# SERIES 44-49

## High Performance Butterfly Valve

Wafer, Lug, Double Flanged

DelVal®
Flow Controls

3-YEAR WARRANTY ON DELVAL PRODUCTS

**delvalflow.com**
1-833-DELVAL1

# **STANDARD** FEATURES

## Quality & Performance

**DelVal Flow Controls** provides a wide range of quality products with the reliability you can count on. All Series 44 - 49 high performance butterfly valves are manufactured in ISO 9001 certified facilities with a robust quality management system and according to ASME B16.34 and API 609 standards.

## Design Construction and Features

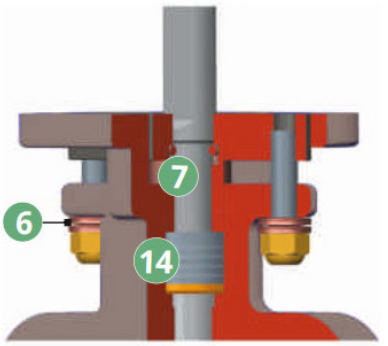
**1. Top Flange**
The top flange is drilled as per EN ISO 5211 to accommodate direct mounting of a wide range of actuators and manual operators.

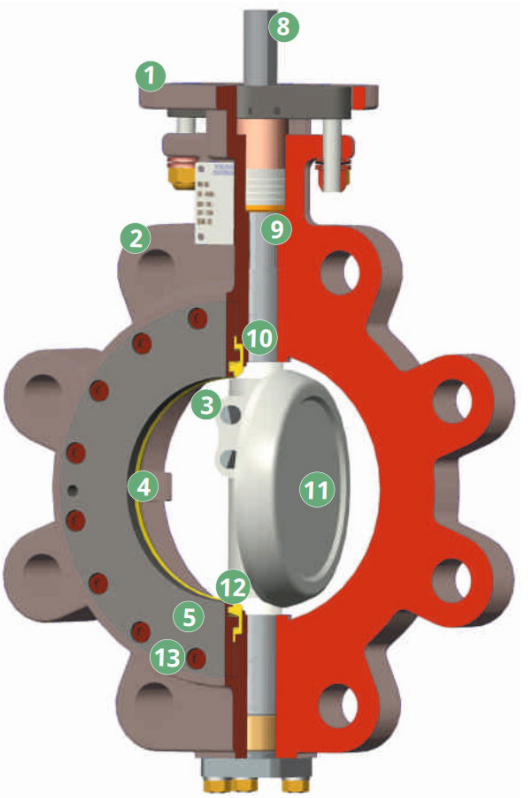
**2. Body**
One-piece wafer, lug, or double flanged style body offers bidirectional sealing as standard, available in ASME CL150 and CL300 pressure classes.

**3. Wedge Keys**
Keys are offset from the center of the stem which places them in compression rather than shear, eliminating potential for failure. The keys are wedge type and precision fit to provide positive mechanical engagement of disc to stem.

**4. Disc Stop**
The disc stop is designed to prevent disc from rotating in the wrong direction and avoiding seat damage.

**5. Seat Retainer**
Retains seat in the body and is supplied in the equivalent material as the body.




**6. Stem Seal**
Gland flange assembly is "live loaded" with Belleville springs. This ensures continuous compression of packing and sealing contact at the stem and body. Rocker shaped gland bridge compensates for uneven adjustment of gland bolts.

**7. Blow-out Proof Stem**
Valves are equipped with a stem retainer at the top of the stem to prevent movement of the top portion of the stem past the compressing ring in case the shaft should break within the valve.

**8. Stem**
A sturdy, one-piece stem provides increased torsional strength for higher torque applications.

**9. Extended Neck**
Extended neck allows for 2" of pipeline insulation and easy access to stem packing adjustment and actuator mounting.

**10. Bearings**
The drive and non-drive end stem "Bear-X" bearings are made out of an engineered, high compressive strength composite polymer material having excellent thermal, chemical and wear resistance.

**11. Disc**
The disc has been engineered to maximize flow and minimize resistance to provide a high flow coefficient (Cv).

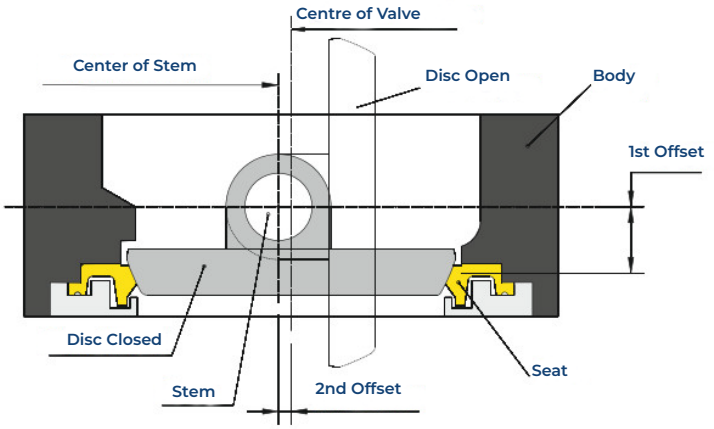
**12. Seat**
Unique seat design utilizes a self energizing, flexible lip seal concept which provides bi-directional sealing without relying on secondary components, avoiding thermal and chemical incompatibility of dissimilar materials.

**13. Bi-Directional Dead End Service**
All lug and double flange valves are suitable for dead-end service to full ASME pressure rating, bi-directionally.

**14. Adjustable Stem Packing**
The stem packing system features easy access to the adjusting hex head nuts without removal of the actuator.

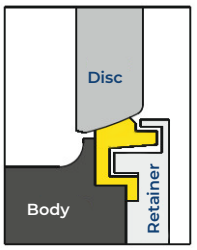
# **Design** and Specifications

## Double Offset Design



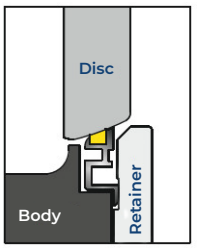

The double offset design produces a cam-like action in disc movement. This action reduces seat wear and eliminates seat deformation, thereby extending service life and reducing operating torques when compared to centric butterfly valve.

## Seat Designs



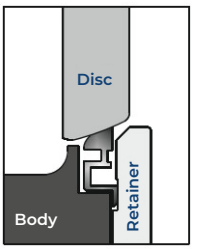

### Soft Seat

**Soft Seat:** Self-energizing flexible lip seat design retains its original shape and maintains a seal against the disc regardless of the flow direction.




### Fire Safe Seat

**Fire Safe Seat:** During and after fire, when the resilient material has been partially or completely destroyed, the backup metal seat ring provides two points of contact seals in either direction of media flow.




### Metal Seat

**Metal Seat:** Flexible metal seat offers a very high sealing capability with low leakage rates. The mechanical properties and the shape of the metal seat allow it to flex and maintain constant positive sealing against the disc.

## Special Applications

**Vacuum**

Standard soft seat and fire safe seat valves are rated for tight shut-off of vacuum to 0.75 Torr.

**Oxygen**

Valves for critical gaseous oxygen service are specially prepared, cleaned, inspected, assembled and tested to ensure removal of all burrs, sharp edges, dirt, hydrocarbon oil or grease and other contaminants.

**NACE Service**

Valves conforming to NACE MR0175 and MR0103 are available. These valves are well suited for oil and gas industry applications requiring resistant materials to sulfide stress cracking.

**Steam**

Valves are suitable for steam up to 200 psig for CL150 and up to 450psig for CL300 (Consult DelVal for seat configuration).

## Standards and Specifications

DelVal® Double Offset High Performance Butterfly Valves are designed and manufactured to meet the requirements of the following industry standards:

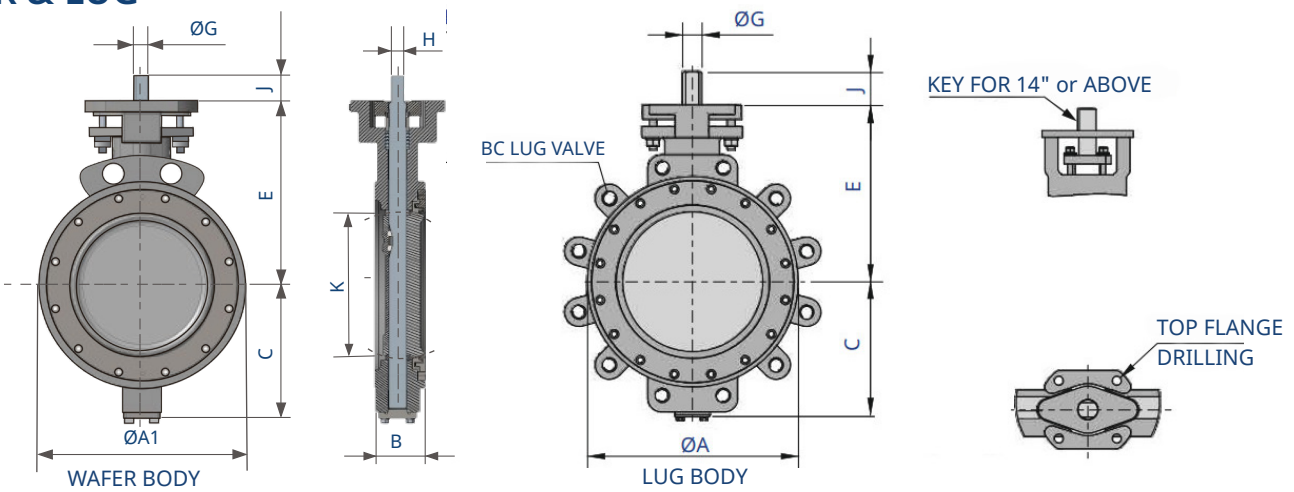
**Reference Design Standards:** API 609, BS EN 593, MSS SP-68
**Face to Face:** API 609, ISO 5752, BS EN 558, MSSSP- 68
**Testing:** API 598, ISO 5208, BS EN 12266, MSS SP-68
**Pressure Temperature:** ASME B16.34
**Flange Accommodation:** ASME B16.5, ASME B16.47 and other international standards
**NACE (optional):** ANSI/ NACE MR0175 / ISO 15156, ANSI/ NACE MR0103 / ISO 17945

