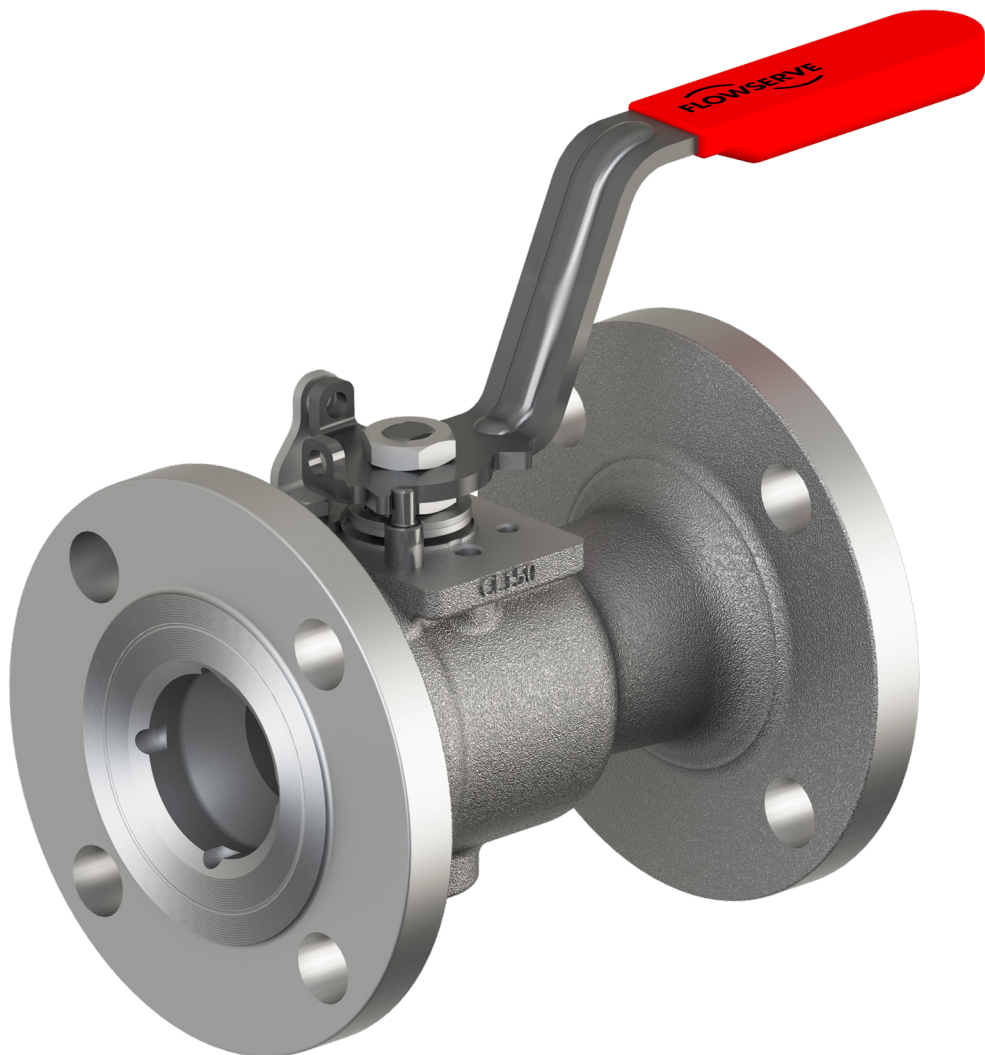


# **Worcester® F51/F52 Series Reduced Port Flanged Ball Valve**



## Designed for global availability and lower total costs

The proven Worcester F51/F52 series flanged ball valve from Flowserve has been engineered for worldwide availability and shorter lead times by standardizing its design, materials and construction.

As a result, the F51/F52 series valve minimizes fugitive emissions, enhances safety, and ensures regulatory and standards compliance to help companies achieve decarbonization and sustainability objectives. The globalized design meets critical certifications and standards in all jurisdictions.

Specifying the F51/F52 series valve also enables companies to lower the total cost of ownership owing to the standardization and interchangeability of parts, which are available in all regions.

In addition, Flowserve provides superior technical support and service available from a global network of Quick Response Centers (QRCs).



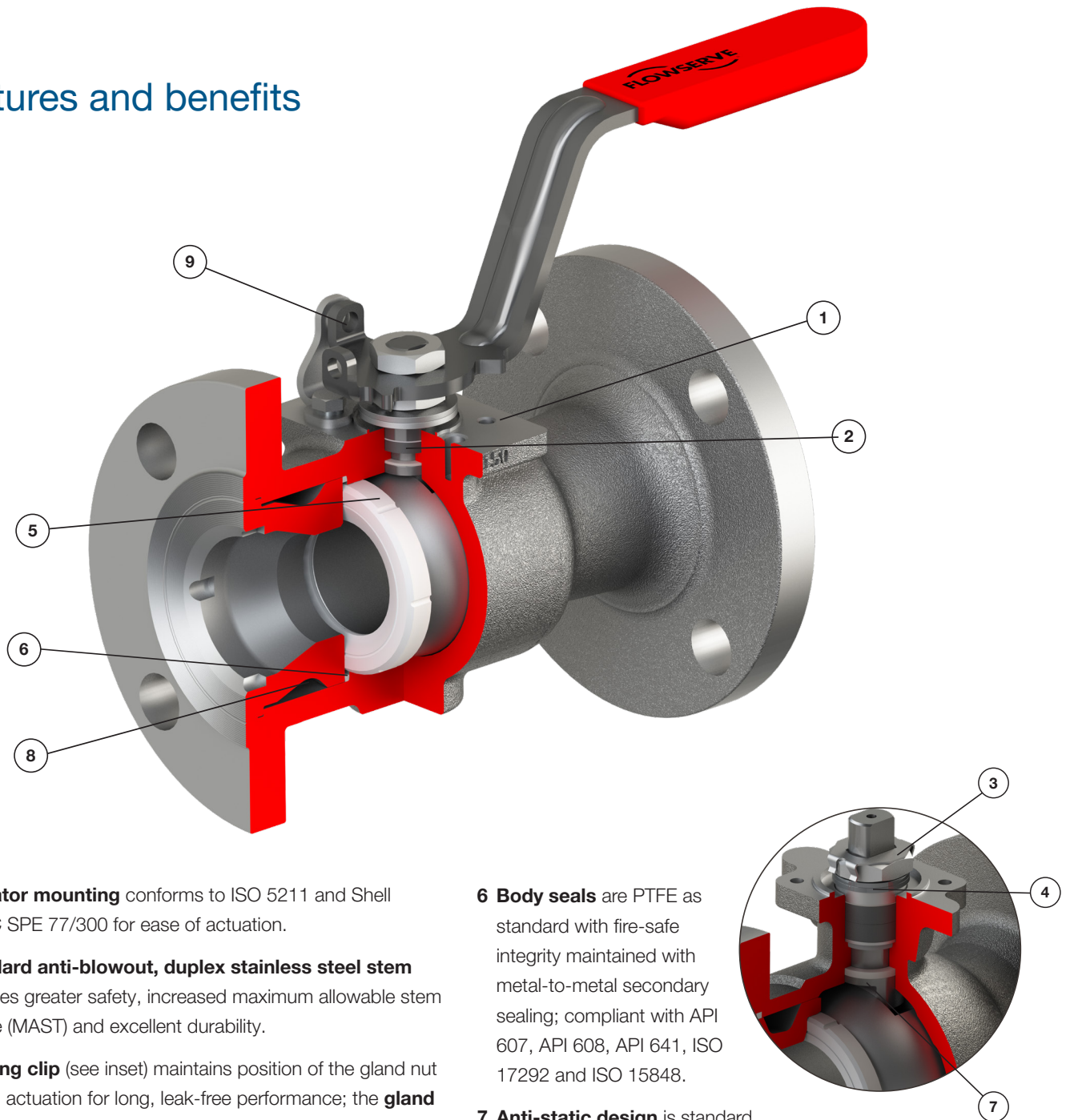
### Standardized for reliability, compliance and safety

