PROCO

*The Expansion Joint and Check Valve People*

# ProFlex™ Rubber Check Valves Series 700

# PROCO SERIES 700

**The PROCO Series 700 *ProFlex*™** Rubber Check Valves are a cost effective way to control back pressures from sewage treatment plants, outfalls and tidal operations. They are a fully passive flow device requiring neither maintenance nor any outside sources of power or manual assistance to operate.

The PROCO Series 700 *ProFlex*™ Check valves are offered as direct replacements for ineffective and maintenance ridden flap type check valves, commonly known to seize, rust and bind in unwanted positions. Unlike flap type valves, the *ProFlex*™ rubber check valves will handle large obstructions without jamming or having swing gates binding open. Specify the PROCO Series 700 *ProFlex*™ rubber check valves to provide backflow protection from (1) Sewage slurries, (2) Outfalls to ocean fronts from heavy rainfall activity, (3) Prevention from land erosion due to back flow conditions, (4) Protection from saltwater to fresh water ponds and catch basins and numerous other water based applications. Our history in the manufacture of rubber piping products dates back to 1930. When an engineered solution is needed to solve a piping or backflow problem, call PROCO.

The Proco Series 700 ProFlex™ Rubber Check Valves are available in the following styles:

- **Style 710: Flanged**: Designed to bolt directly to existing flanges or new installations, flanges are drilled to ANSI 125/150# standard. Other drilling standards are also available upon request. The style 710 can be installed in either vertical or horizontal applications.

- **Style 710TT: Flanged Blending System Valves**: The Patented Torsionally twisted valve is designed to bolt directly on existing or any new installations. This valve is supplied to ensure proper mixing in potable water reservoirs and tanks. The torsional design ensures quick and accurate blending which provides a properly blended volume of potable water.

  The Hydraulic Blending Analysis provided by Proco ( based on CFD and engineered scale modeling) supplies the contractor/end user with strategic location points for each valve. All valves will be ANSI/NSF-61 certified.

- **Style 711/731 Flanged/Slip-on Slope Bottom Check Valve**s: Designed for installation on pre-existing or new pipe lines such as manholes, outfalls, vaults, where the outfall invert of the pipe is close to the floor of the manhole or outfall. Can be engineered into the pipe layout with little concern for outfall clearance due to its "low slope" design.

**Table 1: Available Materials • Temperatures**

For Specific Elastomer Recommendations, See: **PROCO™ "Chemical To Elastomer Guide"**

| PROCO Material Codes | Cover [3] Elastomer | Tube Elastomer | Maximum Operating Temp. °F (°C) | |
|---|---|---|---|---|
| BB | Chlorobutyl | Chlorobutyl | 250° | (121°) |
| EE | EPDM | EPDM | 250° | (121°) |
| NH | Neoprene | CSM | 212° | (100°) |
| NN | Neoprene | Neoprene | 225° | (107°) |
| NN-NSF61 [2] | Neoprene | Neoprene | 225° | (107°) |
| PP | Nitrile | Nitrile | 212° | (100°) |
| NR | Neoprene | Natural Rubber | 180° | (82°) |

*Notes: ProFlex™ is a trademark of PROCO Products, Inc.*
*All products are reinforced with polyester tire cord.*
*1. Styles with Neoprene covers meet all requirements of U.S.C.G.*
*2. NN-NSF/61 UL Classified Water Quality*
*3. Other materials available. Please contact Proco Products*

- **Style 720: Flanged In-line**: Designed to fit directly inside of an existing pipe. Supplied with a flat face rubber flange which allows installation between existing pipe flanges eliminating the requirement for a valve body. Flanges are drilled to ANSI 125/150# standard. Other drilling standards are also available upon request.

- **Style 730: Sleeve Type**: Designed to easily slip over an existing pipe, and is affixed with heavy-duty stainless steel clamps. Can be installed in either a vertical or horizontal application.

- **Style 730M: Molded Type**: Molded Type : A economical engineered valve, available in smaller pipe diameter ranging from 3/4" -6" nominal sch 40 pipe size.
  Designed to prevent odors and low back pressures from seeping back up the stream channel. Supplied with stainless steel gear clamps.

