

*2020 Product Catalog*

# **Cyclone**<sup>®</sup>

## **BACKWATER BALL VALVES**

**Wi Fi Sewer Backup Protection**



## **Flood Prevention Solutions**

Cyclone Valves is dedicated to providing property owners with the very best solutions to help you reduce the risk of a devastating health hazard, sewer backup flooding. Even if you've already had a flood, there are solutions that will help you be proactive to reduce your risk. Making the public aware of every method available to help reduce the risk of sewer backup flooding.

**[www.CycloneValves.com](http://www.CycloneValves.com)**

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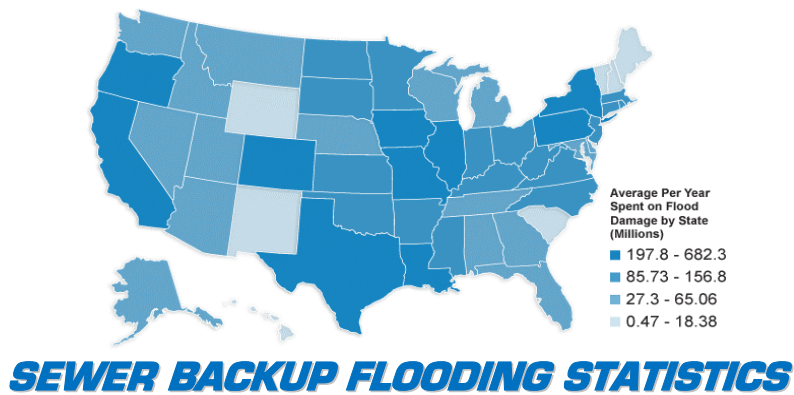
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- Most homeowners probably don't realize that they are responsible for the maintenance and repair of their main sewer line; the pipeline that runs between their house and the municipality's sewer main, usually located underneath the street. The main sewer line is owned and maintained by the property owner, including any part of the line that extends into the street or public right of way.
- Each year in the United States sewer backups occur nearly 500,000 times when about 50,000 municipal sanitary sewer overflows occur. This sewage backup situation creates an environment in which potentially deadly pathogens are introduced into the home and conditions are created in which toxic black mold can grow in the basement. The biggest problems arise in systems that combine storm water and raw sewage into the same pipeline. During many rainstorms, the systems are exposed to more volume than they can handle, and the result is a sewage backup situation that allows sewage to spew out, flooding into basements and other low lying drains. The desire to broaden local tax bases by building more and more homes connected to already aging sewage systems has also contributed to rapid increases in sanitary sewer backups, flooded basements and overflows.
- The reality that funding to maintain and improve sewer systems has decreased while the demands placed upon these aging sewer systems has increased makes the flooding problem even worse. Sewage backups endanger the health of hundreds of thousands of Americans and create hefty repair bills for cities and consumers alike. While local officials and voters have been treating sewers as an "out of sight, out of mind" problem, the results of backed up sewers are increasingly making themselves known in basements throughout the nation.
- The Civil Engineering Research Foundation reports that backed up sewers are increasing at the alarming rate of about three percent each year. A recent report from the American Society of Civil Engineers indicates that the nation's 500,000-plus miles of sewer lines are on average over thirty years old. Our nations aging sewer systems are overflowing and flooding basements with increasing regularity and introducing unprecedented amounts of pollutants into our homes and buildings.
- Studies indicate that over one million Americans become ill each year just from backed up sewer incidents. Raw sewage contains powerful bacteria like E coli, viruses, intestinal worms and parasites. Most of those affected suffer stomach cramps and diarrhea, but untreated sewage can also spread horrible diseases such as cholera and hepatitis. Gastroenteritis and cryptosporidiosis are other parasites contained in sewage and can kill humans when high concentrations are encountered.
- The Water Infrastructure Network, a group of water and public-works associations, believes that municipal governments/ratepayers will have to provide up to \$12 billion a year for capital improvements in the next two decades to replace aging sewer pipes and to meet EPA guidelines. Estimates in some regions show sanitary sewer replacement costs could reach up to \$15,000 per household. Due to the high costs involved, this upgrade won't happen quickly.
- In the meantime, those connected to sewers prone to backups are forced to fund repairs out of their own pockets. And many recommended repairs costing thousands of dollars end up not working. Many homeowners are advised to replace the pipe leading from their dwelling to the street at a cost of about \$75 per ft. an average 50' line is nearly \$4,000.



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## **WASTEWATER POLLUTION CONTROL**

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### **WHAT IS WASTEWATER**

Wastewater is the flow of used water from a community. The characteristics of the wastewater discharges will vary from location to location depending upon the population and industrial sector served, land uses, groundwater levels, and degree of separation between storm water and sanitary wastes. Domestic wastewater includes typical wastes from the kitchen, bathroom, and laundry, as well as any other wastes that people may accidentally or intentionally pour down the drain. Sanitary wastewater consists of domestic wastewater as well as those discharged from commercial, institutional, and similar facilities. Industrial wastes will be as varied as the industries that generate the wastes. The quantities of storm water that combines with the domestic wastewater will vary with the degree of separation that exists between the storm sewers and the sanitary sewers. Most new sewerage systems are separate, collecting sanitary wastewater and storm wastes, whereas older combined systems collect both sanitary wastewater and storm water.

### **STORM WATER AND COMBINED WASTEWATER**

Storm water runoff is precipitation that finds its way across and surfaces into receiving waters. Urban storm runoff is collected and transported in storm or combined sewers. Storm sewers carry storm water only; combined sewers also carry sanitary wastewater. Combined wastewater in dry weather is composed of sanitary wastewater. Since the pipes are sized to carry high flows in wet weather, in dry weather they may allow solids to settle out. In wet weather combined wastewater composition at any time depends on the extent to which sanitary wastewater is diluted by storm water, and is augmented by contaminants in storm water and in the solids deposited in dry weather and scoured in wet weather flows. The drains (catch basins) along the curbs of our city streets are connected by sewer pipes directly to our creeks, rivers and lakes. Whatever goes down the catch basins will flow directly out into the natural environment. Every property in the city contributes to this storm water flow!