To avoid regulatory and financial risks that can occur because of fugitive emissions, Flowserve designed the Worcester F51/F52 series valve to provide superior leakage resistance with a bubble-tight shutoff and a more robust, live-loaded packing design. Safety has been enhanced for end users as a result of the threaded end plug design, which ensures positive retention and eliminates any blowout risk.

### Industries and applications

| Chemical processing                                                                                                                                                            | Petrochemicals                                                                                           | Energy                                                                                                                                  | Other industries                                                                                                                                           |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"><li>• Thermal fluids</li><li>• Oxygen services</li><li>• Ammonia</li><li>• Chlorine</li><li>• Hydrogen peroxide</li><li>• Phosgene</li></ul> | <ul style="list-style-type: none"><li>• BTX</li><li>• Ethylene</li><li>• Polyolefins/aromatics</li></ul> | <ul style="list-style-type: none"><li>• Gasification</li><li>• Hydrogen</li><li>• Liquefied natural gas (LNG)</li><li>• Steam</li></ul> | <ul style="list-style-type: none"><li>• Defense</li><li>• Food and beverage</li><li>• Industrial gases</li><li>• Pharmaceuticals</li><li>• Water</li></ul> |

## Features and benefits



**1 Actuator mounting** conforms to ISO 5211 and Shell MESG SPE 77/300 for ease of actuation.

**2 Standard anti-blowout, duplex stainless steel stem** provides greater safety, increased maximum allowable stem torque (MAST) and excellent durability.

**3 Locking clip** (see inset) maintains position of the gland nut during actuation for long, leak-free performance; the **gland nut** does not need to be removed for actuator mounting, thereby maintaining valve integrity.

**4 Live-loaded packing** (see inset) for enhanced reliability; conforms to API 641 and ISO 15848 fugitive emissions certification standards.

**5 Seat design** is available in a wide range of materials to meet specific application requirements; the cavity pressure-relieving (CPR) design ensures that pressure generated through media expansion when the valve is closed is safely relieved upstream.

**6 Body seals** are PTFE as standard with fire-safe integrity maintained with metal-to-metal secondary sealing; compliant with API 607, API 608, API 641, ISO 17292 and ISO 15848.

**7 Anti-static design** is standard.

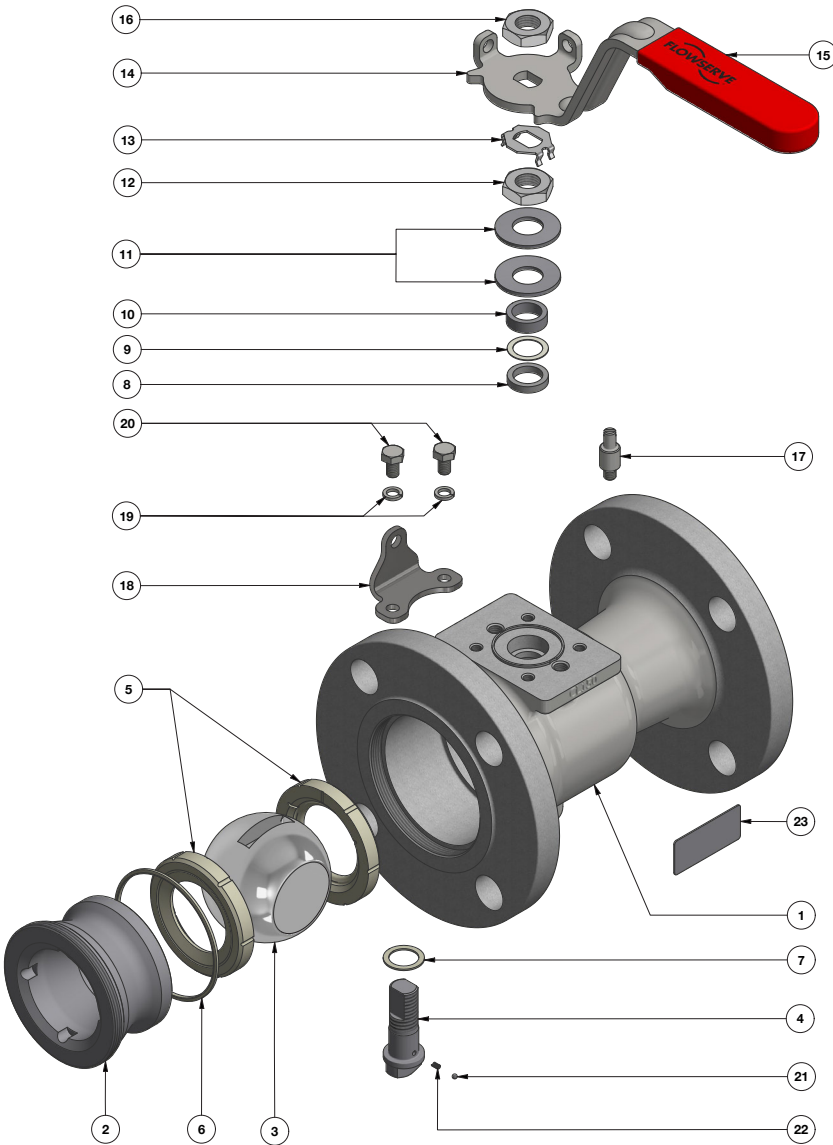
**8 Threaded insert** provides leak-tight positive retention and improved customer safety.

