

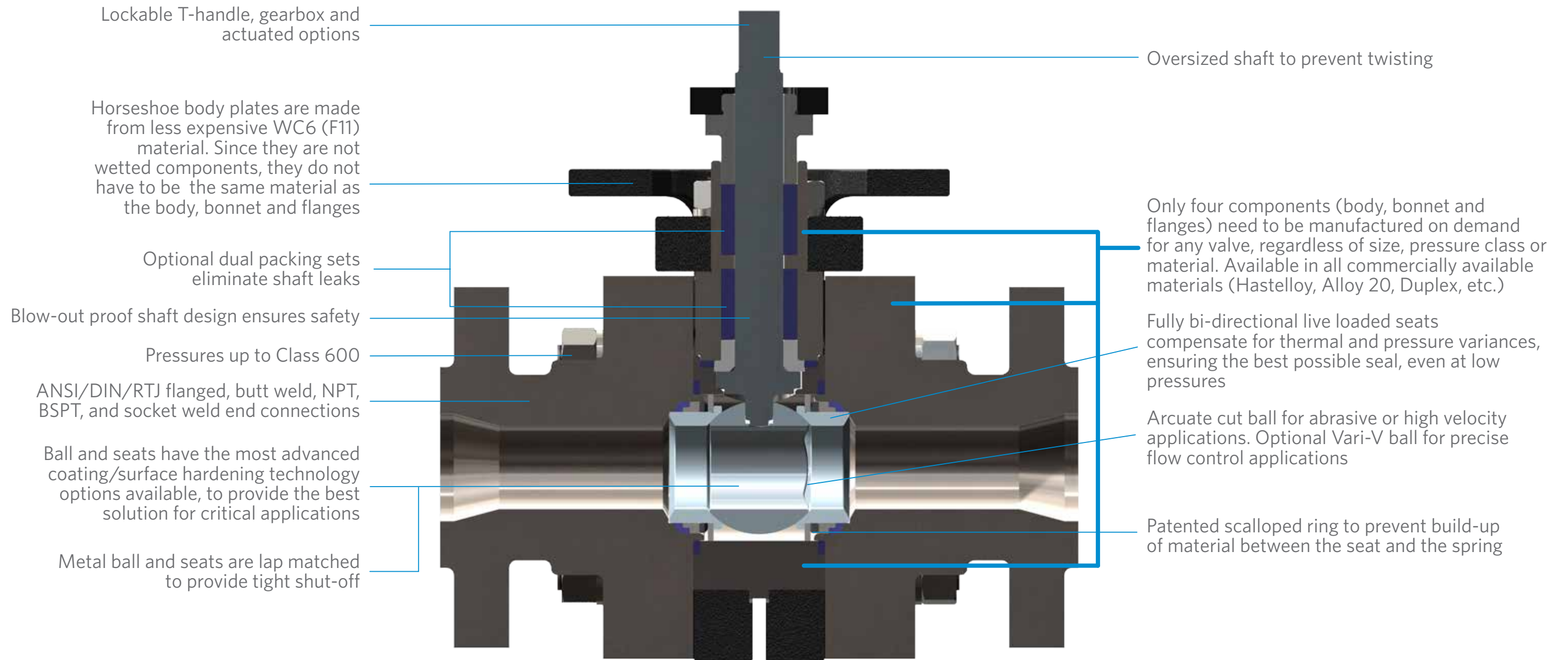
F-CLASS

FAST, FLEXIBLE, FLAWLESS METAL SEATED VALVES



gOSCO
VALVES
designs that outperform

FEATURES & BENEFITS



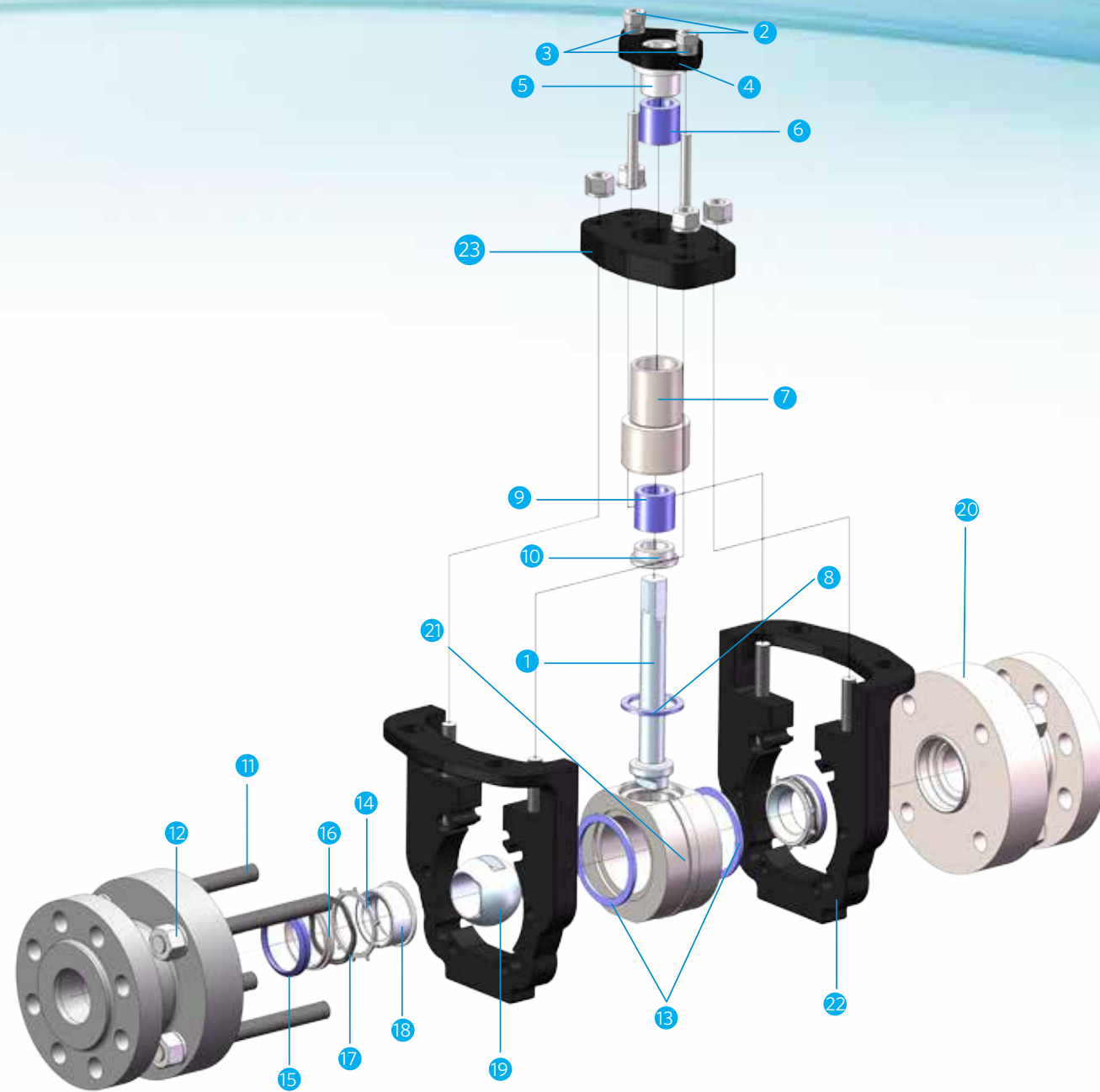
NOTE: NOT ALL FEATURES ARE AVAILABLE ON THE READY-TO-GO VERSION

A Cut Above

- NPS 1/2 full port to NPS 8 standard port (DN 15 to DN 200)
- Class 150 to 600
