



## 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

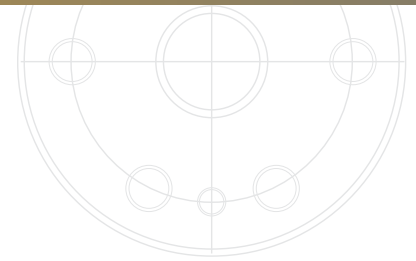
**HIGH PERFORMANCE NON-SLAM NOZZLE CHECK VALVE** The Crown Wafer Nozzle Check Valve was developed with performance in mind, offering both quick dynamic response and low pressure drop in a compact design.

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.

## 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

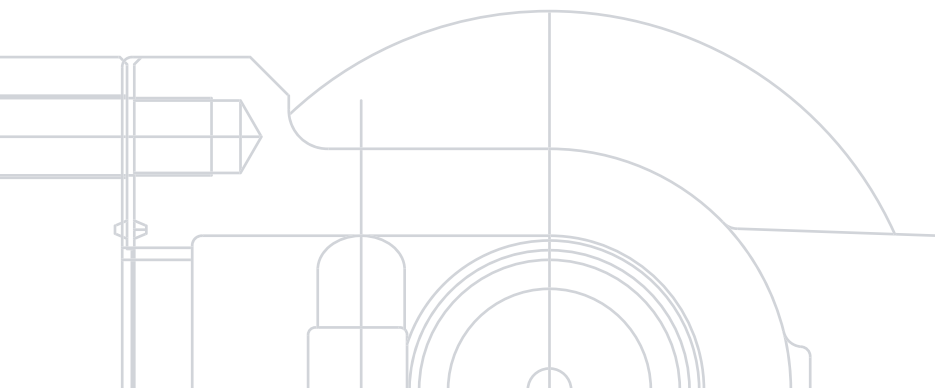
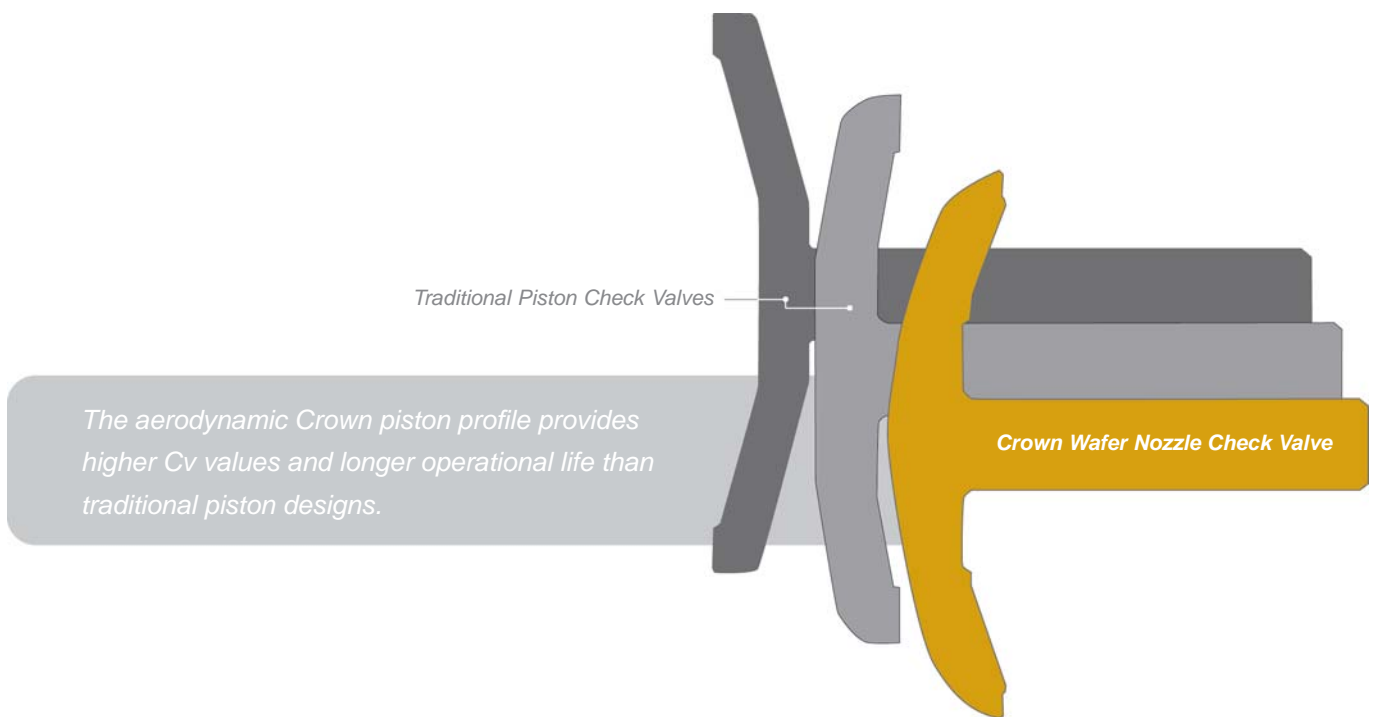