### **TYPES OF SEWERS WITHIN THE CITY**

There are three main types of sewers:

- **Sanitary Sewers** - Sanitary sewers transport wastewater that we release from a drain, toilet, sink or appliance such as a clothes or dishwasher. This wastewater from residences and businesses flows to treatment plants where it is cleaned before being released into a lake/river.
- **Storm Sewers** - Storm sewers capture rainwater or snowmelt from residential and commercial properties. This water flows into nearby watercourses or lake. Watercourses include creeks, streams and rivers natural, concrete channels or underground pipes - that carry water, including storm water and snowmelt from catch basins into lakes.
- **Combined Sewers** - If your home is located in one of the city's older areas, the sewer serving your property may be a combined sewer. In a combined sewer, there is only one pipe, which carries both sanitary and storm drainage. During dry weather, combined sewers carry all contents to treatment plants. However, during periods of heavy rain or snow melting there are occasions when the combined storm water and sewage flow is greater than the combined system can handle. In this case, rather than allow the flow to flood streets or backup into basements, the flow is released into the river or lake, being treated with only chlorination. These occasions have been reduced and will continue to improve.

### **COMBINED SEWER OVERFLOWS - WHAT IS THE PROBLEM?**

As we mentioned above, it is often difficult to determine any one thing that is causing water pollution. Environmentalists have made great strides over the past 50 years, however we are continuously learning more about the impact of our actions on our natural environment and what we need to do about it. During heavy rainstorms and rapid snowmelt, extra flow from storm water runoff into these combined sewers is greater than the interceptor pipes and treatment plant can accommodate. At these times the combined wastewater (including the storm water runoff) overtop flow regulator structures, resulting in combined sewer overflows to a lake and river. When CSOs occur, they discharge untreated sanitary wastewater and runoff from rainfall and snowmelt to the lake and river. The combination of raw sewage and storm water can carry a variety of human bacteria and viruses. In addition, combined sewer overflows contain a variety of chemicals, oils and other wastes. Although the untreated overflow is typically diluted by rain and river water, it still poses a potential health and environmental hazard. Those most likely to be affected by these overflows include people involved in water contact sports like boaters, swimmers, people who fish, etc.

# ***Cyclone Ball Valve Design – Wi Fi Alarms***

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Cyclone Ball Valves - Wi Fi Alarms are one of the newest preventative plumbing systems on the market. Since our inception in 2017, we have expanded from producing one valve to manufacturing a series of valves in a wide range of sizes. Cyclones innovation involves an improved ball-type check valve for use in conditions such as basement sewage backups. Ball valves have many advantages over conventional swing disc check valves. They operate in a very simple, basic manner. The valves have only one moving part, the Ball. When water starts, the flow moves the ball upward and into the track completely out of the flow path. When the water stops the liquid begins to flow in reverse, the ball moves back to its original seated position and prevents further backflow. Cyclone backwater valves are ideal for water/raw sewage applications thanks to our reliable backflow prevention devices, reliable operation and all plastic highly corrosion-resistant construction. Cyclone valve features a full flow design, providing maximum flow for each valve and positive seal, with minimum back pressure when flow stops.

## **Advantages of Cyclone Ball Valve:**

- **Free flow ball design offers zero flow restriction**
- **Open design allows air through the Plumbing System**
- **Self-cleaning ball action helps keep valve clean**
- **Cleanout plug offers easy visual inspection of unit**



**Wi Fi Alarm Products** - Communicate with Cyclone Water Alarms while away from home and be notified of the current status with Wi-Fi Module. Our Wi-Fi Module sends e-mail, text and status alerts to your phone via Tuya Smart phone App, tablet or computer with no monthly or yearly fees or subscriptions. Easily connects to DWV cleanout tee compatible with any 4" or 3" sewer line, Cast Iron or PVC. Cyclone flood alarm is a system that utilizes sensor arms to monitor water flow and pressure. These pieces of technology can be used to detect leaks, floods, or other urgent problems within a plumbing system. By installing a backwater valve flood alarm system, you can actually protect your home from sewer floods.

**Backwater Valves / Floor / Sump Drains** - Cyclone backwater valves are installed on the main home drain allows for the free circulation of air and will protect the entire home from sewage backflow with just one valve. The location of the valve, just inside the footing, makes it easy and convenient for the home owner to find for inspection and servicing The valve also has a built-in sewer cleanout eliminating the need for a building sewer cleanout. Cyclone floor drains operate like a check valve to seal off water backup caused by overloaded sewers. Water flows normally through the drain until the sewer begins to back up. Then the Cyclone Valve Ball rises to seal off the drain opening until the water recedes.

Providing solutions to the costly basement flooding problem and sewer backups, Cyclone Ball Valves will dominate the industry of waste backwater prevention with the most successful sewer backflow preventers available in the world today. Along with our many standard space saving designs, we can design and manufacture our check valves for almost any application. Our customers can be assured that all of our products are rugged, efficient and built to perform to their specifications. The backwater problem has become so common that many cities and suburbs offer a Basement Flooding Protection Subsidy Program.



## **FREQUENT Q/A**

- **How much slope is required in a drain line in order to use a horizontal backwater valve**
  - **Can Cyclone Valves be used as a clean out**
  - **How do I adapt to Clay or Cast Iron pipe**
  - **Do I need a permit for a Cyclone Valve**
  - **What is the Laminar Flow Rule**
  - **What is the leakage rate of the normally open Cyclone Backwater Valve**
  - **How often should I check the Cyclone Valve and what does it entail**
  - **With a normally open Cyclone Backwater Valve, what is the chance of the ball not closing**
  - **Are there any problems reported from using chemical drain cleaners with Cyclone Valves**
  - **How much pressure can a Cyclone Valve withstand**
- 

### **How much slope is required in a drain line in order to use a horizontal backwater valve**

In all installations, make sure the slope is adequate. It must be at least 2% (or 1/4" per foot) to insure proper operation.