- -50°C (-58°F) TO 537°C (1000°F) *Option for 1100°F

One year guarantee or extended guarantee options for special applications

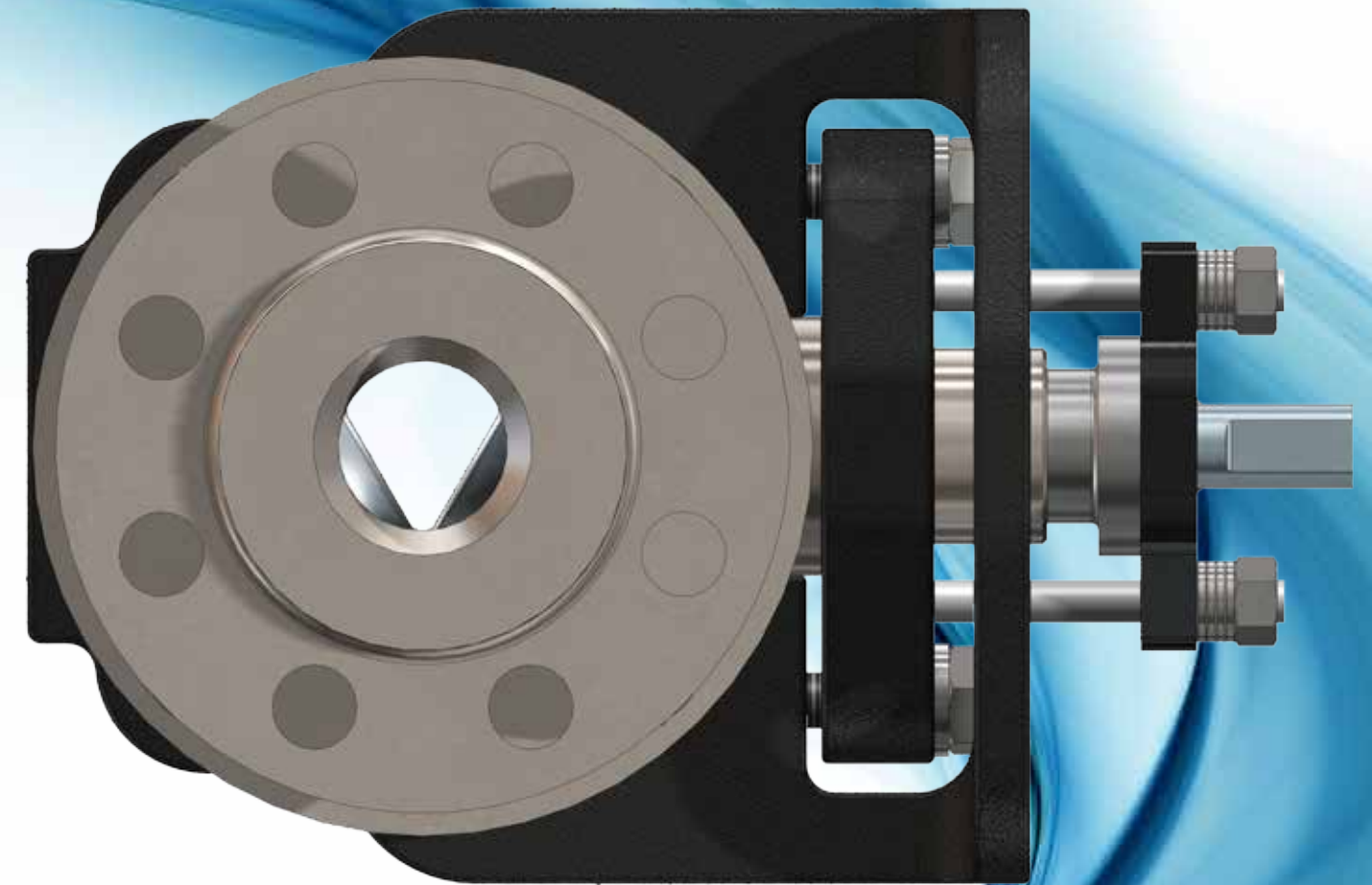
- Bi-directional sealing to handle back pressures to the full pressure rating of the valve
- Body, bonnet and flanges can be machined from bar stock for ultra-fast delivery