**9 Locking wrench** is standard on sizes through NPS 4 (DN100).

**Optional O-ring stem seal** is available for improved stem sealing performance, particularly in vacuum applications.

# Parts and materials lists

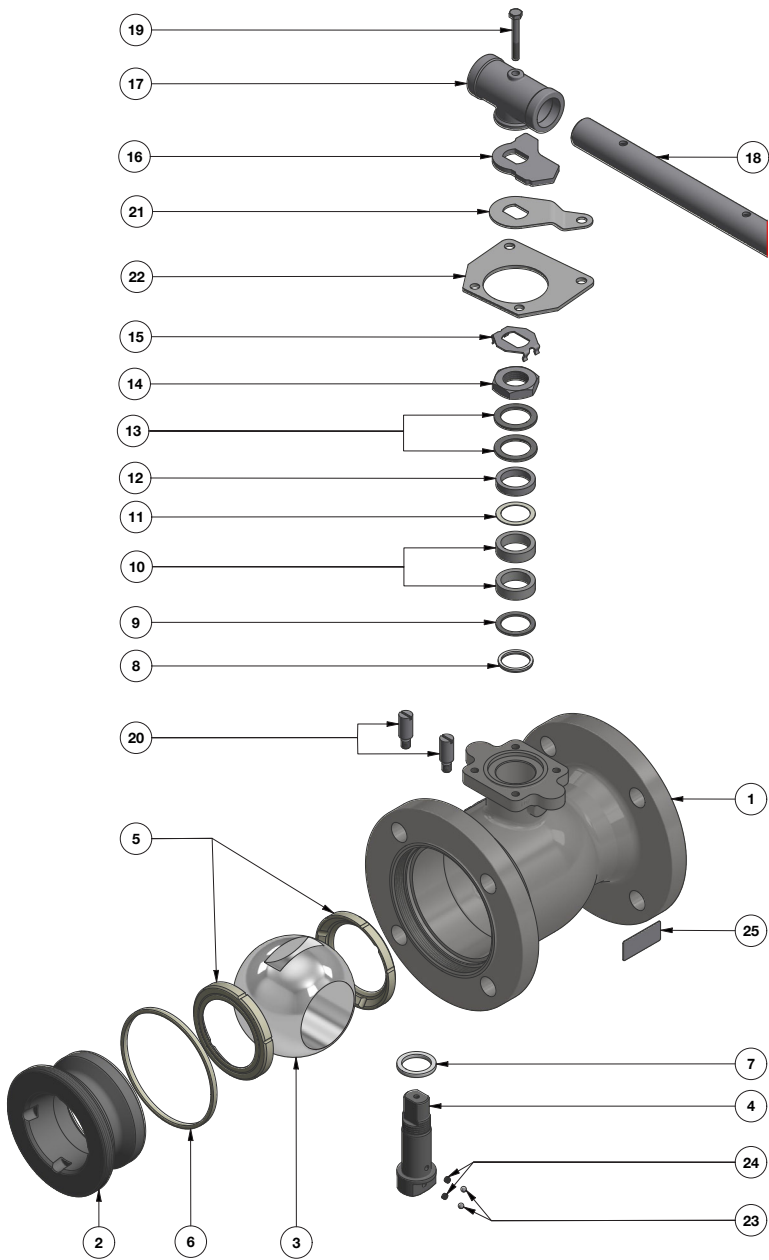
Sizes DN15 to DN50 (NPS ½ to 2)



| Item | Description            | Material                                   |
|------|------------------------|--------------------------------------------|
| 1    | Body*                  | ASTM A351 CF8M Stainless Steel             |
| 2    | Insert*                | ASTM A351 CF8M Stainless Steel             |
| 3    | Ball                   | ASTM A479 316 or A351 CF8M Stainless Steel |
| 4    | Stem                   | ASTM A479 S31803 Duplex Stainless Steel    |
| 5    | Seat                   | Virgin PTFE                                |
| 6    | Body Seal              | Virgin PTFE                                |
| 7    | Stem Thrust Seal       | 25% Glass-Filled PTFE                      |
| 8    | Gland Packing          | Flexible Graphite                          |
| 9    | Bearing Washer         | 25% Glass-Filled PTFE                      |
| 10   | Gland                  | AISI 316 Stainless Steel                   |
| 11   | Belleville Washer      | Stainless Steel                            |
| 12   | Gland Nut              | Stainless Steel                            |
| 13   | Gland Nut Locking Clip | Stainless Steel                            |
| 14   | Locking Wrench         | Stainless Steel                            |
| 15   | Wrench Sleeve          | Vinyl Plastisol                            |
| 16   | Wrench Nut             | Stainless Steel                            |
| 17   | Stop Pin               | Stainless Steel                            |
| 18   | Locking Plate          | Stainless Steel                            |
| 19   | Washers                | Stainless Steel                            |
| 20   | Hex Head Screws        | Stainless Steel                            |
| 21   | Anti-static Ball       | Stainless Steel                            |
| 22   | Anti-static Spring     | Stainless Steel                            |
| 23   | Identification Plate   | Stainless Steel                            |

\*Body and insert available in LCB and other alloys

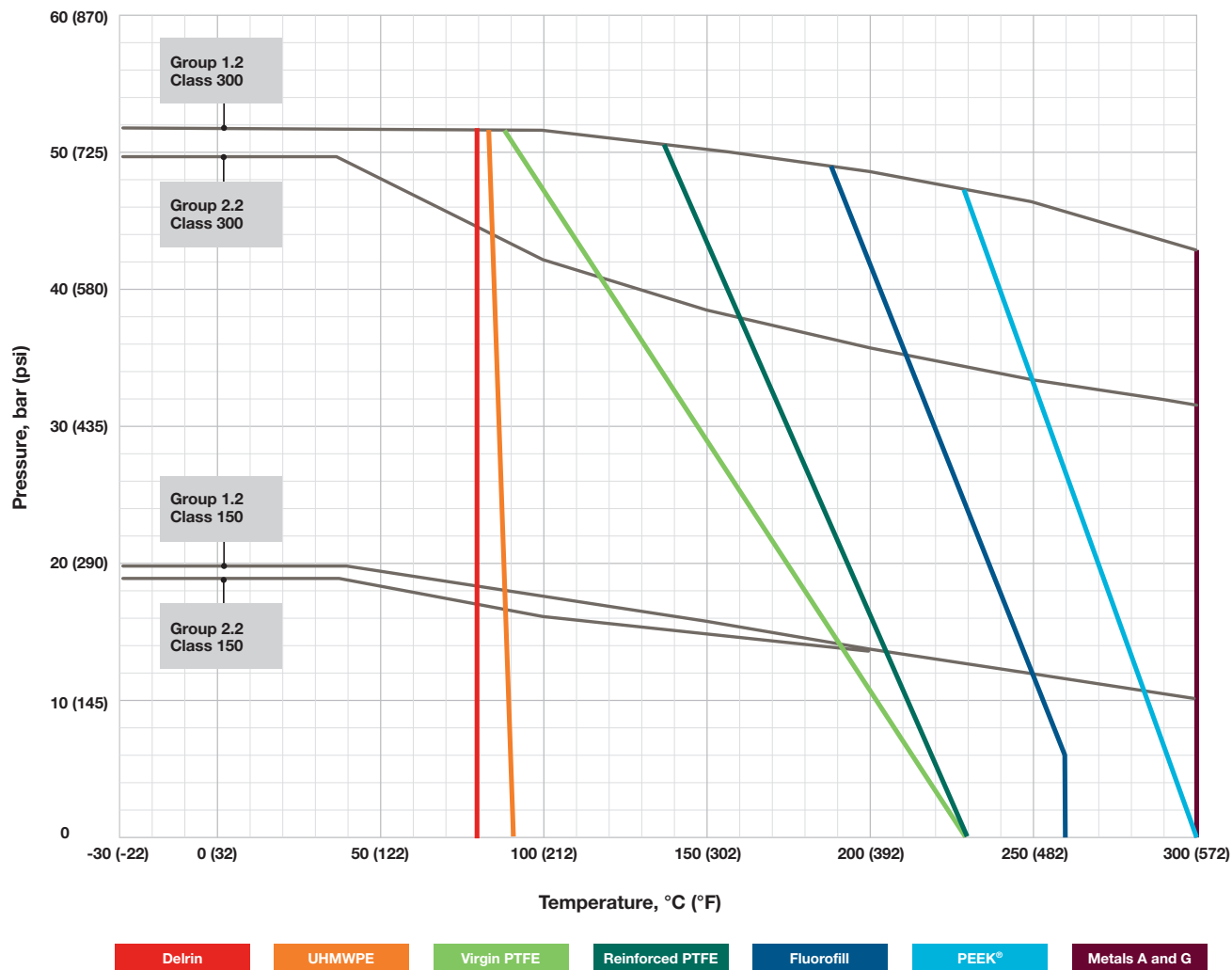
Sizes DN80 to DN200 (NPS 3 to 8)



