

## Neles™ PFA lined ball valve PB2 series

PB2 series PFA lined ball valve is a full bore design to minimize pressure loss and provide maximum flow capacity. The flow port and internal parts are fully covered with PFA for excellent corrosion resistance. Spring loaded V-ring packing provides extremely long cycle life with minimum maintenance. The ISO mounting pad makes it easy for actuator automation.



### Technical description

- Sizes DN 15 to 150 (NPS 1/2 to 6)
- ASME Class 150
- Two-piece body construction
- Live-loaded stem packing
- Bi-directional bubble-tight shut-off

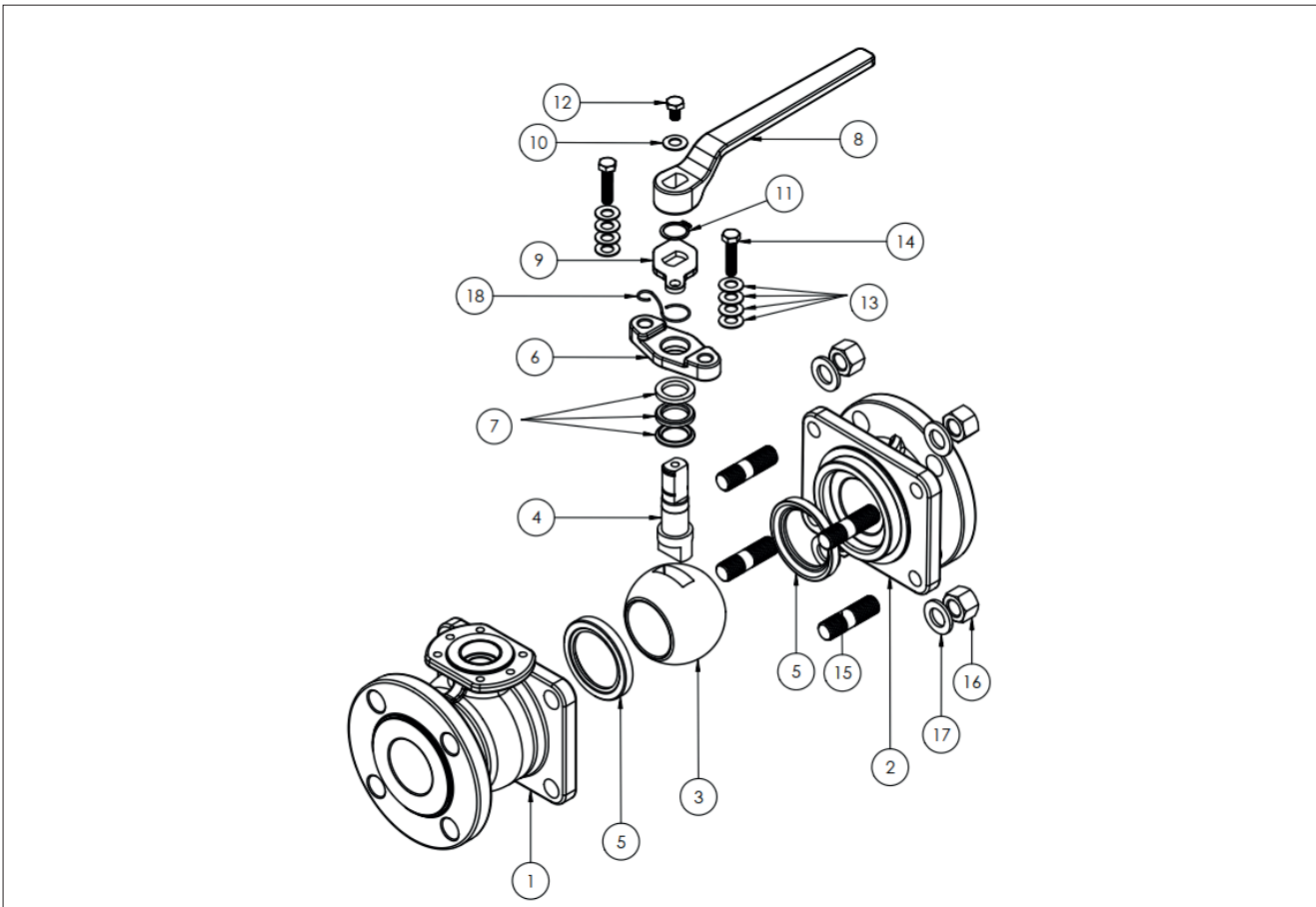
### Features

- ISO 5211 mounting pad for direct mounting of handle, gear operator, manual override, or actuator
- Internal entry blow-out proof stem design
- Spring loaded stem seal provides long cycle life and low emissions with minimal maintenance
- Anti-static grounding between stem and body
- Lockable handle for manual operation
- Liner thickness no less than 2.5 mm
- 15 Kv spark test is 100% done to check liner porosity
- 100% visual inspection on lining parts of each valve to avoid pin holes, porosity, cracks or surface discontinuities

### Applications

- Sulfuric acid
- Nitric acid
- Hydrochloric acid
- Phosphoric acid
- Chlorine
- Bromine
- Sea water
- Brine

## Exploded view and parts list



## Bill of material and parts list

| Part no. | Part name          | Material                               |                   |
|----------|--------------------|--|-------------------|
|          |                    | Ductile iron                           | Stainless steel   |
|          |                    | D2                                     | S4                |
| 1        | Body               | ASTM A395 Ductile Iron+PFA             | ASTM A351 CF8+PFA |
| 2        | Cap                | ASTM A395 Ductile Iron+PFA             | ASTM A351 CF8+PFA |
