

## **PROMINENT PRE-ENGINEERED SYSTEM**

## P/N: 7746431-0-701

4 COUPON RACK 1" PVC BASIC

## **PIPING COMPONENTS**

ASAHI PVC/EPDM OMNI BALL VALVES SPEARS PVC/EPDM LAB BALL VALVES HAYWARD CLEAR PVC/VITON Y-STRAINER METAL SAMPLES PVC/NYLON COUPN HOLDER SPEARS SCH.80 PVC PIPING & FITTINGS



## Omni<sup>®</sup> Ball Valve

## Standard Features (Sizes 3/8" - 3")

- Blocks in two directions
- Rugged structure
- Unibody construction
- Compact, low profile, short face-to-face dimensions
- PTFE seat backed by EPDM for low stem torque
- Rated for full vacuum service

## **Options**

- FKM backing cushions and O-ring
- Electrically actuated

#### Pressure vs. Temperature (PSI, WATER, NON-SHOCK)

| NON    | MINAL | PVC   |       | CP    | PVC    |       |  |  |  |  |
|--------|-------|-------|-------|-------|--------|-------|--|--|--|--|
| S      | IZE   | 30° F | 30° F | 121°F | 141°F  | 176°F |  |  |  |  |
| INCHES | mm    | 120°F | 120°F | 140°F | 175° F | 195°F |  |  |  |  |
| 3/8-2  | 13-50 | 150   | 150   | 120   | 90     | 60    |  |  |  |  |
| 3      | 80    | 150   | 150   | 120   | 90     | 60    |  |  |  |  |

## Sample Specification

All OMNI® ball valves size 3/8"-3" shall be of one-piece compact design non-union type. All O-rings shall be EPDM or FKM with PTFE seats. Seats must have elastomeric backing cushions of the same material as the valve seals. PVC conforming to ASTM D1784 Cell Classification 12454-A, and CPVC conforming to ASTM D1784 Cell Classification 23567-A. Valve shall be rated 150 psi at 70°F, as manufactured by Asahi-America, Inc.

## Dimensions (Sizes 3/8" - 3")

|                 | Specifications        |
|-----------------|-----------------------|
| Sizes:          | 3/8" – 3"             |
| Models:         | Socket anc Threaded   |
| <b>Bodies</b> : | PVC, CPVC             |
| Seats:          | PTFE backed with EPDM |
| Seals:          | EPDM                  |
|                 |                       |

Sizes 3/8" - 3" PVC/EPDM Models available with NSF-61 Certification

Omni<sup>®</sup> is a Trademark of Asahi/America, Inc.

## Parts List (Sizes 3/8"- 3")



\*Used for CPVC body, threaded end, 1/2"-1"



## Weight (LBS.) Cv Values

| NOM    | INAL |       | SOCK  | ΈT   |      | THREADE          | D    |      |      |      |      |      |      | NOM    | INAL | COOKET | NOM    | INAL |     |
|--------|------|-------|-------|------|------|------------------|------|------|------|------|------|------|------|--------|------|--------|--------|------|-----|
| SI     | ZE   | ASTI  | M SCH | 40   |      |                  |      |      |      |      |      |      |      | SI     | ZE   | THR'D  | SI     | ZE   | Cv  |
| INCHES | mm   | dı    | d2    | l    | L    | d1               | l    | L    | d    | А    | D    | D1   | h    | INCHES | mm   |        | INCHES | mm   |     |
| 3/8    | 13   | 0.687 | 0.671 | 0.59 | 3.35 | 3/8-18 NPT       | 0.59 | 3.35 | 0.51 | 2.36 | 1.22 | 1.38 | 1.65 | 3/8    | 13   | 0.22   | 3/8    | 13   | 7.7 |
| 1/2    | 15   | 0.848 | 0.836 | 0.69 | 3.82 | 1/2-14 NPT       | 0.59 | 3.82 | 0.59 | 2.76 | 1.22 | 1.38 | 1.73 | 1/2    | 15   | 0.26   | 1/2    | 13   | 14  |
| 3/4    | 20   | 1.058 | 1.046 | 0.72 | 4.02 | 3/4-14 NPT       | 0.67 | 4.06 | 0.79 | 3.15 | 1.46 | 2.17 | 2.17 | 3/4    | 20   | 0.55   | 3/4    | 20   | 29  |
| 1      | 25   | 1.325 | 1.310 | 0.87 | 4.49 | 1-11 1/2 NPT     | 0.79 | 4.45 | 0.98 | 3.15 | 1.77 | 2.36 | 2.36 | 1      | 25   | 0.88   | 1      | 25   | 47  |
| 1 1/4  | 32   | 1.670 | 1.655 | 0.94 | 5.00 | 1 1/4-11 1/2 NPT | 0.87 | 5.00 | 1.22 | 3.74 | 2.13 | 2.76 | 2.76 | 1 1/4  | 32   | 1.21   | 1 1/4  | 30   | 72  |
| 1 1/2  | 40   | 1.912 | 1.894 | 1.09 | 5.98 | 1 1/2-11 1/2 NPT | 0.98 | 5.94 | 1.38 | 4.33 | 2.50 | 2.99 | 2.99 | 1 1/2  | 40   | 1.32   | 1 1/2  | 40   | 140 |
| 2      | 50   | 2.387 | 2.369 | 1.16 | 6.93 | 2-11 1/2 NPT     | 1.10 | 6.97 | 1.77 | 4.33 | 3.01 | 3.31 | 3.31 | 2      | 50   | 2.20   | 2      | 50   | 185 |
| 3      | 80   | 3.516 | 3.492 | 1.87 | 9.29 | 3-8 NPT          | 1.17 | 9.29 | 2.70 | 7.87 | 4.25 | 4.88 | 4.88 | 3      | 80   | 6.61   | 3      | 80   | 410 |

