 258.6 | 293.1 | 430.9 | 534.3 | 775.7 |
| 50°         | 155.1                                                         | 258.6 | 293.1 | 430.9 | 534.3 | 775.7 | 155.1         | 258.6 | 293.1 | 430.9 | 534.3 | 775.7 | 155.1    | 258.6 | 293.1 | 430.9 | 534.3 | 775.7 |
| 100°        | 154.9                                                         | 258.2 | 292.6 | 430.3 | 533.6 | 774.5 | 154.9         | 258.1 | 292.5 | 430.2 | 533.4 | 774.3 | 155.1    | 258.6 | 293.1 | 430.9 | 534.3 | 775.7 |
| 150°        | 153.1                                                         | 255.2 | 289.2 | 425.3 | 527.4 | 765.5 | 152.9         | 254.8 | 288.8 | 424.6 | 526.5 | 764.3 | 155.1    | 258.6 | 293.1 | 430.9 | 534.3 | 775.7 |
| 200°        | 151.7                                                         | 252.9 | 286.6 | 421.4 | 522.6 | 758.6 | 150.7         | 251.1 | 284.6 | 418.5 | 519.0 | 753.4 | 155.1    | 258.6 | 293.1 | 430.9 | 534.3 | 775.7 |
| 250°        | 151.6                                                         | 252.6 | 286.3 | 421.1 | 522.1 | 757.9 | 149.9         | 249.9 | 283.2 | 416.5 | 516.5 | 749.7 | 155.1    | 258.6 | 293.1 | 430.9 | 534.3 | 775.7 |
| 300°        | 151.6                                                         | 252.6 | 286.3 | 421.1 | 522.1 | 757.9 | 149.3         | 248.9 | 282.1 | 414.8 | 514.4 | 746.7 | 155.1    | 258.6 | 293.1 | 430.9 | 534.3 | 775.7 |
| 325°        | 150.3                                                         | 250.6 | 284.0 | 417.6 | 517.8 | 751.7 | 148.8         | 248.0 | 281.1 | 413.3 | 512.5 | 743.9 | 155.1    | 258.6 | 293.1 | 430.9 | 534.3 | 775.7 |
| 350°        | 146.7                                                         | 244.6 | 277.2 | 407.6 | 505.4 | 733.7 | 147.6         | 246.0 | 278.8 | 410.0 | 508.4 | 738.1 | 154.3    | 257.1 | 291.4 | 428.6 | 531.4 | 771.4 |
| 375°        | 141.3                                                         | 235.5 | 266.9 | 392.5 | 486.7 | 706.5 | 146.3         | 243.8 | 276.3 | 406.3 | 503.8 | 731.3 | 151.5    | 252.5 | 286.2 | 420.9 | 521.9 | 757.4 |
| 400°        | 130.2                                                         | 217.0 | 245.9 | 361.7 | 448.5 | 651.0 | 146.3         | 243.8 | 276.3 | 406.3 | 503.8 | 731.3 | 150.6    | 251.2 | 284.6 | 418.3 | 518.8 | 753.2 |
| 425°        | 107.9                                                         | 179.8 | 203.8 | 299.6 | 371.5 | 539.3 | 146.3         | 243.8 | 276.3 | 406.3 | 503.8 | 731.3 | 148.9    | 248.2 | 281.3 | 413.7 | 513.0 | 744.6 |
| 450°        | Permissible but not recommended for prolonged use above 425°C |       |       |       |       |       | 141.4         | 235.8 | 267.3 | 393.1 | 487.5 | 707.6 | 141.4    | 235.8 | 267.3 | 393.1 | 487.5 | 707.6 |
| 475°        |                                                               |       |       |       |       |       | 128.2         | 213.7 | 242.2 | 356.3 | 441.8 | 641.3 | 128.2    | 213.7 | 242.2 | 356.3 | 441.8 | 641.3 |
| 500°        |                                                               |       |       |       |       |       | 107.1         | 178.6 | 202.4 | 297.5 | 368.9 | 535.4 | 107.1    | 178.6 | 202.4 | 297.5 | 368.9 | 535.4 |
| 538°        |                                                               |       |       |       |       |       | 71.9          | 123.1 | 140.8 | 215.2 | 274.7 | 428.3 | 90.4     | 155.1 | 177.3 | 270.7 | 345.6 | 535.4 |
| 550°        |                                                               |       |       |       |       |       | 61.0          | 104.4 | 119.4 | 182.3 | 232.8 | 363.1 | 86.9     | 145.1 | 164.4 | 241.7 | 299.7 | 435.1 |
| 575°        |                                                               |       |       |       |       |       | 41.1          | 70.3  | 80.4  | 122.9 | 156.8 | 244.6 | 86.9     | 145.1 | 164.4 | 241.7 | 299.7 | 435.1 |
| 600°        |                                                               |       |       |       |       |       | 26.8          | 46.0  | 52.6  | 80.3  | 102.5 | 159.9 | 76.0     | 130.3 | 149.0 | 227.5 | 290.4 | 428.8 |



