

Always follow the complete AquaRise installation instructions provided in this manual. **Failure to comply with handling, storage and installation instructions may cause piping system failure resulting in damage to property.**

### SAFE HANDLING AND STORAGE OF PIPE, FITTINGS & VALVES

Care must be taken when handling AquaRise products to ensure that pipe, fittings, valves and accessories are not damaged prior to installation. Take the following precautions to ensure AquaRise products remain in top condition prior to installation.

- Store pipe indoors if possible
- Pipe stored outside must be covered with a well-ventilated white tarp
- Always keep pipe clean and covered in its original packaging
- Always store pipe on a flat surface and never store other products on top of pipe
- Do not drop or drag pipe
- Always store fittings and valves indoors in original packaging or repackage to protect from damage, dirt and debris
- Inspect all AquaRise products prior to installation
- Never install AquaRise products that are damaged

### SOLVENT WELDING

#### INTRODUCTION

Creating optimal solvent welded connections requires attention to detail, proper preparation of components and an understanding of all instructions provided in this manual.

#### SAFE HANDLING AND STORAGE OF PRIMERS AND SOLVENT CEMENTS

AquaRise primer and solvent cement are made from flammable liquids and must be kept away from all sources of ignition. Good ventilation must be maintained to reduce fire hazard and to minimize the breathing of solvent vapors. Refer to ASTM F402, Standard Practice for Safe Handling of Solvent Cements, Primers, and Cleaners Used for Joining Thermoplastic Pipe and Fittings. Always adhere to local jobsite and workplace safety regulations. For additional safety information, consult the material safety data sheet for this product which is available at [ipexaquarise.com](http://ipexaquarise.com).

- Always provide proper ventilation when applying primers and cements
- Avoid skin or eye contact with primers and cements
- Wash immediately if contact occurs to avoid prolonged exposure
- Do not solvent weld joints near open flames or soldering torches



## WARNING

During the curing of the solvent welded joints, vapors may accumulate inside the piping system, especially should one end of the line be capped. Nearby sparks from welders or torches may inadvertently ignite these vapors and create a hazardous incident. Attention must be given to removing all vapors using air-blowers or water flushing prior to capping one end of an empty piping system.

- Use personal protection equipment (PPE) when handling primers and solvent cements
- Always store primer and cement indoors
- For cold weather installation store primer and cement in a warm location above 40°F (5°C)
- For hot weather installation store primer and cement in a cool, shaded location
- Always check bottom of primer and cement cans for date of manufacture and expiry date
- Never use solvent cement that is older than its recommended shelf life. Use before the expiry date or within 2 years of the manufacturing date stamped on the bottom of the can
- Never use primer that is older than its recommended shelf life. Use before the expiry date or within 3 years of the manufacturing date stamped on the bottom of the can
- Properly discard primer and cement that exceeds its recommended shelf life or expiry date
- Properly discard solvent cement that has hardened or jelled
- Tightly close partially used primer and cement containers

#### SOLVENT WELDING BASICS

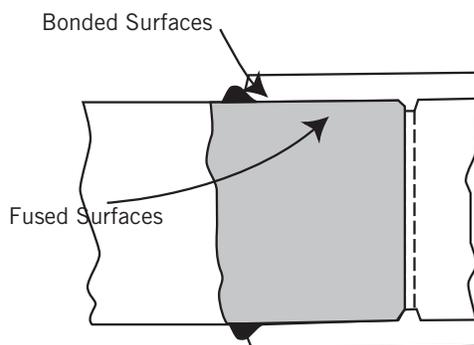
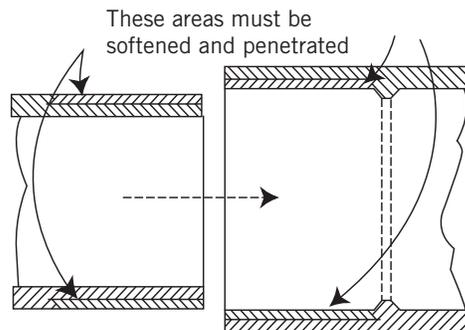
- Dry fit all joints prior to solvent welding to confirm proper interference fit
- Discard fitting joints without proper interference fit
- Do not solvent weld joints that are too loose or too tight
- Always use AquaRise bevelling tools to prepare pipe ends before cementing
- Do not solvent weld joints without first bevelling pipe ends
- Use only AquaRise primer and solvent cements in accordance with IPEX instructions
- Do not use other cements to connect AquaRise pipe, fittings and accessories
- Follow all solvent welding instructions provided with this product
- Follow all AquaRise installation instructions. Visit [ipexaquarise.com](http://ipexaquarise.com) for details