BlownAway

- | | | | |
|---------------------------|--------------------------|----------------------|---------------------------|
| 1) Shaft | 7) Bonnet | 13) Body Gasket | 19) Ball |
| 2) Packing Adjustment Nut | 8) Thrust Washer | 14) Scalloped Ring | 20) End Cap |
| 3) Belleville Washers | 9) Lower Shaft Packing * | 15) Wedge Seal | 21) Body |
| 4) Gland Plate | 10) Lower Shaft Guide | 16) Compression Ring | 22) Horseshoe Body Plates |
| 5) Upper Shaft Guide | 11) End Cap Stud | 17) Seat Spring | 23) Bonnet Plate |
| 6) Upper Shaft Packing | 12) End Cap Nut | 18) Seat | |

* Optional with Premium Version



ControlFreak

The **Vari-V Ball Valve** offers precise flow control through a specific profile that is machined into the ball.

When precise control of flow or pressure is required in a metal seated ball valve, the **Vari-V Ball Valve** is perfect for your tough applications. Standard 10°, 30°, 60°, 90° V's are cut in to the ball for a complete range of CV's and control requirements. Custom profile V's are used for unusual applications requiring special flow characteristics.

VARI-V VALVE BALL OPTIONS

Linear-V



High Turndown-V



Filler-V



90° V-Ball



60° V-Ball



30° V-Ball



10° V-Ball



SmartAlec

The profile of the V-ball determines the flow characteristic of the valve and can be changed to suit the application. 10°, 30°, 60° and 90° V-balls are the most commonly used, but several other profiles are available. The transition between high flow and fine control with the Vari-V is extremely smooth.

- **Linear-V** is a slot in the ball that can be machined for precise flow requirements.
- **High Turndown-V** is used when you need maximum flow for filling followed by precise flow to accurately control the levels.
- **High Turndown-V** maximizes flow in the open position, and provides fine flow control when the valve is partially closed.

FreeSpirit

Custom V-balls are available for applications where specific flow requirements can not be met with the standard V-balls. Using Computational Fluid Dynamics (CFD), we can create a V-ball with a specific profile to fit any application. Anti-cavitation trim is also available.





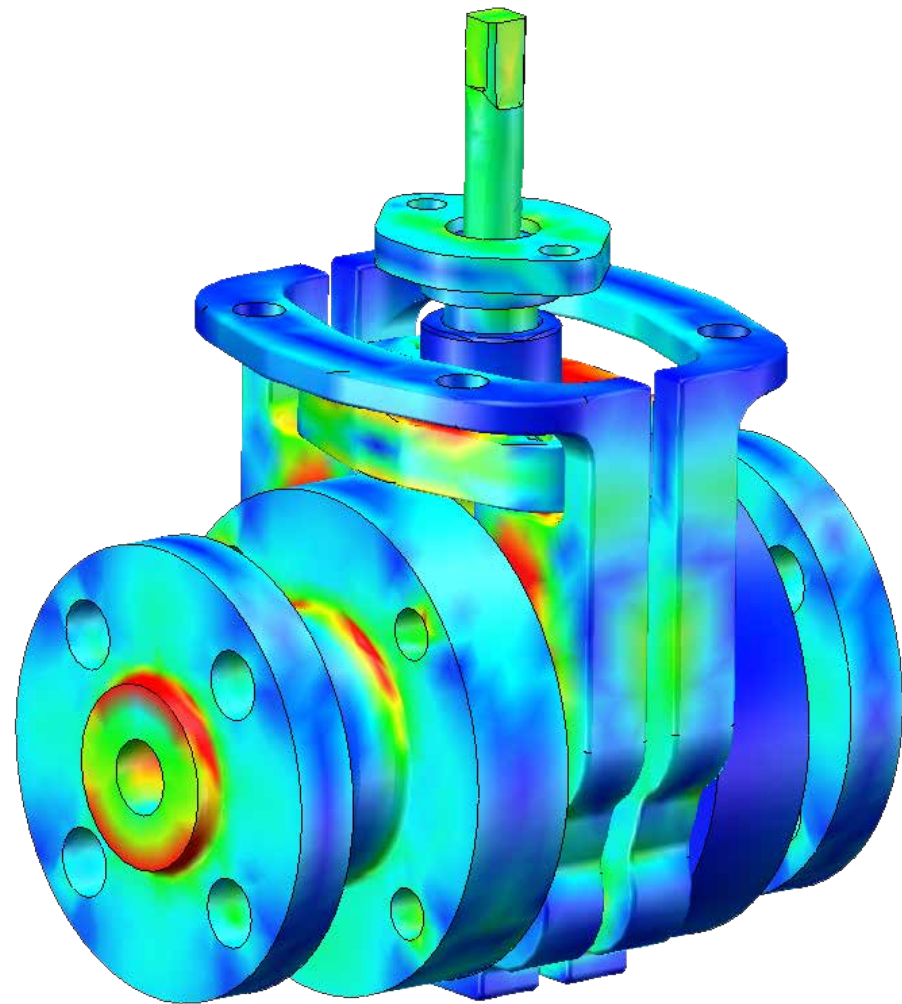
SlowPoke

An arcuate cut is a profile in the ball that reduces velocity both when the valve opens, and as it closes. When a standard ball valve is in the first and last 10° of opening, the gap between the ball and seat is an elliptical shape. The velocities are very high (especially in the corners), and erosion occurs. With an arcuate cut, the opening on the ball is close to three times larger. This reduces the velocity by spreading out the flow through a larger opening, which ultimately reduces wear on the ball and seats. An arcuate cut ball is best utilized in abrasive and high cycle applications.