## SOCKET WELD VALVE DIMENSIONS – IMPERIAL

|                  |                     | Up to<br>ASME 3100 | ASME<br>4500      |          | Up to<br>ASME 3100 |          | ASME 4500         |          |          |                   |          |          |                          |                                      |
|------------------|---------------------|--------------------|-------------------|----------|--------------------|----------|-------------------|----------|----------|-------------------|----------|----------|--------------------------|--------------------------------------|
| Ø<br>Bore<br>in. | Pipe<br>Size<br>NPS | ØA<br>in.          | ØA<br>in.         | B<br>in. | C<br>in.           | D<br>in. | C<br>in.          | D<br>in. | E<br>in. | ØF<br>ISO 5211    | G<br>in. | H<br>in. | J<br>Socket Depth<br>in. | Weight<br>Valve/Handle Assy.<br>lbs. |
| 0.63             | ½                   | 4.00               | 4.00              | 5.69     | 4.00               | 7.98     | 4.00              | 7.98     | 4.50     | F12               | 28.00    | 8.45     | 0.38                     | 39                                   |
|                  | ¾                   | 4.00               | 4.00              |          | 4.00               | 8.37     | 4.00              | 8.37     |          |                   |          |          | 0.50                     | 39                                   |
|                  | 1                   | 4.00               | 4.00              |          | 4.00               | 7.00     | 4.00              | 7.00     |          |                   |          |          | 0.50                     | 38                                   |
|                  | 1½                  | 4.00               | 4.00              |          | 4.00               | 7.00     | 4.25              | 7.63     |          |                   |          |          | 0.50                     | 39                                   |
|                  | 2                   | 4.50               | 4.50              |          | 4.65               | 8.50     | 4.65              | 8.50     |          |                   |          |          | 0.62                     | 49                                   |
| 1.03             | ¾                   | 4.75               | 4.75              | 6.45     | 5.54               | 10.34    | 5.54              | 10.34    | 5.50     | F12/<br>F16       | 36.00    | 9.51     | 0.50                     | 65                                   |
|                  | 1                   | 4.75               | 4.75              |          | 4.50               | 9.58     | 4.50              | 9.58     |          |                   |          |          | 0.50                     | 66                                   |
|                  | 1½                  | 4.75               | 4.75              |          | 4.50               | 8.25     | 4.50              | 8.25     |          |                   |          |          | 0.50                     | 62                                   |
|                  | 2                   | 4.75               | 5.50              |          | 4.50               | 8.25     | 5.13              | 9.75     |          |                   |          |          | 0.62                     | 81                                   |
|                  | 2½                  | 5.50               | 5.50              |          | 5.13               | 9.75     | 5.25              | 9.88     |          |                   |          |          | 0.62                     | 81                                   |
| 1.56             | 1½                  | 5.75               | Not<br>Applicable | 8.33     | 5.25               | 10.42    | Not<br>Applicable | 5.50     | F16      | Not<br>Applicable | 0.50     | 83       |                          |                                      |
|                  | 2                   | 5.75               |                   |          | 5.13               | 10.77    |                   |          |          |                   | 0.62     | 86       |                          |                                      |
|                  | 2½                  | 5.75               |                   |          | 5.13               | 9.00     |                   |          |          |                   | 0.62     | 79       |                          |                                      |