| Item | Description               | Material                                   |
|------|---------------------------|--------------------------------------------|
| 1    | Body*                     | ASTM A351 CF8M<br>Stainless Steel          |
| 2    | Insert*                   | ASTM A351 CF8M<br>Stainless Steel          |
| 3    | Ball                      | ASTM A351 CF8M<br>Stainless Steel          |
| 4    | Stem                      | ASTM A479 S31803<br>Duplex Stainless Steel |
| 5    | Seat                      | Virgin PTFE                                |
| 6    | Body Seal                 | Virgin PTFE                                |
| 7    | Stem Thrust<br>Seal       | 25% Glass-Filled PTFE                      |
| 8    | Secondary<br>Stem Seal    | Virgin PTFE                                |
| 9    | Stem<br>Location<br>Ring  | Stainless Steel                            |
| 10   | Gland<br>Packing          | Flexible Graphite                          |
| 11   | Bearing<br>Washer         | 25% Glass-Filled PTFE                      |
| 12   | Gland                     | AISI 316 Stainless Steel                   |
| 13   | Belleville<br>Washer      | Stainless Steel                            |
| 14   | Gland Nut                 | Stainless Steel                            |
| 15   | Gland Nut<br>Locking Clip | Stainless Steel                            |
| 16   | Stop Plate                | AISI 316 Stainless Steel                   |
| 17   | Wrench<br>Head            | Stainless Steel                            |
| 18   | Wrench<br>Handle          | Stainless Steel                            |
| 19   | Hexagon<br>Headed Bolt    | Stainless Steel                            |
| 20   | Stop Pin                  | Stainless Steel                            |
| 21   | Moving Plate              | Stainless Steel                            |
| 22   | Fixed Plate               | Stainless Steel                            |
| 23   | Anti-static<br>Ball       | Stainless Steel                            |
| 24   | Anti-static<br>Spring     | Stainless Steel                            |
| 25   | Identification<br>Plate   | Stainless Steel                            |

\*Body and insert available in LCB and other alloys

## Pressure/temperature ratings



Material group pressure-temperature ratings are taken from ASME B16.34.

- Group 1.2 represents our dual-certified LCB/LCC and WCB/WCC materials.
- Group 2.2 represents our CF8M material.
- See page 7 for maximum seat temperature limits.

® PEEK is a registered trademark of Victrex plc Corp.

## Seat materials

Refer to page 6 to see pressure/temperature curves for each seat material.

### Delrin (D)

Delrin, also known as POM or acetal homopolymer, is a durable and tough low-friction material. Its superior creep resistance means it performs excellently in high-pressure applications.

**Maximum temperature rating of 80°C (180°F)**

### UHMWPE (U)

Ultra-high molecular weight polyethylene (UHMWPE) offers good performance characteristics in applications where PTFE is not suitable, e.g., tobacco duty. It also has good abrasion resistance.

**Maximum temperature rating of 90°C (200°F)**

### Virgin PTFE (T)

Virgin PTFE, the most common sealing material, is suitable for almost all media since it has excellent chemical resistance. It also has an exceptionally low coefficient of friction, allowing for low valve operating torque.

**Maximum temperature rating of 230°C (450°F)**

### Reinforced PTFE (R)

Seats made from PTFE reinforced with glass are stronger and more wear-resistant than virgin PTFE seats, making them more suitable for applications involving higher pressure/temperature ratings or high cycling.

**Maximum temperature rating of 230°C (450°F)**

### Fluorofill/Polyfill (P)

Seats made from PTFE reinforced with carbon, glass and graphite have outstanding dimensional stability across a broad temperature range. This material is well-suited for a variety of thermal services, including steam and cryogenic applications. Due to its high cycling capabilities, Fluorofill seats are recommended for modulating control applications.

**Maximum temperature rating of 260°C (500°F)**

### PEEK (X)

Polyether ether ketone (PEEK) demonstrates outstanding pressure capabilities at elevated temperatures, and that is why it has the highest P/T rating of our non-metallic seat materials. It also has very good chemical and abrasion resistance.

**Maximum temperature rating of 315°C (600°F)**

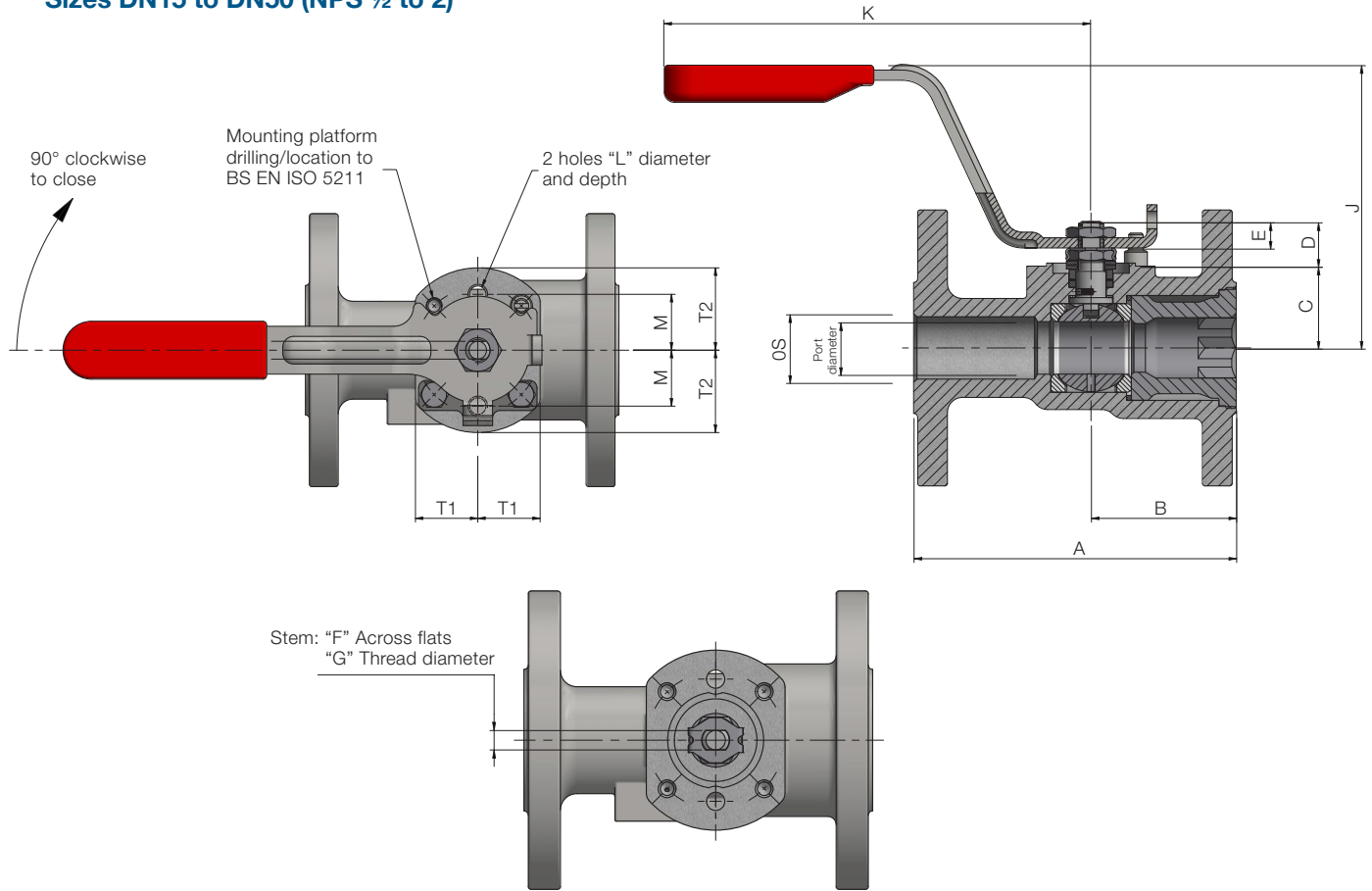
### Metal (A or G)