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| Serial No. | H - V030E - 2     |
|------------|-------------------|
| Senai INO. | $\Pi = VU3UE = 2$ |

## **Compact Ball Valves**

## "OMNI Ball Valves"

User's Manual

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## (1) General operating instructions

- O Operate the valve within the pressure Vs temperature range.
   (The valve can be damaged by operating beyond the allowable range.)
- O Select a valve material that is compatible with the media, refer to "CHEMICAL RESISTANCE ON ASAHI AV VALVE". (Some chemicals may damage incompatible valve materials.)
- O Do not use the valve to fluid containing slurry. (The valve will not operate properly.)
- O Do not use the valve on condition that fluid has crystallized. (The valve will not operate properly.)
- O Do not step on the valve or apply excessive weight on valve. (It can be damaged.)
- O Do not exert excessive force in closing the valve.
- O Make sure to consult a waste treatment dealer to dispose of the valves. (Poisonous gas is generated when the valve is burned improperly.)
- O Allow sufficient space for maintenance and inspection.
- O Keep the valve away from excessive heat or fire. (It can be deformed, or destroyed.)
- O The valve is not designed to bear any kind of external load. Never stand on or place anything heavy on the valve at anytime.
- O Certain liquid such as H<sub>2</sub>O<sub>2</sub>, NaClO, etc may be prone to vaporization which may cause irregular pressure increases, which may destroy the valve.

## (2) General instructions for transportation, unpacking and storage

- O Keep the valve packed in the carton or box as delivered until installation.
- O Keep the valve away from any coal tar, creosote (antiseptic for wood), termite insecticide, vermicides, and paint. (This could cause swelling damage the valve.)
- O Do not impact or drop the valve. (It can be damaged.)
- O Avoid scratching the valve with any sharp object.

## (3) Names or parts



## (4) Comparison between working temperature and pressure



## (5) Installation procedure

#### Threaded end

Necessary item
Sealing tape (A non- sealing tape can cause leakage.)
Strap wrench (Don't use a pipe wrench.)
Spanner wrench

#### **A** Caution

Make sure that the threaded connections are plastic x plastic. (Metallic thread can be damaged)

#### **Procedure**

- 1) Wind a sealing tape around the external thread of the joint, leaving the end (about 3mm) free.
- 2) Tighten the external thread of the joint and the end connector lightly by hand.
- 3) Using a spanner and a strap wrench, screw in the end connector by turning 180°-360° carefully without damaging it.

🔼 Caution

Avoid excessive tightening. (The valve can be damaged.)

#### Socket end

#### ····· Necessary item

- Adhesive for rigid polyvinyl chloride pipe (PVC)
- Adhesive for heat resistant polyvinyl chloride pipe (C PVC)

#### A Caution

Don't install a socket type valve where the atmospheric temperature is  $5^{\circ}$  or lower. (The valve can be damaged.)

#### **Procedure**

- 1) Clean the hub part of the end connector by wiping with waste cloth.
- 2) Apply adhesive evenly to the hub part of the end connector and the pipe spigot.

#### A Caution

Don't apply more adhesive than necessary.

(The valve can be destroyed due to solvent cracking.)

#### Adhesive quantity (guideline)

| Nom. Size   | 13mm   | 15mm   | 20mm   | 25mm | 30mm     | 40mm     | 50mm | 80mm |
|-------------|--------|--------|--------|------|----------|----------|------|------|
|             | (3/8") | (1/2") | (3/4") | (1") | (1 1/4") | (1 1/2") | (2") | (3") |
| Quantity(g) | 0.8    | 1.0    | 1.3    | 2.0  | 2.4      | 3.5      | 4.8  | 9.0  |

- 3) After applying adhesive, insert the pipe quickly to the end connector and leave it alone for at least 60 seconds.
- 4) Wipe away overflowing adhesive.

## (6) Operating procedure

Avoid excessive tightening. (The valve can be damaged.)

O Turn the handle gently to open or close.(Turn the handle clockwise to close and counter clockwise to open.)

Fully closed ..... The position of the handle should be perpendicular to the pipe.

Fully opened ..... The position of the handle should be parallel to the pipe.



## (7) Inspection items

OInspect the following items.

| (1) | Existence of scratches, cracks, deformation, and discoloring.         |
|-----|---|
| (2) | Existence of leakage from the valve to the outside.                   |
| (3) | Existence of leakage when the valve is opened fully at right or left. |

## (8) Trouble shooting

The valve is not able disassemble.

Please replace the valve to new complete another valve, if the trouble may be occurred in parts of the valve.