**Fire Safe Certified (optional):** API 607
**Fugitive Emission (optional):** ISO 15848
**Pressure Equipment Compliance:** PED 2014 / 68 / EU
**Body Style:** Wafer, Lug, Double Flanged
**Pressure Rating:** CL150 to CL300
**Temp. Range*:** -58°F to 500°F (Soft Seat/ Fire Safe Seat)
-58°F to 800°F (Metal Seat)
**Size Range**:** 2" to 60"
**UL/ULC 1091(optional):** DN50 TO DN300 (2" to 12") -25 bar (365psi)

CL600 valves can be offered on request.
*Pressure-temperature rating shall be lesser of the shell rating or the seat rating.
**Consult DelVal® for sizes not available in the catalog.

# DIMENSIONS AND WEIGHTS

## WAFER & LUG




### Dimensions (Inch)

### ASME CLASS 150 WAFER/LUG (SERIES 44/45)

| Valve Size | | ØA | ØA1 | ⌘B | C | E | Top Flange Drilling | | | ØG | H | J | Key Size | K | Lug Bolting Data | | | Aprx Weights in Lbs | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Inch | DN | | | | | | BC | No of Holes | Hole Dia. | | | | | | BC | No of Holes | Tapping/ UNC/ UN2B | Wafer | Lug |
| 2 | 50 | 3.82 | 3.82 | 1.69 | 2.68 | 4.92 | 2.76 | 4 | 0.39 | 0.55 | 0.39 | 1.26 | - | 1.57 | 4.75 | 4 | 5/8-11 | 7.3 | 9.5 |
| 2½ | 65 | 4.13 | 4.13 | 1.89 | 2.95 | 5.75 | 2.76 | 4 | 0.39 | 0.63 | 0.43 | 1.26 | - | 2.19 | 5.50 | 4 | 5/8-11 | 8.8 | 11.0 |
| 3 | 80 | 5.47 | 5.47 | 1.89 | 4.25 | 5.91 | 2.76 | 4 | 0.39 | 0.63 | 0.43 | 1.26 | - | 2.69 | 6.00 | 4 | 5/8-11 | 13.9 | 15.4 |
| 4 | 100 | 6.69 | 6.69 | 2.13 | 4.84 | 6.77 | 2.76 | 4 | 0.39 | 0.63 | 0.43 | 1.26 | - | 3.53 | 7.50 | 8 | 5/8-11 | 18.3 | 26.5 |
| 5 | 125 | 7.32 | 7.32 | 2.24 | 5.47 | 7.40 | 2.76/4.02 | 4 | 0.39/0.47 | 0.75 | 0.51 | 1.26 | - | 4.36 | 8.50 | 8 | 3/4-10 | 19.8 | 29.5 |
| 6 | 150 | 8.50 | 8.50 | 2.24 | 5.83 | 8.07 | 2.76/4.02 | 4 | 0.39/0.47 | 0.75 | 0.51 | 1.26 | - | 5.46 | 9.50 | 8 | 3/4-10 | 30.9 | 35.3 |
| 8 | 200 | 10.59 | 10.59 | 2.52 | 6.81 | 9.45 | 4.92 | 4 | 0.55 | 0.87 | 0.63 | 1.26 | - | 7.21 | 11.75 | 8 | 3/4-10 | 48.5 | 63.9 |
| 10 | 250 | 12.76 | 12.76 | 2.80 | 8.54 | 10.71 | 4.92 | 4 | 0.55 | 1.18 | 0.87 | 2.01 | - | 9.16 | 14.25 | 12 | 7/8-9 | 70.5 | 94.8 |
| 12 | 300 | 15.00 | 14.88 | 3.19 | 9.80 | 12.20 | 4.92 | 4 | 0.55 | 1.38 | 0.94 | 2.01 | - | 10.93 | 17.00 | 12 | 7/8-9 | 106.9 | 147.7 |
| 14 | 350 | 16.26 | 16.26 | 3.62 | 11.18 | 15.94 | 4.92/5.51 | 4 | 0.55/0.71 | 1.57 | - | 2.01 | 0.47 × 0.31 | 12.12 | 18.75 | 12 | 1-8 | 185.2 | 238.1 |
| 16 | 400 | 18.50 | 18.50 | 4.02 | 12.40 | 17.95 | 5.51/6.50 | 4 | 0.71/0.87 | 1.97 | - | 2.52 | 0.47 × 0.39 | 13.94 | 21.26 | 16 | 1-8 | 260.1 | 328.5 |
| 18 | 450 | 21.02 | 21.02 | 4.49 | 13.35 | 19.33 | 5.51/6.50 | 4 | 0.71/0.87 | 2.17 | - | 2.52 | 0.63 × 0.39 | 15.94 | 22.75 | 16 | 1 1/8-8 | 339.5 | 390.2 |
| 20 | 500 | 22.99 | 22.99 | 5.00 | 14.76 | 21.10 | 6.50 | 4 | 0.87 | 2.36 | - | 4.02 | 0.71 × 0.43 | 17.57 | 25.00 | 20 | 1 1/8-8 | 449.7 | 566.6 |
| 22 | 550 | 25.28 | 25.28 | 6.06 | 16.85 | 24.17 | 6.50/10 | 4/8 | 0.87/0.71 | 2.76 | - | 4.02 | 0.79 × 0.47 | 18.66 | 27.25 | 20 | 1 1/4-8 | 628.3 | 738.5 |
| 24 | 600 | 27.36 | 27.36 | 6.06 | 17.24 | 24.96 | 6.50/10 | 4/8 | 0.87/0.71 | 2.76 | - | 4.02 | 0.79 × 0.47 | 20.97 | 29.50 | 20 | 1 1/4-8 | 776.0 | 892.9 |
| 26 | 650 | 29.49 | 29.49 | 6.50 | 18.70 | 26.93 | 10.00 | 8 | 0.71 | 3.00 | - | 4.02 | 0.75 × 0.75 | 23.82 | 31.75 | 24 | 1 1/4-8 | 992.1 | 1168.4 |
| 28 | 700 | 31.50 | 30.00 | 6.50 | 19.69 | 28.74 | 10/11.73 | 8 | 0.71/0.87 | 3.00 | - | 4.02 | 0.75 × 0.75 | 24.61 | 34.00 | 28 | 1 1/4-8 | 1135.4 | 1366.9 |
| 30 | 750 | 33.74 | 33.74 | 7.48 | 21.26 | 28.35 | 10/11.73 | 8 | 0.71/0.87 | 3.50 | - | 4.02 | 0.88 × 0.63 | 25.59 | 36.00 | 28 | 1 1/4-8 | 1140.0 | 1580.7 |
| 32 | 800 | 35.98 | 34.02 | 7.48 | 22.05 | 30.75 | 11.73 | 8 | 0.87 | 3.50 | - | 4.02 | 0.88 × 0.63 | 27.44 | 38.50 | 28 | 1 1/2-8 | 1477.1 | 1873.9 |
| 36 | 900 | 40.24 | 37.99 | 7.99 | 25.59 | 33.86 | 11.73 | 8 | 0.87 | 4.00 | - | 5.27 | 1.00 × 0.75 | 31.00 | 42.75 | 32 | 1 1/2-8 | 1907.0 | 2641.1 |
| 40 | 1000 | 44.25 | 44.25 | 9.88 | 28.82 | 38.98 | 14.02 | 8 | 1.30 | 4.72 | - | 5.90 | 1.26 × 0.71 | 35.04 | 47.25 | 36 | 1 1/2-8 | 3483.0 | 4299.0 |
| 42 | 1050 | 47.00 | 47.00 | 10.00 | 30.16 | 40.12 | 14.02 | 8 | 1.30 | 4.72 | - | 5.90 | 1.26 × 0.71 | 38.00 | 49.5 | 36 | 1 1/2-8 | 4078.0 | 5070.0 |
| 44 | 1100 | 49.02 | 49.02 | 10.87 | 30.91 | 41.34 | 14.02 | 8 | 1.30 | 6.5 | - | 5.90 | 1.26 x 0.71 | 40.94 | 51.75 | 40 | 1 1/2-8 | 4409.0 | 5622.0 |
| 48 | 1200 | 53.50 | 53.50 | 10.87 | 31.89 | 42.52 | 14.02 | 8 | 1.30 | 6.5 | - | 5.90 | 1.26 x 0.71 | 44.02 | 56.00 | 44 | 1 1/2-8 | 4960.0 | 6173.0 |