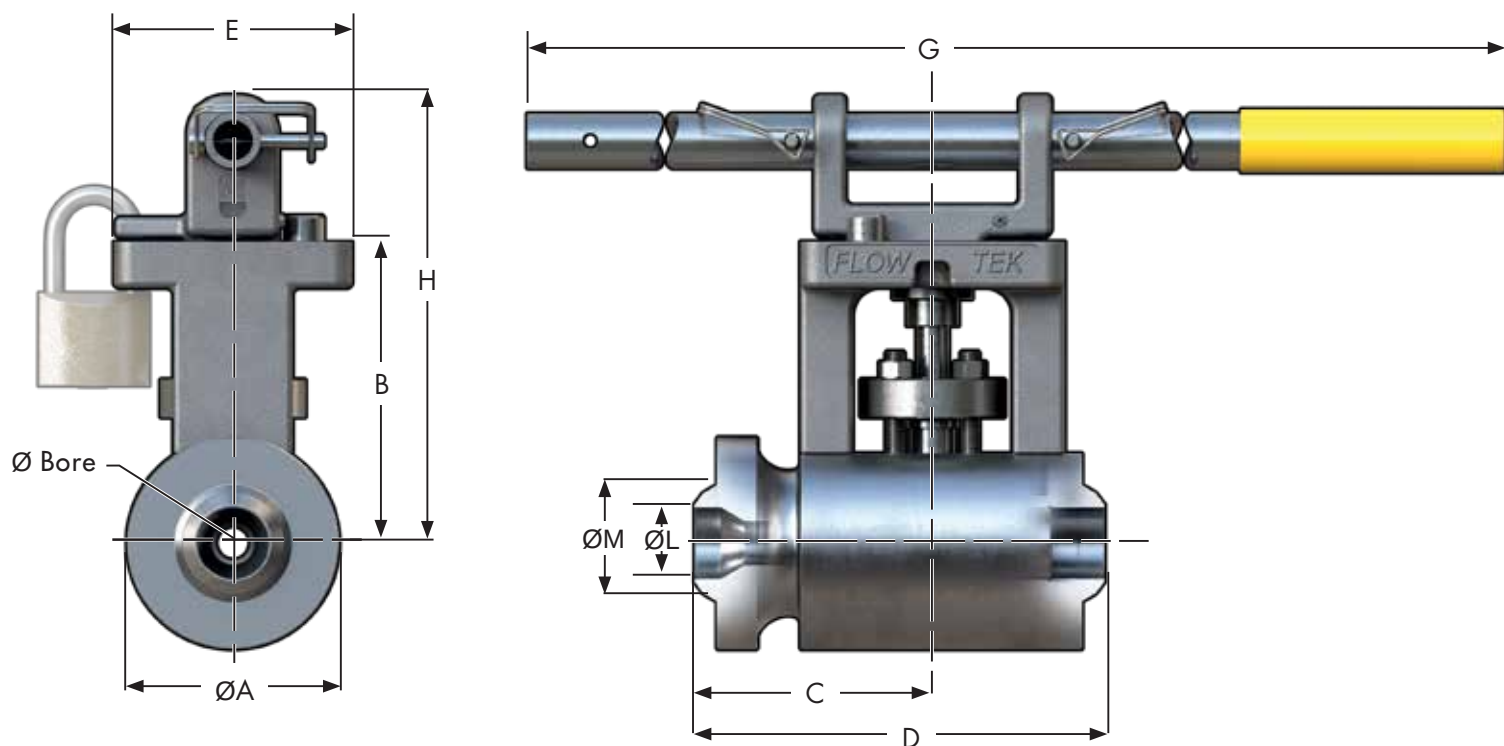
For other valve configurations, consult the factory. Information subject to change; for the latest updates, please visit our website [flow-tek.com](http://flow-tek.com)



