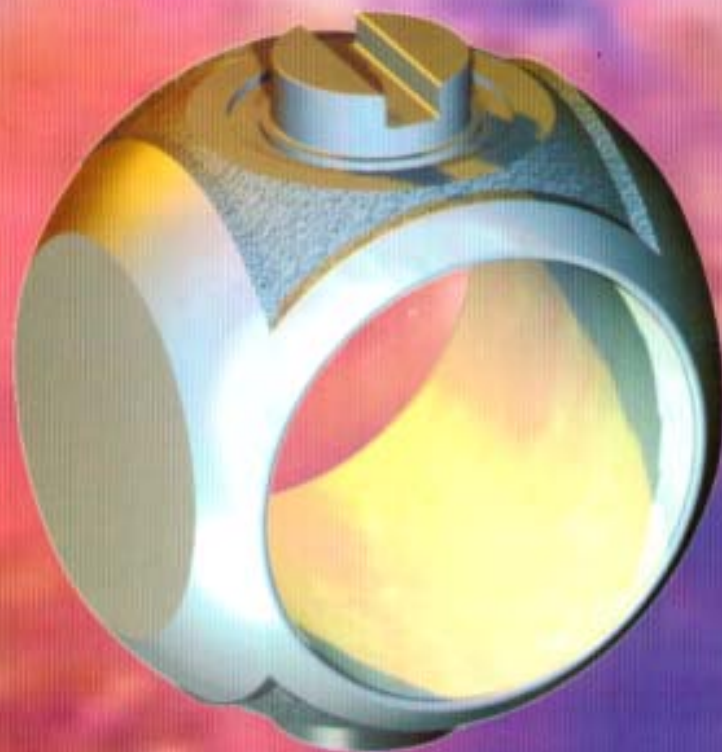


Concordia Valves, Inc.

QuadroSphere!



**A New Generation of
High-Performance Ball Valves**



CONCORDIA Valves, Inc. is a designer, producer and marketer of innovative and improved industrial valve products.

CONCORDIA introduces the QuadroSphere™ Ball Valve ...

The development of the QuadroSphere™ Ball Valve product line is the end result of many years of valve application experience in the geothermal power industry where the heavy buildup of mineral deposits and abrasive particulate matter have been the main cause of valve failure.

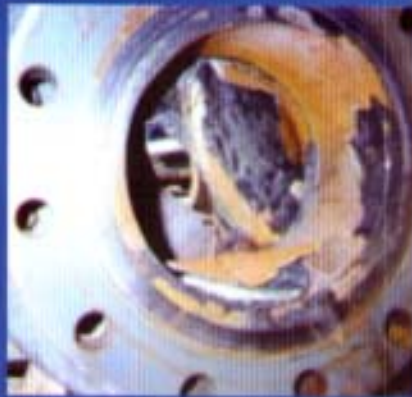


Initial field tests ...

In 1994, an 8"-300, 3-pc, full-port carbon steel ball valve with trunnion-mounted ball was retrofitted with a SS, electroless Nickel plated Q-Sphere ball, a SS/TFE seat on the upstream side and a SS/Stellite seat on the downstream side. The valve was then installed in a normally closed 225F vent isolation service where it handled a mix of geothermal vapor with H₂S, and brine containing silicate, calcite and ferrite at 115 psig.

After the first twelve months, the valve was removed from the line. Heavy scale deposits had formed on all surfaces exposed to the media. But, when the valve was stroked from closed to open, the

lips on the ball scraped off the buildup that had accumulated on the sealing surfaces of the Q-Sphere™ and the seat inserts. The valve was then reinstalled in the line.



Eighteen months later ...

The valve was again removed from the line for further examination. This time we found the bore of its inlet and outlet flanges, and the face of the Q-Sphere™, were covered with a thick concrete-like deposit of hard, abrasive calcite, silica and ferrite scale. However, we found the body cavity, valve seats, and areas of the ball not exposed to the media to be free of any scale deposits.

Then, when the valve was operated, there was a loud cracking sound as the Q-Sphere™ ball readily broke through the heavy scale buildup. At this time the body cavity, valve seats, and area of the ball not exposed to the media were found to be free of any scale deposits.