### ASME CLASS 300 WAFER/LUG (SERIES 47/48)

| | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | 50 | 4.02 | 4.02 | 1.69 | 3.39 | 5.24 | 2.76 | 4 | 0.39 | 0.55 | 0.39 | 1.26 | - | 1.49 | 5.00 | 8 | 5/8-11 | 7.7 | 11.0 |
| 2½ | 65 | 4.13 | 4.13 | 1.81 | 3.86 | 5.75 | 2.76 | 4 | 0.39 | 0.63 | 0.43 | 1.26 | - | 1.99 | 5.87 | 8 | 3/4-10 | 8.8 | 12.1 |
| 3 | 80 | 5.20 | 5.47 | 1.89 | 4.29 | 6.22 | 2.76 | 4 | 0.39 | 0.63 | 0.43 | 1.26 | - | 2.67 | 6.63 | 8 | 3/4-10 | 13.4 | 18.7 |
| 4 | 100 | 6.69 | 6.69 | 2.13 | 4.84 | 6.77 | 2.76 | 4 | 0.39 | 0.63 | 0.43 | 1.26 | - | 3.55 | 7.87 | 8 | 3/4-10 | 19.0 | 26.5 |
| 5 | 125 | 7.32 | 7.32 | 2.32 | 5.47 | 7.99 | 2.76/4.02 | 4 | 0.39/0.43 | 0.87 | 0.63 | 1.26 | - | 4.17 | 9.25 | 8 | 3/4-10 | 20.3 | 36.8 |
| 6 | 150 | 8.50 | 8.50 | 2.32 | 6.42 | 8.66 | 2.76/4.02 | 4 | 0.39/0.47 | 0.87 | 0.63 | 1.26 | - | 5.42 | 10.63 | 12 | 3/4-10 | 39.7 | 55.1 |
| 8 | 200 | 10.63 | 10.63 | 2.87 | 7.87 | 10.94 | 4.92 | 4 | 0.55 | 1.18 | 0.87 | 2.01 | - | 7.16 | 13.00 | 12 | 7/8-9 | 70.5 | 94.8 |
| 10 | 250 | 12.83 | 12.83 | 3.27 | 9.06 | 11.81 | 4.92 | 4 | 0.55 | 1.38 | 0.94 | 2.01 | - | 8.87 | 15.25 | 16 | 1-8 | 100.0 | 134.5 |
| 12 | 300 | 15.00 | 15.00 | 3.62 | 10.51 | 13.43 | 5.51/6.50 | 4 | 0.71/0.87 | 1.57 | 1.14 | 2.01 | - | 10.75 | 17.75 | 16 | 1 1/8-8 | 172.4 | 220.5 |
| 14 | 350 | 16.26 | 16.26 | 4.61 | 12.40 | 17.99 | 5.51/6.50 | 4 | 0.71/0.87 | 2.17 | - | 2.52 | 0.63 × 0.39 | 11.38 | 20.25 | 20 | 1 1/8-8 | 286.6 | 381.4 |
| 16 | 400 | 18.50 | 18.50 | 5.24 | 14.37 | 20.79 | 6.50 | 4 | 0.87 | 2.17 | - | 2.52 | 0.63 × 0.39 | 13.37 | 22.50 | 20 | 1 1/4-8 | 392.4 | 493.8 |
| 18 | 450 | 20.98 | 20.98 | 5.87 | 15.08 | 23.27 | 10.00 | 8 | 0.71 | 2.76 | - | 4.02 | 0.79 × 0.47 | 14.99 | 24.75 | 24 | 1 1/4-8 | 485.0 | 848.8 |
| 20 | 500 | 22.99 | 22.99 | 6.26 | 17.17 | 23.70 | 10/11.73 | 8 | 0.71/0.87 | 3.15 | - | 4.02 | 0.87× 0.55 | 16.07 | 27.00 | 24 | 1 1/4-8 | 877.4 | 998.7 |
| 22 | 550 | 25.28 | 25.28 | 7.13 | 19.45 | 30.71 | 11.73 | 8 | 0.87 | 3.94 | | 5.28 | 1.10 × 0.63 | 18.50 | 29.25 | 24 | 1 1/2-8 | 1047.2 | 1741.6 |
| 24 | 600 | 27.24 | 27.24 | 7.13 | 19.84 | 31.30 | 11.73 | 8 | 0.87 | 3.94 | - | 5.28 | 1.10 × 0.63 | 19.71 | 32.00 | 24 | 1 1/2-8 | 1157.4 | 1862.9 |

*Face to Face dimension 'B' conforms to AP! 609 Category B / BS EN 558 for sizes up to 24", CL150 and CL300. Please consult DelVal® for other dimensions.
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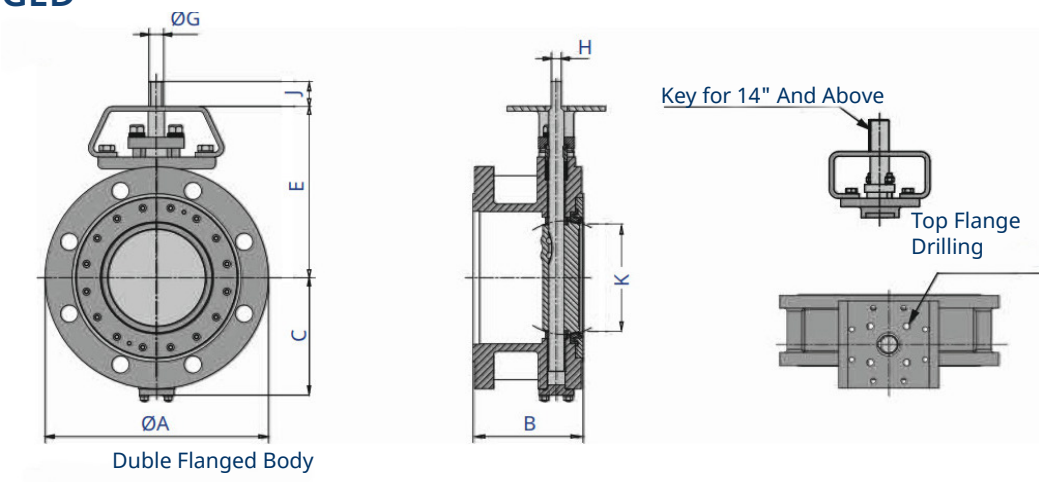
# DIMENSIONS AND WEIGHTS

## DOUBLE FLANGED




Duble Flanged Body

### Dimensions (Inch)

### ASME CLASS 150 DOUBLE FLANGE (SERIES 46)

| Valve Size | | ØA | *B | C | E | Top Flange Drilling | | | ØG | H | J | Key Size | K | Approx. Weight. (lbs) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Inch | DN | | | | | BC | No. of Holes | Hole Dia. | | | | | | |
| 2 | 50 | 6.50 | 4.25 | 3.66 | 6.42 | 1.97/2.76 | 4 | 0.31/0.35 | 0.55 | 0.39 | 1.26 | - | 1.39 | 24.25 |
| 2½ | 65 | 7.01 | 4.41 | 3.98 | 6.38 | 2.76 | 4 | 0.35 | 0.63 | 0.43 | 1.26 | - | 1.50 | 27.56 |
| 3 | 80 | 7.95 | 4.49 | 4.65 | 7.48 | 2.76/4.02 | 4 | 0.35/0.43 | 0.63 | 0.43 | 1.26 | - | 2.15 | 34.17 |
| 4 | 100 | 9.06 | 5.00 | 5.47 | 8.66 | 2.76/4.02 | 4 | 0.35/0.43 | 0.63 | 0.43 | 1.26 | - | 3.14 | 47.40 |
| 5 | 125 | 10.04 | 5.51 | 5.47 | 8.66 | 2.76/4.02 | 4 | 0.35/0.43 | 0.75 | 0.51 | 1.26 | - | 3.77 | 66.14 |
| 6 | 150 | 11.22 | 5.51 | 5.94 | 8.66 | 2.76/4.02 | 4 | 0.35/0.43 | 0.75 | 0.51 | 1.26 | - | 5.12 | 72.75 |
| 8 | 200 | 13.58 | 5.98 | 7.20 | 10.91 | 4.02/4.92 | 4 | 0.43/0.51 | 0.87 | - | 1.26 | 0.24 × 0.24 | 7.05 | 116.84 |
| 10 | 250 | 15.94 | 6.50 | 8.54 | 11.97 | 4.02/4.92 | 4 | 0.43/0.51 | 1.18 | - | 2.01 | 0.31 × 0.28 | 8.84 | 160.94 |
| 12 | 300 | 19.09 | 7.01 | 10.43 | 14.96 | 4.92 | 4 | 0.51 | 1.38 | - | 2.01 | 0.39 × 0.31 | 10.64 | 233.69 |
| 14 | 350 | 21.06 | 7.48 | 11.18 | 15.94 | 4.92/5.51 | 4 | 0.55/0.71 | 1.57 | - | 2.01 | 0.47 × 0.31 | 11.66 | 374.78 |
| 16 | 400 | 23.43 | 8.50 | 12.40 | 19.06 | 5.51/6.50 | 4 | 0.71/0.87 | 1.97 | - | 2.52 | 0.47 × 0.39 | 13.64 | 436.51 |
| 18 | 450 | 25.00 | 8.74 | 13.35 | 19.33 | 5.51/6.50 | 4 | 0.71/0.87 | 2.17 | - | 2.52 | 0.63 × 0.39 | 15.63 | 617.29 |
| 20 | 500 | 27.56 | 9.02 | 15.35 | 22.72 | 6.50/10.00 | 4/8 | 0.87/0.71 | 2.36 | - | 4.02 | 0.71 × 0.43 | 17.31 | 769.41 |
| 22 | 550 | 29.69 | 10.51 | 16.85 | 24.21 | 10 | 8 | 0.71 | 2.76 | - | 4.02 | 0.79 × 0.47 | 18.11 | 870.82 |
| 24 | 600 | 32.09 | 10.51 | 17.24 | 24.96 | 10 | 8 | 0.71 | 2.76 | - | 4.02 | 0.79 × 0.47 | 20.59 | 1062.62 |
| 26 | 650 | 34.25 | 11.50 | 18.70 | 26.93 | 10.00 | 8 | 0.71 | 3.00 | - | 4.02 | 0.87 X 0.55 | 23.82 | 1165.00 |
| 28 | 700 | 36.42 | 11.50 | 19.69 | 28.74 | 10/11.73 | 8 | 0.71/0.87 | 3.00 | - | 4.02 | 0.75 x 0.75 | 24.13 | 1370.00 |
| 30 | 750 | 38.78 | 12.52 | 21.26 | 29.33 | 10/11.73 | 8 | 0.71/0.87 | 3.50 | - | 4.02 | 0.88 × 0.63 | 25.39 | 1907.00 |
| 32 | 800 | 41.73 | 12.52 | 22.05 | 30.75 | 11.73 | 8 | 0.87 | 3.50 | - | 4.02 | 0.88 × 0.63 | 27.13 | 2000.00 |
| 36 | 900 | 46.06 | 12.99 | 25.59 | 33.86 | 11.73 | 8 | 0.87 | 4.00 | - | 5.27 | 1 × 0.75 | 30.51 | 2561.00 |
| 40 | 1000 | 50.79 | 16.14 | 28.82 | 38.98 | 14.02 | 8 | 1.30 | 4.72 | - | 5.90 | 1.26 X 0.71 | 33.46 | 5357.00 |
| 42 | 1050 | 52.95 | 16.14 | 30.16 | 40.12 | 14.02 | 8 | 1.30 | 4.72 | - | 5.90 | 1.26 X 0.71 | 35.43 | 6338.00 |
| 44 | 1100 | 55.31 | 18.50 | 30.51 | 41.34 | 14.02 | 8 | 1.30 | 5.11 | - | 5.90 | 1.26 X 0.71 | 40.94 | 7010.00 |
| 48 | 1200 | 59.45 | 18.50 | 31.89 | 43.70 | 14.02 | 8 | 1.30 | 5.11 | - | 5.90 | 1.26 X 0.71 | 43.58 | 7716.00 |