Flow Vectors



## 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 valve 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

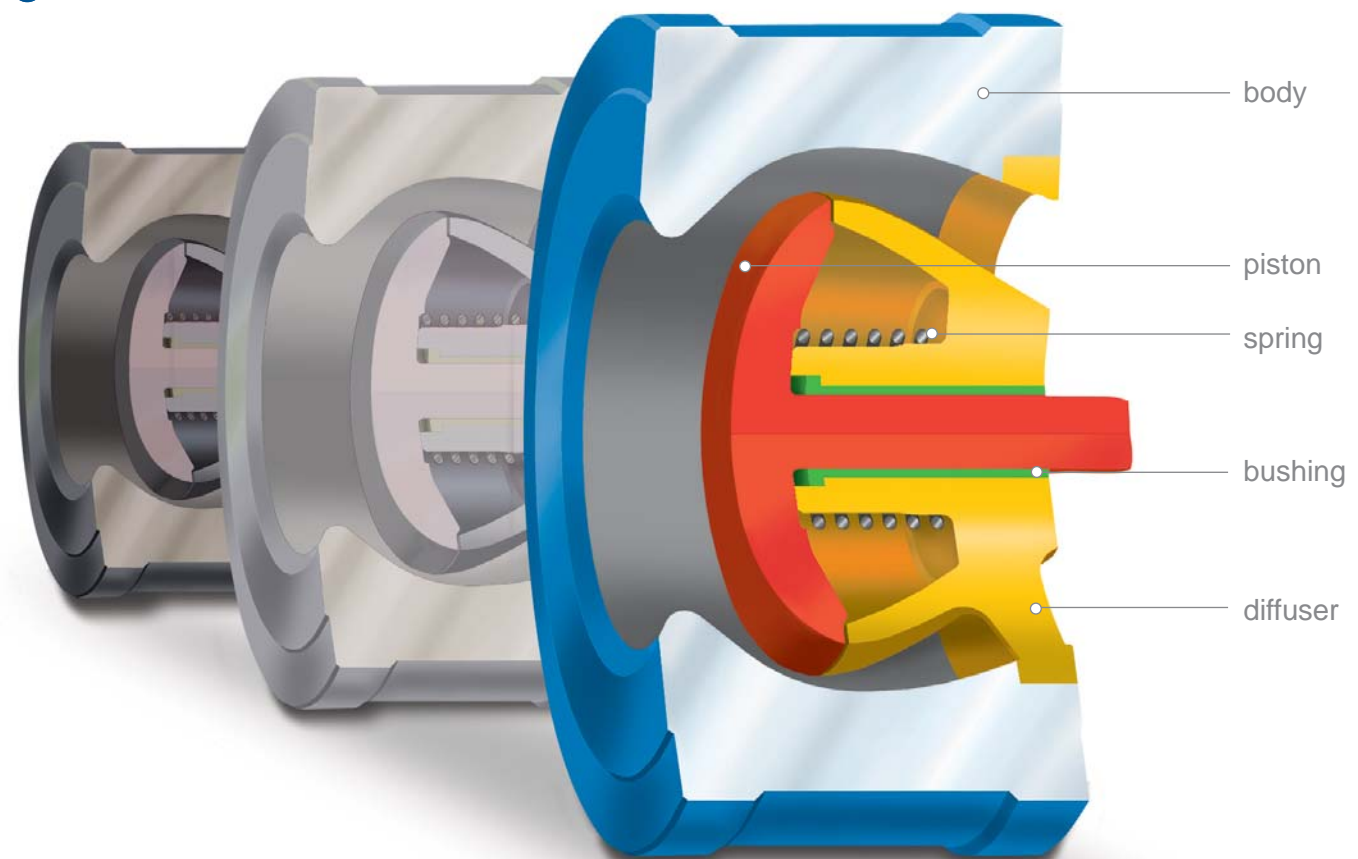
The venturi created by the accelerated flow provides the added benefit of creating a low pressure region behind the piston. This low pressure region assists in keeping the piston fully open during pulsating flow, thereby reducing the wear of moving parts and preventing piston damage caused by the piston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