The valve was cycled several times to clean its seats and, then tested with water at 150 psig. Amazingly, it allowed only minimal leakage of 0.001 gpm from the TFE seated side and 0.239 gpm from the metal seated side.

Road Show...

In 1998, this original "beta" valve was presented to over 100 process piping and valve engineers. Many were so impressed that they wanted to know when a complete range of QuadroSphere™ valves would be available!

QuadroSphere™ is launched...

That was then! A lot has been accomplished since then. After much hard work and considerable investment, CONCORDIA is proud to introduce a new generation of high performance ball valves for tough process applications!



Today, when you want the best...

"Look for the Q-Sphere inside!"

QuadroSphere!™

The first QuadroSphere™ valve was invented to handle hot dirty fluids in the geothermal power industry that were causing many valves to fail due to heavy scale build-up, excessive abrasion, and the erosion of internal components. In subsequent field tests and, also under difficult R & D test conditions, QuadroSphere™ valves exhibited superior performance capabilities in the handling of fluids containing particulate matter, dirt, grit, and scale.

Now, after over six years of severe service field tests and an intensive product development effort, CONCORDIA is pleased to present an exceptional range of high performance valves that utilize a number of major improvements in ball valve technology.

Today's QuadroSphere™ valve is a product that incorporates a "building block" design concept, plus several proprietary design innovations, and the latest in material and process technologies, into an extremely rugged, high capacity range of quarter-turn, full and reduced port process valves.

QuadroSphere!™ performs where other quarter-turn valves fail ...

Unlike conventional ball valves that rely on a highly polished spherical surface, the Q-Sphere™ has two sets of parallel raised spherical lips. One set engages the seats when the valve is fully closed, and another set protects the seats when the valve is open. By removing (recessing) all of the non-essential surface areas on the Q-Sphere™ ball, particulate matter can pass into the recessed areas on the ball and flow around the Q-Sphere™ without damaging the ball's sealing surfaces, or the valve seats. In addition, when a Q-Sphere™ ball is stroked from closed to open, its lips wipe across the seats in such a way to clean them and push any removed contaminants into the recessed areas and safely back into the process stream.

QuadroSphere!™ offers decisive advantages over gate and globe valves ...

Quarter turn valves are often preferred for their simple operation, high flow capacity, compactness, lighter weight, reliable stem seals and ease of automation. They have a big advantage over multi-turn valves, especially when automation is required, as their 1/4-turn operation, compactness, lightweight and low operating torque provide for ease of installation and economy of actuation. Just like all ball valves, QuadroSphere™ valves provide no obstruction to flow when fully open, yet unlike most ball valves, QuadroSphere™ valves can also be used for many throttling services since the recessed surface areas on the Q-Sphere™ ball provide improved flow control characteristics as well as an exceptionally low running torque.

As compared to multi-turn valves such as gate and globe valves, a 1/4-turn valve is simpler to operate and maintain and, unlike linear stroking valves, has the advantage of turning within its own axis. QuadroSphere™ also incorporates CONCORDIA's proprietary "zero leakage" stem sealing system.

QuadroSphere!™ A quarter-turn valve for tough services ...

QuadroSphere™ valves, in either their standard, or special configurations, are well suited for a wide variety of applications in industries such as:

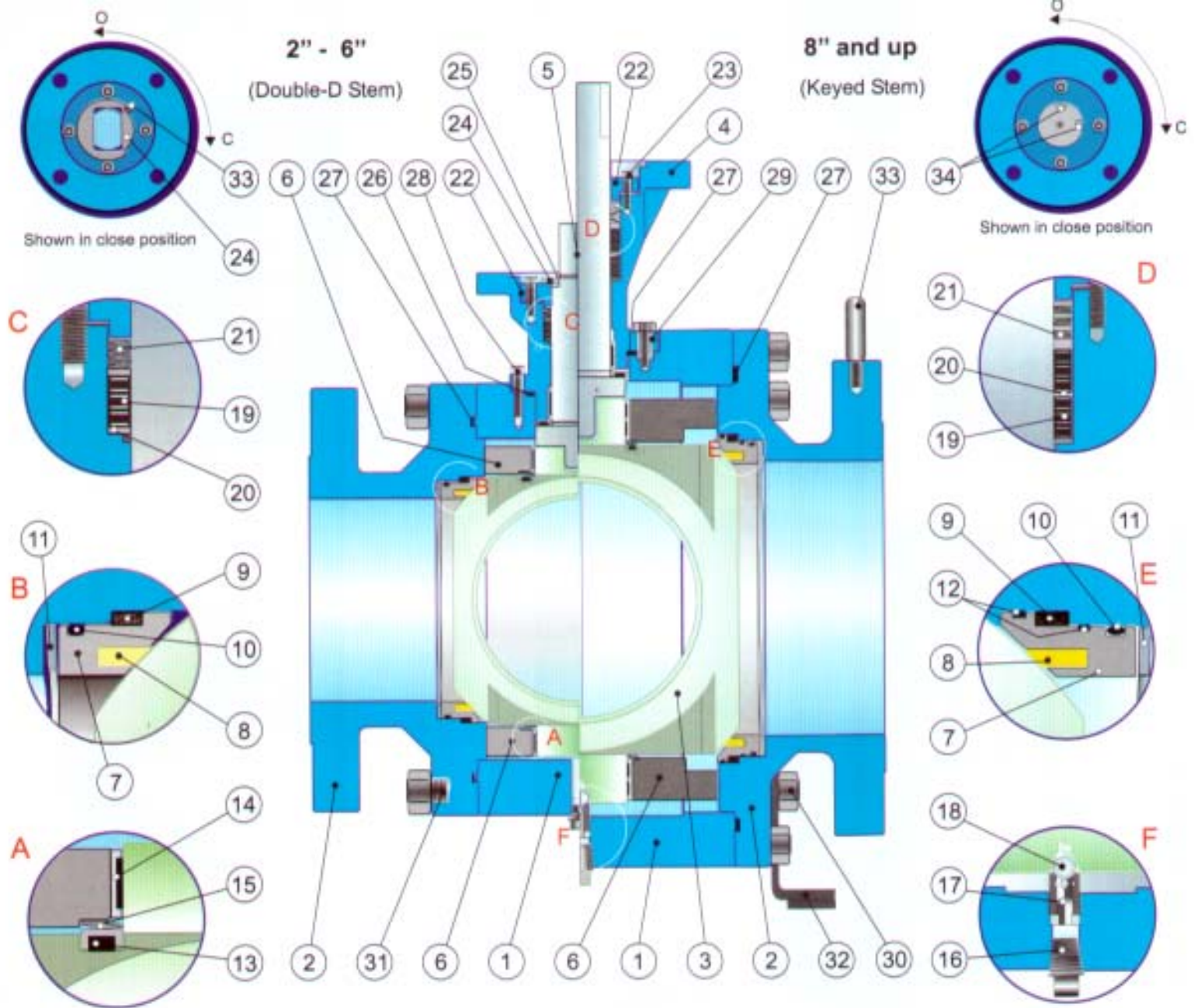
- General Processing
- Oil & Gas
- Power Generation
- Pulp & Paper
- Chemical
- Cryogenics
- Food & Beverage
- Water & Wastewater
- Aircraft & Aerospace
- Marine
- Mining & Metals
- Pipeline

The QuadroSphere™ product line is offered in sizes 2"-24", ANSI 150, 300 and 600, to API 6D face-to-face, and ANSI B16.5 flanged, or weld-ends. It has a three-piece body with fully retained body-to-end-flange seals; a bolted bonnet with live-loaded zero-leakage packing; and a set of robust, spring-loaded, pressure-energized seat rings that make it suitable for double block and bleed services. Metal-to-metal seating is also available along with several hard-facing options.

Full, or reduced port, CS or SS valve bodies, with SS trunnion-mounted QSphere™ ball, and SS seat rings with a selection of soft inserts are readily available. The QuadroSphere™ valve's modular design provides a platform for a series of pre-engineered upgrades and off-the-shelf add-on components for special and severe service applications. This "building block" design also provides for ease of assembly and field repair.

QuadroSphere!™

"OPENING UP APPLICATION OPPORTUNITIES!"