### ASME CLASS 300 DOUBLE FLANGE (SERIES 49)

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | 50 | 6.50 | 4.25 | 3.86 | 6.57 | 1.97/2.76 | 4 | 0.31/0.39 | 0.55 | 0.39 | 1.26 | - | 1.02 | 26.46 |
| 2½ | 65 | 7.48 | 4.41 | 4.72 | 7.24 | 2.76 | 4 | 0.39 | 0.63 | 0.43 | 1.26 | - | 1.38 | 30.86 |
| 3 | 80 | 8.27 | 4.49 | 4.65 | 7.48 | 2.76 | 4 | 0.39 | 0.63 | 0.43 | 1.26 | - | 2.22 | 44.09 |
| 4 | 100 | 10.04 | 5.00 | 4.84 | 7.48 | 2.76 | 4 | 0.39 | 0.63 | 0.43 | 1.26 | - | 3.14 | 55.12 |
| 5 | 125 | 11.02 | 5.51 | 5.47 | 7.87 | 2.76/4.02 | 4 | 0.39/0.47 | 0.87 | - | 1.26 | 0.24 × 0.24 | 3.34 | 123.46 |
| 6 | 150 | 12.60 | 5.51 | 6.81 | 9.65 | 2.76/4.02 | 4 | 0.39/0.47 | 0.87 | - | 1.26 | 0.24 × 0.24 | 5.11 | 127.87 |
| 8 | 200 | 14.96 | 5.98 | 8.15 | 12.01 | 4.92 | 4 | 0.55 | 1.18 | - | 2.01 | 0.31 × 0.28 | 6.96 | 196.21 |
| 10 | 250 | 17.52 | 6.50 | 9.45 | 13.82 | 4.92 | 4 | 0.55 | 1.38 | - | 2.01 | 0.39 × 0.31 | 8.71 | 284.39 |
| 12 | 300 | 20.47 | 7.01 | 10.91 | 15.75 | 5.51/6.50 | 4 | 0.71/0.87 | 1.57 | - | 2.01 | 0.47 x 0.31 | 10.54 | 354.94 |
| 14 | 350 | 23.03 | 7.48 | 12.52 | 17.99 | 5.51/6.50 | 4 | 0.71/0.87 | 2.17 | - | 2.52 | 0.63 × 0.39 | 10.97 | 416.67 |
| 16 | 400 | 25.59 | 8.50 | 14.37 | 20.79 | 6.50 | 4 | 0.87 | 2.17 | - | 2.52 | 0.63 × 0.39 | 12.67 | 734.13 |
| 18 | 450 | 27.95 | 8.74 | 15.75 | 23.27 | 10.00 | 8 | 0.71 | 2.76 | - | 4.02 | 0.79 × 0.47 | 14.06 | 727.52 |
| 20 | 500 | 30.51 | 9.02 | 17.17 | 23.70 | 10.00 | 8 | 0.71 | 3.15 | - | 4.02 | 0.87 x 0.55 | 15.28 | 1179.46 |
| 22 | 550 | 32.99 | 10.51 | 16.93 | 30.39 | 11.73 | 8 | 0.87 | 3.94 | | 5.28 | 1.10 X 0.63 | 17.95 | 1796.75 |
| 24 | 600 | 36.02 | 10.51 | 19.84 | 31.30 | 11.73 | 8 | 0.87 | 3.94 | - | 5.28 | 1.10 X 0.63 | 18.74 | 1900.37 |

*Face to Face dimension 'B' conforms to AP! 609 Category B / BS EN 558 for sizes up to 24", CL150 and CL300. Please consult DelVal® for other dimensions.
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# TORQUE DATA Lbf-Inch

## ASME CLASS 150

### Soft Seat

| Valve Size | | Torques (lb.in) for Preferred Flow Direction at Various Differential Pressure (△P) for CL 150 | | | | |
|---|---|---|---|---|---|---|
| Inch | DN | 50 Psi | 100 Psi | 150 Psi | 230 Psi | 290 Psi |
| 2 | 50 | 212 | 230 | 239 | 248 | 257 |
| 2½ | 65 | 239 | 248 | 257 | 274 | 283 |
| 3 | 80 | 142 | 177 | 204 | 221 | 248 |
| 4 | 100 | 221 | 266 | 292 | 319 | 425 |
| 5 | 125 | 522 | 575 | 620 | 690 | 735 |
| 6 | 150 | 549 | 637 | 690 | 770 | 832 |
| 8 | 200 | 1310 | 1434 | 1549 | 1761 | 1894 |
| 10 | 250 | 1549 | 1682 | 1947 | 2301 | 2567 |
| 12 | 300 | 1832 | 2071 | 2390 | 2850 | 3629 |
| 14 | 350 | 3443 | 4266 | 5125 | 6505 | 7399 |
| 16 | 400 | 4390 | 5470 | 6585 | 8284 | 9523 |
| 18 | 450 | 5718 | 7151 | 8550 | 10833 | 12471 |
| 20 | 500 | 7629 | 9621 | 11471 | 14719 | 16790 |
| 22 | 550 | 9630 | 12161 | 14825 | 18870 | 21817 |
| 24 | 600 | 11550 | 14586 | 17772 | 22640 | 26181 |
| 26 | 650 | 14135 | 17259 | 19560 | 23100 | 28057 |
| 28 | 700 | 15533 | 19029 | 22038 | 25048 | 29739 |
| 30 | 750 | 21198 | 25773 | 30349 | 37669 | 42705 |
| 32 | 800 | 27428 | 33297 | 40085 | 48290 | 55981 |
| 34 | 850 | 31098 | 38316 | 45533 | 57079 | 65021 |
| 36 | 900 | 34208 | 42147 | 50086 | 62787 | 71523 |
| 40 | 1000 | 54007 | 67275 | 80542 | 101775 | 116405 |
| 42 | 1050 | 60920 | 73213 | 86012 | 108687 | 124291 |
| 44 | 1100 | 68372 | 79303 | 91340 | 115414 | 131965 |
| 48 | 1200 | 88065 | 110192 | 130726 | 166447 | 189583 |

Note:
1.Flow from retainer side is the preferred flow direction.
Flow from stem side is non-preferred flow direction. Arrow on valve body indicates the preferred flow direction.

2.BTO-Break to Open; RTO-Run to Open; ETO-End to Open; BTC-Break to Close; RTC- Run to Close; ETC-End to Close.

3.Above mention tabulated torque values are BTO & ETC for preferred flow direction.

4.RTO, ETO, BTC & RTC = 40% of the above tabulated values for preferred direction.