### **Can Cyclone Valves be used as a cleanout**

Yes! Unlike traditional flapper type valves, all you need to do is remove the ball before snaking the sewer line.

### **How do I adapt to Clay or Cast Iron pipe**

Neoprene Rubber Adapters clamp to the outside diameter of the pipe and the backwater valve with stainless steel clamps and sleeves. We do not supply these adapters, you must check your local municipal code to be sure this type of adapter is permitted.

### **Do I need a permit for a Cyclone Valve**

Yes/No. Some cities require a plumbing permit for a basement floor installation.

### **What is the Laminar Flow Rule**

Laminar flow is a term describing the smooth movement of a fluid through a pipe. Openings in the side of a pipe's uniform walls interrupt this smooth flow. The Laminar Flow Rule states that no branch lines should enter the pipe nearer than 2' upstream of the Backwater Valve.

### **What is the leakage rate of the normally open Cyclone Backwater Valve**

The allowable leakage rate up to 2 ft of head is 1 Liter per 10 minutes, as head pressure increases to over 2 ft there is no leakage.

### **How often should I check the Cyclone Valve and what does it entail**

You should check and maintain the valve at least once a year. Flush the mechanism and surrounding pipe with a hose during maintenance to clear any accumulated debris from the area.

### **With a normally open Cyclone Backwater Valve, what is the chance of the ball not closing**

As long as the valve has been properly installed (proper slope, laminar flow rule) and is clean and maintained, it will close. You should inspect your valve every 3 months, removing any buildup noted, clean with water pressure as needed.

### **Are there any known problems reported from using chemical drain cleaners with Cyclone Valves**

Drain cleaners are a fact of life and are used every day. Cyclone Valves has never received a report that drain cleaners have adversely affected their valves, and we do not anticipate that the cleaner would hurt any components of our valves.

### **How much pressure can a Cyclone Backwater Valve withstand**

We have independently tested our valves to withstand at least 150 psi, the weight of a 250 foot column of standing water which is ample in residential applications.

## Products

## Wi Fi Backwater Ball Valves

Cyclone Backwater Valves operate in a very simple basic manner. The valves have only one moving part, the Ball. When water starts, the flow moves the ball upward and into the track completely out of the flow path. When the water stops the liquid begins to flow in reverse, the ball moves back to its original seated position and prevents further backflow. Cyclone Backwater valves are much more effective than swing disc valves in wastewater containing solids, stringy materials and abrasives such as grit and sand. The pressure rating for Cyclone ball valves is 150 pounds per square inch.

<p><b>Model V - 904</b></p>  <p><b>Retail Price: \$274.95</b></p>	<p><b><u>Vertical Backwater Valves</u></b>  <b>Size: 4" or 3"</b>  <b><u>Valve Parts</u></b>          1 Polypropylene Ball          2 O Ring Washers          1 Wi Fi Alarm / Wire Harness          1 Cleanout Plug</p>	<p><b>Model V - 903</b></p>  <p><b>Retail Price: \$224.95</b></p>
<p><b>Model H - 804</b></p>  <p><b>Retail Price: \$274.95</b></p>	<p><b><u>Horizontal Backwater Valves</u></b>  <b>Size: 4" or 3"</b>  <b><u>Valve Parts</u></b>          1 Polypropylene Ball          2 O Ring Washers          1 Wi Fi Alarm / Wire Harness          1 Cleanout Plug</p>	<p><b>Model H - 803</b></p>  <p><b>Retail Price: \$224.95</b></p>
<p><b>Model SP- 705</b></p>  <p><b>Retail Price: \$249.95</b></p>	<p><b><u>Sump Pump Alarm / Ball Valve</u></b>  <b>Size: 1-1/2"</b>  <b><u>Valve Parts</u></b>          2" Polypropylene Ball          2 Rubber Collar Rings          1 Cleanout Threaded Plug/Screen</p>	<p><b>Model CV- 704</b></p>  <p><b>Retail Price: \$94.95</b></p>
<p><b>Model FD - 410</b></p>  <p><b>Retail Price: \$194.95</b></p>	<p><b><u>Floor Drain Ball Valve</u></b>  <b>Size: 2" or 3"</b>  <b><u>Drain Valve Parts</u></b>          2" or 3" PVC Pipe          1 - Stainless Steel Cover          1- Stainless Screws          1 Rubber O Ring</p>	<p><b>Model FD - 310</b></p>  <p><b>Retail Price: \$174.95</b></p>

Michigan 0.06% tax is included in price.

## Products

## Wi Fi Sewer Backup Alarms

Communicate with Cyclone Water Alarms while away from home and be notified of the current status with Wi-Fi Module. Our Wi-Fi Module sends e-mail, text and status alerts to your phone via Tuya Smart phone App, tablet or computer with no monthly or yearly fees or subscriptions. Easily connects to DWV cleanout tee compatible with any 4" sewer line, Cast Iron or PVC. Cyclone flood alarm is a system that utilizes sensor arms to monitor water flow and pressure. These pieces of technology can be used to detect leaks, floods, or other urgent problems within a plumbing system. By installing a backwater valve flood alarm system you can actually protect your home from sewer floods.