No	Part	Std. Materials & Options	No	Part	Std. Materials & Options
1	Main-Body	WCB (A105), CF8M (316 SS)	18	Ball Adjustment Pivot	CS, SS
2	End-Flange	WCB (A105), CF8M (316 SS)	19	Packing Ring	Graphite with anti-extrusion SS rings
3	Q-Sphere Ball	CF8M (316 SS) / (HC or ENP)	20	Spacer Washers	CS, SS
4	Bonnet	WCB (A105), CF8M (316 SS)	21	Packing Spring	CS, SS
5	Stem	316 SS	22	Gland	CS, SS
6	Bearing Plate	CS, SS	23	Gland Bolt	CS, SS
7	Seat Cartridge	SS	24	Stop Plate	CS, SS
8	Seat Insert	RTFE, PEEK, UHMWPE, PCTFE	25	Stop Plate Retainer	CS, SS
9	Seat Back-up Ring	Graphite	26	Bonnet Gasket	Graphite
10	Seat O-Ring	Buna-N, EPDM, Viton	27	Main-Body Gasket	Graphite
11	Seat Wave Spring	CS, SS	28	Bonnet Bolt	CS, SS
12	Seat Back Guide Ring	RTFE	29	Bonnet Mounting Guide	CS, SS
13	Trunnion Thrust Washer	SS / Graphite	30	End-Flange Nut	CS, SS
14	Trunnion Sleeve Bearing	SS / RTFE	31	Main-Body Stud	CS, SS
15	Trunnion Wave Spring	CS, SS	32	Leg	CS
16	Drain Plug	CS, SS	33	Lifting Tab / Hook	CS, SS
17	Ball Adjustment Support	CS, SS	34	Key	CS, SS

QS	A	B	C	D	E	F	G	H	K	L	L1	M	N	N1	O	P	R	S	Wt. (lbs)	Wt. (Kg)
2 -150	7.00	2.00	6.00	0.62	6.45	-	0.75	0.72	0.5	0.75	-	4.75	4	4	3.15	0.35	1/16	-	53	24
2 -300	8.50	2.00	6.50	0.88	6.45	-	0.75	0.72	0.5	0.75	-	5.00	8	4	3.15	0.35	1/16	-	64	29
3 -150	8.90	3.00	7.50	0.75	7.07	-	1	0.96	0.5	0.75	-	5.00	4	4	4.00	0.43	1/16	-	81	37
3 -300	11.12	3.00	8.25	1.12	7.07	-	1	0.96	0.5	0.88	-	6.62	8	4	4.00	0.43	1/16	-	105	48
4 -150	9.00	4.00	9.00	0.94	8.09	-	1	0.96	0.5	0.75	-	7.50	8	4	4.00	0.43	1/16	-	123	56
4 -300	12.00	4.00	10.00	1.25	8.09	-	1	0.96	0.5	0.88	-	7.88	8	4	4.00	0.43	1/16	-	163	74
6 -150	15.50	6.00	11.00	1.00	9.63	-	1.5	1.5	1	0.66	-	9.50	8	4	4.95	0.51	1/16	-	337	153
6 -300	15.87	6.00	12.50	1.44	9.63	-	1.5	1.5	1	0.88	-	10.62	12	4	4.95	0.51	1/16	-	388	176
8 -150	18.00	8.00	13.50	1.12	12.75	0.50	2	2.5	-	0.88	2.25	11.75	8	4	5.51	0.75	1/16	0.275	595	270
8 -300	19.75	8.00	15.00	1.62	12.75	0.50	2	2.5	-	1.00	2.25	13.00	12	4	5.51	0.75	1/16	0.275	672	305
10 -150	21.00	10.00	16.00	1.19	16.10	0.625	2.5	2.87	-	1.00	2.625	14.25	12	4	6.50	0.90	1/16	0.375	853	387
10 -300	22.37	10.00	17.50	1.88	16.10	0.625	2.5	2.87	-	1.12	2.625	15.25	16	4	6.50	0.90	1/16	0.375	926	420
12 -150	24.00	12.00	19.00	1.25	19.75	0.875	3.5	2.87	-	1.00	2.625	17.00	12	8	7.50	0.75	1/16	0.5	1080	490
12 -300	25.50	12.00	20.50	2.00	19.75	0.875	3.5	2.87	-	1.25	2.625	17.75	16	8	7.50	0.75	1/16	0.5	1191	540

Dimensions are in inch

For all other valve sizes and pressure classes please contact Concordia Valves, Inc.