| 3        | Ball               | ASTM A351 CF8+PFA or ASTM A276 304+PFA |                   |
| 4        | Stem               | ASTM A276 304+PFA                      |                   |
| 5        | Seat               | TFM 1600                               |                   |
| 6        | Gland              | ASTM A351 CF8                          |                   |
| 7        | Gland packing      | PTFE                                   |                   |
| 8        | Handle             | ASTM A216 WCB                          | ASTM A351 CF8     |
| 9        | Stop plate         | ASTM A276 304                          |                   |
| 10       | Washer             | ASTM A276 304                          |                   |
| 11       | C-ring             | ASTM A276 304                          |                   |
| 12       | Bolt               | ASTM A193 Gr. B8                       |                   |
| 13       | Washer             | ASTM A276 304                          |                   |
| 14       | Gland bolt         | ASTM A193 Gr. B8                       |                   |
| 15       | Body bolt          | ASTM A193 Gr. B8                       |                   |
| 16       | Body nut           | ASTM A194 Gr.8                         |                   |
| 17       | Washer             | ASTM A276 304                          |                   |
| 18       | Anti-static spring | ASTM A313 302                          |                   |

## Technical specifications

|                       |             |                      |                          |
|-----------------------|-------------|----------------------|--------------------------|
| Nominal diameter:     | NPS 1/2 – 6 | Face to face length: | ASME B16.10              |
| Pressure rating:      | Class 150   | Leakage rate:        | API598                   |
| Flange accommodation: | ASME B16.5  | Standards followed:  | ASME B16.34, ASME B16.10 |