<p><b>Model OD - 504</b></p>  <p><b>Retail Price: \$174.95</b></p>	<p><b><u>Outdoor Cleanout Alarm</u></b>  <b>Size: 4" or 3"</b>  <b><u>Alarm Parts</u></b>            1 - Alarm Sensor            1 - Cleanout Plug            1 - Prong Sensor            6 Ft. Alarm Cable</p>	<p><b>Model OD - 503</b></p>  <p><b>Retail Price: \$149.95</b></p>
<p><b>Model SP- 609</b></p>  <p><b>Retail Price: \$174.95</b></p>	<p><b><u>Sump Pump Backup Alarm</u></b>  <b>Size: 1 "</b>  <b><u>Alarm Parts</u></b>            1 - Alarm Sensor            1Ft. - PVC Tube / 2 zip ties            1 Prong Screen Sensor            1 - 6 Ft. Alarm Cable</p>	<p><b>Model SP- 609</b></p>  <p><b>Retail Price: \$174.95</b></p>
<p><b>Model FD- 404</b></p>  <p><b>Retail Price: \$174.95</b></p>	<p><b><u>Floor Drain Cleanout Alarm</u></b>  <b>Size: 4" or 3"</b>  <b><u>Alarm Parts</u></b>            1 - Alarm Sensor            1 - Cleanout Plug            1 - Prong Sensor            6 Ft. Alarm Cable</p>	<p><b>Model FD- 303</b></p>  <p><b>Retail Price: \$149.95</b></p>
<p><b>Model WF - 300</b></p>  <p><b>Retail Price: \$249.95 (6) Pack</b></p>	<p><b><u>Wi Fi Water Alarms</u></b>  <b>(6) WaterProof Wi Fi Alarms</b>  <b>(1) Year Warranty</b></p>	<p><b>Model WF - 300</b></p>  <p><b>Retail Price: \$44.95 per Alarm</b></p>

Michigan 0.06% tax is included in price.



A backwater valve is required by IPC and UPC plumbing codes, as well as many state and local plumbing codes, when the cover of the nearest upstream manhole is above the flood rim of the lowest fixture in the building. The presence of a backwater valve can also be very important when a combination storm and sewer system is present as well as when sealed manhole covers are present in flood areas. A new exception specifically addresses a common problem encountered with installation of a backwater valve for an existing building. Existing buildings built before the code required backwater valves for fixtures on floor levels below the elevation of the next upstream manhole cover are at risk for sewage backflows caused by public sewer problems. In some cases, many years will pass without the public sewer creating a fixture overflow in an older building. As more building sewer connections are made to the public sewer, and as storm water infiltration increases as the public sewer ages, surcharging and clogs in the public sewer can develop. Usually, a building owner will experience only one sewage overflow in the building before he or she consults with a plumbing contractor to provide a solution to protect against these sometimes catastrophic events. However, installation of a backwater valve after a building is built presents the problem of how to separate the drainage flow from fixtures on floors below the next upstream manhole cover from the fixtures on floors above the next upstream manhole cover. The drainage piping within the building is so integral to the construction of the building that separation of the drainage flows for installation of backwater valve in accordance with the code is often impossible. This exception allows, for existing buildings only, installation of a backwater valve for all fixtures in a building, even if those fixtures are on a floor above the next upstream manhole cover elevation. A building owner should have the ability to protect his or her property from public sewer surcharging that could cause an overflow in the building. Without a backwater valve installed in these situations, multiple overflow events and property damage could continue to occur unabated.

## **1.0 Introduction - 715.1 Exception For Backwater Valve Installations**

**1.1 Purpose:** The purpose of this acceptance criteria is to establish requirements for backwater valves to be recognized in an ICC Evaluation Service, Inc. (ICC-ES), evaluation report under the 2003 *International Plumbing Code*® (IPC), the 2003 *International Residential Code*™ (IRC), and the 2003 *Uniform Plumbing Code* (UPC). Bases of recognition are IPC Section 715, IRC Section P3008, and UPC Section 710.1.

**1.2 Scope:** Backwater valves are installed in the building drain or sewer pipe to prevent backflow of sewage in buildings where the flood-level rim of a plumbing fixture is below the elevation of the manhole cover of the next upstream manhole in the public sewer.

### **1.3 Reference Standards:**

**1.3.1** 2003 *International Plumbing Code*® (IPC), International Code Council.

**1.3.2** 2003 *International Residential Code*® (IRC), International Code Council.

**1.3.3** 2003 *Uniform Plumbing Code* (UPC), International Association of Plumbing and Mechanical Officials.

#### **1.3.4 ASME**

A112.14.1-1975 (R1998), Backwater Valves, American Society of Mechanical Engineers.

**1.3.5** CSA B181.1-99 ABS, Drain, Waste, and Vent Pipe and Pipe Fittings, Canadian Standards Association.

**1.3.6** CSA B181.2-99, PVC Drain, Waste, and Vent Pipe and Pipe Fittings, Canadian Standards Association.

**1.3.7** NSF 14-1999, Plastic Piping System Components and Related Materials, National Sanitation Foundation.

**1.4 Definitions:** Definitions shall be in accordance with the referenced standard, except as noted below:

**1.4.1 Access Sleeve:** Pipe opening through which access is gained to the disc or valve seat.

#### **1.4.2 Collar, Insert Pipe, and Disc Assembly:**

Designed to fit inside the access sleeve, this removable assembly consists of a length of insert pipe permanently attached to the access collar (on top) and a disc assembly (on the bottom). When removed vertically from the access sleeve, the attached disc assembly is also removed, allowing above-grade repair.

## **2.0 BASIC INFORMATION**

**2.1 General:** The following information shall be submitted:

**2.1.1 Product Description:** Complete information concerning material specifications, thickness, size and the manufacturing process.

**2.1.2 Installation Instructions:** Installation details and limitations, pipe connection details.

**2.1.3 Packaging and Identification:** A description of the method of packaging and field identification of the valve must be provided. Identification provisions must include the evaluation report number, and the name or logo of the inspection agency.

**2.1.4 Maintenance:** A copy of the recommended maintenance instructions that include methods and recommended intervals shall be provided.