Seats made from 316L sintered metal impregnated with PTFE (A) or graphite (G) help to reduce torque and improve operability. The strength of the metal creates seats which offer excellent abrasion resistance and pressure-handling capabilities at elevated temperatures.

**Maximum temperature rating of 315°C (600°F)**

# Dimensions

## Sizes DN15 to DN50 (NPS ½ to 2)



### Dimensions indicated in mm (in.)

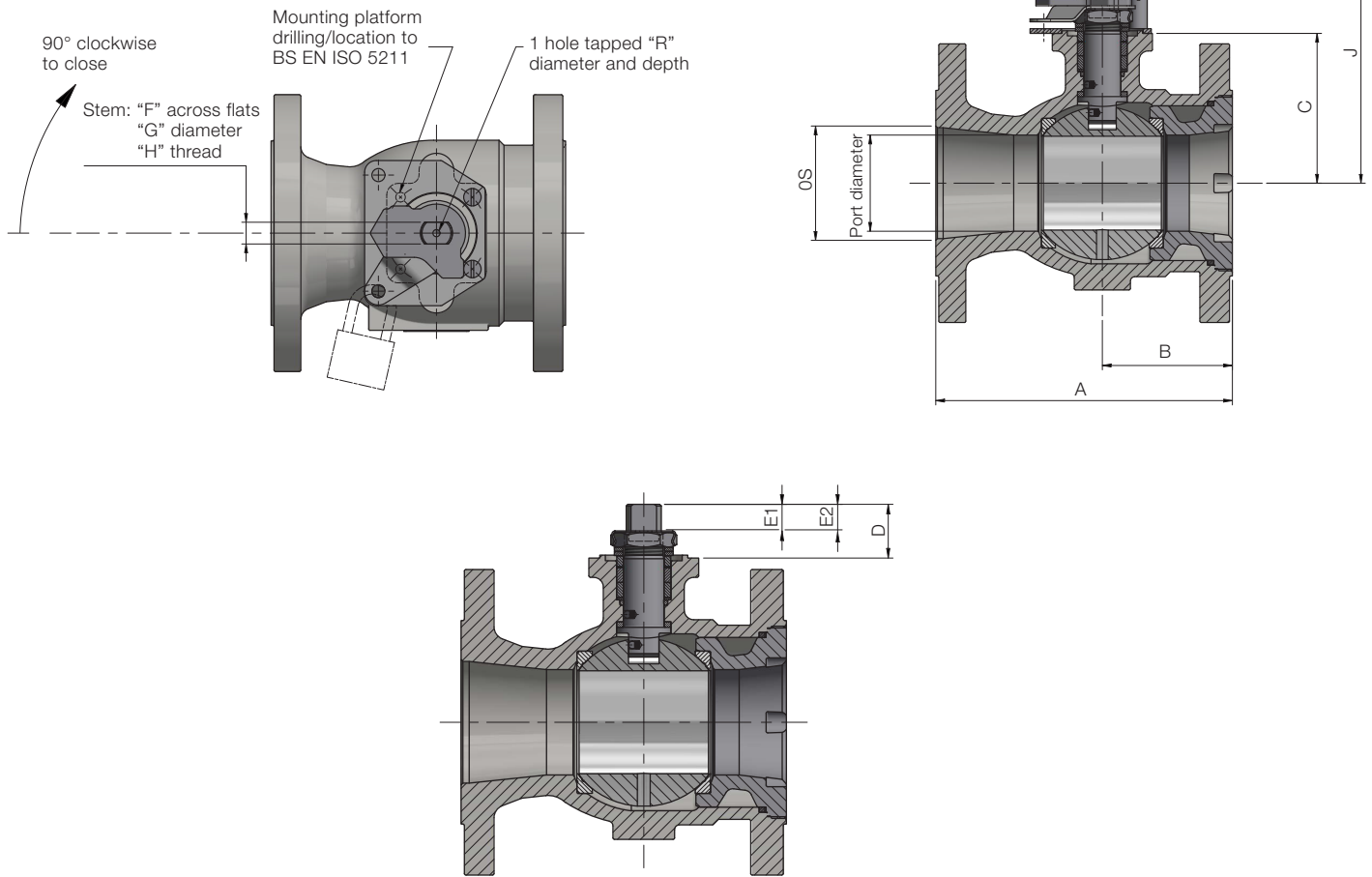
| Valve Size<br>DN | NPS | Valve Series | Min. Port Ø  | A             | B            | C <sup>(1)</sup> | D <sup>(1)</sup> | E Min.       | Stem             |             | J             | K           | L Thread and Depth            | M             | S Ø        | T1            | T2            | ISO Size <sup>(2)</sup> | Approx. Weight kg (lb) |
|------------------|-----|--------------|--------------|---------------|--------------|------------------|------------------|--------------|------------------|-------------|---------------|-------------|-------------------------------|---------------|------------|---------------|---------------|-------------------------|------------------------|
|                  |     |              |              |               |              |                  |                  |              | F <sup>(1)</sup> | G Thread    |               |             |                               |               |            |               |               |                         |                        |
| 15               | ½   | F51          | 11.1 (0.437) | 108.0 (4.252) | 52.5 (2.067) | 22.96 (0.904)    | 18.0 (0.709)     | 8.1 (0.319)  | 7.00 (0.276)     | M10 x 1.25p | 102.6 (4.039) | 155 (6.102) | M6 x 1.0p x 9.2 (0.362) Min.  | 16.9 (0.665)  | 15 (0.591) | 19.2 (0.756)  | 23.25 (0.915) | F03                     | 1.8 (4.0)              |
|                  |     | F52          | 11.1 (0.437) | 140.0 (5.512) | 52.5 (2.067) | 22.96 (0.904)    | 18.0 (0.709)     | 8.1 (0.319)  | 7.00 (0.276)     | M10 x 1.25p | 102.6 (4.039) | 155 (6.102) | M6 x 1.0p x 9.2 (0.362) Min.  | 16.9 (0.665)  | 15 (0.591) | 19.2 (0.756)  | 23.25 (0.915) | F03                     | 2.4 (5.3)              |
| 20               | ¾   | F51          | 14.4 (0.567) | 117.0 (4.606) | 54.6 (2.15)  | 22.96 (0.904)    | 18.0 (0.709)     | 8.1 (0.319)  | 7.00 (0.276)     | M10 x 1.25p | 102.6 (4.039) | 155 (6.102) | M6 x 1.0p x 9.2 (0.362) Min.  | 16.9 (0.665)  | 20 (0.787) | 19.2 (0.756)  | 23.25 (0.915) | F03                     | 2.2 (4.9)              |
