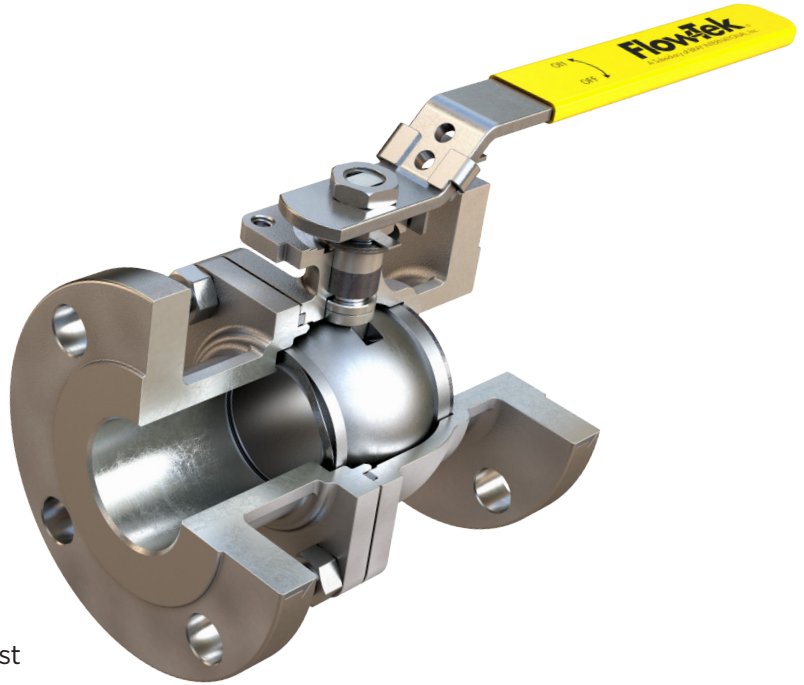


Highlights

- Available for 1/2" to 8" F15/F30 valves
- Temperatures up to 750°F (400°C)
- HVOF Chrome Carbide Hardened Ball and Seat surfaces provide superior wear & abrasion resistance
- Withstands higher pressure & temperature combinations than resilient seated valves
- Class IV standard shutoff, with up to Class VI shutoff available
- Next-day turn around possible
- Low torque values in comparison with competing Metal Seated Valves
- Reversible conversion (Metal Seats may be exchanged back to resilient seats)
- No valve body machining required = Lower cost



Design Features

The Flow-Tek Uni-directional design uses some key features to create the required seal while minimizing the torque. A wave spring is inserted between the upstream seat and valve body. The major benefit of a wave spring is that it produces a much lower initial valve torque in low pressure applications when compared to a Belleville spring. Flow-Tek's metal seated valve uses the wave spring to establish a preload on the metal to metal interface between the ball and seat and also at the graphite seal between the downstream seat and body. In service the ball floats as dictated by the pressure and the wave spring provides a variable load that helps to maintain constant contact between all sealing elements. When the temperature rises the internal components grow due to thermal expansion and the wave spring compresses compensating for the growth that occurs, thus preventing any binding or locking up of the ball and seat.

Seat Leakage Criteria

The Flow-Tek metal seated valves are manufactured and offered in three leakage classes as defined in Fluid Control Institute standard, ANSI/FCI-70-2-2006 titled "Control Valve Seat Leakage". Flow-Tek offers metal seats in both our control valves and valves intended for on-off service. The three classes vary in terms of allowable leakage.

Class IV: from the standard... "This class establishes the maximum permissible leakage generally associated with commercial unbalanced single-seat control valves and balanced single-seat control valves with extra tight piston rings or other sealing means and metal-to-metal seats."

Comment: Flow-Tek ball valves are unbalanced single-seat design.

- a. Seat test media is water at pressure equal to +/- 5% of CWP or air at 45 to 60 psig.
- b. Downstream seat tested only.
- c. Allowable seat leakage rate is 0.01% of the valve capacity.
- d. Valve capacity must be determined or known based on the conditions the valve is to be used. When capacity is unknown Flow-Tek will use the max flow coefficient value, Cv, as the max capacity.

Class V: from the standard... "This class is usually specified for critical applications where control valve(s) may be required to be closed, without a blocking valve, for long periods of time against high pressure. It requires special manufacturing, assembly and testing techniques. This class is generally associated with metal seats(s), unbalanced single-seat control valve or balanced single-seat designs with exceptional seat and seal tightness."

Comment: Flow-Tek ball valves are unbalanced single-seat design.

- a. Seat test media is water at pressure equal to +/-5% of CWP.
- b. Downstream seat tested only
- c. Allowable seat leakage is 0.0005 ml/minute/inch/psi differential of seat diameter.

Class VI: from the standard... "This class establishes the maximum permissible seat leakage generally associated with resilient seating control valves either unbalanced or balanced single-seat with "O" rings or similar gapless seals."