### NOTICE

**Do not use excessive amounts of primer or solvent cement. Too much primer or solvent cement can lead to puddling in the pipe and fittings which can result in product failures and property damage. Always follow the instructions provided with each can of AquaRise primer and/or solvent cement.**

Sufficient cement must be applied to fill the gap in the loose part of the joint. Besides filling the gap, adequate solvent cement layers will penetrate the surfaces and also remain wet until the joint is assembled. If the solvent cement coatings on the pipe and fittings are wet and fluid when assembly takes place, they will tend to flow together and become one solvent cement layer. Also, if the solvent cement is wet, the surfaces beneath them will still be soft, and these dissolved surfaces in the tight part of the joint will fuse together.



As the solvent dissipates, the solvent cement layer and the dissolved surfaces will dry and harden with a corresponding increase in joint strength. Completed joints must not be disturbed until they have properly set. See the Joint Set Schedule table on page 14 for details.

Joint strength continues to develop as the solvent cement dries. To determine when solvent cement joints can be pressure tested see the Joint Cure Schedule table on page 14.

Before beginning, assemble proper materials for the job

(AquaRise One-Step Solvent Cement (1/2" – 2") / AquaRise Two-Step Solvent Cement and Primer (2-1/2" – 4"), appropriate applicator for the size of pipe and fittings to be assembled, tape measure, pencil and beveling tool).

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



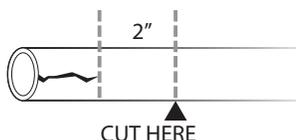
### SOLVENT WELDING INSTRUCTIONS

#### 1. CUTTING THE PIPE

It is important to cut the pipe squarely. A square cut provides the surface of the pipe with the maximum bonding area. Pipe can be easily cut with a wheel-type plastic tubing cutter, chop saw or fine toothed saw. Do not use reciprocating saws. Tools used to cut pipe must be designed for AquaRise piping



and must be in good condition in accordance with the tool manufacturer's recommendations. If there is any indication of pipe damage or evidence of pipe end cracking, cut off at least 2 inches (50mm) beyond any visible crack. Use of ratchet cutters is not recommended as they may split the pipe if not properly used and maintained.



#### 2. PREPARING PIPE ENDS

Always bevel pipe ends. Use the tools provided by IPEX which have been specifically designed for this purpose. Remove burrs and filings from the inside of the pipe using a knife edge or file.

AquaRise beveling tool  
1/2" to 1" diameter



AquaRise beveling tool  
1-1/4" to 4" diameter



#### 3. CLEANING

Using a clean dry cloth, wipe any dirt and moisture from the fitting socket and the pipe end.



#### 4. DRY-FITTING

Before applying primer or solvent cement, test all connections (pipe, fittings and accessories) to confirm a proper interference fit exists. Dry-fit contact between properly bevelled pipe and fitting sockets is essential in making a good joint. The bevelled pipe should easily enter the fitting socket and make contact with the inner fitting socket wall before bottoming out. A proper interference fit is present when the bevelled pipe can only be inserted 1/3 to 2/3 of the way into the fitting socket.



Do not solvent weld pipe, fittings or accessories that fit loosely together or where pipe bottoms out. Proper joint strength cannot be developed.

Do not solvent weld pipe, fittings or accessories if a bevelled pipe cannot easily be inserted at least 1/3 of the way into the fitting socket. This may cause excessive stresses during assembly leading to joint failure.

#### 5. APPLICATOR SIZE

Use the applicators (daubers and swabs) provided with AquaRise solvent cements and in accordance with these instructions. Proper applicator size is critical to ensuring the correct amount of AquaRise primer and/or solvent cement is applied to the pipe, fittings and accessories.

