

Submittal Data Sheet



Job or Customer:

Engineer:

Contractor:

Submitted by:

Date

Approved by:

Date

Order No:

Date

Specification:

< STANDARDS >



ASTM D3965



5391-1
5392-1



RQS

Duraplus™ ABS is designed for industrial pressure pipe applications where the extremely high-impact resistance and ductility of the material offers greater insurance against internal and external shock loadings and site abuse conditions. Its unique combination of ABS properties – non-toxicity, purity, corrosion- and chemical-resistance, toughness, low-hydraulic resistance, and the ability to perform over a wide temperature range -40°F to +140°F (-40°C to +60°C) ensures excellent in-service performance and system life.

Pipe, fittings and valves shall be manufactured from a copolymeric material – acrylonitrile, butadiene, styrene (ABS) – in accordance with ASTM D3965.

material properties

Material Property		Unit	Value
Ultimate tensile strength (strain rate 2 inches/min)	73°F (22.79°C)	lbf/in ²	5,500
	140°F (60°C)	lbf/in ²	3,150
Modulus of elasticity	73°F (22.79°C)	lbf/in ²	240,000
	140°F (60°C)	lbf/in ²	185,000
Izod impact strength notched	73°F (22.79°C)	ft.lb/in notch	8.5
Specific gravity		–	1.04

Submittal Data Sheet

Pipe Availability

Pipe Class	Continuous Pressure Rating @ 73°F (23°C)	Size Range
Class C	145 psi	1" – 8"
Class E	230 psi	1/2" – 4"
Class T	180 psi	1/2" – 2"

Valve Availability

Valve Type	Size Range
Ball Valve (VKD)	1/2" – 4"
Ball Valve (VXE)	1/2" – 2"
Ball Check Valve (SXE)	1/2" – 2"
Diaphragm Valve (DK)	1/2" – 2"
Diaphragm Valve (VM)	3" – 4"
Butterfly (FK)	2" – 8"
Strainers (RV)	1/2" – 2"

Fitting Availability

Fitting	Size
Saddle Clips	1/2" – 4"
Cobra Clips	1/2" – 4"
Couplings	1/2" – 12"
Flange, Full-Face – Undrilled/Socket	1/2" – 6"
Flange, Full-face – Drilled ASA 150, Socket	1/2" – 6"
Flange, Stub – Socket	2" – 8"
Gaskets	1/2" – 8"
Backing Rings - Galvanized Mild Steel, Drilled to ASA 150	1/2" – 8"
Blind Flanges – Drilled to ASA 150	3" – 8"
Cap – Socket	1/2" – 4"
Union – Socket/Plastic to Plastic, EPDM 'o' ring	1/2" – 4"
Union, Composite – Plastic to Brass, Socket/Female, EPDM 'o' ring	1/2" – 2"
Union, Composite – Plastic to Brass, Socket/Male MPT, EPDM 'o' ring	1/2" – 2"
Elbow, 90° – Socket	1/2" – 8"
Elbow, 45° – Socket	1/2" – 8"
Bend, 90° – Short Radius	1/2" – 4"
Bend, 90° Long Radius, (4 x D) – Spigot	3" – 8"
Bend, 45° Long Radius, (4 x D) – Spigot	3" – 8"
Tee, Socket	1/2" – 8"
Saddle, Socket	2" – 6" x 1-1/4" – 2"
Wye, 45° Socket End	1/2" – 2"
Wye, 45° Spigot End – Fabricated	3" – 8"
Reducer Bushing – Spigot x Socket	1/2" – 8" x 3/8" – 8"
Reducer Bushing – Spigot x FPT	1/2" – 1" x 3/8" – 3/4"
Reducer Coupling – Socket	3/4" – 8" x 1/2" – 8"
Female Adapter – Socket x BSPT	1/2" – 2"
Female Adapter – Spigot x BSPT	1/2" – 2"
Nipple – Spigot x MPT	1/2" – 4"
Plug – M.P.T.	1/2" – 2"

Matched pipe, fittings and valves – all supplied by a single manufacturer.
See Duraplus Industrial ABS price list for complete product offering.

Handling & Installation Procedures



WARNING

IPEX cannot accept responsibility for accidents arising from the misuse of its products due to poor system design, installation, or incorrect application.

Unless the procedures and recommendations set out in Volume IV: Duraplus ABS Industrial Piping System Technical Manual have been strictly followed, all warranties are null and void.

Solvent Cement Welding

Duraplus™ ABS solvent cement is specially formulated to withstand the same working conditions as the rest of the Duraplus Industrial components.

The cement operates by chemically attacking the outside of the pipe and the inside of the fittings and therefore the efficiency is greatly reduced if these surfaces are not absolutely clean and properly prepared.

NOTE: All warranties are contingent upon the use of the correct Duraplus™ ABS Industrial Cleaner and Solvent Cement.

IPEX takes no responsibility for any Duraplus System constructed with other primers or solvent cements, or not fabricated with the instructions contained herein.

Precautions

- Do not thin solvent cement with cleaner.
- **NOTE:** Solvent cement and cleaners contains toxic and flammable solvents. Suitable precautions must be taken to safeguard the health of the installers.
- Do not join near open flames and avoid smoking in the working area – all cements and cleaners are flammable.
- Do not use cements or cleaners in confined spaces – under these conditions, solvents may have a narcotic effect.
- Special care should be taken if solvent cementing is done in the rain or in wet conditions.
- Always use clean applicators and do not use the same applicator for different types of cement.
- Always use a clean rag and applicator with the IPEX supplied cleaner and solvent cement.
- Make sure cement cans are closed after use – solvents evaporate and the cement efficiency may be impaired if the container is left open.
- IPEX does not recommend the solvent cement joining of the Duraplus Industrial system to PVC. If necessary, this transition is best accomplished through the use of flanges.

Joining Pipe & Fittings

1

Before beginning, assemble proper materials for the job (IPEX MEK cleaner, Duraplus Industrial ABS cement, and applicator for the size of pipe and fittings to be assembled).

Assemble proper Personal Protective Equipment (PPE) for the job (Respirator, safety glasses, gloves and protective clothing).



2

To make sure that the pipe is cut as square as possible. Use a miter box saw, a power saw with a blade designed to cut plastic or a pipe tube cutter. The blade must be kept sharp. Use a square on the cut end of the pipe to make sure it has been cut squarely. If plastic tubing cutters are used any, raised bead at the end of the pipe must be removed with a file or deburring tool. If not removed it may scrape the cement away during pipe insertion into the fitting during the solvent cementing process.