## (9) Discarding remaining or waste materials



In discarding remaining or waste materials, be sure to ask a waste service company. (Poisonous gas is generated.)

## (10) Inquires

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## <u>Distributor</u>





## LAB BALL VALVES



## Sample Engineering Specification

All thermoplastic valves shall be sealed unit Lab type constructed from PVC Type I, ASTM D 1784 Cell Classification 12454 or CPVC Type IV, ASTM D 1784 Cell Classification 23447. All O-rings shall be EPDM or Viton<sup>®</sup>. All valves shall have double stop Polypropylene handle. All 1/4" valves shall have optional field installable male thread and tubing end connector adapters. All valves shall be certified by NSF International for use in potable water service. All valves shall be pressure rated at 150 psi for water at 73°F, as manufactured by Spears<sup>®</sup> Manufacturing Company.

## **Quick-View Valve Selection Chart**

| Valvo | O-ring   | PV       | C Part Numb | per <sup>1</sup>     | Prossure  |  |
|-------|----------|----------|-------------|----------------------|-----------|--|
| Size  | Material | Socket   | Threaded    | Threaded<br>with Kit | Rating    |  |
| 1/4   | EPDM     | 1522-002 | 1521-002    | 1529-002             | 150 psi   |  |
| 1/4   | Viton®   | 1532-002 | 1531-002    | 1539-002             | Non-Shock |  |
| 2/0   | EPDM     | 1522-003 | 1521-003    | N/A                  | Water     |  |
| 3/0   | Viton®   | 1532-003 | 1531-003    | N/A                  | @ 73 F    |  |

1: For CPVC Valves, add the letter "C" to part number listed (e.g., 1521-002C)

## Valve & Adapter Kit

Kit allows multiple connection options. Adapters use O-ring seals for easy connection to threaded valve. Complete Kit includes:

- 1 1/4" Threaded Valve
- 2 1/4" O-ring Sealed Mpt x Mipt Adapters
- 2 1/4" O-ring Sealed Mpt x Barb Adapters (for 3/8" I.D. tubing)
- 2 EPDM or Viton<sup>®</sup> O-rings (AS568A-013 size)
- 1 End Connector Wrench

## Features – PVC, CPVC

This versatile quarter-turn shutoff valve is ideally suited for a variety of laboratory, system monitoring and OEM applications. Available in IPS sizes 1/4" - 3/8" with socket or threaded end connectors, plus 1/4" threaded Valve & Adapter Kit to provide multiple connection options.

- Chemical & Corrosion Resistant PVC or CPVC Construction
- Maintenance-Free Sealed Unit
- Individual Valve or Multi-functional Valve & Adapter Kit
- Schedule 80 Full-Bore Design
- High Impact Polypropylene Handle
- EPDM or Viton<sup>®</sup> O-rings
- PTFE Floating Seat Design
- Sizes 1/4" 3/8" Pressure Rated to 150 psi @ 73°F
- NSF Certified for Potable Water use
- Assembled with Silicone-Free, Water Soluble
   Lubricant



## LAB BALL VALVES





## Dimensions, Weights & Cv Values

| Nominal   |        | Dimensio |        | Approx. \ | C <sub>v</sub> <sup>2</sup> |     |      |        |
|-----------|--------|----------|--------|-----------|-----------------------------|-----|------|--------|
| Size      | Α      | B1       | С      | D         | Е                           | PVC | CPVC | Values |
| 1/4       | 1-1/16 | 15/16    | 2-1/8  | 1-1/16    | 1-3/4                       | .10 | .11  | 10     |
| 1/4 w/Kit | 1-1/16 | 2-7/16   | 3-7/8  | 1-1/16    | 1-3/4                       | .14 | .15  | 6      |
| 3/8       | 1-5/16 | 1        | 2-3/16 | 1-1/4     | 2                           | .12 | .13  | 24     |

1: Valve Lay Length

2: Gallons per minute at 1 psi pressure drop. Values calculated from valve laying length, based on derivative of Hazen-Williams equation with roughness factor of C=150.

## **Temperature Pressure Rating**

| System Operating<br>Temperature °F (°C) |      | 73<br>(23)    | 100<br>(38)  | 110<br>(43)  | 120<br>(49)  | 130<br>(54)  | 140<br>(60)  | 150<br>(66   | 160<br>(71)  | 170<br>(77)  | 180<br>(82)  | 190<br>(88)  |
|---|------|---------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| Valve Pressure<br>Rating<br>psi (MPa)   | PVC  | 150<br>(1.03) | 124<br>(.85) | 100<br>(.69) | 75<br>(.52)  | -0-<br>(-0-) |
|   | CPVC | 150<br>(1.03) | 140<br>(.97) | 130<br>(.90) | 120<br>(.83) | 110<br>(.76) | 100<br>(.69) | 90<br>(.62)  | 80<br>(.55)  | 70<br>(.48)  | 60<br>(.41)  | -0-<br>(-0-) |

## NOT FOR USE WITH COMPRESSED AIR OR GASES

# HAYWARD Flow Control Systems

## **Y Strainers - Clear PVC**



## 1/2" to 2"



## **Features**

- Clear PVC construction
- Rated to 150 PSI
- FPM Seals
- Standard 1/32<sup>"</sup> Perf Screen
- All-Plastic Construction
- Easy Screen Access
- Can be Used in Horizontal or Vertical Position

## **Options**

 Stainless Steel Strainer Screens

## **Clear PVC Construction**

See how much dirt and debris have been trapped by the strainer screen in the Hayward Clear PVC Y Strainer. The translucent PVC body shows the strainer screen in operation. This helps determine when it needs cleaning based on a visual check of the amount of debris retained by the screen. These Y strainers are available in pipeline sizes up to 2<sup>°</sup> with socket or threaded connections, and are rated at a full 150 PSI.