- **Style 730CBD: Coarse Bubble Diffusers**: Designed to provide excellent coarse bubble diffusion in settling ponds, tanks, reservoirs, Supplied with a stainless steel Hex nipple, PVC adapter and variable orifices, makes this the valve of choice.

- **Style 740: Slip In-Inline**: Designed to slip directly inside of an existing pipe. Supplied with a stainless steel expandable clamp to secure it in place.

- **Style 750: Jacketed**: Designed with a full metal enclosure which allows easy installation in existing piping systems. Utilizes the Style 710 as the check valve.

- **Style 770/780: Wafer Style**: Designed with a metal or plastic orifice plate and a rubber disk , this valve is an ideal valve to provide high back pressure capability on clean water applications.

- **Style 790: Low Headloss In-Line**: Designed as an all one piece constructed valve, the Style 790 is one of lowest headloss valves on the market. A passive flow device ensuring no delamination.

**ELASTOMERS**: All of the PROCO Series 700 *ProFlex*™ Rubber Check Valves are available in a various selection of elastomers including ANSI/NSF-61 certified product under UL Certification #MH47689. The PROCO Series 700 *ProFlex*™ Rubber Check Valves will not freeze or deform and function solely on the inlet and back pressures which will be present in each application.

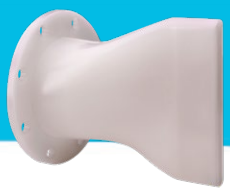
Each valve is carefully constructed using the finest of engineered materials and some of the most experienced rubber technicians in the industry. All check valves are engineered in precise detail to ensure proper operation and will provide years of unhindered operation and trouble free service.

***Benefits of the PROCO Series 700 ProFlex™ Rubber Check Valves:***

- **All rubber construction resists abrasive slurries**
- **Barnacle resistant Neoprene is standard construction, with ANSI/NSF-61 certified valves also available**
- **Very quiet operation with no water hammer**
- **Its unique design prevents backflow**
- **Negligible maintenance and energy costs**
- **Will not warp or freeze**
- **Quick interchange with any flap type check valve**
- **Available in sizes 1"– 96"**
- **Available with special I.D to suit concrete pipe**

## Proco Style 710

**ProFlex™ Flanged Rubber Check Valves**



## Proco Style 710TT

**ProFlex™ ANSI/NSF-61 Flanged Blending System Valves**

*Covered by U.S. Patent No. 11,396,951*

## Proco Style 711

**ProFlex™ Flanged Slope Bottom Check Valves**

*Covered by US Patent Number 11,221,081*

## Proco Style 720

**ProFlex™ In-line Flanged Rubber Check Valves**

## Proco Style 730

**ProFlex™ Slip-on Rubber Check Valves**

## Proco Style 730M

**ProFlex™ Low Pressure Molded Rubber Check Valves**

## Proco Style 730CBD

**ProFlex™ Coarse Bubble Diffusers**

## Proco Style 731

**ProFlex™ Slip-on Slope Bottom Check Valves**

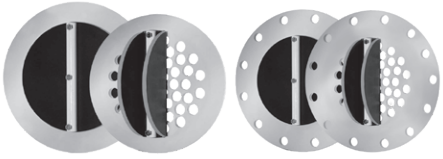
*Covered by US Patent Number 11,221,081*