5.For non-preferred flow direction torque values of soft seat,
2" to 6" - multiply preferred values by 1.24
8" - multiply preferred values by 1.120
10" to 12" - multiply preferred values by 1.20
14" to 24" - multiply preferred values by 1.24
26" to 48" - multiply preferred values by 1.30

6.For non-preferred flow direction torque values of fire safe seat & metal seat , multiply preferred values by 1.25

7.For actuator sizing, the minimum valve differential pressure shall be 50 psi.
For differential pressures above 50 psi the intermediated values to be interpolated. For gear operator sizing, the full rated torque to be considered.

8.The published torque values are without factor of safety.
The following factor of safety shall be considered for operator sizing:
Clean service (liquid, steam, clean gas and non-abrasive) = 1.3
High solids slurry= 1.5
Dry gas= 1.7



### Fire Safe Seat

| Valve Size | | Torques (lb.in) for Preferred Flow Direction at Various Differential Pressure (△P) for CL 150 | | | | |
|---|---|---|---|---|---|---|
| Inch | DN | 50 Psi | 100 Psi | 150 Psi | 230 Psi | 290 Psi |
| 2 | 50 | 411 | 427 | 443 | 466 | 482 |
| 2½ | 65 | 427 | 450 | 458 | 482 | 498 |
| 3 | 80 | 545 | 561 | 577 | 608 | 632 |
| 4 | 100 | 672 | 711 | 743 | 798 | 846 |
| 5 | 125 | 759 | 822 | 893 | 1004 | 1083 |
| 6 | 150 | 1272 | 1383 | 1501 | 1683 | 1786 |
| 8 | 200 | 2086 | 2315 | 2489 | 2805 | 3058 |
| 10 | 250 | 2935 | 3267 | 3644 | 4219 | 4632 |
| 12 | 300 | 4374 | 5030 | 5664 | 6609 | 7353 |
| 14 | 350 | 5025 | 5760 | 6460 | 7709 | 8494 |
| 16 | 400 | 5796 | 6738 | 7809 | 9372 | 10528 |
| 18 | 450 | 7380 | 9200 | 11213 | 14133 | 16310 |
| 20 | 500 | 10442 | 13262 | 15981 | 20671 | 23669 |
| 22 | 550 | 12470 | 15696 | 19129 | 24354 | 28151 |
| 24 | 600 | 16445 | 19443 | 22641 | 27737 | 30849 |
| 26 | 650 | 17831 | 21773 | 24676 | 29142 | 35395 |
| 28 | 700 | 19596 | 24006 | 27802 | 31599 | 37516 |
| 30 | 750 | 26742 | 32514 | 38287 | 47521 | 53874 |
| 32 | 800 | 34602 | 42005 | 50569 | 60919 | 70622 |
| 34 | 850 | 39232 | 48337 | 57442 | 72008 | 82026 |
| 36 | 900 | 43155 | 53170 | 63186 | 79208 | 90229 |
| 38 | 950 | 61938 | 77154 | 92370 | 116721 | 133500 |
| 40 | 1000 | 68132 | 84869 | 101607 | 128393 | 146849 |
| 42 | 1050 | 76853 | 92362 | 108507 | 137113 | 156798 |
| 44 | 1100 | 86254 | 100043 | 115229 | 145599 | 166479 |
| 48 | 1200 | 111097 | 139011 | 164915 | 209980 | 239166 |

### Metal Seat

| Valve Size | | Torques (lb.in) for Preferred Flow Direction at Various Differential Pressure (△P) for CL 150 | | | | |
|---|---|---|---|---|---|---|
| Inch | DN | 50 Psi | 100 Psi | 150 Psi | 230 Psi | 290 Psi |
| 2 | 50 | 513 | 531 | 558 | 584 | 620 |
| 2½ | 65 | 602 | 620 | 646 | 673 | 699 |
| 3 | 80 | 743 | 788 | 805 | 832 | 876 |
| 4 | 100 | 947 | 1000 | 1036 | 1106 | 1186 |
| 5 | 125 | 1053 | 1142 | 1266 | 1407 | 1513 |
| 6 | 150 | 1779 | 1938 | 2089 | 2345 | 2478 |
| 8 | 200 | 2947 | 3266 | 3487 | 3947 | 4266 |
| 10 | 250 | 4337 | 4903 | 5523 | 6257 | 7036 |
| 12 | 300 | 6612 | 7488 | 8532 | 9895 | 11099 |
| 14 | 350 | 7789 | 9037 | 10019 | 11922 | 13143 |
| 16 | 400 | 8984 | 10479 | 12081 | 14639 | 16277 |
| 18 | 450 | 11524 | 14489 | 17206 | 22180 | 25039 |
| 20 | 500 | 16055 | 20392 | 24685 | 32199 | 36722 |
| 24 | 600 | 25490 | 30376 | 35022 | 43156 | 47688 |

# TORQUE DATA Lbf-Inch

## ASME CLASS 300

### Soft Seat

| Valve Size | | Torques (lb.in) for Preferred Flow Direction at Various Differential Pressure (△P) for CL 300 | | | | |
|---|---|---|---|---|---|---|
| Inch | DN | 150 Psi | 290 Psi | 360 Psi | 580 Psi | 750 Psi |
| 2 | 50 | 239 | 257 | 283 | 354 | 372 |
| 2½ | 65 | 257 | 283 | 301 | 372 | 416 |
| 3 | 80 | 301 | 354 | 389 | 478 | 531 |
| 4 | 100 | 434 | 602 | 655 | 841 | 956 |
| 5 | 125 | 779 | 982 | 1089 | 1425 | 1646 |
| 6 | 150 | 1062 | 1363 | 1549 | 2071 | 2434 |
| 8 | 200 | 2018 | 2655 | 3018 | 4062 | 4824 |
| 10 | 250 | 2992 | 4080 | 4691 | 6470 | 7753 |
| 12 | 300 | 4186 | 5656 | 6426 | 8868 | 10524 |
| 14 | 350 | 6408 | 9364 | 11134 | 15993 | 19419 |
| 16 | 400 | 7780 | 11240 | 13205 | 19303 | 23410 |
| 18 | 450 | 10054 | 14621 | 17126 | 24658 | 29836 |
| 20 | 500 | 13285 | 19392 | 23056 | 33288 | 40616 |
| 24 | 600 | 18117 | 26366 | 30845 | 45148 | 54503 |

### Fire Safe Seat

| Valve Size | | Torques (lb.in) for Preferred Flow Direction at Various Differential Pressure (△P) for CL 300 | | | | |
|---|---|---|---|---|---|---|
| Inch | DN | 150 Psi | 290 Psi | 360 Psi | 580 Psi | 750 Psi |
| 2 | 50 | 397 | 432 | 446 | 474 | 496 |
| 2½ | 65 | 411 | 446 | 472 | 496 | 524 |
| 3 | 80 | 517 | 566 | 586 | 616 | 651 |
| 4 | 100 | 666 | 758 | 1032 | 1020 | 1147 |
| 5 | 125 | 878 | 1027 | 1383 | 1374 | 1536 |
| 6 | 150 | 1452 | 1749 | 2479 | 2407 | 2754 |
| 8 | 200 | 2386 | 2917 | 4200 | 4078 | 4666 |
| 10 | 250 | 3583 | 4319 | 6143 | 5934 | 6826 |
| 12 | 300 | 5841 | 7633 | 12108 | 11442 | 13453 |
| 14 | 350 | 6557 | 8546 | 13682 | 12936 | 15202 |
| 16 | 400 | 7952 | 10727 | 18289 | 17036 | 20321 |
| 18 | 450 | 12228 | 18070 | 34150 | 31048 | 37945 |
| 20 | 500 | 17029 | 25625 | 48304 | 44494 | 53671 |
| 24 | 550 | 18976 | 27926 | 63002 | 57763 | 70003 |
| 24 | 600 | 27359 | 40395 | 74973 | 68738 | 83303 |

### Metal Seat

| Valve Size | | Torques (lb.in) for Preferred Flow Direction at Various Differential Pressure (△P) for CL 300 | | | | |
|---|---|---|---|---|---|---|
| Inch | DN | 150 Psi | 290 Psi | 360 Psi | 580 Psi | 750 Psi |
| 2 | 50 | 558 | 620 | 664 | 699 | 735 |
| 2½ | 65 | 646 | 699 | 735 | 788 | 805 |
| 3 | 80 | 805 | 876 | 903 | 956 | 1018 |
| 4 | 100 | 1036 | 1186 | 1328 | 1584 | 1788 |
| 5 | 125 | 1381 | 1593 | 1735 | 2133 | 2381 |
| 6 | 150 | 2257 | 2735 | 3009 | 3770 | 4319 |
| 8 | 200 | 3735 | 4523 | 5071 | 6381 | 7240 |
| 10 | 250 | 5549 | 6727 | 7328 | 9196 | 10621 |
| 12 | 300 | 9205 | 11807 | 13373 | 17808 | 21189 |
| 14 | 350 | 10143 | 13347 | 15073 | 20383 | 23773 |
| 16 | 400 | 12320 | 16728 | 19135 | 26632 | 31756 |
| 18 | 450 | 19109 | 28473 | 33146 | 48104 | 58840 |
| 20 | 500 | 26835 | 39926 | 47360 | 69859 | 83693 |
| 24 | 600 | 42590 | 63628 | 74205 | 107289 | 130212 |

**Note:**

1.Flow from retainer side is the preferred flow direction.
Flow from stem side is non preferred flow direction. Arrow on valve body indicates the preferred flow direction.