### ONE-STEP SOLVENT WELDING PROCEDURE FOR 1/2" TO 2" DIAMETERS



**IMPORTANT:** For 1/2" to 2" diameters use only AquaRISE One-Step (Yellow) solvent cement. Do not use primer with One-Step solvent cement.



■ Measure the fitting socket inner depth and mark the outside of the pipe with this dimension. This will help with application of the proper amount of solvent cement on the pipe and also helps indicate full and proper insertion of the pipe inside the fitting socket.



■ AquaRISE One-Step cement comes with a small dauber inside the can. Use this small dauber for 1/2", 3/4" and 1" diameter joints. A larger dauber is also provided separately inside this carton. Use the larger dauber for 1-1/4", 1-1/2" and 2" diameter joints.

Do not use the larger dauber for 1/2", 3/4" and 1" joints. Joint failure can occur if excessive amounts of One-Step cement are applied. Do not permit One-Step cement to pool inside of fittings or accessories.

Do not use the small dauber on 1-1/4", 1-1/2" and 2" joints. Sufficient One-Step cement must be applied in a timely manner and kept wet prior to assembly of the joint.



■ Apply a medium layer of AquaRISE One-Step solvent cement to the bevelled pipe end. Apply enough cement to just cover the socket insertion mark on the outside of the pipe. Be aggressive and work One-Step cement onto the pipe surface. Apply enough solvent cement to fill the gap between the pipe and fitting to soften the surfaces.



■ Apply a thin, light layer of AquaRISE One-Step solvent cement to the inside of the fitting socket and work this thin layer of One-Step cement into the wall of the fitting socket. For smaller diameters it may not be necessary to re-dip the dauber. A thin layer will prevent puddling of the One-Step solvent cement inside of the pipe or fitting. Excessive solvent cement applied to the fitting socket can cause the joint to clog and the wall of the pipe or fitting to weaken due to softening by the trapped solvents.



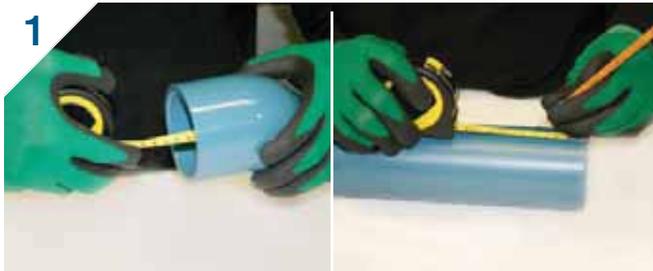
■ Without delay, while the One-Step solvent cement is still wet, assemble the pipe and fitting, and twist 1/8 to 1/4 turn as the pipe is being inserted. Once the pipe end has reached the bottom of the fitting socket, do not turn any further; doing so could break any fusion that is starting to occur.



### TWO-STEP SOLVENT WELDING PROCEDURE FOR 2-1/2" TO 4" DIAMETERS



**IMPORTANT:** For 2-1/2" to 4" diameters always use AquaRISE (Clear) primer with AquaRISE Two-Step (Yellow) solvent cement.



■ Measure the fitting socket depth and mark the outside of the pipe with this dimension. This will help with application of the proper amount of primer and Two-Step solvent cement on the pipe and also helps indicate full and proper insertion of the pipe inside the fitting socket.



■ Apply AquaRISE primer to the inside of the fitting socket. Use the dauber supplied in the can of primer.



■ Apply AquaRISE primer to the pipe end, equal to the depth of the fitting socket. Be aggressive and work the primer into the pipe.



■ Apply AquaRISE primer to the inside of the fitting socket again.



■ While the primer is still wet and the surfaces are soft, use the swab provided to apply a full, even layer of AquaRISE Two-Step solvent cement to the pipe end, equal to the depth of the fitting socket. Like the primer, be aggressive and work the cement into the pipe. Remember to apply enough Two-Step solvent cement to fill the gap between the pipe and fitting.



■ Apply a thin layer of AquaRISE Two-Step solvent cement to the inside of the fitting socket. This will prevent puddling of the solvent cement inside of the pipe or fitting. Excessive solvent cement applied to the fitting socket can cause the joint to clog and the wall of the pipe or fitting to weaken due to softening by the trapped solvents.