3

Use a knife, plastic pipe deburring tool, or file to remove burrs from the end of small diameter pipe. Be sure to remove all burrs from around the inside as well as the outside of the pipe. A slight chamfer (bevel) of about 15° should be added to the end to permit easier insertion of the pipe into the fitting. Failure to chamfer the edge of the pipe may remove cement from the fitting socket, causing the joint to leak. For systems of 2" and above, the pipe must be end-treated with a 15° chamfer cut to a depth of approximately 3/32" (2.5mm). If burrs are not removed, they can scrape channels into surface of the fitting socket during solvent welding.



4

Remove all dirt, grease and moisture. A thorough wipe with a clean dry rag is usually sufficient. (Moisture will retard cure of the solvent cement; dirt or grease can also prevent adhesion).



5

Before solvent welding make sure there is an interference fit between the pipe and fitting socket. Pipe should be able to be inserted 1/3 to 2/3 the way into the socket before an interference fit is encountered.

If the pipe goes all the way into the socket do not use. Set aside and use another fitting. Contact your pipe and fitting supplier for replacement.

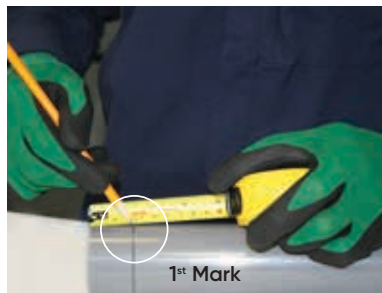


6



Measure the fitting socket depth.

This distance will then be used to draw a line on the OD of the pipe.



Mark this distance (fitting socket depth) on the pipe OD, 1st Mark.

Cleaner and solvent cement will eventually cover the end of the pipe up to this line.

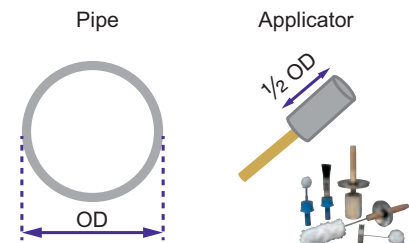


Make a 2nd Mark on the pipe OD. The distance, from the second mark to the 1st Mark should be the same as the fitting socket depth.

This is used to check that the pipe is bottomed out (properly inserted) in the fitting socket after solvent welding.

7

It is critical that the right size applicator be used on the pipe and fitting being solvent welded. The applicator should be 1/2 the size of the pipe diameter (for example; use a 2" applicator on a 4" pipe). The right size applicator will ensure that sufficient quantity of cement is applied to the pipe and fitting socket.



8

Using a clean dry rag, or applicator to apply the cleaner into fitting socket, keeping the surface and applicator wet until the surface has been cleaned. When the surface is cleaned, quickly remove any puddles of cleaner from the socket.



9

Next, apply the cleaner to the end of the pipe. Cleaner should be applied approximately 1/2" beyond the 1st mark (1/2" beyond the depth of the fitting socket).



10

Using right size of applicator, and while surfaces are still wet, apply the Duraplus industrial ABS solvent cement on the outside of the pipe.

NOTE: Do not add primers, cleaners or other thinners into the tin of solvent cement.

11

Without delay apply a full, even layer of solvent cement to the pipe-end equal to the depth of the fitting socket (1st mark) – do not brush it out to a thin paint type layer, as this will dry too quickly.



12

Immediately apply a medium even layer of solvent cement into the fitting socket; aggressively work the solvent cement into the socket wall without allowing the cement in the socket to puddle.



13

Immediately, apply a second, full even layer of solvent cement on the pipe wall.

NOTE: The majority of joint failures are a result of improper or insufficient application of solvent cement.



14

Without delay, while cement is still wet, insert the pipe into the fitting socket. While inserting the pipe in the fitting socket, twist the pipe 1/8 to 1/4 turn until reaching socket bottom.

NOTE: If cement coatings have hardened, cut off pipe end and dispose of fitting and start over. Do not attempt to assemble pipe or fittings with partially cured surfaces.

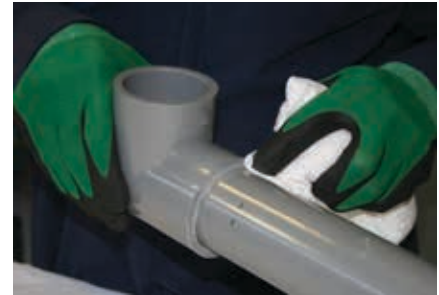
Do not continue to rotate after the pipe has reached the socket bottom. Securely hold the pipe and fitting assembly together, for a minimum of 30 seconds to eliminate push-out or movement.

NOTE: After assembly, a joint should have a clean ring or bead of cement completely around the mouth of the fitting socket. Note, if voids (gaps) in this ring are present, sufficient cement was not applied which can be an indicator of a weak joint.



15

Remove excess cement from the pipe and fitting. This can be done using a clean dry rag. Pay special attention to the ring or bead of solvent cement around the socket entrance, as it will needlessly soften the pipe and fitting, and does not add to joint strength. Excess cement around the socket entrance will also unnecessarily extend the cure time of the solvent cement. Avoid disturbing or moving the joint.



16

Measure the distance from the 2nd mark on the pipe to the mouth of the socket. If the pipe has been fully inserted into the socket, the distance should equal the socket depth previously measured.



17

Exercise care when handling newly assembled joints until initial set has taken place. Strictly follow set and cure times before handling or hydro-testing the piping system (for joint and cure times refer to page 11).

Recommended Procedure for Joining Large Diameter Pipe & Fittings (6" diameter and larger)

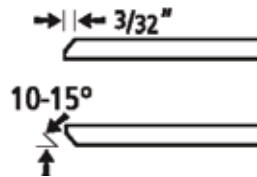
As pipe diameter increases, so does the difficulty in installing it. Using the Solvent Welding instructions listed previously along with the following additional recommendations, the professional installer should be able to successfully assemble large diameter pipe and fittings.

1

Using the correct size applicator is extremely important to ensure enough cement is applied to fill the larger gap that exists between the pipe and fittings. For example, a 3" applicator is required for 6" joint.

2

End of pipe must be cut square and chamfered (beveled).



Courtesy of IPS Corporation

3

Increase size of joining crew:

- 6" – 8": 2 – 3 people per joint

It is important in large diameter joining that the cement be applied simultaneously to the pipe and fittings.

4

Make sure to apply a second, full even layer of solvent cement to the pipe.

5

IT IS VERY IMPORTANT TO HAVE PIPE FULLY INSERTED INTO THE FITTING SOCKET (BOTTOMED OUT). Large diameter pipe is heavy and can develop significant resistance during insertion into the fitting socket, before reaching socket bottom. It is for this reason that we recommend above 4" diameter the use of a pipe-puller such as the one pictured. (Available at IPS[®] Corporation).



