Crown Wafer Nozzle Check Valves

Leading the Way in Pipeline Technology

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Product Scope and Applications

PRODUCT SCOPE

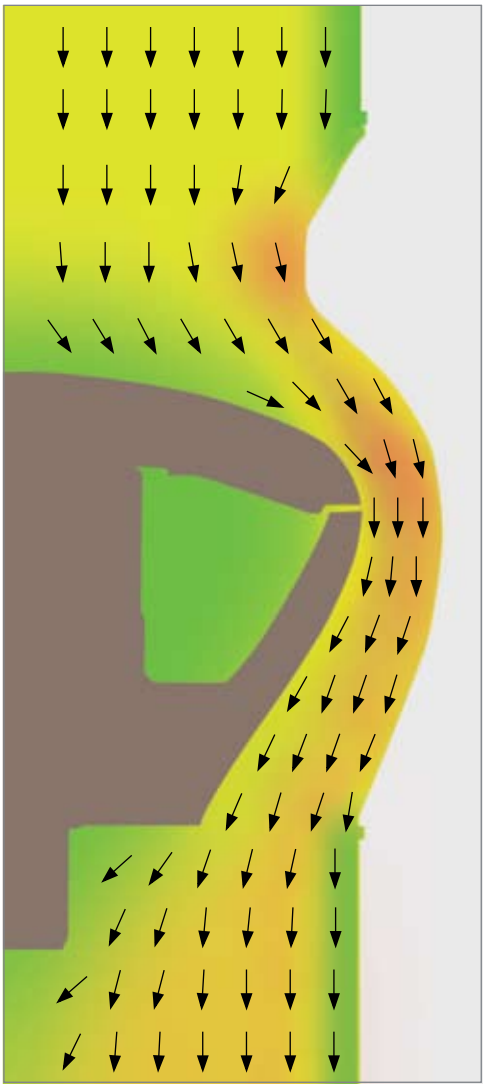
- Sizes 2” - 12”
- ASME B16.34 and API 6D, pressure classes 150 - 900
- Valve is offered in a wafer design
- -50°F (-45°C) to +600°F (+315°C) standard operating temperature range
- Standard and engineered valve configurations available
- Consult Stream-Flo for special application requirements

HIGH PERFORMANCE NON-SLAM NOZZLE CHECK VALVE

The Crown Wafer Nozzle Check Valve was developed with performance in mind, offering both quick dynamic response and low pressure drop in a compact design.

Quick dynamic response is important for the prevention of hammering and surging in the piping system. These conditions occur when reverse flow is allowed to accelerate through the check valve before the valve has time to close. By reducing the mass of the piston, shortening its travel distance and applying a spring force opposite to the flow, the Crown Wafer Nozzle Check Valve is able to close quickly to prevent hammering and surging, thereby providing silent closure of the check valve.

Although quick dynamic response is important, a high flow coefficient also plays an important role by reducing the day-to-day operating costs. The Crown Wafer Nozzle Check Valve creates low pressure drops due to the smooth and gradual transitions in the flow path. Unlike other short pattern in-line piston check valves, the Crown Wafer Nozzle Check Valve has a smooth dome-shaped piston. As the fluid enters the valve, it gradually accelerates around the piston and then gradually decelerates along the diffuser, conserving energy and minimizing turbulence.