### SOCKET WELD VALVE DIMENSIONS – METRIC

|                 |                    | Up To<br>ASME 3100 | ASME<br>4500      |         | Up to<br>ASME 3100 |         | ASME 4500         |         |         |                |                   |         |                         |                                    |
|-----------------|--------------------|--------------------|-------------------|---------|--------------------|---------|-------------------|---------|---------|----------------|-------------------|---------|-------------------------|------------------------------------|
| Ø<br>Bore<br>mm | Pipe<br>Size<br>DN | ØA<br>mm           | ØA<br>mm          | B<br>mm | C<br>mm            | D<br>mm | C<br>mm           | D<br>mm | E<br>mm | ØF<br>ISO 5211 | G<br>mm           | H<br>mm | J<br>Socket Depth<br>mm | Weight<br>Valve/Handle Assy.<br>Kg |
| 16              | 15                 | 102                | 102               | 145     | 102                | 203     | 102               | 203     | 114     | F12            | 711               | 215     | 10                      | 18                                 |
|                 | 20                 | 102                | 102               |         | 102                | 213     | 102               | 213     |         |                |                   |         | 13                      | 18                                 |
|                 | 25                 | 102                | 102               |         | 102                | 178     | 102               | 178     |         |                |                   |         | 13                      | 17                                 |
|                 | 40                 | 102                | 102               |         | 102                | 178     | 108               | 194     |         |                |                   |         | 13                      | 18                                 |
|                 | 50                 | 114                | 114               |         | 118                | 216     | 118               | 216     |         |                |                   |         | 16                      | 22                                 |
| 26              | 20                 | 121                | 121               | 164     | 141                | 263     | 141               | 263     | 140     | F12/<br>F16    | 914               | 242     | 13                      | 29                                 |
|                 | 25                 | 121                | 121               |         | 114                | 243     | 114               | 243     |         |                |                   |         | 13                      | 29                                 |
|                 | 40                 | 121                | 121               |         | 114                | 210     | 114               | 210     |         |                |                   |         | 13                      | 28                                 |
|                 | 50                 | 121                | 140               |         | 114                | 210     | 130               | 248     |         |                |                   |         | 16                      | 37                                 |
|                 | 65                 | 140                | 140               |         | 130                | 248     | 133               | 251     |         |                |                   |         | 16                      | 37                                 |
| 40              | 40                 | 146                | Not<br>Applicable | 212     | 133                | 265     | Not<br>Applicable |         | 140     | F16            | Not<br>Applicable |         | 13                      | 38                                 |
|                 | 50                 | 146                |                   |         | 130                | 274     |                   |         |         |                |                   |         | 16                      | 39                                 |
|                 | 65                 | 146                |                   |         | 130                | 229     |                   |         |         |                |                   |         | 16                      | 36                                 |