## Proco Style 740

**ProFlex™ Slip-in Style In-line Rubber Check Valves**

## Proco Style 750

**ProFlex™ Jacketed In-line Flanged Rubber Check Valves**



## Proco Style 770/780

**ProFlex™ Wafer Style In-line Flanged Rubber Check Valves**

## Proco Style 790

**ProFlex™ Low Headloss In-line Rubber Check Valves**

(800) 344-3246
sales@procoproducts.com

# PROCO STYLE 770

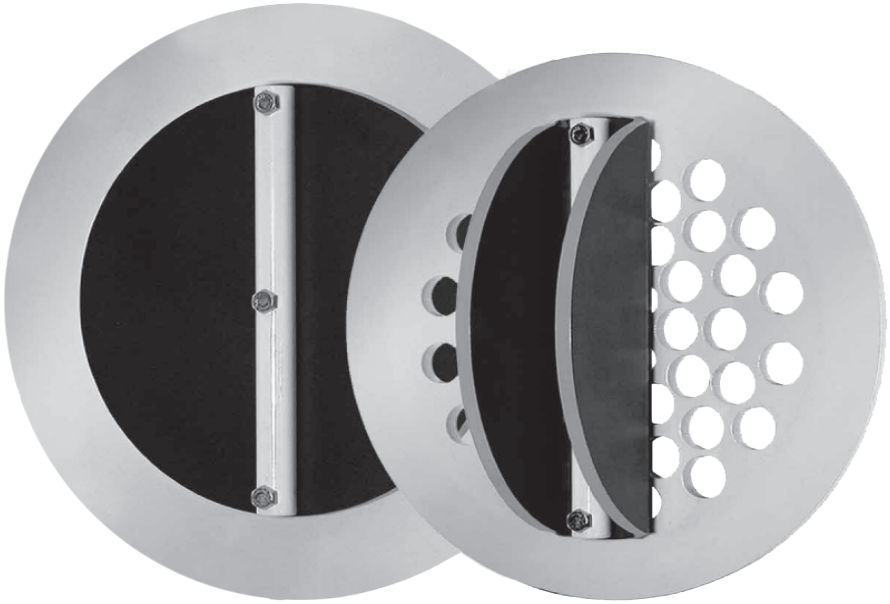
## ProFlex™ Wafer Style In-line Rubber Check Valves

**Available Elastomers**
Neoprene (Barnacle and Algae Resistant), ANSI/NSF-61, EPDM, Nitrile, Natural Rubber, CSM and Chlorobutyl.

**The *ProFlex*™ 770/780** Wafer Style In-line Rubber Check Valves are designed to offer space saving dimensions as opposed to other flap type check valves.

The ***ProFlex*™ 770** Wafer Style In-Line Rubber Check Valve is designed to be installed between two mating flanges and to fit securely inside the bolt circle of the mating flanges.

The ***ProFlex*™ 780** Wafer Style In-line Rubber Check Valve comes standard with ANSI 125/150# flange drilling and can also be supplied with ANSI 250/300, DIN, JIS, BS or AS flange patterns.