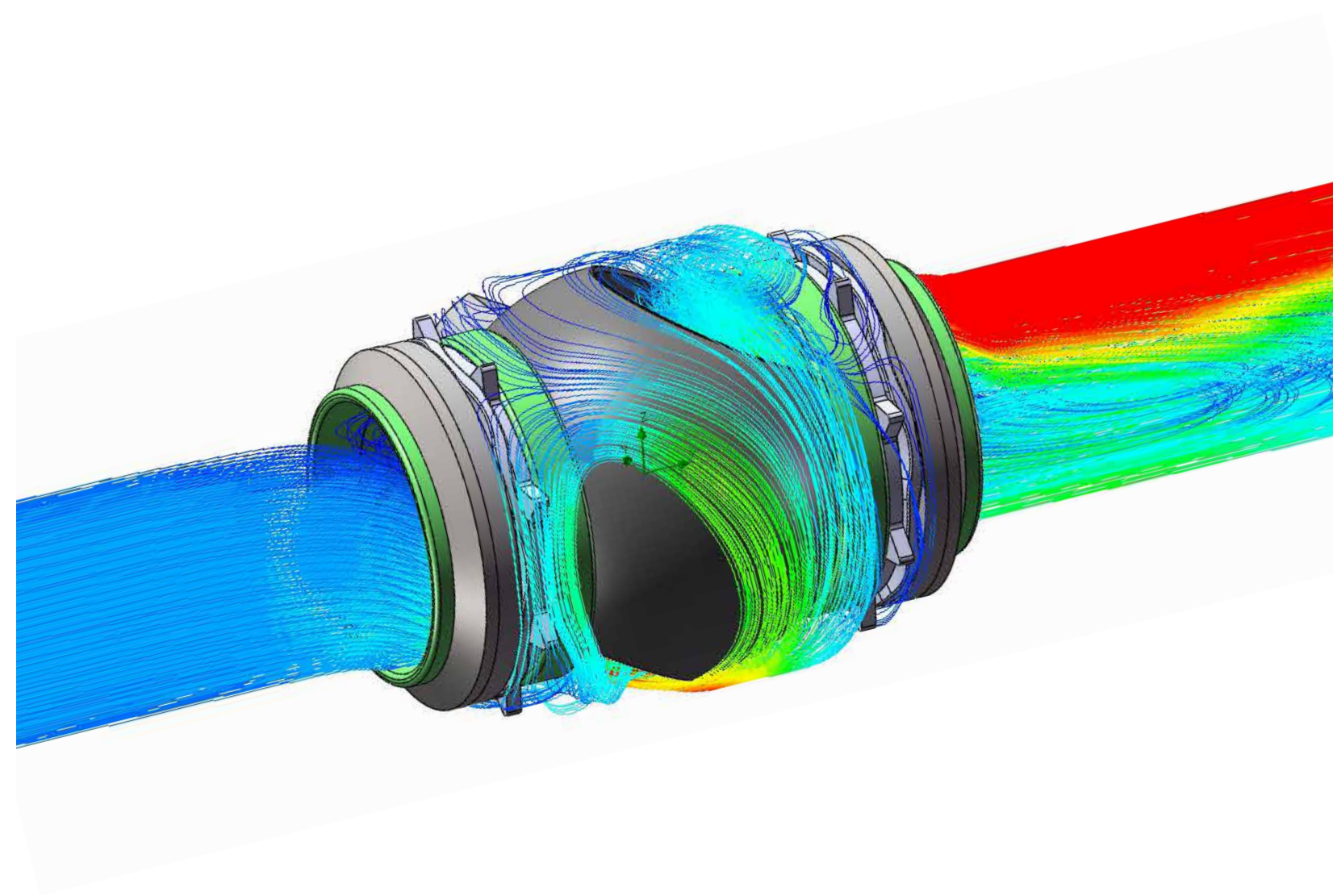
SmoothOperator

A common problem with metal seated valves is the build-up of material between the upstream seat and the body. Our approach to this problem is very different from traditional valve manufacturers. Their valve designs attempt to prevent media from getting behind the seat by sealing the outer edge and back of the seat. Our philosophy is the opposite: let the media flow behind the seat, as the scalloped ring design allows material to escape just as easily.



StressReliever

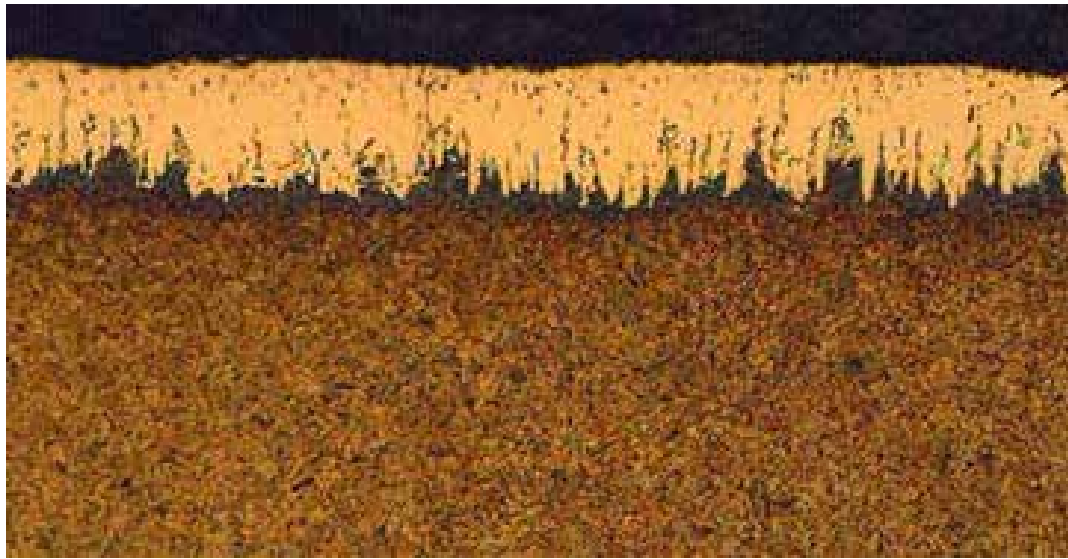
Finite Element Analysis (FEA) is used in Gosco Valves' design process to predict the behavior of a valve's components by subjecting them to varying loads. This ensures structural integrity. The analysis is based on variables such as maximum pressure and temperature inside the valve, and maximum actuator torque. The illustration shows the stress distribution in a valve assembly, based on FEA analysis.