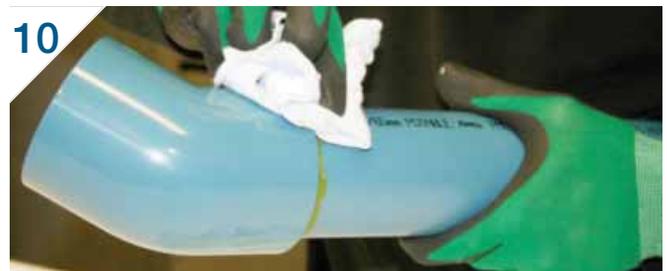
■ Apply a second full, even layer of AquaRise Two-Step solvent cement to the pipe end. Excessive solvent cement on the pipe outer diameter (O.D.) can be wiped away after assembly.



■ Without delay, while the solvent cement is still wet, assemble the pipe and fitting, and twist a 1/8 to 1/4 turn as the pipe is being inserted, if possible. Once the pipe end has reached the fitting socket stop, do not turn any further; doing so could break any fusion that is starting to occur.



■ Hold the pipe and fitting together for approximately 30 seconds to avoid “push-out”.



■ A bead of solvent cement must be formed around the entire socket fitting entrance. With a clean, dry cloth, remove the excess solvent cement from the pipe and fitting socket entrance. This will allow the solvent to evaporate from within the joint.

### NOTES

Average Joint SET Schedule For AquaRise Solvent Cement\*\*

| Temperature Range             | Pipe Sizes 1/2" to 1-1/4" | Pipe Sizes 1-1/2" to 2" | Pipe Sizes 2-1/2" to 4" |
|-------------------------------|---------------------------|-------------------------|-------------------------|
| 60° – 100 °F<br>(15° – 38 °C) | 2 minutes                 | 5 minutes               | 30 minutes              |
| 40° – 60 °F<br>(5° – 15 °C)   | 5 minutes                 | 10 minutes              | 2 hours                 |

**Note:** Initial set schedule is the necessary time to allow before the joint can be carefully handled.

\*\* Due to the many variables in the field, these figures are to be used as a general guide only.

Average Joint CURE Schedule For AquaRise Solvent Cement\*\*1

| Relative Humidity<br>60% or Less                      | Cure Time Pipe Sizes<br>1/2" to 1-1/4" |                  | Cure Time Pipe Sizes<br>1-1/2" to 2" |                  | Cure Time Pipe Sizes<br>2-1/2" to 4" |                  |
|---|--|------------------|--------------------------------------|------------------|--------------------------------------|------------------|
|   | Up to<br>160 psi                       | Above<br>160 psi | Up to<br>160 psi                     | Above<br>160 psi | Up to<br>160 psi                     | Above<br>160 psi |
| Temperature Range during<br>assembly and cure periods |  |                  |                                      |                  |                                      |                  |
| 60° – 100 °F<br>(15° – 38 °C)                         | 15 min                                 | 6 hrs            | 30 min                               | 12 hrs           | 1-1/2 hrs                            | 24 hrs           |
| 40° – 60 °F<br>(5° – 15 °C)                           | 20 min                                 | 12 hrs           | 45 min                               | 24 hrs           | 4 hrs                                | 48 hrs           |

**Note:** Joint cure schedule is the necessary time to allow before pressurizing the system. In damp or humid weather allow 50% more cure time.

\*\* Due to the many variables in the field, these figures are to be used as a general guide only.

1. Pressure values shown in this table indicate the maximum test pressure of the piping system. The system should not be pressurized at all until this cure time has elapsed.

## NOTICE

The values provided in these charts are for guidance only and do not necessarily reflect the actual return to service time required for every situation. Installers must allow for additional time where possible when returning AquaRise systems to hot water service.