|                  |     | F52          | 14.4 (0.567) | 152.0 (5.984) | 54.6 (2.15)  | 22.96 (0.904)    | 18.0 (0.709)     | 8.1 (0.319)  | 7.00 (0.276)     | M10 x 1.25p | 102.6 (4.039) | 155 (6.102) | M6 x 1.0p x 9.2 (0.362) Min.  | 16.9 (0.665)  | 20 (0.787) | 19.2 (0.756)  | 23.25 (0.915) | F03                     | 3.6 (7.9)              |
| 25               | 1   | F51          | 20.7 (0.815) | 127.0 (5.000) | 57.2 (2.252) | 32.34 (1.273)    | 18.0 (0.709)     | 10.4 (0.409) | 7.00 (0.276)     | M10 x 1.25p | 111.6 (4.394) | 168 (6.614) | M8 x 1.25p x 9.7 (0.382) Min. | 22.25 (0.876) | 27 (1.063) | 25.25 (0.994) | 32.8 (1.291)  | F05                     | 3.1 (6.8)              |
|                  |     | F52          | 20.7 (0.815) | 165.0 (6.496) | 57.2 (2.252) | 32.34 (1.273)    | 18.0 (0.709)     | 10.4 (0.409) | 7.00 (0.276)     | M10 x 1.25p | 111.6 (4.394) | 168 (6.614) | M8 x 1.25p x 9.7 (0.382) Min. | 22.25 (0.876) | 27 (1.063) | 25.25 (0.994) | 32.8 (1.291)  | F05                     | 4.8 (10.6)             |
| 40               | 1½  | F51          | 31.8 (1.252) | 165.0 (6.496) | 66.6 (2.622) | 42.33 (1.667)    | 27.0 (1.063)     | 11.8 (0.465) | 9.50 (0.374)     | M14 x 1.5p  | 130.9 (5.154) | 193 (7.598) | M8 x 1.25p x 9.7 (0.382) Min. | 22.25 (0.876) | 40 (1.575) | 25.25 (0.994) | 32.8 (1.291)  | F05                     | 5.6 (12.3)             |
|                  |     | F52          | 31.8 (1.252) | 190.0 (7.480) | 66.6 (2.622) | 42.33 (1.667)    | 27.0 (1.063)     | 11.8 (0.465) | 9.50 (0.374)     | M14 x 1.5p  | 130.9 (5.154) | 193 (7.598) | M8 x 1.25p x 9.7 (0.382) Min. | 22.25 (0.876) | 40 (1.575) | 25.25 (0.994) | 32.8 (1.291)  | F05                     | 8.8 (19.4)             |
| 50               | 2   | F51          | 38.2 (1.504) | 178.0 (7.008) | 70.9 (2.791) | 47.06 (1.853)    | 27.0 (1.063)     | 11.8 (0.465) | 9.50 (0.374)     | M14 x 1.5p  | 135.7 (5.343) | 193 (7.598) | M8 x 1.25p x 9.7 (0.382) Min. | 22.25 (0.876) | 50 (1.969) | 27 (1.063)    | 38.75 (1.526) | F05                     | 8.0 (17.6)             |
|                  |     | F52          | 38.2 (1.504) | 216.0 (8.504) | 70.9 (2.791) | 47.06 (1.853)    | 27.0 (1.063)     | 11.8 (0.465) | 9.50 (0.374)     | M14 x 1.5p  | 135.7 (5.343) | 193 (7.598) | M8 x 1.25p x 9.7 (0.382) Min. | 22.25 (0.876) | 50 (1.969) | 28 (1.102)    | 38.75 (1.526) | F05                     | 10.9 (24.0)            |