Courtesy of IPS Corporation

6

Large diameter pipe and fittings require longer set and cure times.
(In cold weather, a heat blanket may be used to speed up the recommended set and cure times).

7

Prefabricate as many joints as possible in a conditioned space.

8

Never bury empty MEK cleaner or solvent cement cans, rags, brushes, applicators, or anything else containing wet cement, or cleaner, next to the pipe.

Joint Curing Time

The drying time for joints will vary with the following variables; joint fit (between the pipe and fitting), amount of solvent cement applied, environmental conditions, and required working pressure of the piping system. Although full rated pressure and test pressure should not be applied for 24 hours, joints in smaller systems can sometime be put into service within hours of being made. Please refer to Joint Cure Schedule on page 11 for complete table of cure times.

Handling & Installation Procedures

Cold Weather

Although normal installation temperatures are between 40°F (4°C) and 110°F (43°C), high strength joints have been made at temperatures as low as -15°F (-26°C).

In cold weather, solvents penetrate and soften the plastic pipe and fitting surfaces more slowly than in warm weather. In this situation, the plastic is more resistant to solvent attack and it becomes even more important to pre-soften surfaces with an aggressive primer. Be aware that because of slower evaporation, a longer cure time is necessary.

Tips for solvent cementing in cold weather:

Ideally, prefabricate as much of the system as is possible in a heated work area. Short of this, erect a tent around the joints being made to shield from the elements during the joining process.

- Always store solvent cement and cleaner in a warmer area when not in use and make sure they remain fluid.
- Take special care to remove moisture including ice and snow from the surfaces to be joined. All surfaces must be clean and dry prior to joining process.
- Ensure that the temperature of the pipe and fittings, to be joined, is similar.
- Use an IPEX MEK to clean the joining surfaces before applying the solvent cement. More than one application may be necessary.
- Allow a longer cure period before the system is used.

NOTE: A heat blanket may be used to speed up the set and cure times.

An indication of the time to make a joint and number of joints likely to be made per quart of Duraplus cement is indicated in the table that follows:

Size (in.)	Joints per Quart	Time per Joint (min)
1/2 – 1	290	5
1-1/4 – 2	144	7
3	48	10
4	32	10
6	16	13
8	10	16

Hot Weather

There are many occasions when solvent cementing plastic pipe at 95°F (35°C) temperatures and above cannot be avoided. If special precautions are taken, problems can be avoided.

Duraplus ABS Industrial Solvent Cements contain solvents which evaporate faster at elevated temperatures. This is especially true when there is a hot wind blowing. If the pipe is stored in direct sunlight, the pipe surface temperatures may be 20°F to 30°F (10°C to 15°C) higher than the ambient air temperature. In this situation, the plastic is less resistant to attack and the solvents will attack faster and deeper, especially inside a joint. It is therefore very important to avoid puddling the solvent cement inside the fitting socket and to ensure that any excess solvent cement outside the joint is wiped off.

Tips for solvent cementing in hot weather:

- Store solvent cements and primers in a cool or shaded area prior to use.
- If possible, store fittings and pipe (at least the ends to be solvent welded) in a shady area before cementing.
- Try to do the solvent cementing in cooler morning hours.
- Cool surfaces to be joined by wiping with a damp rag.
- Make sure that the surface is dry prior to applying solvent cement.
- Make sure that both surfaces to be joined are still wet with cement when putting them together. With large size pipe, more people on the crew may be necessary.

NOTE: During hot weather the expansion-contraction factor may increase. Refer to the expansion-contraction design criteria in the Duraplus industrial manual.

An indication of the time to make a joint and number of joints likely to be made per quart of Duraplus cement is indicated in the table that follows:

Joint Cure Schedule for IPEX Duraplus Industrial ABS Solvent Cements*

Temperature Range (°F)	Temperature Range (°C)	Pipe Size (in) & System Operating Pressure		
		up to 1-1/4 160 - 230 psi	1-1/2 to 2 160 - 230 psi	2-1/2 to 8 145 - 230 psi
60 to 100	16 to 38	6 hr	12 hr	24 hr
40 to 60	4 to 16	12 hr	24 hr	48 hr
0 to 40	-18 to 4	48 hr	96 hr	8 days

* The figures in the table are estimates based on laboratory tests for water applications (chemical applications may require different set times). In damp or humid weather allow 50% more cure time (relative humidity over 60%).

NOTE 1: Due to the many variables in the field, these figures should be used as a general guideline only.

NOTE 2: Joint cure schedule is the necessary time needed before pressurizing the system.

Branch Connections

Reductions in branch connections can be made as follows:

- Reducer bushings can be solvent welded into tees, from 1/2" through 8".

Reducer bushings offer a neat and simple method of reducing socket size in confined spaces. They are telescopic and may be solvent welded into fittings or into each other.

Care must be taken to properly prepare all jointing surfaces per the solvent welding instructions.

- Reducer saddles can be used, from 2" up to 6".

Saddles permit branch connections to be made without cutting the main pipe in two.

Follow the fitting procedure below carefully:



1

Carefully, cut a hole into the pipe wall with a hole saw to suit the connection. The size of the hole and cutter to be used for each size of saddle is indicated in the table below.

Pipe Size (in)	2	3	4	6
Hole and Cutter Size (in.)	1-7/8	2-3/8	2-7/8	2-7/8



2

Mark out the area covered by the saddle on the pipe.

Position straps onto the pipe. These are needed to clamp the saddle into position after the solvent welding procedure.

The clamping straps recommended are of the worm-drive type. They should be left on either side of the saddle until the joint has cured.



3

Lightly abrade the mating surfaces of the pipe and the saddle with clean medium sand paper or 60-grit emery cloth.



4

Clean and abrade the surfaces of the pipe and saddle using Duraplus MEK cleaner.

Replace the lid on the can once completed.



5

Apply Duraplus cement to the pipe area marked and to the saddle, taking care that cement is applied to the inside of the drilled hole and the outside of the spigot located on the underside of the saddle. Joints require two coats of cement on each surface.



6

Place the saddle into position, ensuring that the spigot is located in the hole against the pipe wall. Clamp the saddle with the straps.



7

Wipe off excess cement.
Replace the lid on the cement can.



Please refer to Joint Cure Schedule on page 11 for complete table of cure times.

Threaded Connections

Plastic-to-Plastic

A range of threaded fittings is available with molded NPT threads. These threaded adapters can be cemented to pipe or fittings to convert them from plain end to threaded styles. IPEX recommends the use of molded threaded fittings wherever possible.

A special thick-walled 'Class T' pipe is available for threading in sizes up to 2" when molded fittings cannot be used.