FluidPerformer

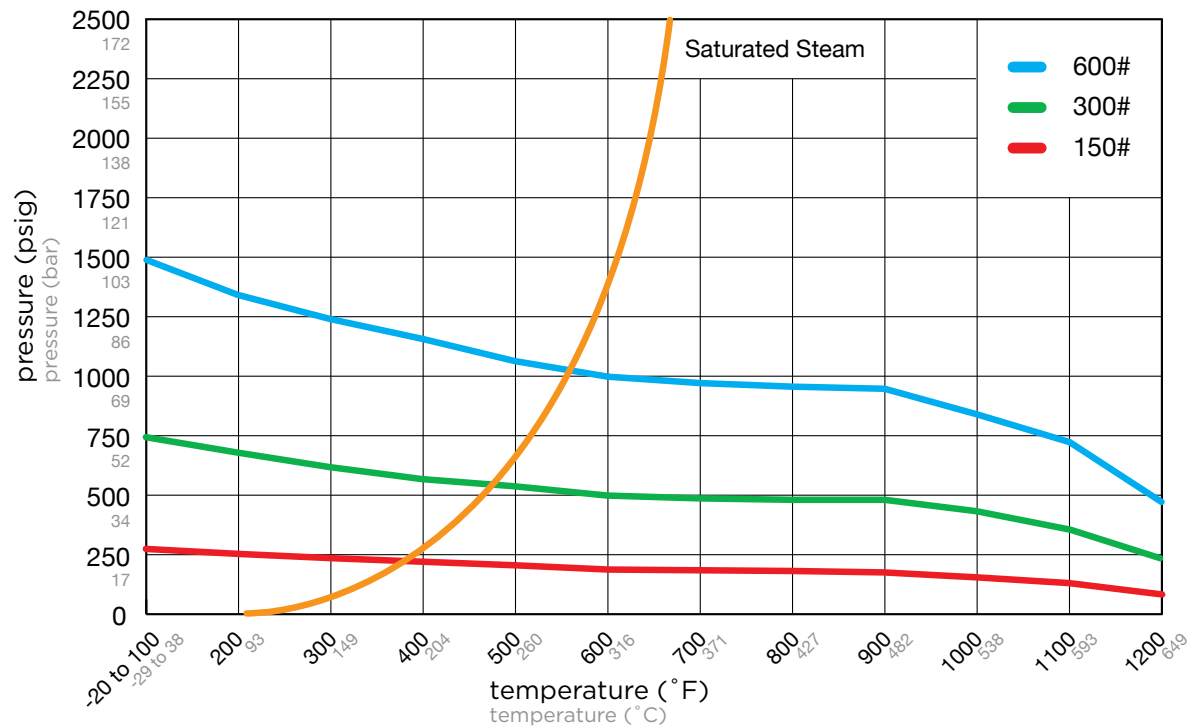
Computational Fluid Dynamics (CFD) is used to calculate the flow through the trim of a valve. It determines locations of high velocity and high flow, and assists in trim engineering for specific applications where velocities need to be controlled. CFD is also used to determine the flow coefficient (C_v) of Gosco Vari-V balls and aids in designing them to custom specifications. The illustration shows flow through a trim set at 45° open.

BORONIZING



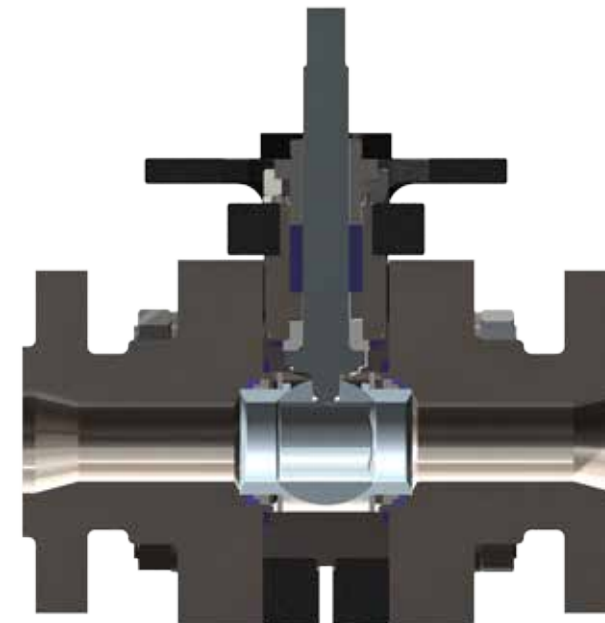
A thermochemical surface treatment in which Boron atoms are diffused into the surface of a base metal to form borides. It creates a new intermetallic layer with a hardness off the Rockwell C scale (1700 Vickers minimum). The base metal is chosen to handle the temperature, abrasion and corrosion of the process, and has a superior wear resistance to that of coatings.