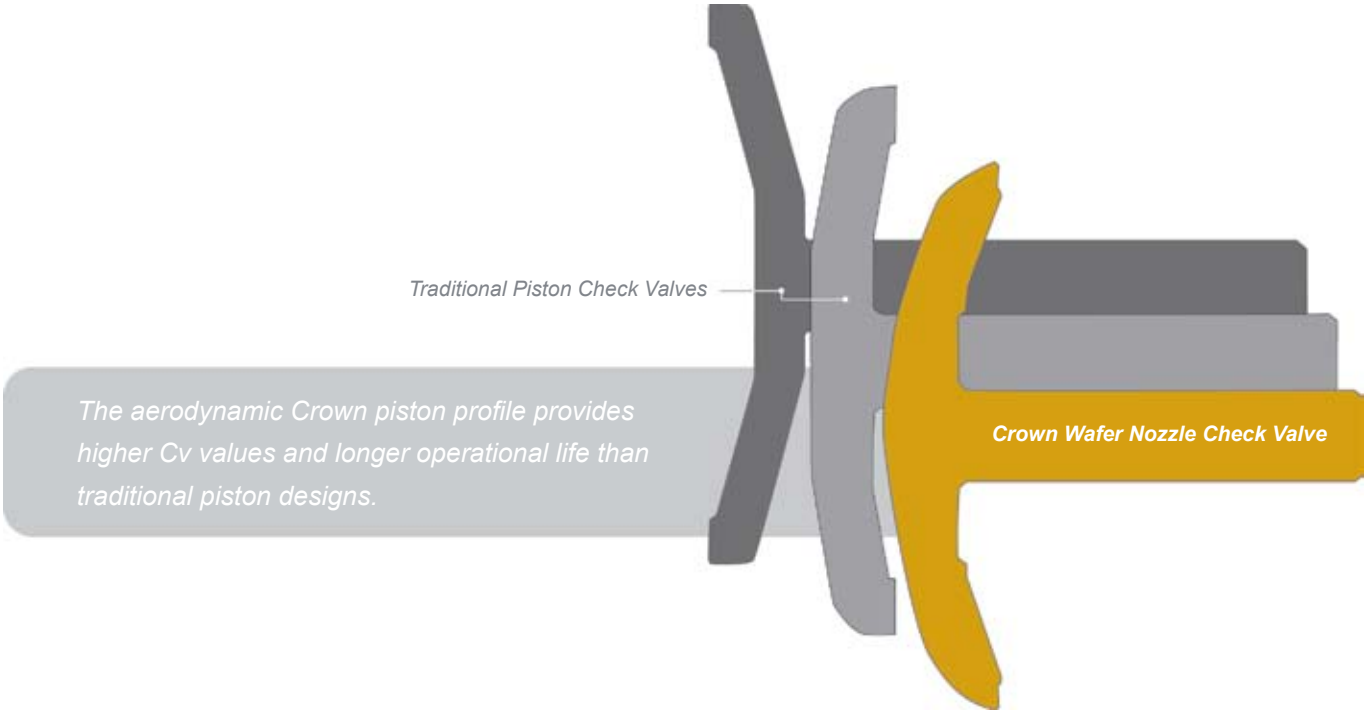
Flow Vectors

APPLICATIONS

- **Gas transmission** compressor suction / discharge / bypass / meter stations
- **Petro-chemical, chemical processing** propylene units
- **Hydrocarbon processing** hydro treating, catalytic cracking
- **Offshore platforms** manifold systems

FEATURES AND BENEFITS

- Compact design and short face-to-face length
- Quick dynamic response minimizing damaging water hammer
- Short stroke to assist in quick response times
- Selection of springs to improve value response for specific critical velocity
- Ease of installation
- Lower pressure drop compared with similar valves
- Intrinsic non-slam design, no need for external dampers
- Ease of maintenance with longer valve life
- Larger flow passages resulting in less flow erosion due to lower velocities
- Zero or low leakage rate
- Suitable for compressor and pump applications in liquid or gas
- Suitable for low and high pressure applications
- Can be engineered for vertical applications
- Metal-to-metal sealing