**2.2 Testing Laboratories:** Testing laboratories shall comply with Section 4.2 of the ICC-ES Rules of Procedure for Evaluation Reports.

**2.3 Test Reports:** Test reports shall comply with the ICCES Acceptance Criteria for Test Reports (AC85).

**2.4 Product Sampling:** Products shall be sampled in accordance with Section 3.0 of AC85.

## **3.0 DATA, TEST AND PERFORMANCE REQUIREMENTS**

**3.1** All bearing portions of backwater valves shall be of corrosion-resistant material.

**3.2** Backwater valves shall comply with one of the following standards.

**3.2.1** ASME A112.14.1. **3.2.2** CSA B181.1. **3.2.3** CSA B181.2.

### **Exceptions:**

**1.** When valves otherwise conforming with CSA B181.2 are provided with access sleeves in excess of 24 inches and accommodating a removable collar, insert pipe, and disc assembly, said valve shall also conform to Sections 5.2 and 5.3 of this criteria.

**2.** Plastic valve bodies may be of any color plastic.

**3.3** Backwater valves shall be so constructed as to provide a mechanical seal against backflow.

**3.4** Backwater valves, when fully opened, shall have a capacity not less than that of the pipes in which they are installed.

**3.5** Backwater valves shall be installed so that access is provided to the working parts for service and repair.

**3.6** Materials used in the valve shall comply with NSF 14.

### **4.0 QUALITY CONTROL**

**4.1** The products shall be manufactured under an approved quality control program with inspections by an inspection agency accredited by the International Accreditation Service, Inc. (IAS), or as otherwise acceptable to ICC-ES.

**4.2** A quality control manual complying with the ICC-ES Acceptance Criteria for Quality Control Manuals (AC10) shall be submitted.

### **5.0 EVALUATION REPORT RECOGNITION**

**5.1** The report shall require the installed valve to be tested for leakage in accordance with IPC Section 312 or UPC Section 712 or 723, as applicable.

**5.2** When valves otherwise conforming with CSA B 181.2 have access sleeves up to 12 feet long and are equipped with removable collar, insert pipe, and disc assemblies, the tests described in Sections 5.2.1 and 5.2.2 shall be successfully completed.

**5.2.1** The seat cleaning test shall be performed in accordance with Sections 5.2.1.1 through 5.2.1.2, with the maximum length of access sleeve. The inner access sleeve and disc assembly shall be removed for this test.

**5.2.1.1** The valve seat shall be covered with a mixture of cooking lard and 25% by weight mortar sand to a minimum depth of 0.25 inch (6.35 mm).

**5.2.1.2** The mixture shall be dislodged by using a hose or pipe with water pressure of maximum 30 psi and a minimum nozzle opening diameter of 1/4 inch (6.35 mm), for a maximum duration of 3 minutes through the maximum sleeve length.

**5.2.2 Pressure Test:** The valve tested as noted in Section 5.2.1, with no additional cleaning of the disc seat, and with the inner access sleeve and disc assembly installed, shall then successfully complete the following leakage test: The valve shall be oriented in its normal operating position. Over a 1-minute period, water pressure shall be gradually increased to 4.5 psi on the exit side of the valve and maintained for a test period of 10 minutes. During the test period, any water that is emitted from the entrance side of the fitting shall be collected, measured, and recorded. Emitted water shall not exceed 21.5 fluid ounces for a valve with a nominal size of 3 inches; or 38.5 fluid ounces for a valve with a nominal size of 4 inches.

**5.3** The removable collar, insert pipe, and disc assemblies shall satisfy Sections 5.3.1 through 5.3.3, as follows:

**5.3.1** The valve shall have an integral lifting device consisting of the removable collar insert pipe and disc assembly equipped with an indicator located not more than 12 inches from the access opening, indicating that the seal element is aligned properly.

**5.3.2** The valve shall be designed such that the removable collar insert pipe and disc assembly is selfaligning and self-seating.

**5.3.3** The valve shall have no seating surface other than the moving seal element below the top of the inlet pipe of the valve.

**5.4** The evaluation report shall require that a copy of the maintenance instructions be left with the property owner.



## ***HYDROSTATIC PRESSURE – 150 PSI.***

The pressure vessel tested is located within a valve body; the valve body is filled with an incompressible fluid, typically water or oil. The valve body is then subjected to a specified internal pressure for specified time duration. The valve shell test pressure is normally a significant percent greater than the valve cold working pressure of the valve (typically 150%). The applied pressure causes the valve body to expand. Instrumentation which is already in place, is then read to determine the total and permanent expansion that the valve body undergoes. A physical and visual inspection then follows the hydrostatic test to determine that the device being tested has not been damaged or permanently distorted due to the test pressure. This procedure normally will be done at valve design and verification.

### **FLOW TESTING - WATER:**

Type of system: Continuous flow closed loop  
Data Acquisition and Loop Control: Lab View  
System Capacity: 72 GPM  
Pumps: 1 variable speed, 125 horse power  
Fixed speed 150 horse power pumps  
Test valve size range piping and fixtures for 2" - 6"

### **EXTREME TEMPERATURE TESTING:**

Elevated Temperature test chamber – Grieve  
Ambient to 120° F – 50"H x 26"W x 37"D  
Extreme temperature test chamber – Associated  
Temperature Range -120° F to 350° F – 14"H X 15"W X 15.5"D  
Oven – 150° F – 550° F 14"H X 15"W X 14"D  
Cryogenic testing to -320° F

### **NOISE AND PIPELINE VIBRATION MEASUREMENT:**

EXTECH Digital Sound Level Meter with RS232 PC interface  
DATAQ Data acquisition system with interface and software

### **ELECTRONIC AND ELECTRICAL:**

Oscilloscopes  
Function Generators  
Multi-Meters  
Loop/Process Calibrators

### **FUGITIVE EMISSIONS:**

FOXBORO Model OVA 88 Century Organic Vapor Analyzer

### **STRAIN MEASUREMENT:**

Strain gauges RS232 PC interface and WIN 5000 Data Acquisition software

### **TORQUE TESTING:**

Digital Torque Wrenches with RS 232 PC interface measures to 100 ft. lbs.  
Dynamometer and lever measures to 210 ft. lbs.