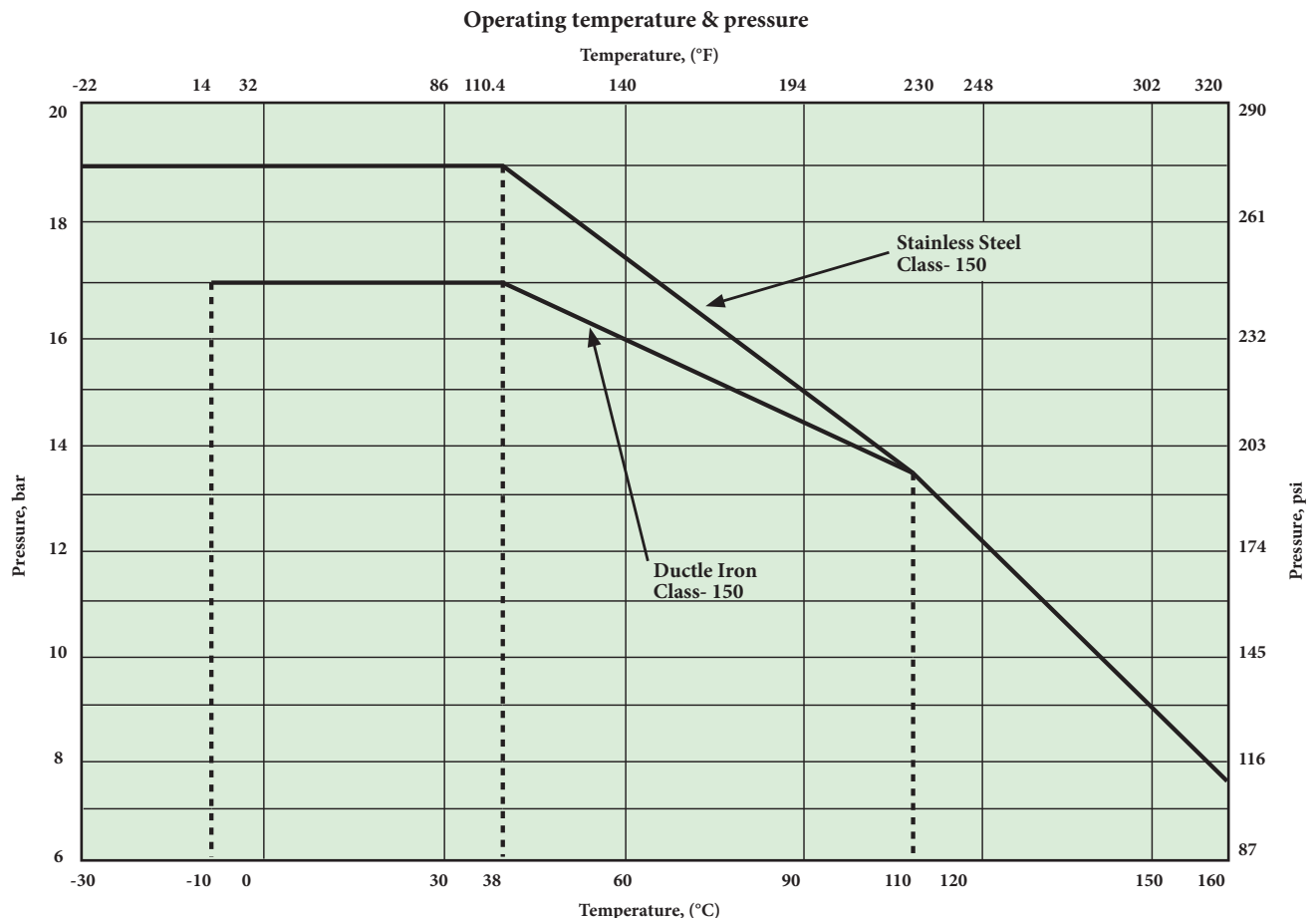
## Flow data

The table at right provides flow coefficients for PB2 series valves covered in this bulletin. Cv values represent the flow of water at +600 °F through the valve in US gallons per minute at a pressure drop of 1 psi. The metric equivalent, Kv, is the flow of water at +160 °C through the valve in cubic meters per hour at a pressure drop of 1 kg/cm<sup>2</sup>.

| Valve size NPS | Cv   | Kv   |
|----------------|------|------|
| 1/2            | 19   | 16   |
| 3/4            | 45   | 39   |
| 1              | 88   | 76   |
| 1 1/2          | 257  | 220  |
| 2              | 425  | 368  |
| 2 1/2          | 783  | 677  |
| 3              | 1053 | 902  |
| 4              | 2130 | 1843 |
| 6              | 3000 | 2595 |

## Operating temperature & pressure

Valve ratings, indicated by solid lines in the chart, are based on differential pressure with the valve ball in the fully closed position. The dotted lines indicate temperatures where the pressure ratings change. The solid lines are the valve rating as established by the body material, seat and seal materials, and lining material. Ductile iron valves are rated to a minimum temperature of -10 °C. Low temperature limit for the TFM seat is -30 °C.



## Valve torque data

Use this torque chart as a guide for actuator selection. The recommended minimum actuator torque includes a safety factor and is suitable for the maximum differential pressure of the fluid that the valve can withstand.