When Class T pipe is threaded, the pipe must be de-rated to 180 psi at 73°F.

- Teflon tape should be wound onto male threads for a satisfactory seal.
- Tightening should only be done by hand or, at most, by an extra quarter turn with a strap wrench.
- Extra care must be taken not to over tighten or damage the pipe.
- Never use a pipe wrench.

Any Duraplus Industrial System incorporating a threaded connection is restricted to a maximum of 180 psi pressure at 73°F.



CAUTION

Anaerobic adhesive thread sealants e.g. Loctite 542, 572, can chemically attack ABS and must not be used. We recommend the use of Teflon[®] tape only.

Handling & Installation Procedures

ABS to Metal

There are several methods of connecting metal and plastic systems.

- Flanges
- Socket/Male Threaded Adapters*
- Composite Unions*
- Reinforced Female Threaded Adapters*

* **CAUTION:** Not all adapters are manufactured to NPT pipe threads. Consult with IPEX prior to using threaded adapters to connect metal and plastic systems.

The incorporation of a metal threaded composite union into the system means that a threaded plastic component need not be used and therefore pressure de-rating is not required.

Composite unions are available with brass female threads up to and including 1".

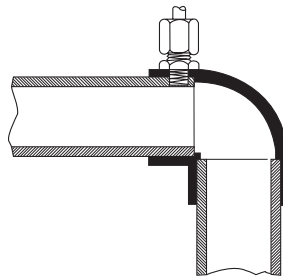


Note 1: Metal pipes and heat exchangers should be flushed thoroughly if they are to be connected to Duraplus ABS. This will ensure that if there are any harmful chemicals or settlement they will not contaminate or attack the ABS pipe.

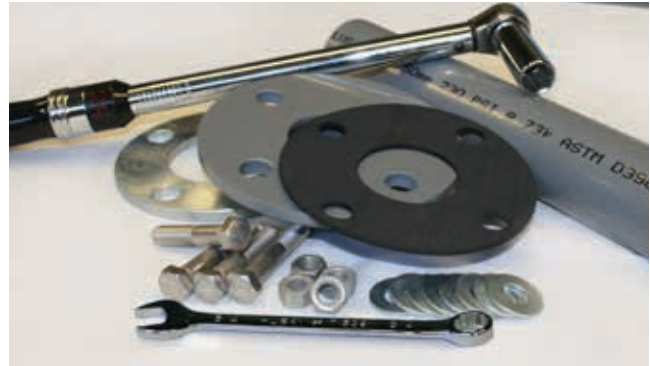
Note 2: Avoid screwing metallic male threads into plastic female threads, except those that have metal reinforcement. Consult the factory or your IPEX sales representative for the availability of these metal reinforced fittings.

Connections for Instrumentation

On 6" diameter pipe and above, small diameter connections up to 1/4" NPT can be made by drilling through pipe and fitting where the material is at its thickest and tapping the hole to receive a threaded fitting. This must never be done while the system is in service or under any internal pressure conditions.



Flanged Joints



The Duraplus Industrial range consists of two types:

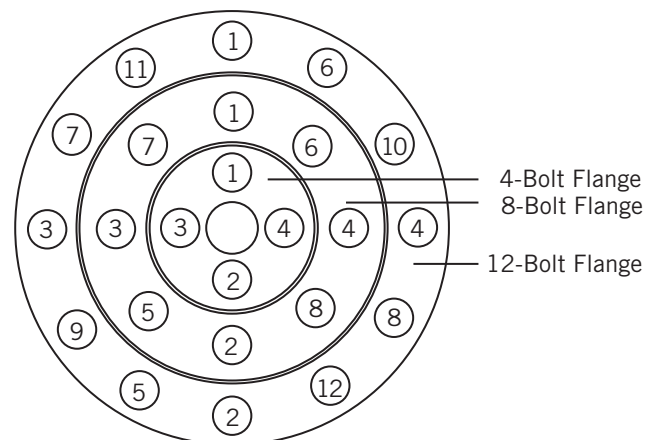
- Full-face flanges from 1/2" to 6"
- Stub flanges from 2" to 8"

A galvanized mild steel backing ring and the appropriate neoprene gasket must be used with both types of flanges.

The full-face flange has a serrated face and makes use of a flat drilled gasket.

The stub flange has a serrated face and makes use of a plain, flat, undrilled gasket.

Stub-type flanges make bolt hole adjustment very simple.



Testing

Site Pressure Testing

The purpose of an onsite pressure test is to establish that the installed section of the piping system – and in particular all joints and fittings – will withstand the design working pressure, plus a safety margin, without loss of pressure or fluid.

Generally a test pressure of 1-1/2 times the safe working pressure, but not exceeding the maximum Rated Pressure of the piping system, for the installed pipe is adequate. Whenever possible, it is recommended that hydrostatic testing be carried out. It is recommended that the following hydrostatic test procedure be followed after the solvent-welded joints have been allowed to cure for a minimum period of 24 hours at 73°F (timed from the last joint). However, please refer to Joint Cure Schedule on page 11 for complete table of cure times.

Hydrostatic Test Procedure

1. Fully inspect the installed piping for evidence of mechanical abuse and/or dry, suspect joints.
2. Split the system into convenient test sections.
3. Slowly fill the pipe section with cold water, taking care to evacuate all entrapped air in the process. Use air release valves at any high points in the system. Do not pressurize at this stage.
4. Leave the section for at least 1 hour to allow equilibrium temperature to be achieved.
5. Check the system for leaks. If clear, check for and remove any remaining air and increase pressure up to 50 psi. Do not pressurize further at this stage.
6. Leave the section pressurized for 10 minutes. If the pressure decays, inspect for leaks. If the pressure remains constant, slowly increase the hydrostatic pressure to 1-1/2 times the nominal working pressure but not exceeding the maximum Rated Pressure of the piping system.
7. Leave the section pressurized for a period not exceeding 1 hour. During this time, the pressure should not change.

If there is a significant drop in static pressure or extended times are required to achieve pressure, either joint leakage has occurred or air remains in the line. Inspect for leakage and if none is apparent, reduce the pressure and check for trapped air. This must be removed before further testing.

Any joint leaks should be repaired and allowed to cure fully before re-pressurizing for a minimum of 24 hours. However, please refer to Joint Cure Schedule on page 11 for complete table of cure times.

Storage

Prolonged Storage in Sunlight

Prolonged storage in sunlight may lead to degradation and some loss of impact resistance because of the combined effect of heat and ultraviolet radiation. White opaque and well ventilated tarps should be used wherever possible to prevent this from happening.