### COLD WEATHER SOLVENT WELDING – BELOW 50°F (10°C)

- Do not solvent weld joints when pipe, fitting, valve or installation temperatures are less than 40°F (5°C)
- Prefabricate as much of the system as possible in a heated area
- Store AquaRise primer and solvent cement in a warm location above 40°F (5°C) when not in use and make certain cement remains fluid
- Take special care to remove moisture including snow and ice from the surfaces being joined including pipe ends and fitting and valve sockets
- Ensure that the pipe, fittings and valves are at the same temperature prior to solvent welding
- Ensure the surfaces are softened before joining. Check for proper softening of surfaces and correct amount of cement on a sample pipe. Surfaces are sufficiently softened when scraping a blade on the treated part results in the effortless removal of a thin layer of the base material
- Colder weather requires longer set and cure times. Refer to the Tables on page 14 for required set and cure schedules before moving or pressure testing joints. A heating blanket may be used to speed up the set and cure times

### HOT WEATHER SOLVENT WELDING – ABOVE 86°F (30°C)

- Store AquaRise primer and solvent cement in a cool or shaded area prior to use
- Store pipe and fittings in a shaded area prior to solvent welding
- Cool surfaces to be joined with a clean, damp rag. Be sure the surface is dry prior to solvent welding
- Consider solvent welding joints in the cooler morning hours
- Make sure both surfaces to be joined are still wet with solvent cement when joining them together
- Vigorously stir or shake the AquaRise solvent cement before use

### SOLVENT WELDING BALL VALVES



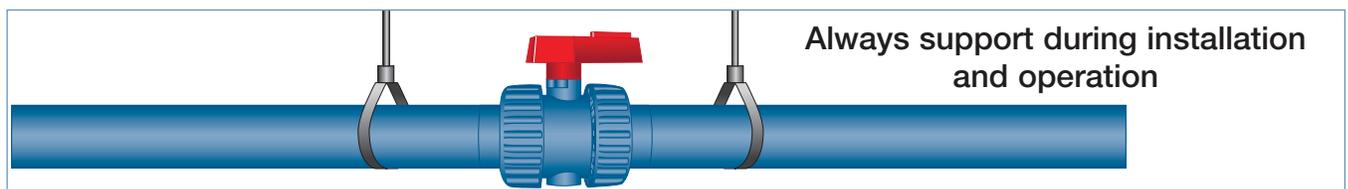
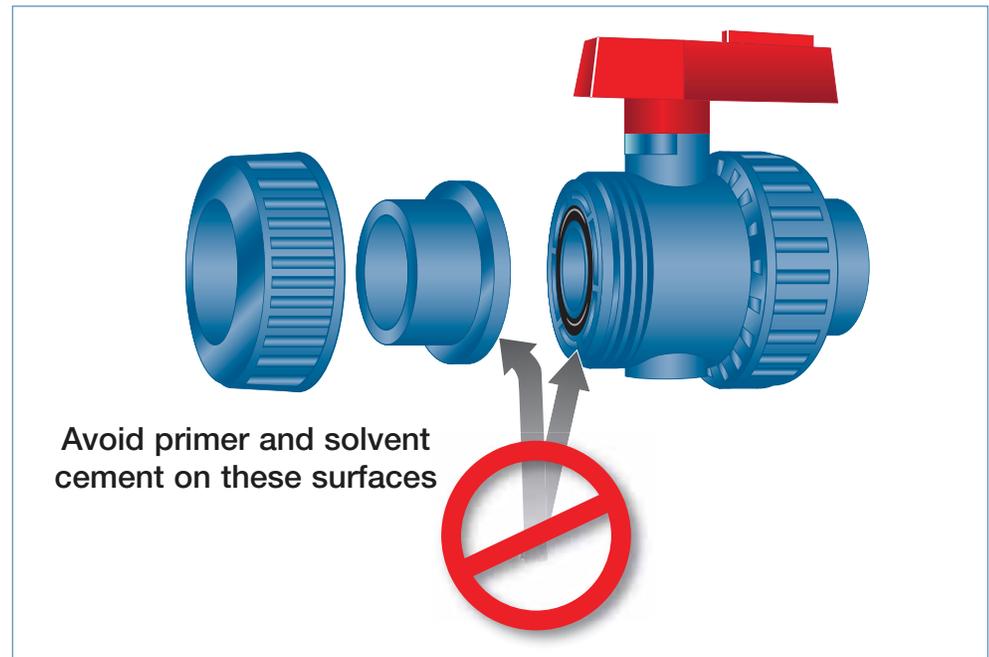
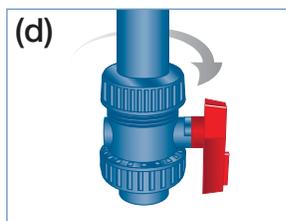
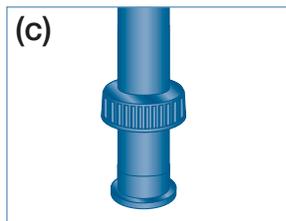
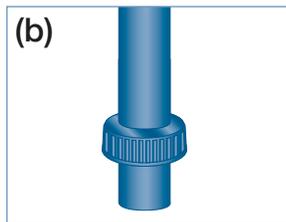
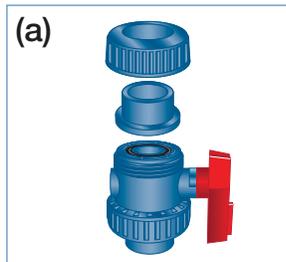
Solvent weld AquaRise valves using the standard solvent welding procedure outlined in this manual. To avoid damage to AquaRise valves, follow these important steps:

- Always ensure the valve handle is in the open position. Never install valves with the handle in the closed position as this exposes the ball to dirt, damage and solvent cement.
- Do not use excessive cement as it may puddle inside the valve and interfere with valve function.
- Never allow solvent cement to contact the sealing surface of the union end connector or the o-ring on the valve end. Solvent cement will damage these components and prevent proper sealing. Discard any valve that has solvent cement on these components.
- Always ensure AquaRise valves are properly supported during the solvent welding procedure. The weight of an unsupported valve may cause unwanted stress on new solvent cement joints.

### VERTICAL INSTALLATIONS FOR TRUE UNION BALL VALVES

- For vertical installations, follow the guidelines below:
  - (a) remove upper union nut and end connector
  - (b) slide union nut onto end of upper pipe section
  - (c) solvent weld pipe end to loose end connector
  - (d) assemble pipe complete with end connector and union nut back on to valve

Tighten the union nut on the side opposite to that which is marked "ADJUST". Hand tightening is typically sufficient to maintain a seal for the maximum working pressure. Over-tightening may damage the threads on the valve body and/or the union nut, and may even cause the union nut to crack.



### FLANGE CONNECTIONS

Flanges are used where periodic dismantling is required and for convenient transition to metallic piping or components such as pumps and metal valves. AquaRise flanges have solvent cement socket ends and the same bolt hole dimensions as Class 150 metal flanges per ANSI B16.5. All flanges conform to ASTM F1970 and are made using AquaRise fitting compound which is listed to NSF Standard 61 for potable water.

Two types of AquaRise flanges are offered; solid (one-piece) flanges and Vanstone (two-piece) flanges which assist with bolt hole alignment. Both flange styles are pressure rated for

150 psi at 73°F (1,034 kPa at 23°C). When using these flanges at elevated temperatures, the allowable operating pressure is reduced. Refer to the AquaRise Technical Manual.

Flange gaskets must be installed between the AquaRise flange and its mating surface. These gaskets are not supplied by IPEX but they are readily available. Gaskets must be approved for potable water and must be chemically compatible with AquaRise. They must also be full-faced design and appropriately sized for the flange.



Solid One-Piece Flange

Finally, flange gaskets must be made of an elastomeric material with a Durometer A hardness of 50 to 70.



Vanstone Flange

Full-Pressure (FP) Flange kits are available to increase the operating pressure of solid AquaRise flanges to the same level of AquaRise pipe and fittings – 400 psi at 73°F

(2,758 kPa at 23°C) and 150 psi at 160°F (1,034 kPa at 71°C). These kits consist of a solid flange, split metal backing ring, connecting hardware and a NSF-61 listed elastomeric gasket.



Full Pressure (FP) Flange Kit

Note: FP flange kits are not compatible with two-piece Vanstone flanges.

### FLANGE INSTALLATION GUIDELINES

#### SOLVENT WELDING FLANGES

In all cases, avoid excessive force on the solvent welded end of AquaRise flanges. Failure to properly support the flanged connection can lead to excessive stress and failure of the solvent weld flange connection.