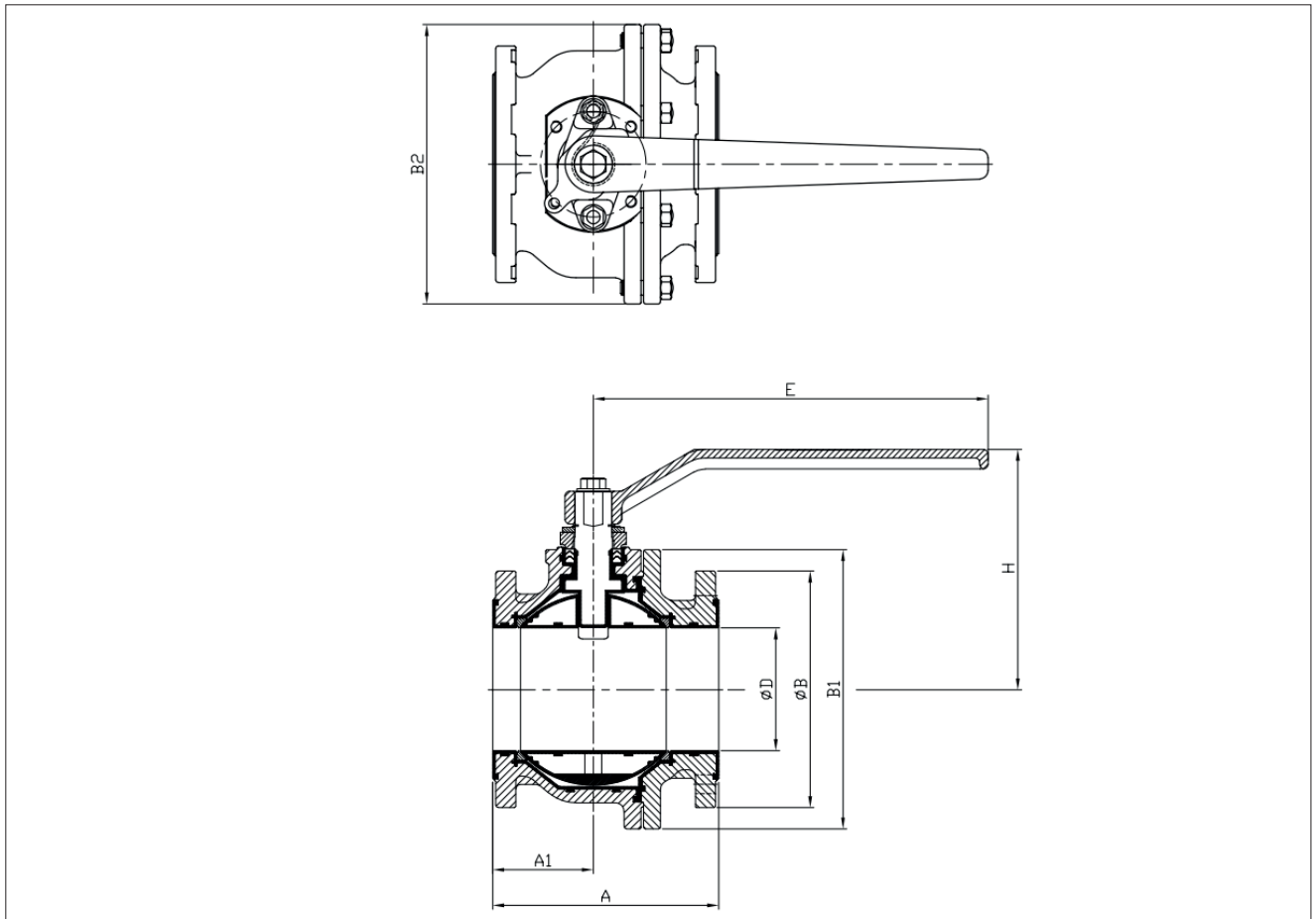
| Valve size<br>NPS | Recommended actuator torque |       |        |
|-------------------|-----------------------------|-------|--------|
|                   | Nm                          | ft-lb | kgf.cm |
| 1/2               | 6                           | 4     | 56     |
| 3/4               | 7                           | 6     | 70     |
| 1                 | 8                           | 6     | 84     |
| 1.5               | 21                          | 15    | 210    |
| 2                 | 35                          | 25    | 350    |
| 2.5               | 48                          | 35    | 490    |
| 3                 | 62                          | 45    | 630    |
| 4                 | 76                          | 56    | 770    |
| 6                 | 364                         | 269   | 3705   |