## **Economical Protection**

Hayward Y Strainers protect piping system components from damage caused by dirt or debris in the process media. They cost less than other types of strainers and are lightweight and very compact. Because they can often be supported by the pipeline alone, they work in applications where other strainers cannot.

## Screens for All Applications

Hayward Y Strainers are supplied with a 1/32" perforated plastic screen. This screen is ultrasonically welded, not glued, for superior strength. Screens fabricated from type 316 stainless steel are also available in openings from 1/2" down to super fine 325 mesh. All screens have an open area at least twice that of the equivalent pipe size cross-sectional area to minimize pressure drop.

## Easy Clean Out

All sizes of Hayward Y Strainers feature a heavy-duty hex cap that permits quick and easy removal of the strainer screen when cleanout becomes necessary.

## Adaptable Design

Hayward Y Strainers will work equally well in the horizontal or vertical position, simplifying piping system layout.

## **All Plastic Construction**

Hayward Plastic Y Strainers will never rust or corrode – and they will not contaminate sensitive process media.

## 1-888-429-4635 (1-888-HAYINDL)

# HAYWARD Flow Control Systems

## **Technical Information**



## **Dimensions - Inches / Millimeters**

| Size   | A                       | В                      | С                       | D                      | F                      | G                      | н                      | J                      | Weight (lb / kg)<br>Skt / Thd |
|--------|-------------------------|------------------------|-------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|-------------------------------|
| 1/2″   | 3.38 / <mark>86</mark>  | 1.38 / <mark>35</mark> | 2.25 / <mark>57</mark>  | 1.50 / <mark>38</mark> | 0.56 / 14              | 1.00 / 25              | 2.13 / 54              | 2.50 / <mark>64</mark> | 0.25 / .11                    |
| 3/4″   | 4.18 / <mark>106</mark> | 1.69 / <mark>43</mark> | 2.88 / <mark>73</mark>  | 2.00 / <mark>51</mark> | 0.81 / <mark>21</mark> | 1.25 / <mark>32</mark> | 2.75 / <mark>70</mark> | 3.00 / <mark>76</mark> | 0.63 / .29                    |
| 1″     | 5.19 / <mark>132</mark> | 2.00 / <mark>51</mark> | 3.63 / <mark>92</mark>  | 2.16 / <mark>55</mark> | 1.00 / <mark>25</mark> | 1.50 / <mark>38</mark> | 3.30 / <mark>84</mark> | 3.32 / <mark>84</mark> | 0.88 / .40                    |
| 1-1/4″ | 6.63 / <mark>168</mark> | 2.63 / <mark>67</mark> | 4.50 / 114              | 2.94 / <mark>75</mark> | 1.25 / <mark>32</mark> | 2.00 / 51              | 4.50 / 114             | 4.45 / 113             | 1.75 / . <mark>80</mark>      |
| 1-1/2″ | 6.63 / <mark>168</mark> | 2.63 / 67              | 4.50 / 114              | 2.94 / 75              | 1.56 / <mark>40</mark> | 2.00 / 51              | 4.50 / 114             | 4.45 / <b>113</b>      | 1.63 / .74                    |
| 2″     | 7.63 / <mark>194</mark> | 3.38 / <mark>86</mark> | 5.38 / <mark>137</mark> | 3.75 / <mark>95</mark> | 2.00 / <mark>51</mark> | 2.38 / 60              | 5.06 / 129             | 4.88 / 124             | 3.00 / 1.4                    |

## **Cv Factors\***

| Size | Factor | Size   | Factor |
|------|--------|--------|--------|
| 1/2″ | 4.0    | 1-1/4″ | 12.0   |
| 3/4″ | 6.8    | 1-1/2″ | 28.0   |
| 1″   | 9.0    | 2″     | 28.0   |

\* With 1/32" plastic screen

## **Pressure Drop Calculations**

The pressure drop across the strainer, for water or fluids with a similar viscosity, can be calculated using the formula at the right:

 $\Delta \mathsf{P} = \left[\frac{\mathsf{Q}}{\mathsf{C}\mathsf{v}}\right]^2$ 

Where  $\Delta P$  = Pressure Drop Q = Flow in GPM Cv = Flow Coefficient The pressure loss across a valve or filter can be calculated using the system's flow rate and the Cv factor for that valve or filter. For example, a 1<sup>°</sup> strainer with a Cv factor of 8 will have a 4 PSI pressure loss in a system with a 16 gpm flow rate  $(16 \div 8)^2 = 4$ 

## **Operating Temperature/Pressure**



## **Selection Chart**

| L | Size       | Material  | <b>End Connection</b> | Seal | Rating         |
|---|------------|-----------|-----------------------|------|----------------|
| 7 | 1/2" to 2" | Clear PVC | Thd or Skt            | FPM  | 150 PSI @ 70°F |

## **Strainer Screen Selection**

- Y Strainers are furnished with a 1/32" perf plastic screen.
  Stainless steel strainer screens are available in these perfs: 1/32", 3/64",
- 1/16", 5/64", 7/64", 1/8", 5/32", 3/16", 1/4", 3/8", 1/2"; and in mesh sizes: 20, 40, 60, 80, 100, 200, 325.