PRINCIPLES

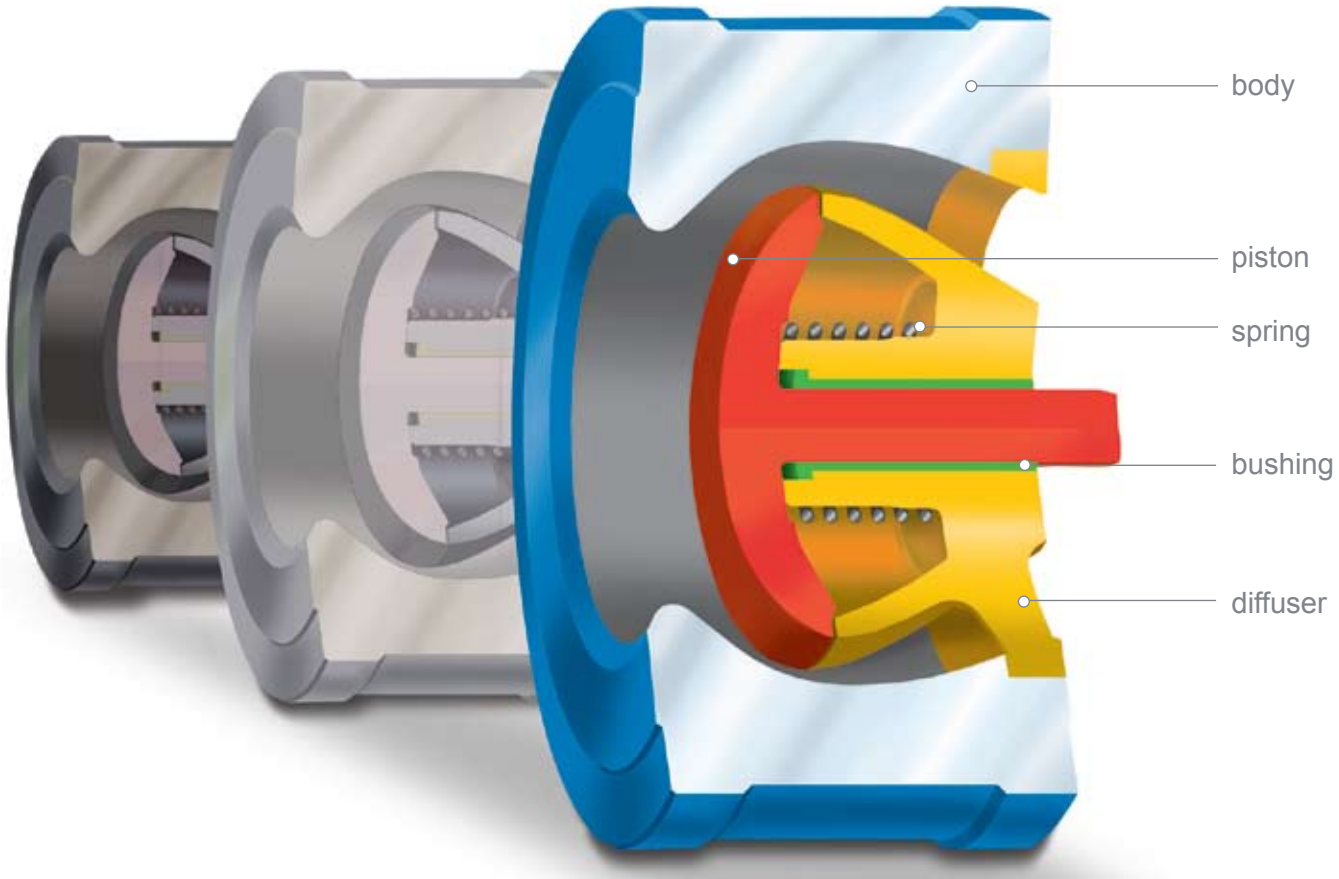
The venturi created by the accelerated flow provides the added benefit of creating a low pressure region behind the piston. This low pressure region assists in keeping the piston fully open during pulsating flow, thereby reducing the wear of moving parts and preventing piston damage caused by the piston hammering open against the diffuser.

The Crown Wafer Nozzle Check Valve is the best combination of superior flow efficiency and excellent dynamic response in a compact check valve.

CERTIFICATION & STANDARDS

- Complies with NACE MR0175
- Monogrammed per API 6D/ISO 14313
- Face-to-face dimensions in accordance with API 594 unless specified
- Designed to exceed the requirements of API 6D/ISO 14313, ASME B16.34, ASME Section VIII, Division 1 and CSA Z24.15
- API Q1 and ISO 9001 certified manufacturing facility

COMPONENTS



CNC Machine

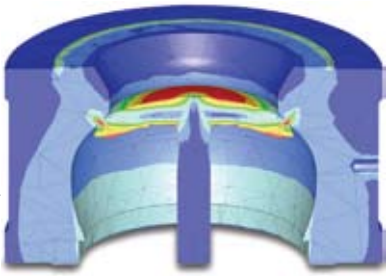
QUALITY The Crown Wafer Nozzle Check Valve is manufactured in our API Q1 and ISO 9001 certified manufacturing facility in Edmonton, Canada. Parts are manufactured using state-of-the-art computer numerically controlled (CNC) machines and then inspected with a coordinate measuring machine (CMM). This ensures that the flow characteristics of every valve are predictable and consistent.