(1) Dimensions C, D and F are indicated for the minimum and maximum tolerances to support mounting kits and automation. All other dimensions indicate their centerline.

(2) ISO platform dimensions as per ISO 5211.

# Worcest<sup>®</sup> F51/F52 Series Reduced Port Flanged Ball Valve

## Sizes DN80 to DN200 (NPS 3 to 8)



## Dimensions indicated in mm (in.)

| Valve Size         |                  | Valve Series | Min. Port Ø   | A              | B             | C <sup>(1)</sup>               | D <sup>(1)</sup>             | E1 Min.      | E2 Min.      | Stem                           |                                |            | J             | K              | S Ø           | R Thread and Depth             | ISO Size <sup>(2)</sup> | Approx. Weight kg (lb) |
|--------------------|------------------|--------------|---------------|----------------|---------------|--------------------------------|------------------------------|--------------|--------------|--------------------------------|--------------------------------|------------|---------------|----------------|---------------|--------------------------------|-------------------------|------------------------|
| DN                 | NPS              |              |               |                |               |                                |                              |              |              | F <sup>(1)</sup>               | G Ø                            | H Thread   |               |                |               |                                |                         |                        |
| 80                 | 3                | F51          | 65.8 (2.591)  | 203.0 (7.992)  | 89.0 (3.504)  | 102.7 (4.043)<br>102.3 (4.028) | 34.0 (1.339)<br>33.0 (1.299) | 16.6 (0.654) | 17.1 (0.673) | 14.99 (0.590)<br>14.95 (0.589) | 21.95 (0.864)<br>21.85 (0.860) | M24 x 2.0p | 175.7 (6.917) | 349.0 (13.74)  | 78.2 (3.079)  | M6 x 1.0p x 12.0 (0.472) Min.  | F07                     | 16.8 (37.0)            |
|                    |                  | F52          | 64.2 (2.528)  | 282.0 (11.102) | 89.0 (3.504)  | 102.7 (4.043)<br>102.3 (4.028) | 34.0 (1.339)<br>33.0 (1.299) | 16.6 (0.654) | 17.1 (0.673) | 14.99 (0.590)<br>14.95 (0.589) | 21.95 (0.864)<br>21.85 (0.860) | M24 x 2.0p | 175.7 (6.917) | 349.0 (13.74)  | 78.5 (3.090)  | M6 x 1.0p x 12.0 (0.472) Min.  | F07                     | 25.1 (55.3)            |
| 100                | 4                | F51          | 76.5 (3.012)  | 229.0 (9.016)  | 107.0 (4.213) | 112.2 (4.417)<br>111.8 (4.402) | 34.0 (1.339)<br>33.0 (1.299) | 16.6 (0.654) | 17.1 (0.673) | 14.99 (0.590)<br>14.95 (0.589) | 21.95 (0.864)<br>21.85 (0.860) | M24 x 2.0p | 185.2 (7.291) | 349.0 (13.74)  | 101.9 (4.012) | M6 x 1.0p x 12.0 (0.472) Min.  | F07                     | 25.4 (56.0)            |
|                    |                  | F52          | 76.5 (3.012)  | 305.0 (12.008) | 107.0 (4.213) | 119.7 (4.713)<br>119.3 (4.697) | 45.0 (1.772)<br>43.0 (1.693) | 22.0 (0.866) | 22.6 (0.890) | 18.99 (0.748)<br>18.94 (0.746) | 27.95 (1.100)<br>27.85 (1.096) | M30 x 2.0p | 206.7 (8.138) | 557.0 (21.929) | 104.5 (4.114) | M6 x 1.0p x 12.0 (0.472) Min.  | F10                     | 40.2 (88.6)            |
| 150 <sup>(3)</sup> | 6 <sup>(3)</sup> | F51          | 102.3 (4.028) | 267.0 (10.512) | 129.0 (5.079) | 140.4 (5.528)<br>140.0 (5.512) | 45.0 (1.772)<br>43.0 (1.693) | 24.7 (0.972) | 21.5 (0.846) | 18.99 (0.748)<br>18.94 (0.746) | 27.95 (1.100)<br>27.85 (1.096) | M30 x 2.0p | -             | -              | 154 (6.063)   | M6 x 1.0p x 12.0 (0.472) Min.  | F10                     | 42.0 (92.6)            |
|                    |                  | F52          | 102.3 (4.028) | 403.0 (15.866) | 129.0 (5.079) | 146.9 (5.783)<br>146.5 (5.768) | 56.0 (2.205)<br>54.0 (2.126) | 27.1 (1.067) | 27.1 (1.067) | 23.99 (0.944)<br>23.94 (0.943) | 36.00 (1.417)                  | M36 x 2.0p | -             | -              | 154 (6.063)   | M8 x 1.25p x 12.0 (0.472) Min. | F12                     | 73.1 (161.2)           |
| 200 <sup>(3)</sup> | 8 <sup>(3)</sup> | F51          | 153 (6.024)   | 419.0 (16.496) | 144.5 (5.689) | 182.2 (7.173)<br>181.8 (7.157) | 55.8 (2.197)<br>54.0 (2.126) | 26.9 (1.059) | 26.9 (1.059) | 23.99 (0.944)<br>23.94 (0.943) | 36.00 (1.417)                  | M36 x 2.0p | -             | -              | 206.5 (8.13)  | M8 x 1.25p x 12.0 (0.472) Min. | F12                     | 75.5 (166.5)           |
|                    |                  | F52          | 153 (6.024)   | 419.0 (16.496) | 144.5 (5.689) | 194.4 (7.654)<br>194.0 (7.638) | 69.0 (2.717)<br>67.0 (2.638) | 35.0 (1.378) | 35.0 (1.378) | 31.99 (1.259)<br>31.93 (1.257) | 48.00 (1.889)                  | M48 x 3.0p | -             | -              | 206.5 (8.13)  | M8 x 1.25p x 12.0 (0.472) Min. | F14                     | 121.3 (267.4)          |

(1) Dimensions C, D and F are indicated for the minimum and maximum tolerances to support mounting kits and automation. All other dimensions indicate their centerline.

(2) ISO platform dimensions as per ISO 5211.

(3) DN150 (NPS 6) and DN200 (NPS 8) have gearboxes as standard. Consult factory for gearbox dimensions.

## Technical information

### Standards of compliance

|                     |                                                                                                                                                                                                                                                                                                   |
|---------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Valve Specification | FM Approval Certified<br>BS EN ISO 17292 and API 608<br>Pressure Equipment Directive 2014/68/EU<br>Pressure Equipment Regulations SI 2016<br>Assessment Category: Pressure Accessory, Group 1 GAS, Table 6,<br>Module 'H', Category III<br>SIL 3 Capable<br>TSG<br>FM<br>CRN<br>TR CU 010/012/032 |
| Face-to-face        | F51 Series: BS EN 558-2 and ASME B16.10<br>F52 Series: BS EN 558-2 and ASME B16.10                                                                                                                                                                                                                |
| Flanged Connections | BS EN 1759-1 and ASME B16.5 CL150<br>BS EN 1759-1 and ASME B16.5 CL300                                                                                                                                                                                                                            |
| Fugitive Emissions  | ISO 15848: Class BH and API 641                                                                                                                                                                                                                                                                   |
| Surface Quality     | MSS SP-55                                                                                                                                                                                                                                                                                         |
| Fire Test           | API 607 and ISO 10497                                                                                                                                                                                                                                                                             |
| Pressure Test       | BS EN 12266-1, ISO 5208 and API 598                                                                                                                                                                                                                                                               |
| Sour Service        | NACE MR0175 and ISO 15156 or MR0103                                                                                                                                                                                                                                                               |

### Flow coefficients

| Valve Size |     | Flow Coefficients |                   | Equivalent Length of Pipe |      |
|------------|-----|-------------------|-------------------|---------------------------|------|
| DN         | NPS | Cv <sup>(1)</sup> | Kv <sup>(2)</sup> | m                         | ft   |
| 15         | ½   | 8                 | 7                 | 1.19                      | 3.9  |
| 20         | ¾   | 12                | 10                | 2.65                      | 8.7  |
| 25         | 1   | 32                | 28                | 1.10                      | 3.6  |
| 40         | 1½  | 82                | 71                | 1.13                      | 3.7  |
| 50         | 2   | 120               | 104               | 1.98                      | 6.5  |
| 80         | 3   | 350               | 303               | 2.16                      | 7.1  |
| 100        | 4   | 720               | 623               | 2.10                      | 6.9  |
| 150        | 6   | 1,020             | 882               | 6.22                      | 20.4 |
| 200        | 8   | 1,800             | 1,557             | 11.49                     | 37.7 |

(1) Cv: Flow in US gpm (measured with a pressure drop across the valve of 1 psi)

(2) Kv: Flow in m³/h (measured with a pressure drop across the valve of 1 bar)