Comment: Class VI leakage has never been intended for metal seated valves. Class VI allowable leakage is the toughest criteria to meet with metal-to-metal seating. Flow-Tek will offer metal-to-metal seated ball valves to Class VI as an unbalanced single-seat design. Metal seats to Class VI require special manufacturing and assembly techniques. Flow-Tek Class VI metal seated valves will be unidirectional with the upstream seat spring loaded and only the downstream seat tested.

- a. Seat test media is air at 60 to 100 psig.
- b. Downstream seat tested only.
- c. Allowable seat leakage per Table 2 of FCI 70-2.

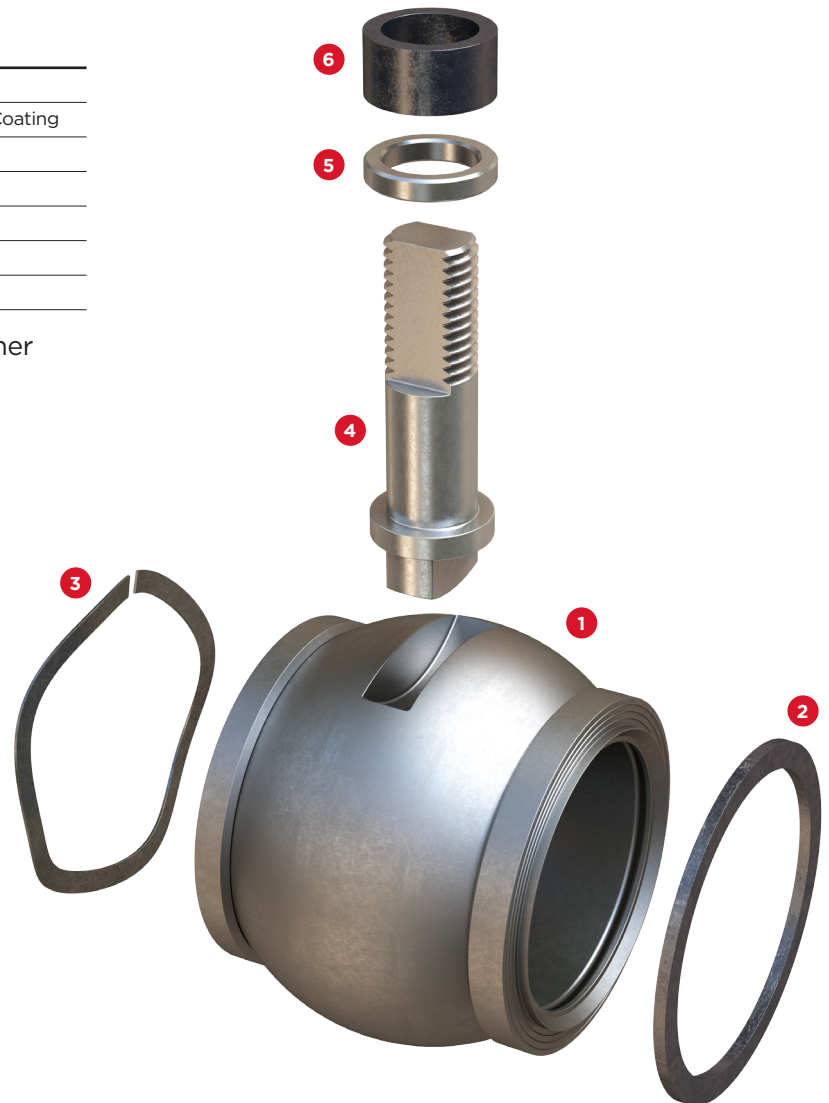
Maximum Allowable Leakage

FCI 70-2	Test Method	Units	1/2"	3/4"	1"	1 1/2"	2"	3"	4"	6"	8"
Class IV	Hydro	(ml/min)	12	22	39	104	189	435	794	1892	3633
Class V	Hydro (150#)	(ml/min)	0.07	0.11	0.14	0.21	0.29	0.43	0.57	0.86	1.14
	Hydro (300#)	(ml/min)	0.19	0.28	0.37	0.56	0.74	1.11	1.48	2.22	2.96
	Air	(bubbles/min)	15.67	23.5	31.33	47	62.67	94	125.33	188	250.67
		(ml/min)	2.35	3.525	4.7	7.05	9.4	14.1	18.8	28.2	37.6
Class VI	Air	(bubbles/min)	0.19	0.42	1	2	3	6	11	27	45
		(ml/min)	0.03	0.06	0.15	0.30	0.45	0.90	1.70	4.00	6.75