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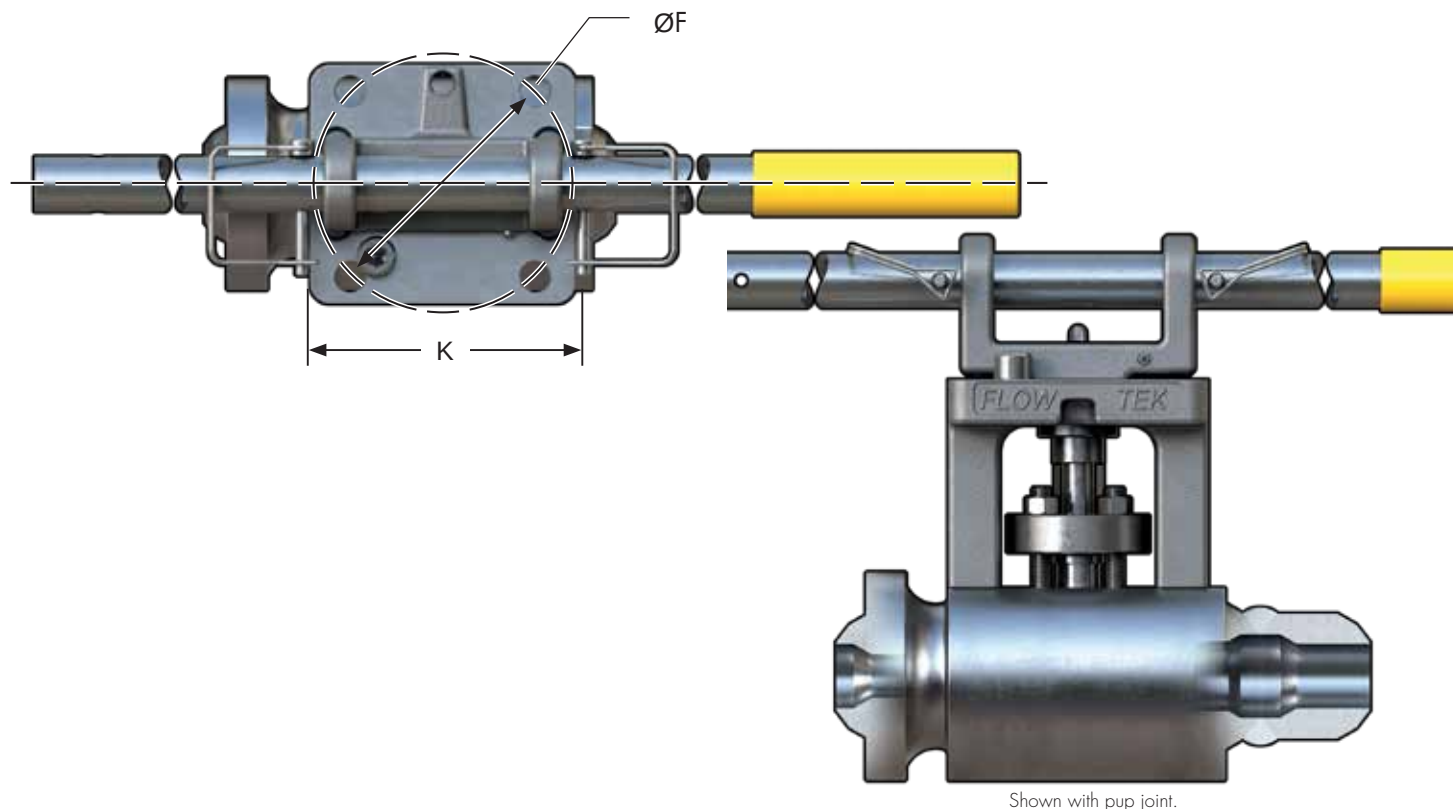