OPERATIONAL INFORMATION

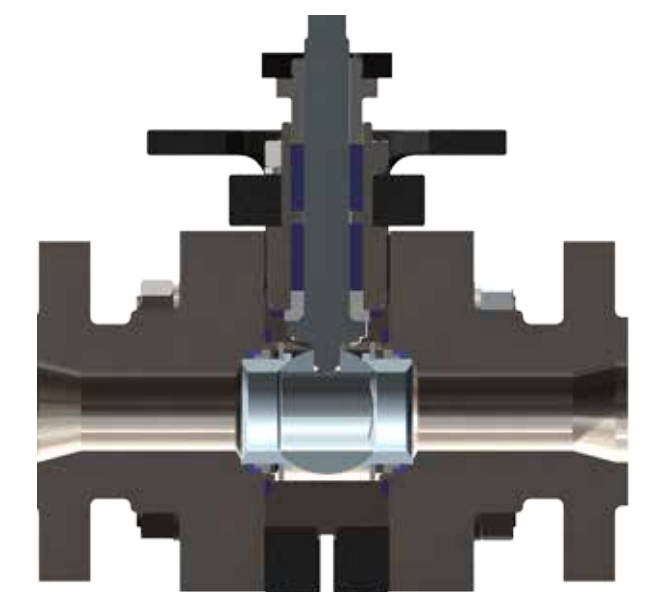


This is a generic materials operating chart. Refer to page 15 for accurate temperature ratings.

F-CLASS VALVE OPTIONS



READY-TO-GO



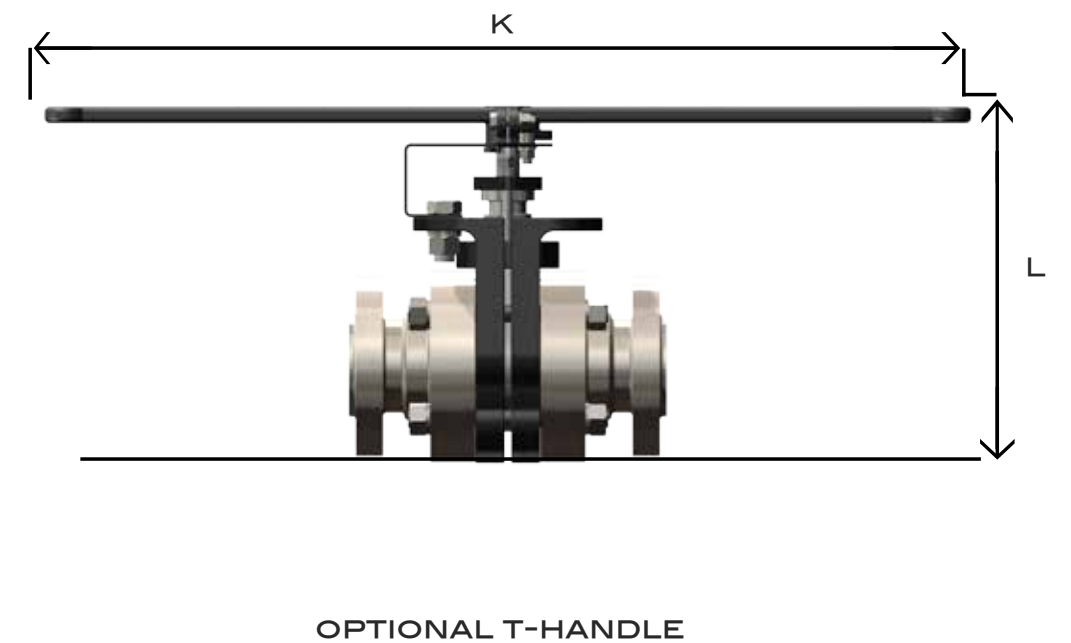
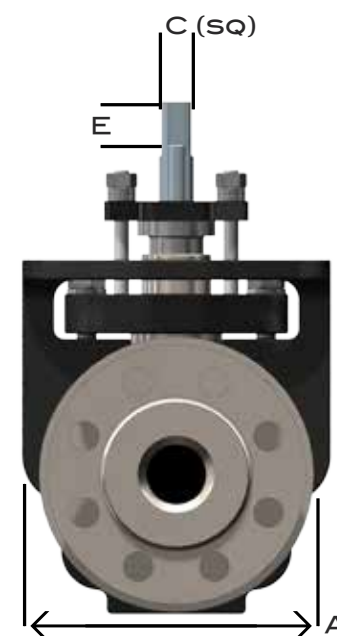
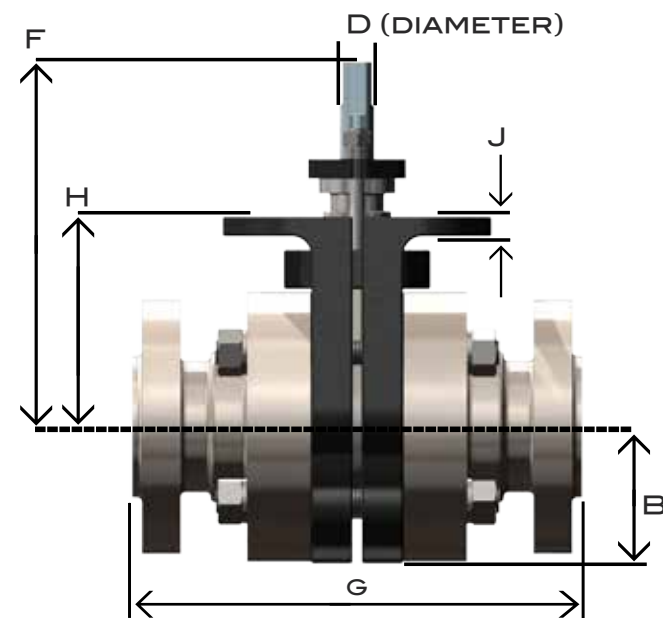
PREMIUM

	READY-TO-GO	PREMIUM
SHAFT	A286 (ASTM A638)	A286 (ASTM A638) or Inconel 718 (AMS 5663)
BALL / SEAT MATERIAL	Borided Inconel 718	Borided Inconel 718
BALL PROFILE	Arcuate Cut Ball	Arcuate Cut Ball or Vari-V Ball
CORE COMPONENTS (BODY, BONNET & ENDS)	ASTM A351 Gr. CF8M or A479 Gr. 316	Any commercially available material
TEMPERATURE RATING	-50°C to 537°C (-58°F to 1000°F)	-50°C to 537°C (-58°F to 1000°F)
SEALING TYPE	Fully bi-directional MSS-SP-61 or API 6D (On/Off only)	Fully bi-directional MSS-SP-61, API 6D (On/Off), ANSI FCI 70-2, Class IV, V or VI (Modulating)
PACKING TYPE	Single Packing (Chevron PTFE or Graphite)	Dual Packing (Chevron PTFE or Graphite)