On-site Storage

The high-impact strength of the Duraplus Industrial System provides some protection against damage to plastic pipe often incurred during handling and storage on-site.

However, it is recommended the following precautions are taken:

1. The storage site should be flat, level and free from sharp stones, etc.
2. Pipes should not be stacked to heights exceeding the following:

Pipe Size (in.)	Max Stacking Height
Up to 3	20 x pipe size
4 – 6	12 x pipe size
8	7 x pipe size

3. Smaller pipes may be 'nested' inside larger pipes.
4. Side bracing should be provided to prevent stack collapse.

Handling & Installation Procedures



CAUTION

Freezing Conditions

Precautions should be taken to prevent contents from freezing, as this can cause pipe work to split. Glycol can be added to the system to lower the freezing point.

Thermal Insulation

Some insulation products can contain substances capable of having a detrimental effect on thermoplastic pipe work (eg. certain types of foam rubber insulations can cause pipes to fail where the ABS is conveying liquids at temperatures above 86°F (30°C.) Common insulation materials known to be suitable with ABS pipe work are:

- fiber wool, such as 'Rockwool'
- Armaflex Class 1 HT
- Koolphen K Phenolic foam
- Polystyrene

Note: Please contact our Technical Customer Service if further assistance or recommendations are required.

Some adhesives can be detrimental. Do not bond insulation to ABS. (This comment also applies to any tapes, adhesives, or other substances used to secure the heating tape to the pipe work.)

Trace Heating

The selection of heating tapes with silicone rubber, woven wire, or woven polyester outer sheaths will eliminate the risk of plasticizer migration. These tapes are therefore preferred for use on thermoplastic systems.

Pipe Contents Identification

Do not put self-adhesive labels directly on to pipe surfaces as this may be detrimental to pipe performance. It is recommended that some sort of barrier, such as aluminum foil, is placed between pipe and identification label.

Sealants

Certain sealants are formulated with phthalates. Phthalates are known to be extremely aggressive toward ABS materials, and therefore confirmation of the suitability of any mastic sealant should be determined before being used in conjunction with ABS pipe work. IPEX recommends using Teflon tape.

Contact with Synthetic Oils

Some synthetic oils used for drawing tubes and tube bending in the production of equipment such as fan coils, refrigeration display cases and other metal coiled devices are unsuitable for use with thermoplastic piping systems.

The main types of synthetic oils identified as being incompatible with thermoplastic piping systems include but are not limited to Esters, Polyalkylene Glycols, and Organic Phosphates.

Some metal equipment manufacturers use these oils in their manufacturing process and normally remove these oils after manufacturing the part. However, IPEX recommends flushing the metal equipment thoroughly before installation with the thermoplastic piping system to ensure that residual oil left in the equipment cannot come into contact with the ABS.

IPEX recommends flushing the equipment with methylated spirits, however the equipment manufacturer should always be contacted for compatibility and complete flushing procedures. It is important to ensure proper drying time after flushing before connecting the equipment to the ABS piping system. Please note that only the metal pipe in the equipment should be flushed, ABS piping should not be flushed with methylated spirits.

Contact with Fluxes

Some fluxes can be detrimental to ABS. Care should be taken when soldering copper pipe work directly above, or close to, ABS pipe work.

Pressure Surges

Pressure surges should not be allowed to exceed the maximum continuous working pressure of the system.

Insulation

Some insulation products may be unsuitable for use with Duraplus ABS Industrial piping systems. They may contain harmful plasticizers which can migrate into the ABS material. Certain insulation products are suitable for use with ABS but may need to be installed using adhesives that contain harmful solvents.

It is important to ensure compatibility of the insulation material as well as installation materials, such as adhesives, with your IPEX representative.

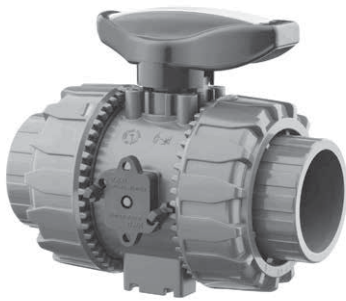
VKD Series Ball Valves

IPEX VKD Series Ball Valves offer a variety of advanced features such as the patented seat stop carrier, a high quality stem and ball support system, and a multifunctional handle with optional lock. The new DUAL BLOCK[®] system locks the union nuts preventing back-off due to vibration or thermal cycling. Deep grooves, thick o-rings, and cushioned Teflon[®] seats contribute to strong seals under pressure while integral mounting features and bracketing combine for simple adaptation for actuation and anchoring.

Pressure rated to 232 PSI at 73°F. Sizes 1/2" to 4".

Note: Additional information is available in the IPEX Volume IV: Duraplus ABS Industrial Piping System Technical Manual.

Sizes 1/2" to 2"



Sizes 3" and 4"



Pneumatically Actuated



Electrically Actuated



Size (inches):

- | | |
|--------------------------------|--------------------------------|
| <input type="checkbox"/> 1/2 | <input type="checkbox"/> 1-1/2 |
| <input type="checkbox"/> 1/2 | <input type="checkbox"/> 2 |
| <input type="checkbox"/> 3/4 | <input type="checkbox"/> 3 |
| <input type="checkbox"/> 1 | <input type="checkbox"/> 4 |
| <input type="checkbox"/> 1-1/4 | |

Control Style:

- Manual
- Electrically Actuated
- Pneumatically Actuated

(Note: Please refer to IPEX valve price list for additional components with actuated valves)

Seals:

- EPDM

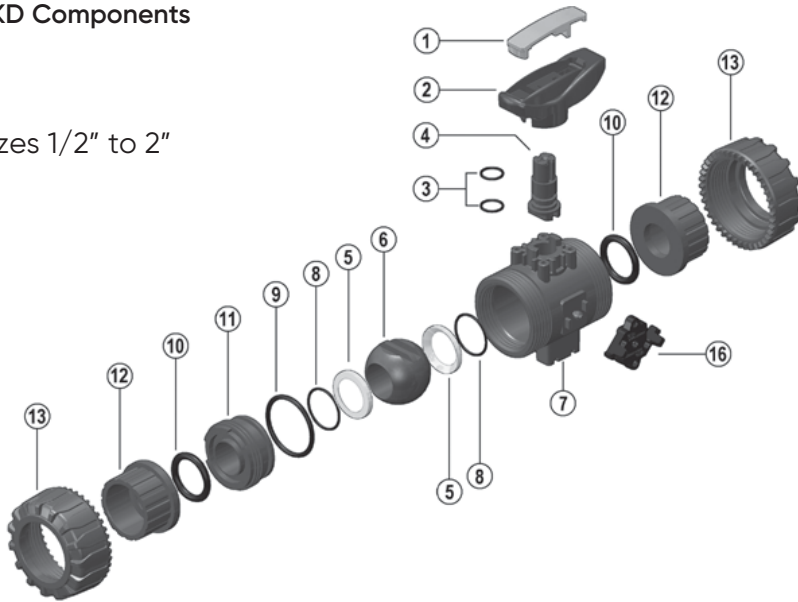
Valve Material:

- Duraplus ABS

Submittal Data Sheet

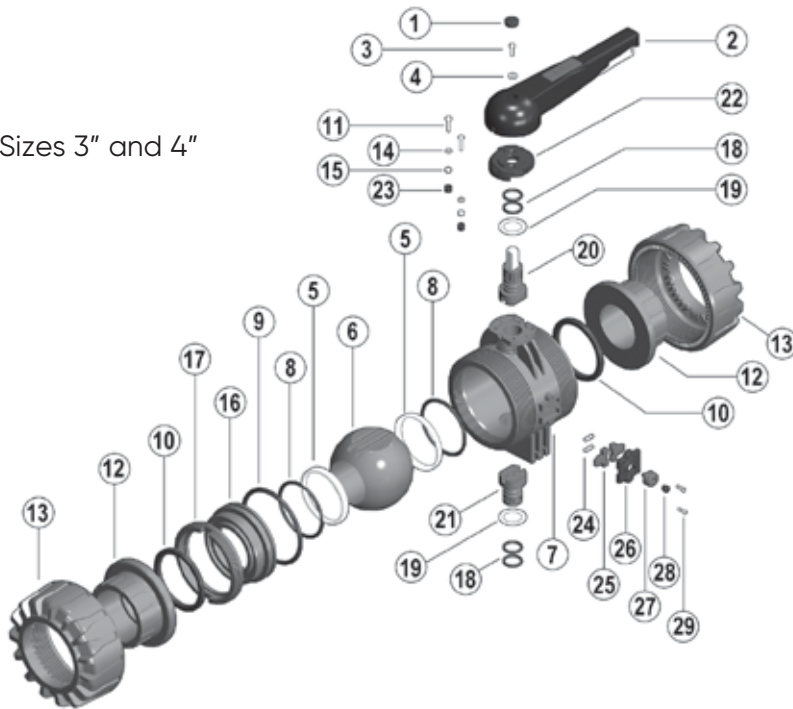
VKD Components

Sizes 1/2" to 2"



#	Component	Material
1	Insert	PVC
2	Handle	PVC
3	Stem O-Ring	EPDM
4	Stem	Duraplus ABS
5	Ball Seat	PTFE
6	Ball	Duraplus ABS
7	Body	Duraplus ABS
8	Ball Seat O-Ring	EPDM
9	Body O-Ring	EPDM
10	Socket O-Ring	EPDM
11	Carrier with Stop Ring	Duraplus ABS
12	End Connector	Duraplus ABS
13	Union Nut	Duraplus ABS
16	Dual Block®	POM

Sizes 3" and 4"



#	Component	Material
1	Protective Cap	PE
2	Handle	PVC
3	Bolt	SS
4	Washer	SS
5	Ball Seat	PTFE
6	Ball	Duraplus ABS
7	Body	Duraplus ABS
8	Ball Seat O-ring	EPDM
9	Body O-Ring	EPDM
10	Socket O-Ring	EPDM
11	Bolt	SS
12	End Connector	Duraplus ABS
13	Union Nut	Duraplus ABS
14	Washer	SS
15	Nut	SS
16	Carrier	Duraplus ABS
17	Stop Ring	Duraplus ABS
18	Stem O-Ring	EPDM
19	Bushing	PTFE
20	Upper Stem	Duraplus ABS & SS
21	Lower Stem	Duraplus ABS
22	Pad	GRPP
23	Protective Cap	PE
24	Spring	SS
25	Nut Block	GRPP
26	Cover	PP
27	Nut Block Button	GRPP
28	Protective Cap	PE
29	Screw	Nylon

VXE Series Ball Valve

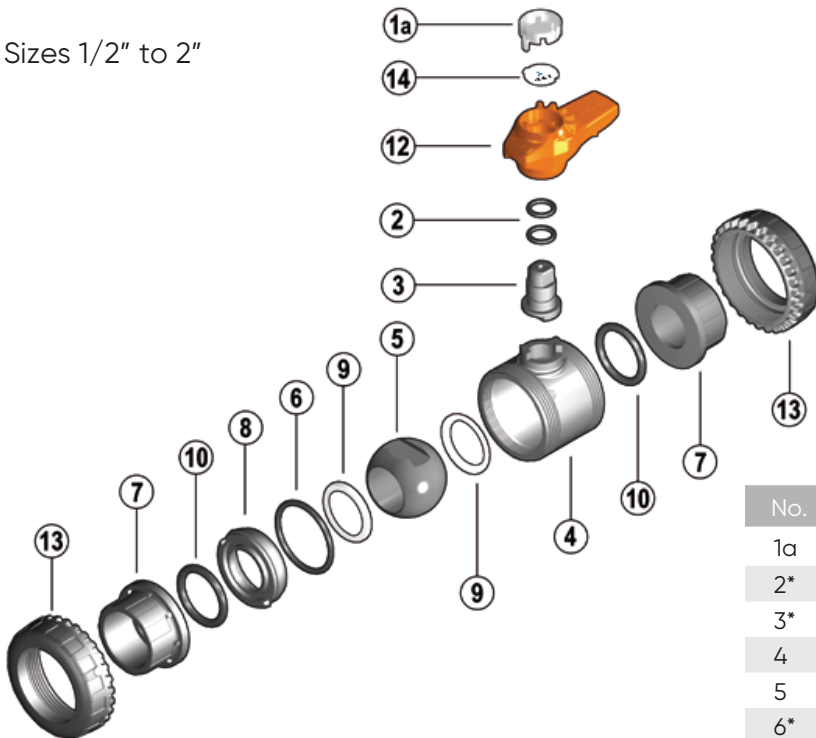
The VXE EasyFit true union ball has a pressure rating of 232psi at 73°F. The valve is available from 1/2" to 2" with socket ends, PTFE seats, and EPDM seals.

This valve features an ultra-compact double block design, and full port bi-directional operation. The true union design allows the valve to be easily removed from the piping system and fully serviced. A threaded seat stop carrier provides improved seal integrity under tough service conditions while the EasyFit multifunction handle doubles as a tool for ball seat adjustment, and for tightening union nuts precisely.