2.BTO-Break to Open; RTO-Run to Open; ETO-End to Open; BTC-Break to Close; RTC- Run to Close; ETC-End to Close.

3.Above mention tabulated torque values are BTO & ETC for preferred flow direction.

4.RTO, ETO, BTC & RTC = 40% of the above tabulated values for preferred direction.

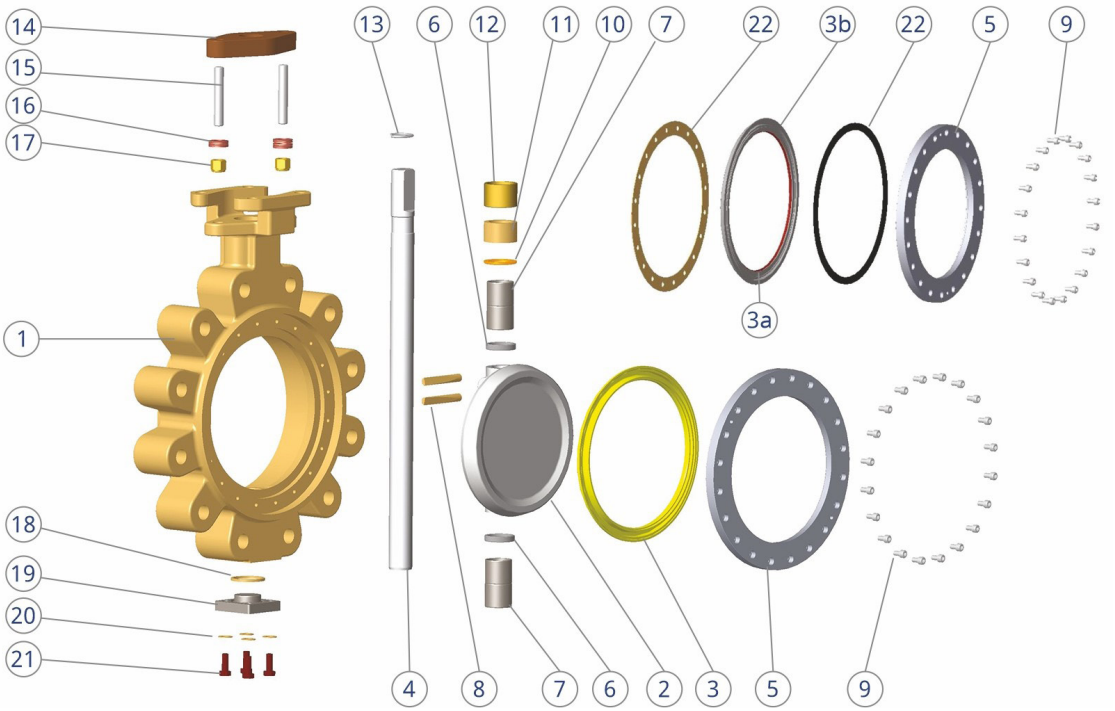
5.For non-preferred flow direction torque values of soft seat, fire safe seat & metal seat, multiply preferred values by 1.25

6.For actuator sizing, the minimum valve differential pressure shall be 150psi.
For differential pressures above 150psi the intermediated values to be interpolated.
For gear operator sizing, the full rated torque to be considered.

7.The published torque values are without factor of safety.
The following factor of safety shall be considered for operator sizing: Clean service (liquid, steam, clean gas and non-abrasive)= 1.3
High solids slurry= 1.5
Dry gas= 1.7

# **STANDARD MATERIALS** OF CONSTRUCTION

## WAFER & LUG (2" to 12")




## Part List

| Item | Description | Standard Materials* | |
|---|---|---|---|
| | | Carbon Steel | Stainless Steel |
| 1 | Body | ASTM A 216 WCB/WCC<br>ASTM A 352 LCC | ASTM A 351 CF8M/CF3M |
| 2 | Disc | ASTM A 351 CF8M/CF3M | ASTM A 351 CF8M/CF3M |
| 3** | Seat (Soft) | PTFE#/ULTRA/RPTFE/UHMWPE | PTFE#/ULTRA/RPTFE/UHMWPE |
| 3a** | Seat (Fire Safe) | ASTM A 240 SS316 + ULTRA | ASTM A 240 SS316 + ULTRA |
| 3b** | Seat (Metal) | ASTM A 240 SS316 | ASTM A 240 SS316 |
| 4 | Stem (Soft Seat) | ASTM A 322 4130 + ENP<br>ASTM A 479 SS410 –cond. 3<br>ASTM A 564 Type 630 (17-4PH) | ASTM A 564 Type 630 (174PH)<br>ASTM A 479 XM19<br>ASTM A 479 SS316 Strain Hardened Level 2 |
| | Stem (Fire-Safe Seat) | ASTM A 479 SS410 –cond. 3<br>ASTM A 564 Type 630 (17-4PH) | ASTM A 564 Type 630 (17-4PH)<br>ASTM A 479 XM19 |
| | Stem ( Metal Seat) | ASTM A 564 Type 630 (17-4PH) | ASTM A 564 Type 630 (17-4PH)<br>ASTM A 479 XM19 |
| 5 | Seat Retaining Ring | ASTM A 516 Gr. 70 Steel | ATM A 240 SS316/SS316L<br>ASTM A 240 SS304 |
| 6 | Disc Spacer | ASTM A 479 SS316/SS316L | ASTM A 479 SS316/SS316L |
| 7 | Bearing (Soft Seat) | Bear-X | |
| | Bearing(Fire Safe Seat and Metal Seat) | Fireproof DFP-D1 | |
| 8 | Wedge Key | ASTM A564 Type 630(17- 4PH) | ASTM A 564 Type 630 (17-4PH)<br>ASTM A 479 XM19<br>ASTM A 479 SS316 |
| 9 | Retainer Screw | ISO 3506 A4-70<br>ASTM A 1082 TYPE 630 (17-4PH)<br>ASTM A 193 Gr. B8M | ISO 3506 A4-70<br>ASTM A 1082 TYPE 630 (17-4PH)<br>ASTM A 193 Gr. B8M |
| 10 | Packing Spacer | ASTM A 479 SS316/SS316L | ASTM A 479 SS316/SS316L |

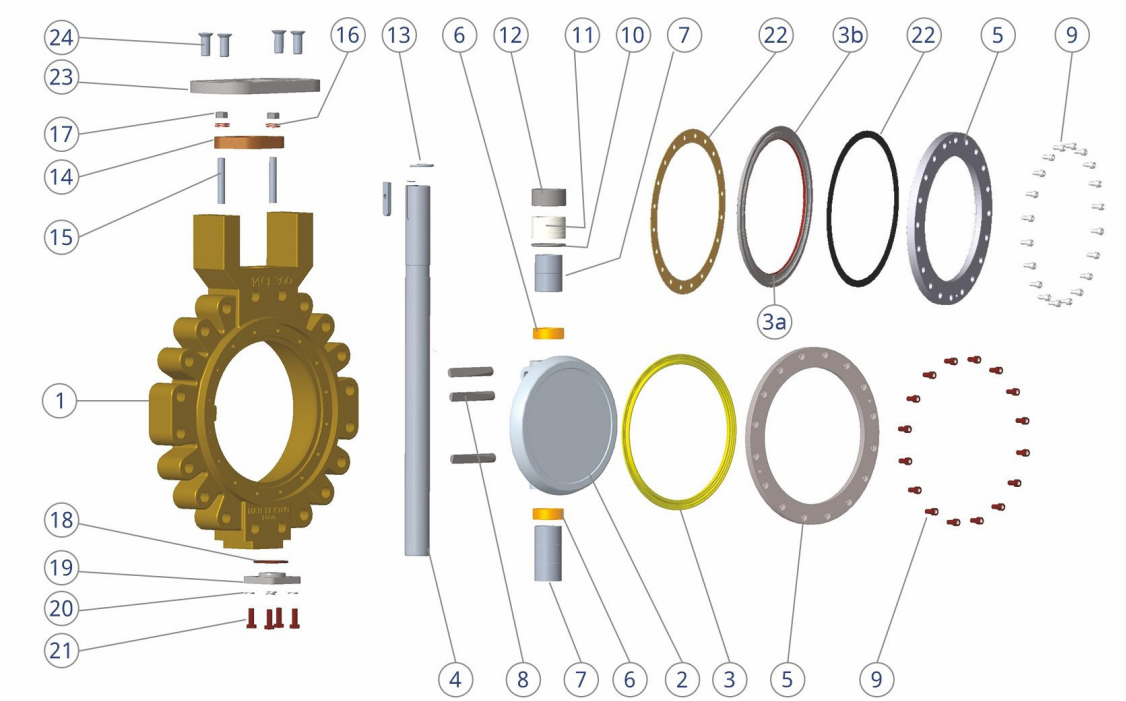
| Item | Description | Standard Materials* | |
|---|---|---|---|
| | | Carbon Steel | Stainless Steel |
| 11** | Gland Packing | PTFE (CHEVRON V-RING)/ Graphite | PTFE (CHEVRON V-RING)/ Graphite |
| 12 | Gland | ASTM A 479 SS316/ SS316L | ASTM A 479 SS316/ SS316L |
| 13** | Stem Retainer | ASTM A 313 SS302 | ASTM A 313 SS302 |
| 14 | Gland Flange | ASTM A 516 Gr. 70<br>ASTM A105<br>ASTM A216 WCB<br>Steel | ASTM A 240 SS316<br>ASTM A 351 CF8M<br>ASTM A182 F316 |
| 15 | Stud | ASTM A 193 Gr. B7<br>ASTM A 193 Gr. B7M<br>ASTM A 193 Gr. B8M | ASTM A 193 Gr. B8M<br>ASTM A 1082 TYPE 630 (17-4PH) |
| 16** | Belleville Spring | ASTM A 666 SS 304 | ASTM A 666 SS 316 |
| 17 | Hex Nut | ASTM A 194 Gr. 8M<br>ASTM A 194 Gr. 2H<br>ASTM A 194 Gr. 2HM | ASTM A 194 Gr. 8M<br>ASTM A 1082 TYPE 630 (17-4PH) |
| 18** | Cover Gasket | PTFE#/Graphite | PTFE#/Graphite |
| 19 | Bottom Cover | ASTM A 516 Gr. 70<br>ASTM A 240 SS304<br>Steel | ASTM A 240 SS316/ SS316L |
| 20 | Spring Washer | ASTM A 580 SS304 | ASTM A 580 SS304 |
| 21 | Hex HD Screw | ISO 3506 A4-70<br>ASTM A 193 Gr. B7<br>ASTM A 193 Gr. B7M<br>ASTM A 193 Gr. B8M | ISO 3506 A4-70<br>ASTM A 1082 TYPE 630 (17-4PH)<br>ASTM A 193 Gr. B8M |
| 22** | Seat Gasket (Fire-Safe Seat and Metal Seat) | Graphite | Graphite |