If possible, complete the flange bolt connections first and ensure the bolts are fully tightened in accordance with the instructions outlined in this manual. Once this is completed and the flange is fully supported, the solvent weld connection

can be performed on the socket end of the flange. Follow all solvent welding procedures in this manual. Ensure the solvent welded joint is fully cured before modifying the bolted flange connection or pressure testing the system. See the set and cure tables shown on page 14.

If the solvent welded connection of the flange must be completed first, ensure that the solvent welded joint is fully cured and properly supported before assembling the bolted portion of the flange. See the set and cure tables shown on page 14.

#### SOLID AND VANSTONE FLANGE CONNECTIONS

1. Make sure all bolt holes of the matching flanges are aligned.
2. Ensure a proper full-faced gasket is installed between the flange surfaces.
3. Make sure mating flange faces are in contact with each other prior to tightening bolts. Do not use bolt tightening to close gaps between flange faces as this can lead to excessive stress on the flange.
4. AquaRise Flanges can be installed against mating surfaces that include an integrated gasket, like wafer-style butterfly valves.
5. To assist with tightening, lubricate bolt threads with a lubricant fully compatible with AquaRise such as IPEX Ring-Tite pipe lubricant.
6. Always tighten nuts in incremental stages following the cross star bolt tightening sequence on page 18. Always use a torque wrench to ensure values in the Recommended Torque Table are not exceeded. Uniform stress across the flange will prevent leaks.
7. Always support the flange connection and accessory (pump, valve, etc.) to eliminate potential stress.

#### Solid and Vanstone Flanges – Bolt Dimensions (inches)

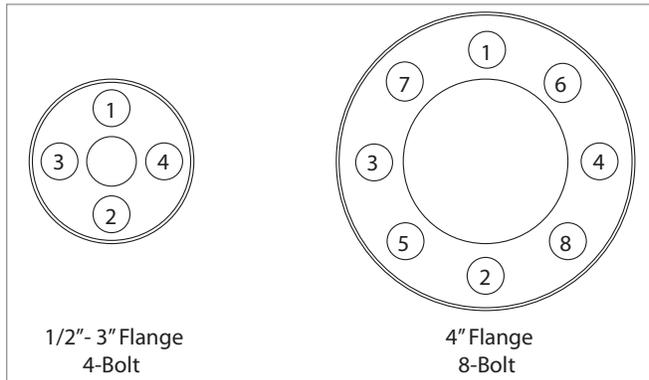
| Pipe Size | # of Holes | Bolt Diameter | Bolt Length |
|-----------|------------|---------------|-------------|
| 1/2       | 4          | 0.50          | 1.75        |
| 3/4       | 4          | 0.50          | 2.00        |
| 1         | 4          | 0.50          | 2.00        |
| 1-1/4     | 4          | 0.50          | 2.25        |
| 1-1/2     | 4          | 0.50          | 2.50        |
| 2         | 4          | 0.63          | 2.75        |
| 2-1/2     | 4          | 0.63          | 3.00        |
| 3         | 4          | 0.63          | 3.00        |
| 4         | 8          | 0.63          | 3.25        |

Note: Bolt length will vary if metal backing rings are used.

### Solid and Vanstone Flanges – Maximum Bolt Torque Values

| Flange Size<br>(in.) | Recommended Maximum Torque |      |
|----------------------|----------------------------|------|
|                      | (ft.lb)                    | (Nm) |
| 1/2 to 1-1/2         | 15                         | 20.3 |
| 2 to 4               | 30                         | 40.7 |

### CROSS STAR BOLT TIGHTENING SEQUENCE



### FULL PRESSURE (FP) FLANGE KIT INSTALLATION

This kit is for installation on solid AquaRise flanges only. Do not install this kit on Vanstone flanges. This kit must be installed using all the components supplied. Any substitution of components such as longer bolts or a replacement gasket must comply with the original kit specifications. Failure to comply with kit specifications nullifies the kit certification and may compromise the pressure rating and flange performance.