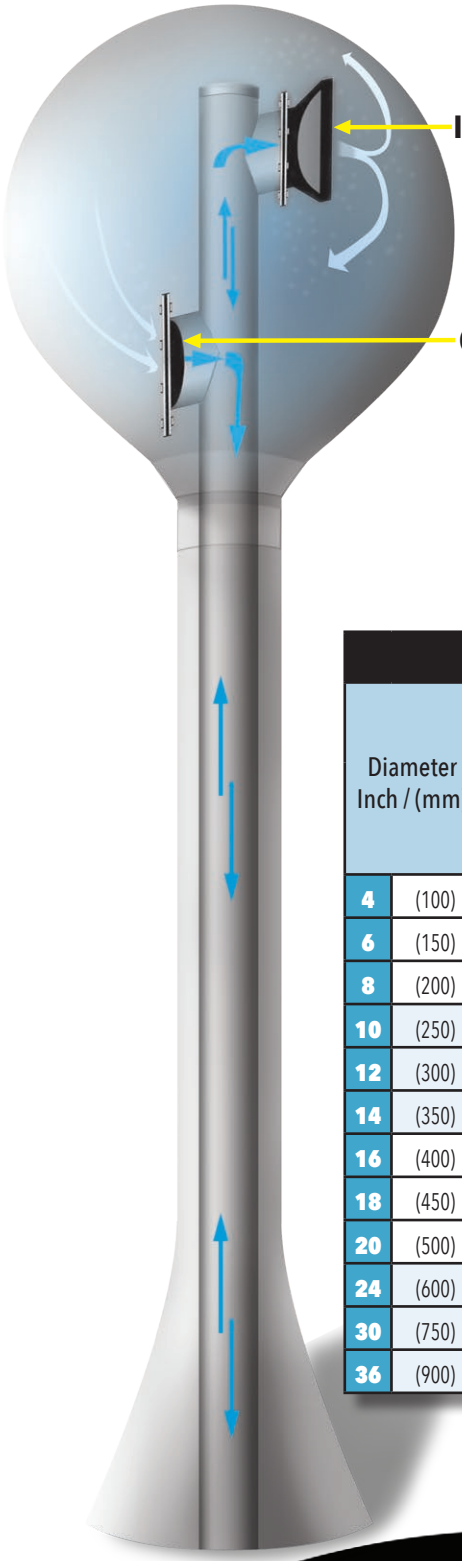
**Style 770**

| Diameter Inch / (mm) | | Standard Valve Dimensions | | | | Back Pressure PSIG / (bar) | | VELOCITY (ft/s) vs. HEADLOSS (ft) [2] | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Plate Thickness Inch / (mm) | | Plate O.D. Inch / (mm) | | | | 1 | 2 | 4 | 6 | 8 | 10 |
| 4 | (100) | 0.250 | (6.35) | 6.19 | (157.23) | 150 | (10.0) | 0.40 | 1.29 | 3.97 | 6.18 | 8.17 | 9.83 |
| 6 | (150) | 0.250 | (6.35) | 8.50 | (215.90) | 150 | (10.0) | 0.44 | 1.48 | 4.31 | 6.54 | 8.50 | 10.16 |
| 8 | (200) | 0.375 | (9.53) | 10.63 | (270.00) | 150 | (10.0) | 0.48 | 1.67 | 4.64 | 6.91 | 8.84 | 10.48 |
| 10 | (250) | 0.375 | (9.53) | 12.75 | (323.85) | 150 | (10.0) | 0.52 | 1.86 | 4.98 | 7.27 | 9.17 | 10.81 |
| 12 | (300) | 0.500 | (12.70) | 15.00 | (381.00) | 150 | (10.0) | 0.56 | 2.05 | 5.32 | 7.63 | 9.51 | 11.14 |
| 14 | (350) | 0.500 | (12.70) | 16.25 | (412.75) | 150 | (10.0) | 1.18 | 2.77 | 5.82 | 8.02 | 9.79 | 11.37 |
| 16 | (400) | 0.750 | (19.05) | 18.00 | (457.20) | 150 | (10.0) | 1.80 | 3.50 | 6.33 | 8.41 | 10.08 | 11.60 |
| 18 | (450) | 0.750 | (19.05) | 19.88 | (504.95) | 150 | (10.0) | 2.42 | 4.23 | 6.84 | 8.79 | 10.37 | 11.83 |
| 20 | (500) | 0.750 | (19.05) | 22.00 | (558.80) | 150 | (10.0) | 2.82 | 4.69 | 7.17 | 9.05 | 10.56 | 11.98 |
| 24 | (600) | 1.000 | (25.40) | 27.25 | (692.15) | 150 | (10.0) | 2.86 | 4.75 | 7.24 | 9.12 | 10.64 | 12.06 |
| 30 | (750) | 1.000 | (25.40) | 34.50 | (876.30) | 150 | (10.0) | 2.93 | 4.84 | 7.35 | 9.21 | 10.75 | 12.17 |
| 36 | (900) | 1.000 | (25.40) | 41.00 | (1041.40) | 150 | (10.0) | 2.99 | 4.93 | 7.46 | 9.31 | 10.86 | 12.28 |

*Notes: Higher back pressures can be provided by using internal vacuum supports and/or engineered Hi-Tensile reinforcement, contact PROCO.*
*1.Dimensions are approximate and may change due to pipe dimension changes, inlet, back pressures and flow rates.*
*2.Larger sizes available upon request.*
*3. Weights are approximate.*