### **VACUUM TESTING:**

13.3 SCFM Vacuum Pump  
(2) 2 SCFM Vacuum Pumps

### **MECHANICAL VIBRATION TESTING:**

Vibration testing table – Frequencies up to 60 Hertz

### **MISCELLANEOUS TESTING:**

Automated Test Stand for Manual Actuator Cycling

### **MATERIALS TESTING:**

Scott Tensile tester (Materials Lab)  
Techpro ODR Rheometer (Materials Lab)  
Brinell Hardness Tester  
Magnetic Particle Testing  
Microscope 50, 100, 400 Power for material analysis

Cyclone ball valves are constructed of quality materials using virgin schedule 80 PVC EPDM seats and seals. Rated 150 PSI at 72 degrees Fahrenheit water temperature. Full port flow opening, quarter turn operation. Fit schedule 2, 3, 4, 6, pipes. Solvent ends comply ASTM D2466.



## ***PVC DWV Compliance to NSF/ANSI Standard 14:***

Plastics Piping System Components and Related Materials are required by all major plumbing codes including the UPC, the National Standard Plumbing Code and the International Plumbing and Residential Code. NSF/ANSI 14 establishes minimum physical, performance, health effects, quality assurance, marking and record keeping requirements for plastic piping components and related materials such as:

- **Thermoplastic materials**
- **Thermoset materials**
- **Non-plastic components**
- **Piping and tubing**
- **Fittings and valves**
- **Appurtenances**
- **Joining materials and gaskets**
- **Ingredients of materials**
- **Special engineered products and materials**

**NSF International has the qualifications and reputation to help your business meet the needs of the market and get the recognition and acceptance that is critical to your company's success.**

### **Application**

Corrosion resistant CLEAR pressure pipe, IPS sizes 1/4" through 12", for use at temperatures up to and including 140 °F. Pressure rating (70 psi to 570 psi) varies with schedule, pipe size, and temperature as stated on this specification. Generally resistant to most acids, bases, salts, aliphatic solutions, oxidants, and halogens. Chemical resistance data should be referenced for proper material selection. Pipe exhibits excellent physical properties and optimum clarity. Typical applications include process, sight glass, and dual containment piping as found in chemical processing, high purity applications, food processing, pharmaceuticals, laboratory use, waste treatment, plating, and other applications involving fluid transfer where visual monitoring of process lines is warranted.

### **Scope**

This specification outlines minimum manufacturing requirements for CLEAR Polyvinyl Chloride (PVC) Schedule 40 and Schedule 80 iron pipe size (IPS) pressure pipe. This pipe is intended for use in systems where the fluid conveyed does not exceed 140°F. This pipe meets and or exceeds applicable industry standards and requirements as set forth by the American Society for Testing and Materials (ASTM).

### **PVC Materials**

The material used in the manufacture of the pipe shall be a rigid polyvinyl chloride (PVC) compound, with a Cell Classification of 12454 as defined in ASTM D1784. This compound shall comply with the provisions of Title 21 United States FDA Code of Federal Regulations and shall be safe for use with food contact applications. This compound shall be transparent in color, and shall be approved by NSF International for use with potable water (NSF Std 61).

### **Dimensions**

PVC Clear Schedule 40 and Schedule 80 pipe shall be manufactured in strict accordance with the dimensional requirements of ASTM D1785 to Schedule 40 or Schedule 80 dimensions and tolerances as applicable. All PVC Clear pipe/valves shall meet the minimum burst pressure requirements and water pressure rating requirements of PVC Type II, Grade I, established for PVC 2110 as defined in ASTM D1785. Each production run of pipe shall also meet or exceed the test requirements for materials, workmanship, flattening, and extrusion quality defined in ASTM D1785. All belled-end pipe shall have tapered sockets to create an interference-type fit, which meet or exceed the dimensional requirements and the minimum socket length for pressure-type sockets as defined in ASTM D2672.

### **Marking**

All Clear PVC Schedule 40 and Schedule 80 pipe shall be permanently embossed with the manufacturers name or (or the manufacturers trademark when privately labeled), pipe size, dimension (i.e. Sch 40 or Sch 80), and date and time of manufacture.

### **Sample Specification**

All PVC Schedule 40 & Schedule 80 CLEAR pipe shall be manufactured from a Type I, Grade I Polyvinyl Chloride (PVC) compound with a Cell Classification of 12454 per ASTM D1784. The pipe shall be manufactured in strict compliance to ASTM D1785, consistently meeting and/or exceeding the applicable Quality Assurance test requirements of this standard with regard to material, dimensions, workmanship, burst pressure, flattening and extrusion quality. The pipe shall be manufactured in the USA by an ISO 9001 certified manufacturer. All PVC pipe fittings shall be packaged immediately after its manufacture to prevent damage, and shall then be stored indoors at the manufacturing site until shipped from factory.



**Cyclone Valves invention relates to a ball-type check valve, and more especially to transparent ball-type check valves for use in conditions involving sewage backups.**

Check valves are used in piping systems to allow the flow of a fluid in one direction but not in the other direction. A ball-type check valve utilizes a ball which is not directly attached to any other component of the valve, but which is constrained within a cage or other supporting assembly. When the fluid flows in the allowed direction, the ball is supported on a device such as a retainer cup with orifices around the periphery which allows fluid to flow around the perimeter of the ball. When the fluid flows in the opposite direction, the ball is pressed against a constricted passageway called a "seat", which blocks the flow in that direction. One object of the present invention is to create a ball-type check valve which can operate under conditions of high pressure, high temperature, and abrasion. Providing solutions to the costly basement flooding problem and sewer backups, Cyclone Ball Valves will dominate the industry of waste backwater prevention with the most successful sewer backflow preventers available in the world today. After reviewing the information you will discover Cyclone Ball Valve's system to be one of the most reliable systems available. With a proven reliability rate, the PP/PVC series backflow preventers are guaranteed to remove your worries of sewage contamination and flooding 365 days a year. Our patented technology will safeguard your home.