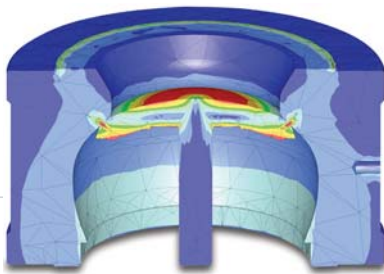


CMM Inspection

**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.

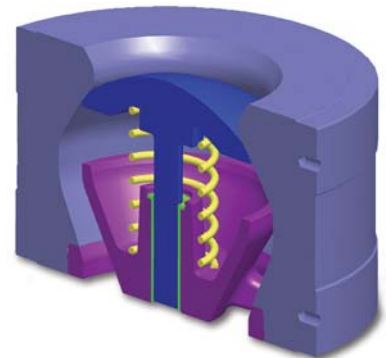
The Crown Wafer Nozzle Check Valve exceeds the requirements of API 6D/ISO 14313, ASME B16.34, CSA Z245.15 and NACE MR0175.

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Flow 3D is a registered trademark of Flow Science Inc.*



Finite Element Analysis

| <b>PART</b> | <b>MATERIAL</b>                           |
|-------------|---|
| body        | A350 LF2 / A352 LCC                       |
| piston      | A350 LF2 (2" - 6")<br>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.<br>(DN) | Class<br>(PN) | Weight<br>lbs. (kg) | Length<br>in. (mm) | O.D.<br>in. (mm) | Bore<br>in. (mm) | No.<br>Stud<br>Bolts | Stud<br>Bolt<br>Size in. | Length<br>in. (mm) |
|------------------|---------------|---------------------|--------------------|------------------|------------------|----------------------|--------------------------|--------------------|
| 2"<br>(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"<br>(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"<br>(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"<br>(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"<br>(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"<br>(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"<br>(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.<br>(DN) | Class<br>(PN)       | Spring<br>Type | Cracking<br>Pressure |
|------------------|---------------------|----------------|----------------------|
| 2"<br>(50)       | 150-900<br>(20-150) | Standard       | 0.10 psi             |
|                  |                     | Heavy          | 0.15 psi             |
| 3"<br>(80)       | 150-900<br>(20-150) | Standard       | 0.16 psi             |
|                  |                     | Heavy          | 0.22 psi             |
| 4"<br>(100)      | 150-900<br>(20-150) | Standard       | 0.21 psi             |
|                  |                     | Heavy          | 0.30 psi             |
| 6"<br>(150)      | 150-900<br>(20-150) | Standard       | 0.31 psi             |
|                  |                     | Heavy          | 0.44 psi             |
| 8"<br>(200)      | 150-900<br>(20-150) | Standard       | 0.36 psi             |
|                  |                     | Heavy          | 0.66 psi             |
| 10"<br>(250)     | 150-900<br>(20-150) | Standard       | 0.38 psi             |
|                  |                     | Heavy          | 0.71 psi             |
| 12"<br>(300)     | 150-900<br>(20-150) | Standard       | 0.46 psi             |
|                  |                     | Heavy          | 0.82 psi             |

## Cv VALUES

| Size In.<br>(DN) | Class 150<br>(PN 20) | Class 300<br>(PN 50) | Class 600<br>(PN 100) | Class 900<br>(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                  |