DIMENSIONAL INFORMATION

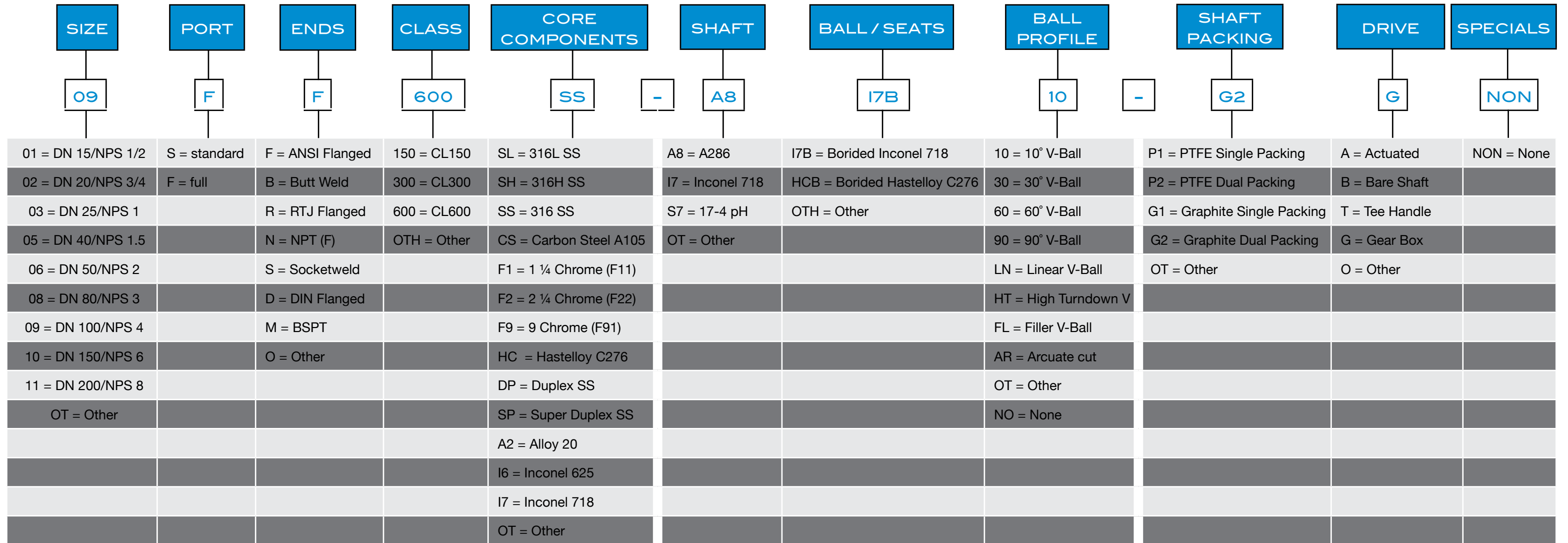
Column values inches/millimetres.