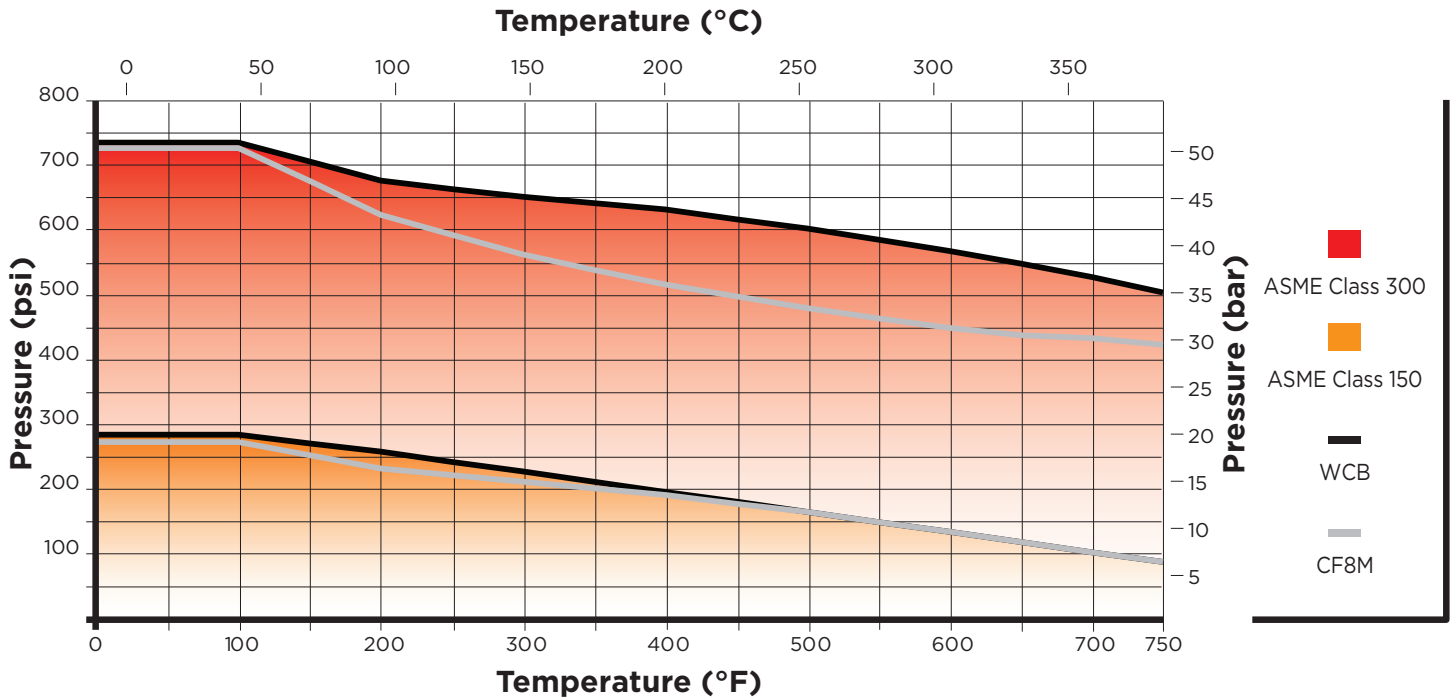
Components & Materials

Item No.	Description	Qty.	Material
1	Ball & Seat Set	1	CF8M w/ Chrome Carbide Coating
2	Gasket	1	Graphite
3	Spring	1	17-7 PH
4	Stem	1	17-4 PH or 660
5	Thrust Washer	1	Nitronic® 60
6	Packing	1	Graphite

As a standard, the F15/F30 MS is available in either WCB or CF8M body and end piece, with both having a CF8M ball and seat set. The ball and seat set are coated with an option of Chrome Carbide or a Hard Chrome and Stellite® combination. The mate lapped coated surfaces provide a low friction interface that is both wear resistant and able to withstand high temperature. The stem is available in either SS660 or 17-4PH SS. These materials fill the basic requirements for a wide variety of "intermediate severe service" valve applications. When other materials are required, Flow-Tek® will continue its practice of offering the F15/F30 in special alloys to suit specific customer requirements. Care should be taken to evaluate whether an application may require non-standard coatings with advanced wear or corrosion properties (as Tungsten Carbide, Chrome Oxide, Titanium Oxide, etc.) The factory should be consulted for any questions concerning material specifications.



Pressure / Temperature Ratings



Summary

Unlike other metal seated ball valves, the internal components fit directly into the standard F15/F30 valve body and end piece seat pockets with no machining modifications. This allows for a significant reduction in lead times for the metal seated valves. This standardization also means that the F15/F30 can make use of many traditional F15/F30 options like V-ball control or the Media Containment Unit.

Flow-Tek will offer metal-to-metal seated ball valves to three leakage classes as defined in ANSI/FCI-70-2-2006 at different pricing levels. Each leakage class represents a tighter allowable leakage as the class number increases.

Flow-Tek metal seated ball valves are tested to be below the allowable leakage rate specified in the leakage class at the time of shipment. Seat tightness may change with the valve service.