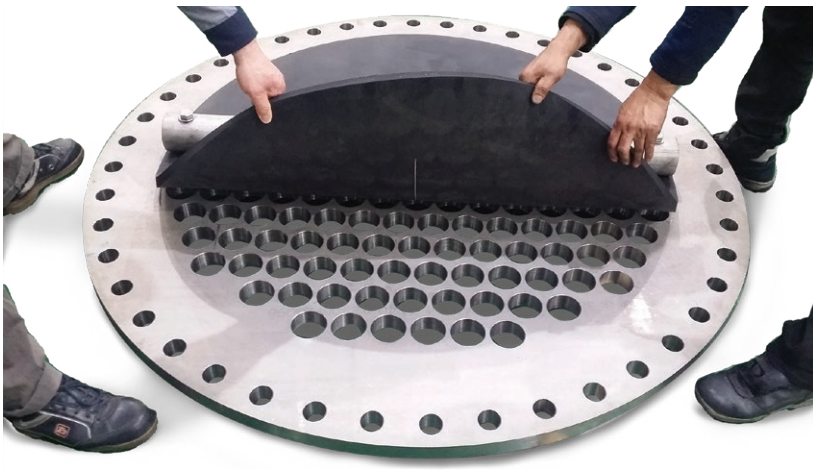
# PROCO STYLE 780

## ProFlex™ Wafer Style In-line Flanged Rubber Check Valves



**Inlet Valves**
- *ProFlex™ Style 710TT*
- *Opens during tank filling*
- *Provides complete mixing with optimal jet velocities*
- *Closed during tank draining*

**Outlet Valves**
- *ProFlex™ Style 780*
- *Closed during tank filling*
- *Opens for tank draining*



| Style 780 | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Diameter Inch / (mm) | | Standard Valve Dimensions | | | | | | Back Pressure PSIG / (Bar) | VELOCITY (ft/s) vs. HEADLOSS (ft) [2] | | | | | |
| | | Plate Thickness Inch / (mm) | | Flange O.D. Inch / (mm) | | Bolt Circle Inch / (mm) | No. of Holes | Size of Holes Inch / (mm) | | 1 | 2 | 4 | 6 | 8 | 10 |
| 4 | (100) | 0.250 | (6.4) | 9.00 | (229) | 7.50 (191) | 8 | 0.750 | (19.1) | 150 (10.0) | 0.40 | 1.29 | 3.97 | 6.18 | 8.17 | 9.83 |
| 6 | (150) | 0.250 | (6.4) | 11.00 | (279) | 9.50 (241) | 8 | 0.875 | (22.2) | 150 (10.0) | 0.44 | 1.48 | 4.31 | 6.54 | 8.50 | 10.16 |
| 8 | (200) | 0.375 | (9.5) | 13.50 | (343) | 11.75 (299) | 8 | 0.875 | (22.2) | 150 (10.0) | 0.48 | 1.67 | 4.64 | 6.91 | 8.84 | 10.48 |
| 10 | (250) | 0.375 | (9.5) | 16.00 | (406) | 14.25 (362.) | 12 | 1.000 | (25.4) | 150 (10.0) | 0.52 | 1.86 | 4.98 | 7.27 | 9.17 | 10.81 |
| 12 | (300) | 0.500 | (12.7) | 19.00 | (483) | 17.00 (432) | 12 | 1.000 | (25.4) | 150 (10.0) | 0.56 | 2.05 | 5.32 | 7.63 | 9.51 | 11.14 |
| 14 | (350) | 0.500 | (12.7) | 21.00 | (533) | 18.75 (476) | 12 | 1.250 | (31.8) | 150 (10.0) | 1.18 | 2.77 | 5.82 | 8.02 | 9.79 | 11.37 |
| 16 | (400) | 0.750 | (19.0) | 23.50 | (597) | 21.25 (540) | 16 | 1.250 | (31.8) | 150 (10.0) | 1.80 | 3.50 | 6.33 | 8.41 | 10.08 | 11.60 |
| 18 | (450) | 0.750 | (19.0) | 25.00 | (635) | 22.75 (578) | 16 | 1.250 | (31.8) | 150 (10.0) | 2.42 | 4.23 | 6.84 | 8.79 | 10.37 | 11.83 |
| 20 | (500) | 0.750 | (19.0) | 27.50 | (699) | 25.00 (635) | 20 | 1.250 | (31.8) | 150 (10.0) | 2.82 | 4.69 | 7.17 | 9.05 | 10.37 | 11.98 |
| 24 | (600) | 1.000 | (25.4) | 32.00 | (813) | 29.50 (749) | 20 | 1.375 | (34.9) | 150 (10.0) | 2.86 | 4.75 | 7.24 | 9.12 | 10.56 | 12.06 |
| 30 | (750) | 1.000 | (25.4) | 38.75 | (984) | 36.00 (914) | 28 | 1.375 | (34.9) | 150 (10.0) | 2.93 | 4.84 | 7.35 | 9.21 | 10.75 | 12.17 |
| 36 | (900) | 1.000 | (25.4) | 46.00 | (1168) | 42.75 (1086) | 32 | 1.625 | (41.3) | 150 (10.0) | 2.99 | 4.93 | 7.46 | 9.31 | 10.86 | 12.28 |