## BUTT WELD VALVE DIMENSIONS – IMPERIAL

| Ø Bore<br>in | Pipe Size<br>NPS | Pipe*<br>Schedule | Class                     | ØA<br>in. | B<br>in. | C<br>in. | D<br>in. | E<br>in. | ØF<br>ISO 5211 | G<br>in. | H<br>in. | K<br>in. | ØL<br>Pipe ID<br>in. | ØM<br>Pipe OD<br>in. | Weight<br>Valve/Handle Assy<br>lbs. |
|--------------|------------------|-------------------|---------------------------|-----------|----------|----------|----------|----------|----------------|----------|----------|----------|----------------------|----------------------|-------------------------------------|
| 0.63         | 1                | 160               | Up to<br>ASME<br>4500 LTD | 4.00      | 5.69     | 4.50     | 9.88     | 4.50     | F12            | 28.00    | 8.45     | 5.00     | 0.815                | 1.315                | 42                                  |
|              |                  | XXS               |                           |           |          |          | 9.88     |          |                |          |          |          | 0.599                | 1.315                | 42                                  |
|              | 1½               | 160               |                           |           |          |          | 7.75     |          |                |          |          |          | 1.338                | 1.900                | 42                                  |
|              |                  | XXS               |                           |           |          |          | 9.88     |          |                |          |          |          | 1.100                | 1.900                | 42                                  |
|              | 2                | 160               |                           |           |          |          | 7.75     |          |                |          |          |          | 1.687                | 2.375                | 41                                  |
|              |                  | XXS               |                           |           |          |          | 7.75     |          |                |          |          |          | 1.503                | 2.375                | 41                                  |
| 1.03         | 1½               | 160               | Up to<br>ASME<br>4500 LTD | 4.75      | 6.45     | 5.25     | 12.33    | 5.50     | F12/<br>F16    | 36.00    | 9.51     | 6.00     | 1.338                | 1.900                | 72                                  |
|              |                  | XXS               |                           |           |          |          | 12.33    |          |                |          |          |          | 1.100                | 1.900                | 71                                  |
|              | 2                | 160               |                           |           |          |          | 12.33    |          |                |          |          |          | 1.687                | 2.375                | 71                                  |
|              |                  | XXS               |                           |           |          |          | 12.33    |          |                |          |          |          | 1.503                | 2.375                | 71                                  |
|              | 2½               | 160               |                           |           |          |          | 9.20     |          |                |          |          |          | 2.125                | 2.875                | 67                                  |
|              |                  | XXS               |                           |           |          |          | 12.33    |          |                |          |          |          | 1.771                | 2.875                | 70                                  |
|              | 3                | 160               |                           |           |          |          | 9.20     |          |                |          |          |          | 2.624                | 3.500                | 66                                  |
|              |                  | XXS               |                           |           |          |          | 9.20     |          |                |          |          |          | 2.300                | 3.500                | 66                                  |
| 1.56         | 2                | 160               | Up to<br>ASME<br>3100 LTD | 5.75      | 8.33     | 5.73     | 13.73    | 5.50     | F16            | -        | -        | 6.75     | 1.687                | 2.375                | 90                                  |
|              |                  | XXS               |                           |           |          |          | 13.73    |          |                |          |          |          | 1.503                | 2.375                | 90                                  |
|              | 2½               | 160               |                           |           |          |          | 13.73    |          |                |          |          |          | 2.125                | 2.875                | 90                                  |
|              |                  | XXS               |                           |           |          |          | 13.73    |          |                |          |          |          | 1.771                | 2.875                | 90                                  |
|              | 3                | 160               | Up to<br>ASME<br>3100     |           |          |          | 13.73    |          |                |          |          |          | 2.624                | 3.500                | 89                                  |
|              |                  | XXS               |                           |           |          |          | 13.73    |          |                |          |          |          | 2.300                | 3.500                | 89                                  |
|              | 4                | 160               |                           |           |          |          | 10.10    |          |                |          |          |          | 3.438                | 4.500                | 80                                  |
|              |                  | XXS               |                           |           |          |          | 10.10    |          |                |          |          |          | 3.152                | 4.500                | 80                                  |

\*Other pipe schedules available upon request.

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### BUTT WELD VALVE DIMENSIONS – METRIC