### **ABSTRACT**

The present invention provides a ball check valve in which the area of a channel leading from a ball chamber to a discharge-side channel can be increased, and the adhesion of a ball to a valve seat surface is satisfactory even when the ball check valve is used in a horizontal/vertical position. In the ball check valve having a ball movably housed in a ball chamber provided inside a valve casing, two or more rail-like ridges protruding toward the interior of the ball chamber to guide the ball are provided on a peripheral wall demarcating the ball chamber. Furthermore, valve seats constituted separately from the valve casing are mounted, respectively, on the inflow side and the discharge side of the valve casing.

### **CLAIMS**

#### **US Patent # On request. (14) Backwater Ball Valves**

1. A ball check valve having a ball movably housed in a ball chamber provided inside a valve casing, said ball chamber having a curved structure in a direction perpendicular to a discharge-side channel leading to a discharge port from an inflow port, comprising: an opening portion provided in a peripheral wall of said ball chamber for demarcating the ball chamber so as to be open to the discharge-side channel; and a pair of ridges protruding toward an interior of the ball chamber from the peripheral wall thereof so as to guide the ball; wherein said pair of ridges is formed integrally with said peripheral wall so as to sandwich the opening portion at both sides of the opening.
2. The ball check valve of claim 1, wherein the ridges are disposed such that when the ball housed in the ball chamber contacts the peripheral wall of the ball chamber and the ridges, the ball is prevented from rotating on a valve seat surface in a circumferential direction of the valve seat surface.
3. The ball check valve of claim 1, wherein the ridges are disposed such that when the ball housed in the ball chamber, a center of gravity of the ball is positioned inwardly of the ridges.
4. The ball check valve of claim 1, wherein the peripheral wall of the ball chamber and the ridges protruding from the peripheral wall are formed by integrally molded resin having corrosion resistance.
5. The ball check valve of claim 1, wherein the peripheral wall of the ball chamber and the ridges protruding from the peripheral wall are formed by coating resin on an inner surface thereof.
6. A ball check valve having a ball movably housed in a ball chamber provided inside a valve casing, said ball chamber having a curved structure in a direction perpendicular to a discharge-side channel comprising: an inflow port and a discharge port provided at both ends of the channel inside the valve casing, each of said ports having larger diameter than the diameter of the ball; and valve seats constituted separately from the valve casing, the valve seats being replacably mounted on the inflow port and the discharge port of the valve casing via O-ring seals, respectively; and a pair of ridges provided on a peripheral wall of the ball chamber and protruding toward an interior of the ball chamber to guide the ball.
7. A ball check valve of claim 6, wherein said ball comprises a resinous core material; and a surface coated with an elastic body around said core.



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## **1 YEAR PRODUCT WARRANTY**

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**In the rare event that your Cyclone Valve product fails to work due to a defect in workmanship or materials, Cyclone Valves LLC. will at its discretion, replace your product with the same or a similar product according to the 1-year limited warranty offered.**

### **Valid warranty claims:**

- Warranty claims must be made within **1 year** of the date of original purchase period where required by law.
- The warranty covers manufacturing defects only. It does not cover normal wear and tear of parts, personal preferences, damage caused by misuse, loss, abuse or negligent handling. It also does not apply to any unit that has been subject to tampering.

### **Product information needed for a warranty claim:**

- Proof of purchase. If you do not have proof of purchase, your product is not covered under this warranty program.
- Purchase date
- Purchase location (i.e., web site or store name)
- Defect description
- Product serial number (located on the bottom of the box above the larger barcode or located on the product for the Cyclone Valve)

### **Shipping costs for warranty claims:**

- Items returned to Cyclone Valves for a warranty claim must be shipped with prepaid postage. We will not accept Collect on Delivery (COD) returns.
- Shipping costs for warranty claims are non-refundable.
- Will cover the cost of shipping replacement items to the address provided on the Warranty and RMA Request Form.
- If an item returned to us does not adhere to the warranty criteria, it will be returned to the customer at the customer's cost.

### **To make a warranty claim:**

- Complete the Warranty and RMA Request Form to obtain a Return Merchandise Authorization (RMA) number and return instructions. We cannot accept returned merchandise without an RMA number.
- When your request is successfully submitted, you will see a confirmation notice and a case number. Note that this case number is **NOT** your RMA number.
- Once we validate the information provided in the Warranty and RMA Request Form, you will receive an email with a unique RMA number and return instructions. This typically occurs within 3-5 business days.
- Combine the items to be returned, the RMA number and proof of purchase in a single package and follow the return instructions provided. All items returned must be shipped prepaid as described above.
- We will inspect the items returned and send an email to confirm how the return will be processed. If the warranty claim is approved, you will receive a replacement item within 7-10 business days. If you have questions, email us at [cyclonevalves@gmail.com](mailto:cyclonevalves@gmail.com)
- If you do not receive an email from us, please check your Junk Mail or Spam folder in case the email has been misdirected.

**Cyclone Valves LLC.**

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We will credit or exchange for DEFECTIVE items only (minus the cost of shipping and handling, and subject to a 15% restocking fee). Please return the items in their original packaging within 30 days to the address on your packing slip. Items returned without original packaging will NOT be refunded, so please keep all packaging for the 30 day return period.