*Notes: Higher back pressures can be provided by using internal vacuum supports and/or engineered Hi-Tensile reinforcement, contact PROCO.*

1. *Dimensions are approximate and may change due to pipe dimension changes, inlet, back pressures and flow rates.*
2. *Larger sizes available upon request.*
3. *Weights are approximate.*

# Frequently Asked Questions

## ProFlex™ Check Valves

**1. Does the *ProFlex*™ rubber check valve have to be installed in a certain position?**
Yes; it should be installed in a vertical position with the bill being the vertical. In zero clearance situations the valve can be rotated up to 30-35 Deg to gain bottom clearance if required.

**2. In which degree can the *ProFlex*™ rubber check valve be installed?**
Because the valve is not reliant on any hinges, gates, or weights the *ProFlex*™ rubber check valve can be installed in any angle from vertical to horizontal.

**3. What is "Back Pressure"?**
When the *ProFlex*™ rubber check valve is submerged in a liquid it is subjected to external pressure. It is critical that the maximum depth that the valve will be submerged is specified as this will be considered the maximum back pressure that the valve will be subjected to.

**4. What is the cracking pressure to allow the valve to open?**
It typically takes 1" to 2" of head pressure over back pressure to crack open all 700 series valve(s). For the Series 790 it will take approximately 33-50% of pipe diameter to flush the valve completely. Contact Proco for further assistance.

**5. What back pressures can the *ProFlex*™ rubber check valve withstand?**
Back pressures are in direct relation to the size of the valve, on the smaller diameters it is acceptable to specify up to 200 psi of back pressure and on larger diameters a back pressure limitation would be approximately 12 psi. Each *ProFlex*™ rubber check valve is manufactured to the exact line pressure, back pressure and flow rates which we require from you for manufacture. Proco can even supply valves up to 650 psi utilizing internal back pressure supports.

**6. What are the most common installations?**
The *ProFlex*™ 710 flanged rubber check valve is bolted directly to a head wall replacing an existing flap gate, the *ProFlex*™ 730 sleeved type rubber check valves are clamped directly to a fabricated flanged nipple or clamped directly to an existing pipe.

**7. Can I use the *ProFlex*™ rubber check valve on potable water applications?**
The *ProFlex*™ rubber check valves are available with an ANSI/NSF-61 certified elastomer. Due to the large demand for clean water and potable applications, this will eliminate the concerns commonly affiliated with contaminants or leaching of elastomers in potable water systems.

**8. Can the *ProFlex*™ rubber check valve be installed on an "out of round" pipe?**
Yes, please have the approximate dimensions from 4 different angles to provide proper sizing.

**9. Can river currents and ocean waves damage the valves?**
In most cases river currents and ocean waves will not damage the *ProFlex*™ rubber check valves, but if currents or waves in question are of an abnormal nature, it is suggested that side walls or rock pilings are utilized.