VXE Components

Sizes 1/2" to 2"



Size (inches):

- 1/2 1-1/4
 3/4 1-1/2
 1 2

Control Style:

- Manual

Seals:

- EPDM

Valve Material:

- Duraplus ABS

No.	Component	Material	Qty
1a	Transparent Service Plug	PVC	1
2*	Stem O-Ring	EPDM	2
3*	Stem	Duraplus ABS	1
4	Body	Duraplus ABS	1
5	Ball	PVCC	1
6*	Body Seal O-Ring	EPDM	1
7	End Connector	Duraplus ABS	2
8	Support for Ball Seat	Duraplus ABS	1
9*	Ball Seat	PTFE	2
10*	Socket Seal O-Ring	EPDM	2
12	Handle	PVC	1
13	Union Nut	Duraplus ABS	2
14	Tag Holder	PVC	1

* Spare parts available

FK Series Butterfly Valves

IPEX FK Series Butterfly Valves offer superior strength and chemical resistance in highly corrosive environments and process flow conditions. The special trapezoid shape of the liner and a serrated body cavity guarantee a bubble tight seal while keeping break-away torque at an absolute minimum. This versatile industrial valve features double self-lubricating seals and direct actuator mount capability.

Pressure rated to 120 PSI at 73°F. Sizes 1-1/2" to 8".

Note: Additional information is available in the IPEX Volume IV: Duraplus ABS Industrial Piping System Technical Manual.

Sizes 1-1/2" to 2"



Sizes 3" to 8"



Size (inches):

- | | |
|--------------------------------|----------------------------|
| <input type="checkbox"/> 1-1/2 | <input type="checkbox"/> 4 |
| <input type="checkbox"/> 2 | <input type="checkbox"/> 6 |
| <input type="checkbox"/> 3 | <input type="checkbox"/> 8 |

Control Style:

- Lever Handle
- Mounted Gear Box
- Electric Actuation
- Pneumatic Actuation

Body Style:

- Wafer

Seals:

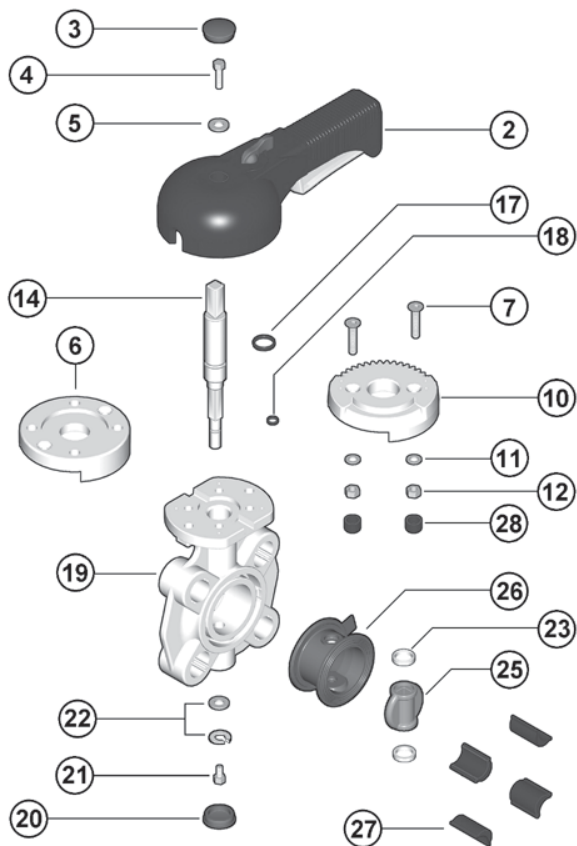
- EPDM
- FPM

Disc Material:

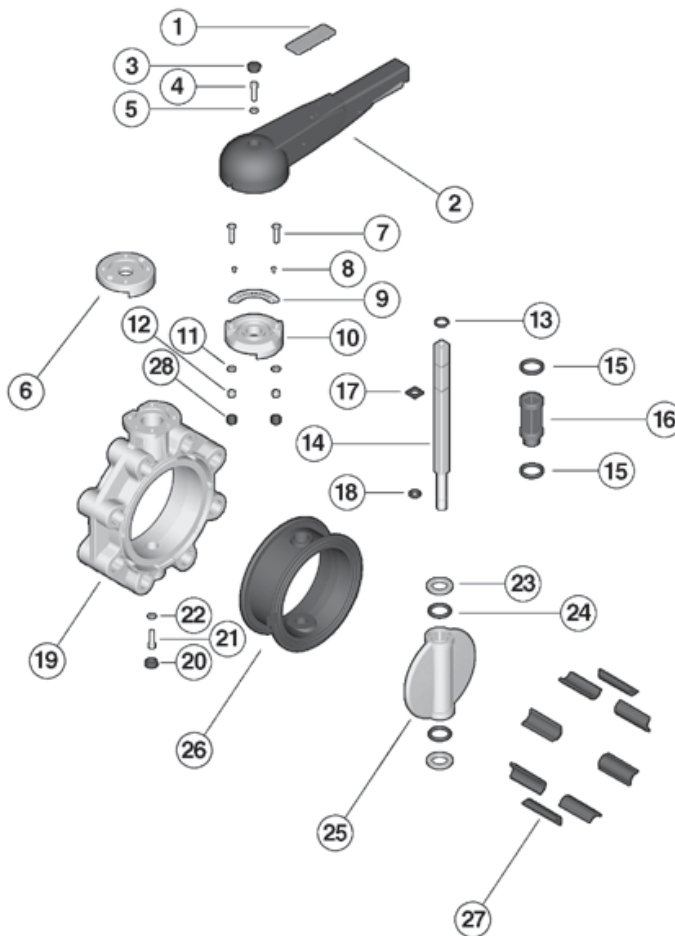
- 1-1/2" – 8"
- Duraplus ABS

FK Components

Sizes 1-1/2" to 2"



Sizes 3" to 8"



#	Component	Material
1	Handle Insert	Duraplus ABS
2	Handle	PVC
3	Cap	PE
4	Screw	SS
5	Washer	SS
6	Spacer Pad	GRPP
7	Screw	SS
8	Screw	SS
9	Ratchet	SS
10	Pad	GRPP
11	Washer	SS
12	Nut	SS
13	Retaining Ring	SS
14	Shaft	420 SS

#	Component	Material
15	Bushing O-Ring	EPDM
16	Bushing	nylon
17	Shaft O-Ring	EPDM
18	Shaft O-Ring	EPDM
19	Body	GRPP
20	Cap	PE
21	Screw	SS
22	Washer	SS
23	Anti-Friction Ring	PTFE
24	Disc O-Ring	EPDM
25	Disc	Duraplus ABS
26	Primary Liner	EPDM
27	Inserts	ABS
28	Cap	PE