*Other materials are available on request.
**Recommended spares.
Gland Packing/Cover Gasket MOC is dependent on application service.
#CL 150 only.

Item 18,19, 20 & 21 are not applicable for 2"/DN50 CL150

# **STANDARD MATERIALS** OF CONSTRUCTION

## WAFER & LUG (14" to 48")




## Part List

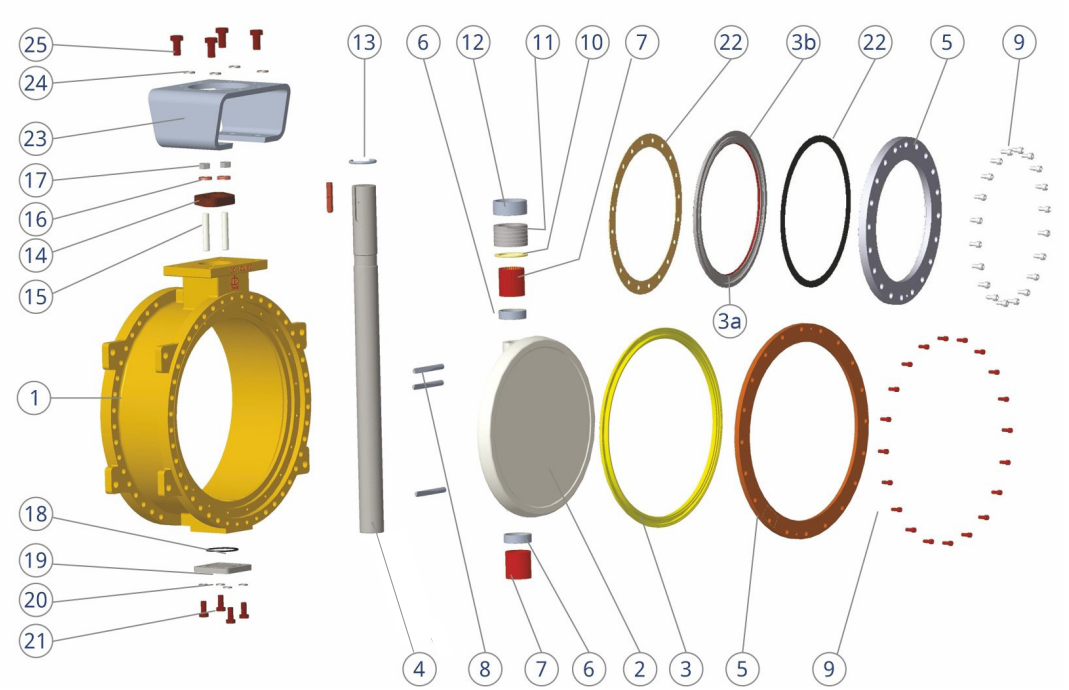
| Item | Description | Standard Materials* | |
|---|---|---|---|
| | | Carbon Steel | Stainless Steel |
| 1 | Body | ASTM A 216 WCB/WCC<br>ASTM A 352 LCC | ASTM A 351 CF8M/CF3M |
| 2 | Disc | ASTM A 351 CF8M/CF3M | ASTM A 351 CF8M/CF3M |
| 3** | Seat (Soft) | PTFE#/ULTRA/RPTFE/UHMWPE | PTFE#/ULTRA/RPTFE/UHMWPE |
| 3a** | Seat (Fire Safe) | ASTM A 240 SS316 + ULTRA | ASTM A 240 SS316 + ULTRA |
| 3b** | Seat (Metal) | ASTM A 240 SS316 | ASTM A 240 SS316 |
| 4 | Stem (Soft Seat) | ASTM A 322 4130 + ENP<br>ASTM A 479 SS410 –cond. 3<br>ASTM A 564 Type 630 (17-4PH) | ASTM A 564 Type 630 (174PH)<br>ASTM A 479 XM19<br>ASTM A 479 SS316 Strain Hardened Level 2 |
| | Stem (Fire-Safe Seat) | ASTM A 479 SS410 –cond. 3<br>ASTM A 564 Type 630 (17-4PH) | ASTM A 564 Type 630 (17-4PH)<br>ASTM A 479 XM19 |
| | Stem ( Metal Seat) | ASTM A 564 Type 630 (17-4PH) | ASTM A 564 Type 630 (17-4PH)<br>ASTM A 479 XM19 |
| 5 | Seat Retaining Ring | ASTM A 516 Gr. 70 Steel | ATM A 240 SS316/SS316L<br>ASTM A 240 SS304 |
| 6 | Disc Spacer | ASTM A 479 SS316/SS316L | ASTM A 479 SS316/SS316L |
| 7 | Bearing (Soft Seat) | Bear-X | |
| | Bearing(Fire Safe Seat and Metal Seat) | Fireproof DFP-D1 | |
| 8 | Wedge Key | ASTM A564 Type 630(17- 4PH) | ASTM A 564 Type 630 (17-4PH)<br>ASTM A 479 XM19<br>ASTM A 479 SS316 |
| 9 | Retainer Screw | ISO 3506 A4-70<br>ASTM A 1082 TYPE 630 (17-4PH)<br>ASTM A 193 Gr. B8M | ISO 3506 A4-70<br>ASTM A 1082 TYPE 630 (17-4PH)<br>ASTM A 193 Gr. B8M |
| 10 | Packing Spacer | ASTM A 479 SS316/SS316L | ASTM A 479 SS316/SS316L |
| 11** | Gland Packing | PTFE (CHEVRON V-RING)/ Graphite | PTFE (CHEVRON V-RING)/ Graphite |

| Item | Description | Standard Materials* | |
|---|---|---|---|
| | | Carbon Steel | Stainless Steel |
| 12 | Gland | ASTM A 479 SS316/ SS316L | ASTM A 479 SS316/ SS316L |
| 13** | Stem Retainer | ASTM A 313 SS302 | ASTM A 313 SS302 |
| 14 | Gland Flange | ASTM A 516 Gr. 70<br>ASTM A105<br>ASTM A216 WCB<br>Steel | ASTM A 240 SS316<br>ASTM A 351 CF8M<br>ASTM A182 F316 |
| 15 | Stud | ASTM A 193 Gr. B7<br>ASTM A 193 Gr. B7M<br>ASTM A 193 Gr. B8M | ASTM A 193 Gr. B8M<br>ASTM A 1082 TYPE 630 (17-4PH) |
| 16** | Belleville Spring | ASTM A 666 SS 304 | ASTM A 666 SS 316 |
| 17 | Hex Nut | ASTM A 194 Gr. 8M<br>ASTM A 194 Gr. 2H<br>ASTM A 194 Gr. 2HM | ASTM A 194 Gr. 8M<br>ASTM A 1082 TYPE 630 (17-4PH) |
| 18** | Cover Gasket | PTFE#/Graphite | PTFE#/Graphite |
| 19 | Bottom Cover | ASTM A 516 Gr. 70<br>ASTM A 240 SS304<br>Steel | ASTM A 240 SS316/ SS316L |
| 20 | Spring Washer | ASTM A 580 SS304 | ASTM A 580 SS304 |
| 21 | Hex HD Screw | ISO 3506 A4-70<br>ASTM A 193 Gr. B7<br>ASTM A 193 Gr. B7M<br>ASTM A 193 Gr. B8M | ISO 3506 A4-70<br>ASTM A 1082 TYPE 630 (17-4PH)<br>ASTM A 193 Gr. B8M |
| 22** | Seat Gasket (Fire-Safe Seat and MetalSeat) | Graphite | Graphite |
| 23 | Mounting Plate | ASTM A516 Gr. 70<br>ASTM A240 SS304 | ASTM A240 55316/ SS316L |
| 24 | Counter Sunk Screw | ISO 3506 A4-70 | ISO 3506 A4-70 |

*Other materials are available on request.
**Recommended spares.
Gland Packing/Cover Gasket MOC is dependent on application service.
#CL 150 only.