## Actuator selection

Selected rack and pinion actuator sizes in the chart are based on 4 barg minimum air supply pressure. Selected spring return actuator size is suitable for fail open or fail close configuration.

| Valve size<br>NPS | Recommended actuator model<br>4 bar air supply |          |
|-------------------|--|----------|
|                   | RNP DN00                                       | RNP SR40 |
| 1/2               | RNP 40   | RNP 50   |
| 3/4               | RNP 40   | RNP 50   |
| 1                 | RNP 40   | RNP 50   |
| 1.5               | RNP 63   | RNP 80   |
| 2                 | RNP 63   | RNP 90   |
| 2.5               | RNP 80   | RNP 100  |
| 3                 | RNP 80   | RNP 100  |
| 4                 | RNP 90   | RNP 110  |
| 6                 | RNP 150  | RNP 200  |

## Dimensions



| Valve size<br>NPS | Dimensions |     |       |       |       |     |     |       | ISO5211 | Weight<br>Kg |
|-------------------|------------|-----|-------|-------|-------|-----|-----|-------|---------|--------------|
|                   | ΦD         | A   | A1    | ΦB    | B1    | B2  | H   | E     |         |              |
| 1/2"              | 15         | 108 | 48.1  | 88.9  | 65.8  | 106 | 83  | 145   | F04     | 2.6          |
| 3/4"              | 20         | 117 | 50.8  | 98.6  | 67.9  | 108 | 84  | 145   | F04     | 3            |
| 1"                | 25         | 127 | 53.6  | 108   | 85.3  | 113 | 101 | 165   | F05     | 4.5          |
| 1 1/2"            | 40         | 165 | 76.5  | 127   | 106.4 | 145 | 128 | 225   | F07     | 8.8          |
| 2"                | 50         | 178 | 81.2  | 152.4 | 119.1 | 148 | 136 | 225   | F07     | 11.4         |
| 2 1/2"            | 65         | 190 | 88.3  | 177.8 | 158.5 | 179 | 168 | 350   | F07     | 16           |
| 3"                | 80         | 203 | 101.5 | 190.5 | 186.2 | 230 | 177 | 350   | F07     | 21.7         |
| 4"                | 100        | 229 | 91.5  | 228.6 | 228   | 228 | 233 | 400   | F10     | 33.7         |
| 6"                | 145        | 267 | 118.9 | 279.4 | 332   | 332 | 288 | 466.5 | F12     | 71.7         |

## How to order

| 1   | 2 | 3 | 4  | 5  | 6 | 7 | 8 | 9 |
|-----|---|---|----|----|---|---|---|---|
| PB2 | C | A | 01 | D2 | Z | T | A | - |

| 1. sign | Valve series & style                                       |
|---------|--|
| PB2     | PFA lined ball valve, full bore, Face-to-face: ASME B16.10 |

| 2. sign | Pressure rating |
|---------|-----------------|
| C       | ASME Class 150  |

| 3. sign | Construction                       |
|---------|------------------------------------|
| A       | Standard construction, PFA lining. |

| 4. sign | Size NPS |
|---------|----------|
| 0H      | 1/2"     |
| 3Q      | 3/4"     |
| 01      | 1"       |
| 1H      | 1 1/2"   |
| 02      | 2"       |
| 2H      | 2 1/2"   |
| 03      | 3"       |
| 04      | 4"       |
| 06      | 6"       |

| 5. sign | Material of body & trim |         |         |
|---------|-------------------------|---------|---------|
|         | Body                    | Ball    | Stem    |
| S4      | CF8+PFA                 | 304+PFA | 304+PFA |
| D2      | DI+PFA                  | 304+PFA | 304+PFA |

| 6. sign | Material of seat |
|---------|------------------|
| Z       | TFM 1600         |

| 7. sign | Packing material         |
|---------|--------------------------|
| T       | PTFE Live loaded packing |

| 8. sign | Version |
|---------|---------|
| A       | Model A |

| 9. sign | Additional requirement |
|---------|------------------------|
| -       | No                     |
| LD      | Locking device         |



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