CMM Inspection

DESIGN The Crown Wafer Nozzle Check Valve is designed with the help of Pro Mechanica® finite element analysis (FEA) and Flow 3D® computational fluid dynamics (CFD) software. These tools allow the design team to create a light-weight moving assembly with excellent flow and dynamic characteristics. Flow testing and hydrostatic testing are performed for design validation.

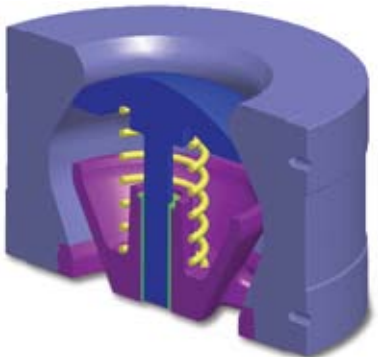
The Crown Wafer Nozzle Check Valve exceeds the requirements of API 6D/ISO 14313, ASME B16.34, CSA Z245.15 and NACE MR0175.

Pro Mechanica® is a registered trademark of PTC, the product development company™
Flow 3D is a registered trademark of Flow Science Inc.



Finite Element Analysis

PART	MATERIAL
body	A350 LF2 / A352 LCC
piston	A350 LF2 (2” - 6”)
	A352 LCC (8” - 12”)
diffuser	A352 LCC
bushing	A276 316
spring	alloy X-750
snap ring	alloy steel
eye bolt	steel



WEIGHTS & DIMENSIONS

Size in. (DN)	Class (PN)	Weight lbs. (kg)	Length in. (mm)	O.D. in. (mm)	Bore in. (mm)	No. Stud Bolts	Stud Bolt Size in.	Length in. (mm)
2" (50)	150 (20)	7 (3.2)	2.38 (60)	4.13 (105)	1.50 (38)	4	5/8	5.75 (146)
	300 (50)	8 (3.6)	2.38 (60)	4.38 (111)	1.50 (38)	8	5/8	6.00 (152)
	600 (100)	8 (3.6)	2.38 (60)	4.38 (111)	1.50 (38)	8	5/8	6.75 (171)
	900 (150)	17 (7.7)	2.75 (70)	5.63 (143)	1.50 (38)	8	7/8	8.75 (222)
3" (80)	150 (20)	14 (6.4)	2.88 (73)	5.38 (137)	2.44 (62)	4	5/8	6.5 (165)
	300 (50)	17 (7.7)	2.88 (73)	5.88 (149)	2.44 (62)	8	3/4	7.25 (184)
	600 (100)	17 (7.7)	2.88 (73)	5.88 (149)	2.44 (62)	8	3/4	8.00 (203)
	900 (150)	26 (11.8)	3.25 (83)	6.63 (168)	2.44 (62)	8	7/8	9.25 (235)
4" (100)	150 (20)	23 (10.4)	3.13 (79) *	6.88 (175)	3.38 (86)	8	5/8	6.75 (171)
	300 (50)	26 (11.8)	3.13 (79) *	7.13 (181)	3.38 (86)	8	3/4	7.75 (197)
	600 (100)	31 (14.1)	3.13 (79)	7.63 (194)	3.38 (86)	8	7/8	9.00 (229)
	900 (150)	45 (20.4)	4.00 (102)	8.13 (206)	3.38 (86)	8	1 1/8	11.00 (279)
6" (150)	150 (20)	51 (23.1)	5.38 (137) *	8.75 (222)	5.06 (129)	8	3/4	9.50 (241)
	300 (50)	76 (34.5)	5.38 (137) *	9.88 (251)	5.06 (129)	12	3/4	10.25 (260)
	600 (100)	91 (41.3)	5.38 (137)	10.50 (267)	5.06 (129)	12	1	12.25 (311)
	900 (150)	132 (59.9)	6.25 (159)	11.38 (289)	5.06 (129)	12	1 1/8	14.00 (356)
8" (200)	150 (20)	111 (50.3)	8.13 (207) *	10.88 (276)	6.75 (171)	8	3/4	12.50 (318)
	300 (50)	158 (71.7)	8.13 (207) *	12.00 (305)	6.75 (171)	12	7/8	13.75 (349)
	600 (100)	186 (84.4)	8.13 (207) *	12.63 (321)	6.75 (171)	12	1 1/8	16.00 (406)
	900 (150)	258 (117.0)	8.13 (207)	14.13 (359)	6.75 (171)	12	1 3/8	17.00 (432)
10" (250)	150 (20)	195 (88.5)	9.50 (241) *	13.25 (337)	8.10 (206)	12	7/8	14.25 (362)
	300 (50)	246 (111.6)	9.50 (241) *	14.13 (359)	8.10 (206)	16	1	16.00 (406)
	600 (100)	336 (152.4)	9.50 (241) *	15.63 (397)	8.10 (206)	16	1 1/4	18.25 (464)
	900 (150)	429 (194.6)	9.50 (241)	17.00 (432)	8.10 (206)	16	1 3/8	19.00 (483)
12" (300)	150 (20)	350 (158.8)	11.50 (292) *	16.00 (406)	9.75 (248)	12	7/8	16.50 (419)
	300 (50)	392 (177.7)	11.50 (292) *	16.00 (406)	9.75 (248)	16	1 1/8	18.50 (470)
	600 (100)	507 (229.9)	11.50 (292) *	17.88 (454)	9.75 (248)	20	1 1/4	20.50 (521)
	900 (150)	661 (299.8)	11.50 (292)	19.50 (495)	9.75 (248)	20	1 3/8	21.75 (552)