### Torque values

| Valve Size |     | Valve Series | Maximum Allowable Stem Torque (MAST) <sup>(1)</sup> |        | Break-to-Open Torque With PTFE Seat <sup>(2)</sup> |        | Gland Nut Tightening Torque |            |
|------------|-----|--------------|-----------------------------------------------------|--------|----------------------------------------------------|--------|-----------------------------|------------|
| DN         | NPS |              | Nm                                                  | in.-lb | Nm                                                 | in.-lb | Nm                          | in.-lb     |
| 15         | ½   | F51          | 40                                                  | 354    | 5                                                  | 44     | 4.5 to 6.0                  | 40 to 53   |
|            |     | F52          | 40                                                  | 354    | 5                                                  | 44     |                             |            |
| 20         | ¾   | F51          | 40                                                  | 354    | 5                                                  | 44     | 4.5 to 6.0                  | 40 to 53   |
|            |     | F52          | 40                                                  | 354    | 5                                                  | 44     |                             |            |
| 25         | 1   | F51          | 40                                                  | 354    | 7                                                  | 62     | 5.5 to 7.5                  | 49 to 66   |
|            |     | F52          | 40                                                  | 354    | 9                                                  | 81     |                             |            |
| 40         | 1½  | F51          | 110                                                 | 974    | 19                                                 | 168    | 8 to 11                     | 71 to 97   |
|            |     | F52          | 110                                                 | 974    | 26                                                 | 230    |                             |            |
| 50         | 2   | F51          | 110                                                 | 974    | 24                                                 | 212    | 8 to 11                     | 71 to 97   |
|            |     | F52          | 110                                                 | 974    | 32                                                 | 283    |                             |            |
| 80         | 3   | F51          | 609                                                 | 5,390  | 72                                                 | 637    | 27 to 32                    | 239 to 283 |
|            |     | F52          | 609                                                 | 5,390  | 105                                                | 929    |                             |            |
| 100        | 4   | F51          | 609                                                 | 5,390  | 130                                                | 1,151  | 27 to 32                    | 239 to 283 |
|            |     | F52          | 1,046                                               | 9,256  | 190                                                | 1,682  |                             |            |
| 150        | 6   | F51          | 1,046                                               | 9,256  | 276                                                | 2,443  | 36 to 43                    | 319 to 381 |
|            |     | F52          | 1,568                                               | 13,878 | 435                                                | 3,850  |                             |            |
| 200        | 8   | F51          | 1,568                                               | 13,878 | 480                                                | 4,248  | 44 to 50                    | 389 to 443 |
|            |     | F52          | 4,249                                               | 37,607 | 675                                                | 5,974  |                             |            |

(1) MAST values calculated using the standard duplex stainless steel stem material

(2) Duty factor = 0; F51 @ 20 bar; F52 @ 50 bar; values are from AUTOSIZE 4.3; consult factory for other seat materials

# Product code

**Example 1:**      20 F 51 5 5 6 6 T T 7 - Z 150 \_\_\_\_\_  
                          1   2   3   4   5   6   7   8   9   10   11   12   13   14

**Example 2:**      40 F 52 6 6 6 6 R T 7 T Z 300 \_\_\_\_\_  
                          1   2   3   4   5   6   7   8   9   10   11   12   13   14

## 1. Size

| Code | DN  | NPS |
|------|-----|-----|
| 05   | 15  | ½   |
| 07   | 20  | ¾   |
| 10   | 25  | 1   |
| 15   | 40  | 1½  |
| 20   | 50  | 2   |
| 30   | 80  | 3   |
| 40   | 100 | 4   |
| 60   | 150 | 6   |
| 80   | 200 | 8   |

## 2. Variant

|           |                                                 |
|-----------|-------------------------------------------------|
| <b>F</b>  | Fire-safe                                       |
| <b>CF</b> | Cryogenic fire-safe, including bonnet extension |
| <b>EF</b> | EnviroSafe fire-safe                            |
| <b>S</b>  | Shell-compliant                                 |
| <b>V</b>  | V-Flow CPT control valve                        |

## 3. Series

|            |                           |
|------------|---------------------------|
| <b>F51</b> | Class 150 one-piece valve |
| <b>F52</b> | Class 300 one-piece valve |

## 4. Body

|          |                                 |
|----------|---------------------------------|
| <b>4</b> | WCB/WCC                         |
| <b>5</b> | WCB/LCB/LCC (Tripled Certified) |
| <b>6</b> | CF8M                            |
| <b>7</b> | Monel®                          |
| <b>A</b> | Alloy 20                        |
| <b>C</b> | Hastelloy® C                    |

## 5. End/insert

|          |                                 |
|----------|---------------------------------|
| <b>4</b> | WCB/WCC                         |
| <b>5</b> | WCB/LCB/LCC (Tripled Certified) |
| <b>6</b> | CF8M                            |
| <b>7</b> | Monel                           |
| <b>A</b> | Alloy 20                        |
| <b>C</b> | Hastelloy C                     |

## 6. Ball

|          |             |
|----------|-------------|
| <b>6</b> | CF8M        |
| <b>7</b> | Monel       |
| <b>A</b> | Alloy 20    |
| <b>C</b> | Hastelloy C |

## 7. Stem

|          |                                |
|----------|--------------------------------|
| <b>6</b> | Stainless steel <sup>(1)</sup> |
| <b>Q</b> | 17-4PH                         |
| <b>7</b> | Monel <sup>(2)</sup>           |
| <b>A</b> | Alloy 20 <sup>(2)</sup>        |
| <b>C</b> | Hastelloy C <sup>(2)</sup>     |

## 8. Seat

|          |                                 |
|----------|---------------------------------|
| <b>D</b> | Delrin                          |
| <b>T</b> | V-PTFE                          |
| <b>R</b> | Reinforced PTFE                 |
| <b>P</b> | Fluorofil/Polyfill              |
| <b>U</b> | UHMWPE                          |
| <b>X</b> | PEEK                            |
| <b>A</b> | Metal impregnated with PTFE     |
| <b>G</b> | Metal impregnated with graphite |

## 9. Body seal

|          |          |
|----------|----------|
| <b>T</b> | V-PTFE   |
| <b>Z</b> | Graphite |

## 10. Thrust seal

|          |                    |
|----------|--------------------|
| <b>7</b> | 25% glass PTFE     |
| <b>X</b> | PEEK               |
| <b>P</b> | Fluorofil/Polyfill |

## 11. Secondary stem seal/O-ring (optional)<sup>(3)</sup>

|          |                    |
|----------|--------------------|
| <b>T</b> | V-PTFE             |
| <b>V</b> | FKM                |
| <b>P</b> | Fluorofil/Polyfill |

## 12. Gland/stem packing

|          |          |
|----------|----------|
| <b>T</b> | V-PTFE   |
| <b>Z</b> | Graphite |

## 13. End connection/pressure class

|            |                      |
|------------|----------------------|
| <b>150</b> | ANSI B16.5 Class 150 |
| <b>300</b> | ANSI B16.5 Class 300 |

## 14. Special

Consult factory for "Special" options.

**Note:** The F51/F52 series valves include a gearbox as standard for sizes DN150 (NPS 6) or larger. This is not called out in the product code because it is a standard feature. Likewise, locking wrenches are included as standard for all valve sizes up to DN100 (NPS4).

- (1) Stainless steel stem material grade is selected based on stem strength and end use application requirements. Duplex as standard.
- (2) Depending on end use conditions, these stem materials may not comply with all the requirements of ISO 17292 or API 608.
- (3) Valve sizes DN50 (NPS 2) or below do not contain a secondary stem seal. As a result, this is reflected in the product code as a dash (-) to represent 'no option'.
- (4) Consult factory for other build configurations and materials.

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