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We do not keep all merchandise in inventory, in our warehouse. We cannot guarantee that a product listed as "In Stock" will actually ship right away, as inventory can change significantly from day to day. In rare cases, a product may be in stock when you place your order, and sold out by the time your order is processed. If any selected merchandise is temporarily out of stock, your credit card will not be charged until the merchandise is shipped to you. Please note: Any items not in stock when you place your order will be shipped immediately when received from the manufacturer at no additional cost.

#### **Back-orders (Out-Of-Stock Items)**

Back-ordered merchandise includes items that are not currently in stock. In most cases, these items are on order from the manufacturers. When we receive the product, we notify you by email and ship it to you promptly. Back-ordered products usually come into stock within one week but can occasionally take longer. If your order is not ready to ship within 30 days, we will send you an update by email. If, for any reason, we determine that a back-ordered item will no longer be available, we will notify you immediately by email, cancel the item from your order. Note: We never charge your credit card until the item ships; therefore, no adjustment will need to be made to your credit card upon order cancellation.

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We request information from the user on our order form. Here, a user must provide contact information (like name email address and shipping address.) This if we have trouble processing an order, this contact information is used to get in touch with the user.

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FAX: (313) 886-6462

**Producer: LAKEPOINTE INSURANCE AGENCY**25124 Jefferson Av.  
St. Clair Shores Mi 48081  
Phone: (586) 776-6990**216112**

FAX: (586) 776-7799

**ACCOUNT POLICY RECAP**Spectrum  
Sentinel Ins Co LTD**Policy Number Eff Date Exp Date Premium****CT-0161493 01-2-2020 01-2-2021 \$4,575.00****POLICY DETAIL****Policy Spectrum****Property Coverages - Form****Limit Deductible****Location 001 Building 001**491 COLONIAL RD  
GROSSE POINTE WOOD, MI 48236-1777**Comm'l Liability Coverages****Applicable to all policy locations**

Each Occurrence.....	\$1,000,000
Damage to Premises Rented to You.....	\$100,000
Medical Expense (Any One Person).....	\$10,000
Personal & Advertising Injury.....	\$1,000,000
General Aggregate.....	\$2,000,000
Product/Completed Operation Aggregate.....	\$2,000,000

**Umbrella Liability Coverage****Policy Number****CUP-0161493**Umbrella Limits: Each Occurrence.....\$2,000,000 Aggregate  
Including Products and Completed Operations.....\$2,000,000

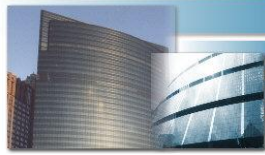
\$10,000

CYBERFLEX COVERAGE

TERRORISM

**Class Description Detail****Code****Premium Basis**LOCATION-001 **Plumbing Supplies Manufacturing**  
**Plumbing Pipe Fittings****58096****\$100,000**

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## ***INSTALLATION INSTRUCTIONS***

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The principle of the ball check valve is very simple. The ball has sufficient weight to seat tightly even in high viscous liquid, but to open freely so that the head loss is minimal. Cyclone ball check valves can be installed horizontally or vertically. The preferred installation of a cyclone ball valve is in the vertical position. This will insure that gravity will seat the ball properly each time. The pressure rating for Cyclone ball check valves is 150 pounds per square inch. Cyclone ball check valves incorporate a standard sinking ball, which operates on gravity. The maximum recommended operating temperature for Cyclone ball check valves is 180°F.

### **Installation:**

1. Check for any foreign material that should not be inside the valve and remove.
2. Check the operation of the ball by pushing it away from the seating surface to be sure it moves freely.
3. Inspect the ends to be sure there are no burrs, edges that would allow the valve to not seal when connected.
4. Install the valve with the flow arrow in the direction of flow.
5. If installed in a vertical position the direction of flow must be in a down-arrow direction.
6. If installed in a horizontal position the valve must be installed with the clean out plug oriented to the top.

**NOTE: 4" Horizontal Main Valves must be at least 2% (or 1/4" slope per foot) to insure proper operation.**

### **Maintenance:**

Cyclone ball check valves sometimes require 12 month regular maintenance.

### **Service / Repair:**

Disassembly of the valve may be required due to debris obstructing the valves ability to operate correctly or for inspecting the valve for wear.

- Loosen and remove collar rings (if applicable) and or remove the valve.
- Remove the O-ring.
- Clean and inspect the ball for damage and or debris.
- Examine the seating area for damage.
- Reassemble valve with new or existing parts as needed.
- Put valve back in operating service.
- Inspect valve for any cover and end connection leaks.

## ***MAINTENANCE***

---

Cyclone Valves are installed in sewer lines to prevent storm water runoff and raw sewage from entering the home during high levels of precipitation. Homes are susceptible to sewage backup if the lowest drain in the home is below the nearest upstream manhole. Water municipalities try to keep the lines clear, but problems can occur. In areas prone to such issues, building codes insist on the installation of a valve to prevent basement flooding.

Unlike traditional ball valves, Cyclone Valves are self-cleaning when in the full open position. Cyclone Valves are self-cleaning ball valves which also provides full unobstructed flow and bidirectional, bubble-tight shutoff. These are significant advantages over floating ball designs, as well as diaphragm and butterfly valves.

### **CLEANING INSTRUCTIONS:**

1. Locate the backwater valve for the sewer line. The backwater valve will be near the lowest sewer line in the basement or outside, connected to the lateral line.
2. Check the backwater valve for debris clogs. Some backwater valves are manufactured with a clear catch pipe at the top so you can see debris; others have a threaded screw cap. Remove the plug by twisting it counterclockwise.
3. Remove debris from inside the backwater valve. Homeowners in areas prone to flooding should remove debris monthly during the rainy season. Wear a pair of rubber gloves to remove a clog as it's likely the debris has come in contact with sewage.
4. Run water down the backwater valve to flush out the valve. Running water through the valve will flush the system of surface dirt. You can pour water from a pitcher or run a water hose down the valve to flush it.

## Contact Information



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