## www.haywardflowcontrol.com



## HAYWARD INDUSTRIAL PRODUCTS INSTALLATION OPERATION & MAINTENANCE OF <u>Y-STRAINER</u>

# PLEASE READ THE FOLLOWING INFORMATION PRIOR TO INSTALLING AND USING HAYWARD VALVES, STRAINERS, FILTERS, AND OTHER ASSOCIATED PRODUCTS. FAILURE TO FOLLOW THESE INSTRUCTIONS MAY RESULT IN SERIOUS INJURY.

- 1. Hayward guarantees its products against defective material and workmanship only. Hayward assumes no responsibility for damage or injuries resulting from improper installation, misapplication, or abuse of any product.
- Hayward assumes no responsibility for damage or injury resulting from chemical incompatibility between its products and the process fluids to which they are subjected. Compatibility charts provided in Hayward literature are based on ambient temperatures of 70F and are for reference only. Customer should always test to determine application suitability.
- 3. Consult Hayward literature to determine operating pressure and temperature limitations before installing any Hayward product. Note that the maximum recommended fluid velocity through any Hayward product is eight feet per second. Higher flow rates can result in possible damage due to the water hammer effect. Also note that maximum operating pressure is dependent upon material selection as well as operating temperature.
- 4. Hayward products are designed primarily for use with non-compressible liquids. They should NEVER be used or tested with compressible fluids such as compressed air or nitrogen.
- 5. Systems should always be depressurized and drained prior to installing or maintaining Hayward products.
- 6. Temperature effect on piping systems should always be considered when the systems are initially designed. Piping systems must be designed and supported to prevent excess mechanical loading on Hayward equipment due to system misalignment, weight, shock, vibration, and the effects of thermal expansion and contraction.
- 7. Because PVC and CPVC plastic products become brittle below 40F, Hayward recommends caution in their installation and use below this temperature.
- Published operating torque requirements are based upon testing of new valves using clean water at 70F. Valve torque is affected by many factors including fluid chemistry, viscosity, flow rate, and temperature. These should be considered when sizing electric or pneumatic actuators.
- 9. Due to differential thermal expansion rates between metal and plastic, transmittal of pipe vibration, and pipe loading forces DIRECT INSTALLATION OF METAL PIPE INTO PLASTIC CONNECTIONS IS NOT RECOMMENDED. Wherever installation of plastic valves into metal piping systems is necessary, it is recommended that at least 10 pipe diameter in length of plastic pipe be installed upstream and downstream of the plastic valve to compensate for the factors mentioned above.

#### **SOCKET CONNECTION:**

Socket end connections are manufactured to ASTM D2467-94. Solvent cementing of socket end connections to pipe should be performed per ASTM specifications D2855-87. Cut pipe square. Chamfer and deburr pipe. Surfaces must be cleaned and free of dirt, moisture, oil and other foreign material. Apply primer to inside socket surface of the strainer. Never allow primer or cement to contact sealing surfaces or the screen, as leaking may result. Use a scrubbing motion. Repeat applications may be necessary to soften the surface of the socket. Next, liberally apply primer to the male end of the pipe to the length of the socket depth. Again apply to the socket, without delay apply cement to the pipe while the surface is still wet with primer. Next apply cement lightly, but uniformly to the inside of the socket. Apply a second coat of cement to the pipe, and assemble the strainer to the pipe, rotating the strainer 1/4 turn in one direction as it is slipped to full depth on to the pipe. The strainer should be held in position for approx. 30 seconds to allow the connection to "set". After assembly wipe off excess cement. Full set time is a minimum of 30 minutes at 60 to 100 F. Full cure time should be based on the chart below.

#### JOINT CURE SCHEDULE:

The cure schedules are suggested as guides. They are based on laboratory test data, and should not be taken to be the recommendations of all cement manufacturers. Individual manufacturer's recommendations for their particular cement should be followed.