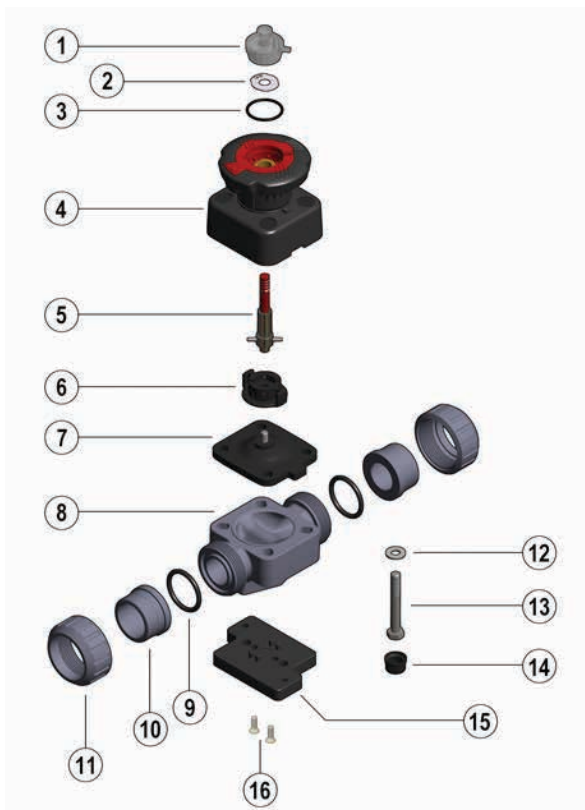
DK Series Diaphragm Valves

IPEX DK Series Dialock® Diaphragm Valves are the ideal solution for modulating flow and controlling dirty or abrasive fluids in a variety of applications. The modular nature of these valves results in many material, body style, and diaphragm options. The re-designed weir-style body has significantly improved the DK's flow rate compared to the old design and it facilitates precise linear flow regulation through the valve's full range of operation. The new innovative and patented Dialock locking mechanism allows the manual handwheel to be adjusted and locked in over 300 positions.

Pressure rated to 150 psi at 73°F. Sizes 1/2" to 2".



Components



#	Component	Material	Qty
1	Transparent Cap	PVC	1
2	Labelling Plate	PVC	1
3	O-Ring	EPDM	1
4	Handwheel / Bonnet	GFPP / PVDF	1
5	Threaded Stem – Indicator	SS	1
6	Compressor	IXEF®	1
7	Diaphragm	EPDM	1
8	Valve Body	Duraplus ABS	1
9	Socket Seal O-Ring	EPDM	2
10	End Connector	Duraplus ABS	2
11	Union Nut	Duraplus ABS	2
12	Washer	SS	4
13	Hex Bolt	SS	4
14	Protective Cap	PE	4
** 15	Wall/Panel Mounting Plate	GFPP	1
** 16	Screw	SS	2

Items 1 through 6 are supplied as an assembly.

** Accessories

Contact IPEX for availability of spare components for Spigot and Flanged style valves.

Size (inches):

- 1/2 1-1/4
 3/4 1-1/2
 1 2

Control Style:

- Manual

Seals:

- EPDM

Valve Material:

- Duraplus ABS

VM Series Diaphragm Valves

IPEX VM Series Diaphragm Valves are the ideal solution for modulating flow and precise throttling in a variety of applications. The compact modular design allows for installation in any orientation, simple elastomer replacement, and possible conversion to an automated valve without removing the body from the line.

Pressure rated to 150 PSI at 73°F. Sizes 3" to 4".

Note: Additional information is available in the IPEX Volume IV: Duraplus ABS Industrial Piping System Technical Manual.



Size (inches):

- 3**
- 4**

Control Style:

- Manual

Seals:

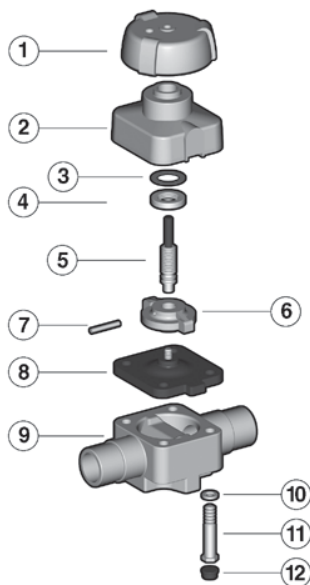
- EPDM

Valve Material:

- Duraplus ABS

** 3" and 4" are spigot ends

VM Components



#	Component	Material
1	Handwheel	GFPP
2	Bonnet	GFPP
3	Compression Bearing	POM
4	Security Ring	brass
5	Indicator - Stem	SS
6	Compressor	PBT
7	Pin	SS
8	Diaphragm	EPDM
9	Valve Body	Duraplus ABS
10	Washer	zinc plated steel
11	Hex Bolt	zinc plated steel
12	Protective Cap	PE

SXE Ball Check Valve – Socket, True Union, EPDM Seals



All sizes are rated to 150psi @ 73°F.

Note: This valve must be installed at a minimum distance of 10X the nominal diameter from a pump flange (eg: 20" for size 2").

Size (inches):

- | | |
|------------------------------|--------------------------------|
| <input type="checkbox"/> 1/2 | <input type="checkbox"/> 1-1/4 |
| <input type="checkbox"/> 3/4 | <input type="checkbox"/> 1-1/2 |
| <input type="checkbox"/> 1 | <input type="checkbox"/> 2 |

Seals:

- EPDM

Valve Material:

- Duraplus ABS

RV Sediment Strainer – Socket, True Union, EPDM Seals



Mesh: 1.5 mm mesh, ASTM mesh size 30, polypropylene.

Note: Additional information is available in the IPEX Volume IV: Duraplus ABS Industrial Piping System Technical Manual.

Size (inches):

- | | |
|------------------------------|--------------------------------|
| <input type="checkbox"/> 1/2 | <input type="checkbox"/> 1-1/4 |
| <input type="checkbox"/> 3/4 | <input type="checkbox"/> 1-1/2 |
| <input type="checkbox"/> 1 | <input type="checkbox"/> 2 |

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As leading suppliers of thermoplastic piping systems, the IPEX Group of Companies provides our customers with some of the world's largest and most comprehensive product lines. All IPEX products are backed by more than 50 years of experience. With state-of-the-art manufacturing facilities and distribution centers across North America, we have established a reputation for product innovation, quality, end-user focus and performance.

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- Industrial process piping systems
- Municipal pressure and gravity piping systems
- Plumbing and mechanical piping systems
- Electrofusion systems for gas and water
- Industrial, plumbing and electrical cements
- Irrigation systems
- PVC, CPVC, PP, PVDF, PE, ABS, and PEX pipe and fittings

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