Valve Size (NPS - DN)	A	B	C	D	E	F	G			H	Weight (lbs/kg)			I Hole Dia (x4)	PCD	ISO	J	K	L
							150	300	600		150	300	600						
1/2" FP (NPS 1/2 - DN 15)	5/127.0	2.25/57.2	0.373/0.95	0.5/1.3	0.531/13.5	5.84/148.3	4.25/10.8	5.5/14.0	6.5/16.5	3.43/87.0	19/8.6	20/9.1	23/10.5	0.41/10.3	4.016/102.0	FA10	0.38/9.5	16.9/429.3	5.86/148.8
3/4" SP (NPS 3/4 - DN 20)	5/127.0	2.25/57.2	0.373/0.95	0.5/1.3	0.531/13.5	5.84/148.3	4.62/11.7	6/15.2	7.5/19.1	3.43/87.0	21/9.5	23/10.5	26/11.8	0.41/10.3	4.016/102.0	FA10	0.38/9.5	16.9/429.3	5.86/148.8
3/4" FP (NPS 3/4 - DN 20)	6/152.4	2.75/69.9	0.498/1.26	0.625/1.6	0.719/18.3	7.57/192.2	4.62/11.7	6/15.2	7.5/19.1	4.25/108.0	29/13.2	35/15.9	38/17.3	0.56/14.3	4.921/125.0	FA12	0.38/9.5	25/635.0	7.54/191.5
1" SP (NPS 1 - DN 25)	6/152.4	2.75/69.9	0.498/1.26	0.625/1.6	0.719/18.3	7.57/192.2	5/12.7	6.5/16.5	8.5/21.6	4.25/108.0	31/14.1	34/15.5	45/20.5	0.56/14.3	4.921/125.0	FA12	0.38/9.5	25/635.0	7.54/191.5
1" FP (NPS 1 - DN 25)	6/152.4	2.75/69.9	0.498/1.26	0.625/1.6	0.719/18.3	7.57/192.2	5/12.7	6.5/16.5	8.5/21.6	4.25/108.0	31/14.1	34/15.5	45/20.5	0.56/14.3	4.921/125.0	FA12	0.38/9.5	25/635.0	7.54/191.5
1-1/2" SP (NPS 1-1/2 - DN 40)	6/152.4	2.75/69.9	0.498/1.26	0.625/1.6	0.719/18.3	7.57/192.2	6.5/16.5	7.5/19.1	9.5/24.1	4.25/108.0	35/15.9	42/19.1	53/24.1	0.56/14.3	4.921/125.0	FA12	0.38/9.5	25/635.0	7.54/191.5
1-1/2" FP (NPS 1-1/2 - DN 40)	7.75/196.9	3.5/88.9	0.748/1.90	0.875/2.2	1.063/27.0	9.34/237.2	6.5/16.5	7.5/19.1	9.5/24.1	5.38/136.5	60/27.3	67/30.5	80/36.4	0.81/20.7	6.496/165.0	FA16	0.50/12.7	33.5/850.9	9.35/237.5
2" SP (NPS 2 - DN 50)	7.75/196.9	3.5/88.9	0.748/1.90	0.875/2.2	1.063/27.0	9.34/237.2	7/17.8	8.5/21.6	11.5/29.2	5.38/136.5	65/29.5	76/34.5	97/44.1	0.81/20.7	6.496/165.0	FA16	0.50/12.7	33.5/850.9	9.35/237.5
2" FP (NPS 2 - DN 50)	8.5/215.9	3.89/98.8	0.748/1.90	1/2.5	1.125/28.6	10.15/257.8	7/17.8	8.5/21.6	11.5/29.2	6.13/155.6	92/41.8	98/44.5	123/55.9	0.81/20.7	7.5/190.5	N/A	0.63/15.9	33.5/850.9	10.1/256.5
3" SP (NPS 3 - DN 80)	8.5/215.9	3.89/98.8	0.748/1.90	1/2.5	1.125/28.6	10.15/257.8	8/20.3	11.12/28.2	14/35.6	6.13/155.6	108/49.1	126/57.3	150/68.2	0.81/20.7	7.5/190.5	N/A	0.63/15.9	33.5/850.9	10.1/256.5
3" FP (NPS 3 - DN 80)	10.88/276.2	5.07/128.8	1.248/3.17	1.5/3.8	1.813/46.1	13.33/338.5	8/20.3	11.12/28.2	14/35.6	7.88/200.0	167/75.9	198/90.0	241/109.5	0.94/23.8	8.75/222.3	N/A	0.75/19.1	GEARBOX REQUIRED	
4" SP (NPS 4 - DN 100)	10.88/276.2	5.07/128.8	1.248/3.17	1.5/3.8	1.813/46.1	13.33/338.5	9/22.9	12/30.5	17/43.2	7.88/200.0	188/85.5	221/100.5	291/132.3	0.94/23.8	8.75/222.3	N/A	0.75/19.1		
4" FP (NPS 4 - DN 100)	13.25/336.6	6.25/158.8	1.248/3.17	1.75/4.4	1.875/47.6	15.05/382.3	9/22.9	12/30.5	17/43.2	9.13/231.8	289/131.4	329/149.5	450/204.5	1.09/27.8	10/254.0	N/A	0.88/22.2		
6" SP (NPS 6 - DN 150)	13.25/336.6	6.25/158.8	1.248/3.17	1.75/4.4	1.875/47.6	15.05/382.3	15.5/39.4	15.88/40.3	22/55.9	9.13/231.8	428/294.5	459/208.6	571/259.5	1.09/27.8	10/254.0	N/A	0.88/22.2		
6" FP (NPS 6 - DN 150)	16.75/425.5	8/203.2	1.498/3.80	2/5.1	2.125/54.0	17.05/433.1	15.5/39.4	15.88/40.3	22/55.9	11.50/292.1	611/277.7	648/294.5	901/409.5	1.22/31.0	12/304.8	N/A	1.00/25.4		
8" SP (NPS 8 - DN 200)	16.75/425.5	8/203.2	1.498/3.80	2/5.1	2.125/54.0	17.05/433.1	18/45.7	19.75/50.2	26/66.0	11.50/292.1	679/308.6	746/339.1	1030/468.2	1.22/31.0	12/304.8	N/A	1.00/25.4		



PART NUMBERING SYSTEM

(e.g. part number: 09FF600-SSA817B10-G2GNON)



Example valve: DN 100 / NPS 4, full port, Class 600 ANSI flanged, 316SS body, A286 shaft, Borided Inconel 718 ball and seats, 10° V-Ball, dual graphite packing, gearbox, no special †

WARRANTY

WARRANTY - The Seller warrants its products against defects in material or workmanship, when used on those services approved by the Seller, for a period of one (1) year from date of original shipment. The Seller's liability under this warranty shall be limited to repair or replacement at Seller's option of such defective products, F.O.B. factory, upon proof of defect satisfactory to Seller. Seller shall have no further liability for damages of any kind, including but not limited to personal injuries and property damage, resulting from use of Seller's product. This warranty is expressly in lieu of all other warranties, either express or implied, including any implied warranty as to merchantability or fitness for any particular purpose. Special and consequential damages: In no event shall Seller be liable for any consequential or special damages arising from any breach of these terms and conditions from the use of its products.

DESIGN TESTING & SPECIFICATIONS

- ASTM A 194/A193M-96b Alloy Steel and Stainless Steel Bolting Materials for High Temperature Service
- ASTM A 194/A194M-96 Carbon and Alloy Steel Nuts for High Pressure and High Temperature Service
- ANSI/ASME B1.3M Screw Thread Gauging System for Dimensional Acceptability
- ANSI/ASME B16.10 Face-to-Face and End-to-End Dimensions of Valves
- ANSI/ASME B16.34 Valves-Flanged, Threaded and Welding Ends
- MSS SP-25 Standard Marking System for Marking Valves, Fittings, Flanges and Unions
- CSA B51-95 Boiler, Pressure Vessel and Pressure Piping Code
- Mill certificates, PMI, and additional non-destructive testing are available if required
- API 608 Metal Ball Valves - Flanged, Threaded and Welding ends
- API 598 Valve Inspection and Testing
- API 6D Pipeline Valves
- ISO 9001: 2008
- MSS-SP-61 Pressure Testing of Valves
- ANSI FCI 70-2 Control Valve Seat Leakage Classifications



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