| Temperature     | Test I  | Press  | ures for Pipe  | Test Pressur   | res for Pipe    | Test Pre     | ssures for Pipe  | Test Press      | ures for | Pipe        |
|-----------------|---------|--------|----------------|----------------|-----------------|--------------|------------------|-----------------|----------|-------------|
| Range During    | Size    | es 1/2 | 2 to 1-1/4 In. | Sizes 1-1/     | 2 to 3 In.      | Sizes 4      | 4 to 5 In.       | Sizes 6         | to 8 In. |             |
| Cure Period(B   | ) Up    | to     | Above 180 to   | Up to A        | Above 180 to    | Up to        | Above 180 to     | Up to           | Abov     | re 180 to   |
| °F(°C)          | 180 PS  | SI     | 370 PSI (1240  | 180 PSI 3      | 15 PSI 1240)    | 180 PSI      | 315 PSI (1240    | 180 PSI         | 315 PS   | SI (1240    |
|                 | (1240 k | Pa)    | to 2550 kPa)   | (1240 kPa)     | to 2170 kPa)    | (1240 kF     | a) to 2170 kPa)  | (1240 kPa)      | to 21    | 170 kPa)    |
| 60 to 100 (15 t | to 40)  | 1 h    | 6 h            | 2 h            | 12 h            | 6 h          | 18 h             | 8 h             |          | 24 h        |
| 40 to 60 ( 5    | to 15)  | 2 h    | 12 h           | 4 h            | 24 h            | 12 h         | 36 h             | 16 h            |          | 48 h        |
| 20 to 40 (-7    | to 5)   | 6 h    | 36 h           | 12 h           | 72 h            | 36 h         | A 4 days A       | 3 day           | ys A     | 9 days A    |
| 10 to 20) (-15  | to 7)   | 8 h    | 48 h           | 16 h           | 96 h            | 72 ł         | A 8 days A       | 4 da            | ys A     | 12 days A   |
| Colder than 10  | (-15)   |        | Extren         | ne care should | be exercised or | n all joints | made where nine. | fittings or cer | nent is  | below 10°F. |

A: It is important to note that at temperatures colder than 20°F on sizes that exceed 3 in., test results indicate that many variables exist in the actual cure rate of the joint. The data expressed in these categories represent only estimated averages. In some cases, cure will be achieved in less time, but isolated test results indicate that even longer periods of cure may be required.

B: These cure schedules are based on laboratory test data obtained on Net Fit Joints (NET FIT=in a dry fit the pipe bottoms snugly in the fitting socket without meeting interference).

#### **THREADED CONNECTION:**

Threaded end connections are manufactured to ASTM specifications D2464-88. F437-88 and ANSI B2.1. Wrap threads of pipe with Teflon tape of 3 to 3-1/2 mil thickness. The tape should be wrapped in a clockwise direction starting at the first or second full thread. Overlap each wrap by, 1/2 the width of the tape. The wrap should be applied with sufficient tension to allow the threads of a single wrapped area to show through without cutting the tape. The wrap should continue for the full effective length of the thread. Pipe sizes 2" and greater will not benefit with more than a second wrap, due to the greater thread depth. To provide a leak proof joint, the pipe should be threaded into the end connection "hand tight". Using a strap wrench <u>only</u>. (Never use a stillson type wrench) tighten the joint an additional 1/2 to 1-1/2 turns past hand tight. Tightening beyond this point may induce excessive stress that could cause failure.

#### **FLANGED CONNECTION:**

Flange bolts should be tight enough to slightly compress the gasket and make a good seal, without distorting or putting excessive stress on the flanges. Suitable washers should be used between the bolt head and flange and the nut and flange. Bolts should be tightened in alternating sequence.

| RECOMMENDED FLANC | E BOLT 1 | ORQUE. | USE WELL | LUBRICATED METAL BO | LTS AND | NUTS. USE SC | OFT RUBBER GASKETS. |
|-------------------|----------|--------|----------|---------------------|---------|--------------|---------------------|
|                   | FLANG    | E BOLT | TORQUE   | FLANG               | E BOLT  | TORQUE       |                     |
|                   | SIZE     | DIA.   | FT. LBS. | SIZE                | DIA.    | FT. LBS.     |                     |
|                   | 1/2      | 1/2    | 10-15    | 2                   | 5/8     | 15-25        |                     |
|                   | 3/4      | 1./2   | 10-15    | 2-1/2               | 5/8     | 20-25        |                     |
|                   | 1        | 1/2    | 10-15    | 3                   | 5/8     | 20-25        |                     |
|                   | 1-1/4    | 1/2    | 10-15    | 4                   | 5/8     | 20-25        |                     |
|                   | 1-1/2    | 1/2    | 10-15    | 6                   | 3/4     | 30-40        |                     |

#### **INSTALLATION:**

It is recommended that these strainers be installed no closer than 10 pipe diameters from a pump. At least 5 pipe diameters should be between these strainers and an elbow.

As in all plastic piping the maximum fluid velocity is 8 feet per second. This velocity minimizes the effects of valve closure and pump start up or shut down.

#### **SCREEN CLEANING:**

#### EXTREME CAUTION MUST BE TAKEN WHEN WORKING ON THIS STRAINER. THE PIPING SYSTEM MUST BE DEPRESSURIZED AND DRAINED. PROPER CARE MUST BE TAKEN. CONSULT M.S.D.S. (MATERIAL SAFETY DATA SHEETS) INFORMATION REGARDING YOUR SPECIFIC APPLICATION.

When the pressure drop across the strainer is in excess of 5 PSI the screen requires cleaning. To clean the screen remove the screen cap nut from the strainer by turning counter clockwise. The collected debris should be removed with the screen. Clean the screen. **DO NOT POUND OR DEFORM THE SCREEN**. Insert the screen back into the strainer with the flange, if one is on the screen into the body first. Install the o-ring in the body groove. Use a non-petroleum base lubricant to lubricate the o-ring and thread , and re-assemble the cap to the strainer.