**10. Can the *ProFlex*™ rubber check valve be used as a pressure relief valve?**
The *ProFlex*™ rubber check valves have been designed to offer superior service as a backflow preventer and can also be considered as a pressure relief valve. Often used on reservoirs to prevent hydraulic lifting or floating of tanks.

**11. Can PROCO make a special design to suit my requirements?**
In most instances the *ProFlex*™ rubber check valve can be fabricated to suit different applications. Contact PROCO for your requirements.

**12. What types of elastomer are available?**
The *ProFlex*™ rubber check valves can be manufactured and supplied to withstand almost any type of media. Most commonly supplied is a barnacle and algae resistant Neoprene. Other common elastomers are EPDM, Nitrile, Natural Rubber, and elastomers to meet ANSI/NSF-61 and ANSI/NSF-372 specifications.

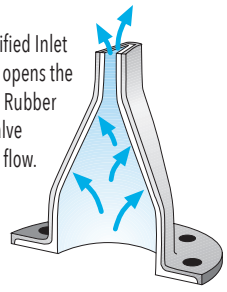
**13. What types of materials are available for the backing rings and banding clamps?**
*ProFlex*™ rubber check valves are supplied with 316 stainless steel backing rings and 304 stainless steel clamps as a standard. Other materials are available upon request.

**14. Can the *ProFlex*™ 710 be supplied with special flanges or drilling?**
Yes, the standard drilling pattern is ANSI 125/150# drilling, other drilling standards such as: ANSI 250/300#, BS-10, DIN NP-10 and DIN NP-16, JIS-5k and JIS-10K are available upon special request.

**15. Can I install a *ProFlex*™ rubber check valve near a residential area?**
Yes, one of the unique features of the *ProFlex*™ rubber check valve is the design of the bill section. While the bill will open and allow passage of fluid when head pressure is present, the bill will close and not allow children or animals to crawl inside when there is no head pressure.
Since the *ProFlex*™ rubber check valve is manufactured entirely of rubber compounds there is no chance of loud banging which is commonly heard from flap type valves.

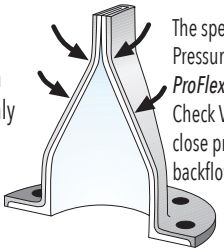
**16. Can I use a *ProFlex*™ rubber check valve in winter conditions?**
Yes, as in any installation the *ProFlex*™ rubber check valve will not be hindered by winter or sub-zero installations. If the valve is installed in a running water application the valve will continue to operate satisfactorily, due to the elastomers unique chemical makeup. If unusual circumstances occur the *ProFlex*™ rubber check valve will freeze without any damage and will return to operation upon thaw.

**17. Will the *ProFlex*™ rubber check valve operate if buried in sand or sediment?**
In normal conditions the discharge flow will create a small flow pattern which will then be followed by the flow velocity of the media. This velocity will flush the rest of the sediment away from the valve opening. This has been found to be unique only to the straight bill design as supplied by Proco.


The specified Inlet Pressure opens the *ProFlex*™ Rubber Check Valve allowing flow.

**18. What is the maximum temperature that the *ProFlex*™ rubber check valve can handle?**
Temperature can range from – 65 Deg to +400 Deg depending on the specified elastomer.

**19. What is the life expectancy of the *ProFlex*™ Rubber check valves?**
All of the *ProFlex*™ valves are manufactured with the highest grade of elastomers, which commonly are known to supply 35-50 years of service life.


The specified Back Pressure forces the *ProFlex*™ Rubber Check Valve to close preventing backflow.

(800) 344-3246
sales@procoproducts.com

PROCO PRODUCTS, INC.

2431 North Wigwam Dr. (95205)
P.O. Box 590 • Stockton, CA
95201-0590 • USA

Toll-Free Phone: (800) 344-3246 NATIONWIDE AND CANADA

Facsimile: (209) 943-0242

(209) 943-6088 INTERNATIONAL

email: sales@procoproducts.com

website: http://www.procoproducts.com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