| Ø Bore<br>mm | Pipe Size<br>DN | Pipe*<br>Schedule | Class                     | ØA<br>mm | B<br>mm | C<br>mm | D<br>mm | E<br>mm | ØF<br>ISO 5211 | G<br>mm | H<br>mm | K<br>mm | ØL<br>Pipe ID<br>mm       | ØM<br>Pipe OD<br>mm | Weight<br>Valve/Handle Assy<br>kg |     |     |     |             |     |     |     |    |    |    |
|--------------|-----------------|-------------------|---------------------------|----------|---------|---------|---------|---------|----------------|---------|---------|---------|---------------------------|---------------------|-----------------------------------|-----|-----|-----|-------------|-----|-----|-----|----|----|----|
| 16           | 25              | 160               | Up to<br>ASME<br>4500 LTD | 102      | 145     | 114     | 251     | 114     | F12            | 711     | 215     | 127     | 21                        | 33                  | 19                                |     |     |     |             |     |     |     |    |    |    |
|              |                 | XXS               |                           |          |         |         | 251     |         |                |         |         |         | 15                        | 33                  | 19                                |     |     |     |             |     |     |     |    |    |    |
|              | 40              | 160               |                           |          |         |         | 197     |         |                |         |         |         | 34                        | 48                  | 19                                |     |     |     |             |     |     |     |    |    |    |
|              |                 | XXS               |                           |          |         |         | 251     |         |                |         |         |         | 28                        | 48                  | 19                                |     |     |     |             |     |     |     |    |    |    |
|              | 50              | 160               |                           |          |         |         | 197     |         |                |         |         |         | 43                        | 60                  | 19                                |     |     |     |             |     |     |     |    |    |    |
|              |                 | XXS               |                           |          |         |         | 197     |         |                |         |         |         | 38                        | 60                  | 19                                |     |     |     |             |     |     |     |    |    |    |
|              | 26              | 40                |                           |          |         |         | 160     |         |                |         |         |         | Up to<br>ASME<br>4500 LTD | 121                 | 164                               | 133 | 313 | 140 | F12/<br>F16 | 914 | 242 | 152 | 34 | 48 | 33 |
|              |                 |                   |                           |          |         |         | XXS     |         |                |         |         |         |                           |                     |                                   |     | 313 |     |             |     |     |     | 28 | 48 | 32 |
| 50           |                 | 160               | 313                       | 43       | 60      | 32      |         |         |                |         |         |         |                           |                     |                                   |     |     |     |             |     |     |     |    |    |    |
|              |                 | XXS               | 313                       | 38       | 60      | 32      |         |         |                |         |         |         |                           |                     |                                   |     |     |     |             |     |     |     |    |    |    |
| 65           |                 | 160               | 234                       | 54       | 73      | 30      |         |         |                |         |         |         |                           |                     |                                   |     |     |     |             |     |     |     |    |    |    |
|              |                 | XXS               | 313                       | 45       | 73      | 32      |         |         |                |         |         |         |                           |                     |                                   |     |     |     |             |     |     |     |    |    |    |
| 80           |                 | 160               | 234                       | 67       | 89      | 30      |         |         |                |         |         |         |                           |                     |                                   |     |     |     |             |     |     |     |    |    |    |
|              |                 | XXS               | 234                       | 58       | 89      | 30      |         |         |                |         |         |         |                           |                     |                                   |     |     |     |             |     |     |     |    |    |    |
| 40           | 50              | 160               | Up to<br>ASME<br>3100 LTD | 146      | 212     | 146     | 349     | 140     | F16            | -       | -       | 171     | 43                        | 60                  | 41                                |     |     |     |             |     |     |     |    |    |    |
|              |                 | XXS               |                           |          |         |         | 349     |         |                |         |         |         | 38                        | 60                  | 41                                |     |     |     |             |     |     |     |    |    |    |
|              | 65              | 160               |                           |          |         |         | 349     |         |                |         |         |         | 54                        | 73                  | 41                                |     |     |     |             |     |     |     |    |    |    |
|              |                 | XXS               |                           |          |         |         | 349     |         |                |         |         |         | 45                        | 73                  | 41                                |     |     |     |             |     |     |     |    |    |    |
|              | 80              | 160               | Up to<br>ASME<br>3100     |          |         |         | 349     |         |                |         |         |         | 67                        | 89                  | 40                                |     |     |     |             |     |     |     |    |    |    |
|              |                 | XXS               |                           |          |         |         | 349     |         |                |         |         |         | 58                        | 89                  | 40                                |     |     |     |             |     |     |     |    |    |    |
|              | 100             | 160               |                           |          |         |         | 257     |         |                |         |         |         | 87                        | 114                 | 36                                |     |     |     |             |     |     |     |    |    |    |
|              |                 | XXS               |                           |          |         |         | 257     |         |                |         |         |         | 80                        | 114                 | 36                                |     |     |     |             |     |     |     |    |    |    |

\*Other pipe schedules available upon request.

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