** Special Face-to-Face Dimension*

CRACKING PRESSURES

Size In. (DN)	Class (PN)	Spring Type	Cracking Pressure
2” (50)	150-900 (20-150)	Standard Heavy	0.10 psi 0.15 psi
3” (80)	150-900 (20-150)	Standard Heavy	0.16 psi 0.22 psi
4” (100)	150-900 (20-150)	Standard Heavy	0.21 psi 0.30 psi
6” (150)	150-900 (20-150)	Standard Heavy	0.31 psi 0.44 psi
8” (200)	150-900 (20-150)	Standard Heavy	0.36 psi 0.66 psi
10” (250)	150-900 (20-150)	Standard Heavy	0.38 psi 0.71 psi
12” (300)	150-900 (20-150)	Standard Heavy	0.46 psi 0.82 psi

Cv VALUES

Size In. (DN)	Class 150 (PN 20)	Class 300 (PN 50)	Class 600 (PN 100)	Class 900 (PN 150)
2” (50)	86	86	86	86
3” (80)	191	191	191	191
4” (100)	340	340	340	340
6” (150)	740	740	740	830
8” (200)	1516	1516	1516	1516
10” (250)	1879	1879	1879	1879
12” (300)	2957	2957	2957	2957

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202 - 6 Avenue SW
Calgary Alberta Canada T2P 2R9
Tel 403.269.5531
Fax 403.266.3307

Canadian Sales, Service & Distribution Centres

Brooks AB	403.362.7600
Edson AB	780.712.5505
Estevan SK	306.634.4719
Fort McMurray AB	780.743.0744
Fort Nelson BC	250.775.6789
Fort St. John BC	250.785.9500
Grande Prairie AB	780.532.1433
Rainbow Lake AB	780.956.3655
Red Deer AB	403.346.2550
Slave Lake AB	780.849.6100

International Sales

Kilgore Texas USA	903.983.2992
Granbury Texas USA	817.326.5341
Beeville Texas USA	361.362.2600
Longview Texas USA	903.753.6785
Midland Texas USA	432.685.9908
Indiana Pennsylvania USA	724.349.6090
Williamsport Pennsylvania USA	570.494.1052
Edmond Oklahoma USA	405.330.5504
Rifle Colorado USA	970.625.5286
Jakarta Indonesia	62.21.7918.1234
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