# **STANDARD MATERIALS** OF CONSTRUCTION

## DOUBLE FLANGED (2" to 48")



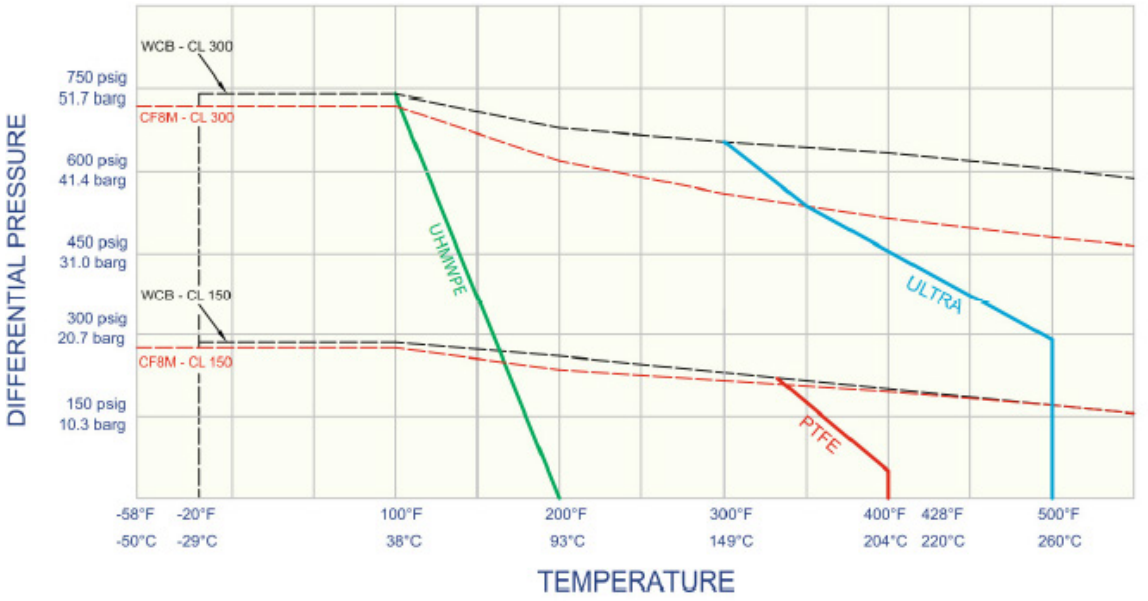

## Part List

| Item | Description | Standard Materials* | |
|---|---|---|---|
| | | Carbon Steel | Stainless Steel |
| 1 | Body | ASTM A 216 WCB/WCC<br>ASTM A 352 LCC | ASTM A 351 CF8M/CF3M |
| 2 | Disc | ASTM A 351 CF8M/CF3M | ASTM A 351 CF8M/CF3M |
| 3** | Seat (Soft) | PTFE#/ULTRA/RPTFE/UHMWPE | PTFE#/ULTRA/RPTFE/UHMWPE |
| 3a** | Seat (Fire Safe) | ASTM A 240 SS316 + ULTRA | ASTM A 240 SS316 + ULTRA |
| 3b** | Seat (Metal) | ASTM A 240 SS316 | ASTM A 240 SS316 |
| 4 | Stem (Soft Seat) | ASTM A 322 4130 + ENP<br>ASTM A 479 SS410 –cond. 3<br>ASTM A 564 Type 630 (17-4PH) | ASTM A 564 Type 630 (174PH)<br>ASTM A 479 XM19<br>ASTM A 479 SS316 Strain Hardened Level 2 |
| | Stem (Fire-Safe Seat) | ASTM A 479 SS410 –cond. 3<br>ASTM A 564 Type 630 (17-4PH) | ASTM A 564 Type 630 (17-4PH)<br>ASTM A 479 XM19 |
| | Stem ( Metal Seat) | ASTM A 564 Type 630 (17-4PH) | ASTM A 564 Type 630 (17-4PH)<br>ASTM A 479 XM19 |
| 5 | Seat Retaining Ring | ASTM A 516 Gr. 70 Steel | ATM A 240 SS316/SS316L<br>ASTM A 240 SS304 |
| 6 | Disc Spacer | ASTM A 479 SS316/SS316L | ASTM A 479 SS316/SS316L |
| 7 | Bearing (Soft Seat) | Bear-X | |
| | Bearing(Fire Safe Seat and Metal Seat) | Fireproof DFP-D1 | |
| 8 | Wedge Key | ASTM A564 Type 630(17- 4PH) | ASTM A 564 Type 630 (17-4PH)<br>ASTM A 479 XM19<br>ASTM A 479 SS316 |
| 9 | Retainer Screw | ISO 3506 A4-70<br>ASTM A 1082 TYPE 630 (17-4PH)<br>ASTM A 193 Gr. B8M | ISO 3506 A4-70<br>ASTM A 1082 TYPE 630 (17-4PH)<br>ASTM A 193 Gr. B8M |
| 10 | Packing Spacer | ASTM A 479 SS316/SS316L | ASTM A 479 SS316/SS316L |
| 11** | Gland Packing | PTFE (CHEVRON V-RING)/ Graphite | PTFE (CHEVRON V-RING)/ Graphite |

| Item | Description | Standard Materials* | |
|---|---|---|---|
| | | Carbon Steel | Stainless Steel |
| 12 | Gland | ASTM A 479 SS316/ SS316L | ASTM A 479 SS316/ SS316L |
| 13** | Stem Retainer | ASTM A 313 SS302 | ASTM A 313 SS302 |
| 14 | Gland Flange | ASTM A 516 Gr. 70<br>ASTM A105<br>ASTM A216 WCB<br>Steel | ASTM A 240 SS316<br>ASTM A 351 CF8M<br>ASTM A182 F316 |
| 15 | Stud | ASTM A 193 Gr. B7<br>ASTM A 193 Gr. B7M<br>ASTM A 193 Gr. B8M | ASTM A 193 Gr. B8M<br>ASTM A 1082 TYPE 630 (17-4PH) |
| 16** | Belleville Spring | ASTM A 666 SS 304 | ASTM A 666 SS 316 |
| 17 | Hex Nut | ASTM A 194 Gr. 8M<br>ASTM A 194 Gr. 2H<br>ASTM A 194 Gr. 2HM | ASTM A 194 Gr. 8M<br>ASTM A 1082 TYPE 630 (17-4PH) |
| 18** | Cover Gasket | PTFE#/Graphite | PTFE#/Graphite |
| 19 | Bottom Cover | ASTM A 516 Gr. 70<br>ASTM A 240 SS304<br>Steel | ASTM A 240 SS316/ SS316L |
| 20 | Spring Washer | ASTM A 580 SS304 | ASTM A 580 SS304 |
| 21 | Hex HD Screw | ISO 3506 A4-70<br>ASTM A 193 Gr. B7<br>ASTM A 193 Gr. B7M<br>ASTM A 193 Gr. B8M | ISO 3506 A4-70<br>ASTM A 1082 TYPE 630 (17-4PH)<br>ASTM A 193 Gr. B8M |
| 22** | Seat Gasket (Fire-Safe Seat and MetalSeat) | Graphite | Graphite |
| 23 | Mounting Plate | ASTM A516 Gr. 70<br>ASTM A240 SS304 | ASTM A240 55316/ SS316L |
| 24 | Counter Sunk Screw | ISO 3506 A4-70 | ISO 3506 A4-70 |
| 25 | Hex Hd Screw | ISO 3506 A4- 70 | ISO 3506 A4- 70 |

*Other materials are available on request.
**Recommended spares.
Gland Packing/Cover Gasket MOC is dependent on application service.
#CL 150 only.

# Pressure Temperature Ratings




## ULTRA Seat

An engineered fluorocarbon polymer that is rated for 500 °Fat 285 psig. Excellent for handling aggressive fluids at high pressures, ULTRA is recommended for extended service in hostile environments involving chemical, thermal, and mechanical stress. ULTRA has excellent thermal stability and is ideal for steam, hot gases, and a variety of process chemicals where service can also be subject to pressure cycling.

## Temperature Limits*

| | | Lower Limit | Upper Limit |
|---|---|---|---|
| | | Deg F | Deg F |
| BODY | WCB | -20 | 800 |
| | LCB | -50 | 650 |
| | CF8 | -320 | 1000 |
| | CF8M | -320 | 1000 |
| SEAT | PTFE | -58 | 400 |
| | ULTRA | -58 | 500 |
| | UHMWPE | -20 | 200 |

*Pressure-temperature rating shall be lesser of the shall rating or the seat rating.

## Operator Information

All valves can be mounted with pneumatic actuators or electric actuators and accessories for complete on-off automation or modulating control. Valves can be also mounted with manual overrides.

Valves of all sizes can be direct mounted with gear operators for manual operation. Gear operators can also be attached with chain-wheel operators to open or close valves located on pipelines at high elevations.

Valves can be supplied with lever handles for manual operation. Optional accessories for handlever operation can be provided for various flow control requirements. Pad-lock can also be provided to prevent unauthorized operation.

# 100% TESTING

# 100% SERIALIZATION

## CERTIFICATES



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