## **Coupon Holders**

## **Fixed (Pipe Plug) Coupon Holders**

Metal Samples carries a variety of standard pipe plug coupon holders for flat and cylindrical specimens. We can design and make these assemblies to meet your specifications for size and material requirements.

| P/N          | Plug Size | 3" (Std.)<br>Stem | Used with<br>Coupon P/N |
|--------------|-----------|-------------------|-------------------------|
| RC12E*100036 | 3/4" NPT  | Nylon             | CO102, CO117            |
| RC13E*100036 | 1" NPT    | Nylon             | CO102, CO117            |
| RC12Q*100036 | 3/4" NPT  | Teflon®           | CO102, CO117            |
| RC13Q*100066 | 1" NPT    | Teflon®           | CO102, CO117            |
| RC12E*010036 | 3/4" NPT  | Nylon             | CO100, CO103, CO115     |
| RC13E*010036 | 1" NPT    | Nylon             | CO100, CO103, CO115     |
| RC12Q*010030 | 3/4" NPT  | Teflon®           | CO100, CO103, CO115     |
| RC13Q*010026 | 1" NPT    | Teflon®           | CO100, CO103, CO115     |
| RC12E*030036 | 3/4" NPT  | Nylon             | CO118, CO120            |
| RC13E*030036 | 1" NPT    | Nylon             | CO118, CO120            |
| RC12Q*030036 | 3/4" NPT  | Teflon®           | CO118, CO120            |
| RC13Q*030035 | 1" NPT    | Teflon®           | CO118, CO120            |
| RC12E*090036 | 3/4" NPT  | Nylon             | CO105, CO106            |
| RC13E*090036 | 1" NPT    | Nylon             | CO105, CO106            |
| RC12Q*090036 | 3/4" NPT  | Teflon®           | CO105, CO106            |
| RC13Q*090036 | 1" NPT    | Teflon®           | CO105, CO106            |
| RC11E*010036 | 1/2" NPT  | Nylon             | CO100, CO103, CO115     |

#### **Pipe Plug Assemblies for Flat Coupons**

## **Pipe Plug Assemblies for Cylindrical Coupons**

| P/N          | Carbon Steel Plug | Insert  | # of Stems |
|--------------|-------------------|---------|------------|
| PA2080413709 | 2" NPT            | Nylon   | 8          |
| PA2080413783 | 2" NPT            | Teflon® | 8          |
| RC11Q3040000 | 1/2" NPT          | Teflon® | 1          |
| RC12Q3040000 | 3/4" NPT          | Teflon® | 1          |
| RC13Q3040000 | 1" NPT            | Teflon® | 1          |

All of these holders are used with ES2 series coupons.

## **Bypass Piping Systems**

We provide conventional or custom-designed bypass systems for on-line corrosion monitoring. Commonly used in the industrial water treatment industry to determine the corrosive properties of potable or cooling water, these systems are available in PVC, carbon and stainless steels, and other materials.

Bypass systems are easily installed to your existing piping. Normally, all you need is a 1" NPT male fitting on which to attach the bypass. Standard bypass systems come equipped with 4 pipe plug assemblies, 4 pre-weighed mild steel coupons, and a 5-gpm flow control valve.









# **PVC SCHEDULE 80 FITTINGS**

80-2-1000

## **Performance Engineered & Tested**



SPEARS<sup>®</sup> Schedule 80 PVC fitting designs combine years of proven experience with computer generated stress analysis to yield the optimum physical structure and performance for each fitting. Material reinforcement is uniformly placed in stress concentration areas for substantially improved pressure handling capability. Resulting products are subjected to numerous verification tests to assure obtaining the very best PVC fittings available.

#### Full 1/4" Through 12" Availability

Spears<sup>®</sup> comprehensive line of injection molded PVC fittings offers a variety of configurations in molded Schedule 80 sizes 1/4" through 12" conforming to ASTM D 2467 and Spears<sup>®</sup> exclusive CL150 Flanges in sizes 1/2" through 16".

#### **Exceptional Chemical & Corrosion Resistance**

Unlike metal, PVC fittings never rust, scale, or pit, and will provide many years of maintenance-free service and extended system life.

#### **High Temperature Ratings**

PVC thermoplastic can handle fluids at service temperatures up to  $140^{\circ}$  F (60°C), allowing a wide range of process applications, including corrosive fluids.

#### **Lower Installation Costs**

Substantially lower material costs than steel alloys or lined steel, combined with lighter weight and ease of installation, can reduce installation costs by as much as 60% over conventional metal systems.

# H PRIDIS

#### **Higher Flow Capacity**

Smooth interior walls result in lower pressure loss and higher volume than conventional metal fittings.

#### Additional Fabricated Configurations through 36"

Extra large, hard-to-find, and custom configurations are fabricated from NSF Certified pipe. Fittings are engineered and tested to provide full pressure handling capabilities according to Spears<sup>®</sup> specifications.

#### **Advanced Design Specialty Fittings**

Spears<sup>®</sup> wide range of innovative, improved products include numerous metal-to-plastic transition fittings and unions with Spears<sup>®</sup> patented special reinforced (SR) plastic threads.

#### **PVC Valves**

SPEARS<sup>®</sup> PVC Valve products are available for total system compatibility and uniformity; see SPEARS<sup>®</sup> THERMOPLASTIC VALVES PRODUCT GUIDE & ENGINEERING SPECIFICATIONS (V-4).

#### Sample Engineering Specifications

All PVC Schedule 80 fittings shall be produced by Spears<sup>®</sup> Manufacturing Company from PVC Type I, cell classification 12454, conforming to ASTM Standard D 1784. All injection molded PVC Schedule 80 fittings shall be Certified for potable water service by NSF International and manufactured in strict compliance to ASTM D 2467. All fabricated fittings shall be produced in accordance with Spears<sup>®</sup> General Specifications for Fabricated Fittings. All PVC flanges shall be designed and manufactured to meet CL150 bolt pattern per ANSI Standard B16.5 and rated for a maximum internal pressure of 150 psi, non-shock at 73°F.

**PROGRESSIVE PRODUCTS FROM SPEARS**<sup>\*</sup> **INNOVATION & TECHNOLOGY** Visit our web site: www.spearsmfg.com

#### **PVC Thermoplastic Pipe Temperature Pressure De-Rating**

To determine the maximum internal pressure rating at an elevated temperature, simply multiply the pipe pressure rating at 73°F by the percentage specified for the desired temperature.

| System Operating    | 73   | 80   | 90   | 100  | 110  | 120  | 130  | 140  |
|---------------------|------|------|------|------|------|------|------|------|
| Temperature °F (°C) | (23) | (27) | (32) | (38) | (43) | (49) | (54) | (60) |
| PVC                 | 100% | 90%  | 75%  | 62%  | 50%  | 40%  | 30%  | 22%  |

NOTE: Valves, Unions and Specialty Products have different elevated temperature ratings than pipe.

| Properties                                       | ASTM<br>Test<br>Method | PVC                    |  |  |  |  |
|--|------------------------|------------------------|--|--|--|--|
| Mechanical Properties, 73°F                      |                        |                        |  |  |  |  |
| Specific Gravity, g/cm <sup>3</sup>              | D 792                  | 1.41                   |  |  |  |  |
| Tensile Strength, psi                            | D 638                  | 7,000                  |  |  |  |  |
| Modulus of Elasticity, psi                       | D 638                  | 440,000                |  |  |  |  |
| Compressive Strength, psi                        | D 695                  | 9,000                  |  |  |  |  |
| Flexural Strength, psi                           | D 790                  | 13,200                 |  |  |  |  |
| Izod Impact, notched, ft-lb / in                 | D 256                  | .65                    |  |  |  |  |
| Thermal Properties                               |                        |                        |  |  |  |  |
| Heat Deflection Temperature, °F at 66 psi        | D 648                  | 165                    |  |  |  |  |
| Thermal Conductivity, BTU / hr / sq ft / °F / in | C 177                  | 1.2                    |  |  |  |  |
| Coefficient of Linear Expansion, in / in / °F    | D 696                  | 3.0 x 10 <sup>-5</sup> |  |  |  |  |
| Flammability                                     |                        |                        |  |  |  |  |
| Limited Oxygen Index, %                          | D 2863                 | 43                     |  |  |  |  |
| UL 94 Rating                                     | 94                     | V-0                    |  |  |  |  |
| Other Properties                                 |                        |                        |  |  |  |  |
| Water Absorption, % 24 hr.                       | D 570                  | .05                    |  |  |  |  |
| Industry Standard Color                          | White / D              | Dark Gray              |  |  |  |  |
| ASTM Cell Classification                         | D 1784                 | 12454                  |  |  |  |  |
| NSF Potable Water Approved                       |                        | YES                    |  |  |  |  |

#### **Typical Material Properties**

#### **PVC Chemical Resistance**

PVC is generally inert to most mineral acids, bases, salts and paraffinic hydrocarbon solutions. For more information on PVC chemical resistance refer to the Chemical Resistance of Rigid Vinyls Based on Immersion Test, published by the GEON<sup>®</sup> company.

#### **NOT FOR USE WITH COMPRESSED AIR OR GASES**

Spears® Manufacturing Company DOES NOT RECOMMEND the use of thermoplastic piping products for systems to transport or store compressed air or gases, or the testing of thermoplastic piping systems with compressed air or gases in above and below ground locations. The use of our product in compressed air or gas systems automatically voids any warranty for such products, and its use against our recommendation is entirely the responsibility and liability of the installer.

WARNING: DO NOT USE COMPRESSED AIR OR GAS TO TEST ANY PVC OR CPVC THERMOPLASTIC PIPING PRODUCT OR SYSTEM, AND DO NOT USE DEVICES PROPELLED BY COMPRESSED AIR OR GAS TO CLEAR SYSTEMS. THESE PRACTICES MAY **RESULT IN EXPLOSIVE FRAGMENTATION OF** SYSTEM PIPING COMPONENTS CAUSING SERIOUS OR FATAL BODILY INJURY.



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