### INSTALLATION PROCEDURE

1. First, follow all recommended procedures shown in the Solvent Welding Flanges section of this manual.
2. Begin kit installation by placing the backing ring over the back of the hub of the AquaRise flange, ensuring that the bolt holes are aligned.
3. Slip the gasket provided between the two flanges and bring the AquaRise and mating flanges together.
4. Align bolt holes of back up ring, flanges and gasket.
5. The bolt threads must be well lubricated with a lubricant fully compatible with AquaRise such as IPEX Ring-Tite pipe lubricant.
6. Install the provided flat washers beneath each nut and the bolt head.
7. Insert the bolts through the matching holes of both the flanges and backing ring. Use only the bolts supplied in this kit.

8. When the bolts are installed, hand-tighten bolts until flange faces are in light contact.
9. Using a torque wrench, placed over the nut (not on bolt head). Snug tighten the nut first, which is approximately 10-15 ft-lb of torque depending on size.
10. Tighten bolts in incremental steps to the torque values shown in the table below. During bolt tightening use the cross star sequence previously illustrated.
11. Bolts must be tightened with a torque wrench to the final recommended torque values specified in the table below.
12. Once this assembly is complete, perform a check pass of the bolts by starting at one and going around in a clockwise direction ensuring each nut is tightened to the highest recommended torque level for that size.

### Incremental Torque Values

| Size<br>(in.) | Step 1  |      | Step 2  |      | Step 3  |       | Step 4  |       |
|---------------|---------|------|---------|------|---------|-------|---------|-------|
|               | (ft.lb) | (Nm) | (ft.lb) | (Nm) | (ft.lb) | (Nm)  | (ft.lb) | (Nm)  |
| 2-1/2         | 20      | 27.1 | 40      | 54.2 | 70      | 94.9  | -       |       |
| 3             | 20      | 27.1 | 40      | 54.2 | 70      | 94.9  | -       |       |
| 4             | 20      | 27.1 | 40      | 54.2 | 80      | 108.5 | 110     | 149.1 |

### Notes:

1. AquaRise FP Flange kits can be installed against mating surfaces that include an integrated gasket, like wafer-style butterfly valves. However, a metal "spacer" ring must be used between the valve and the Flange Kit. Longer bolts than those provided in the kit will be required.

The bolt length will vary for flange size and assembly configuration. The length of bolts supplied in this kit assumes a connection to a metal flange. For AquaRise to AquaRise flange connections, bolts should be 1/2" longer so that the bolts extend approximately 1/4" minimum beyond the nut after final assembly.

2. This Flange assembly has been certified to ASTM F1970. As such, any components that are replaced must comply with the listing in order to maintain the certification.

Replacement parts shall be: Stress-Saver XP gasket (70 Durometer Hardness), SAE J429 Grade 8 bolts with associated hex nut, two (2) flat washers per bolt.

3. Installers must use a torque wrench for proper assembly.



### CAUTION

1. Do not over-torque flange bolts
2. Use the proper bolt tightening sequence
3. Make sure the system is in proper alignment
4. Flange joints must not be used to draw piping assemblies together
5. Full face gaskets must be used
6. Flat washers must be used under every nut and bolt head
7. Gaskets must be approved for potable water and must be chemically compatible with AquaRise

### NOTICE

#### Hot Water Flange Connections

For flange connections in hot water systems, FP Flange Kits are required when connecting to solid flanges. This provides a full pressure rating of 150 psi at 160°F (1,034 kPa at 71°C).



### THREADED ADAPTER FITTINGS

AquaRise threaded adapter fittings are offered in a range of fitting configurations from 1/2" through 2". Both male and female threaded adapter fittings utilize American National Standard Taper Pipe Threads (NPT) and allow for quick connection from AquaRise to alternative materials or metallic threaded accessories such as valves and pumps.

The strength of the high grade metallic alloy provides a robust thread design, while the material composition of the alloy provides resistance to dezincification and stress cracking caused by harsh water treatment chemicals such as chloramines.

The threaded adapter fittings will provide the following performance: 400 psi at 73°F (2,758 kPa at 23°C),

150 psi at 160°F (1,034 kPa at 71°C), and are listed to CSA B137.6 and ASTM F1970. These fittings carry a potable water listing as per NSF/ANSI 61 and are certified as lead free to NSF/ANSI 372.

### INSTALLATION GUIDELINES

1. Begin by applying the PTFE (Teflon™) tape to the male threaded end of the joint. Wrap the tape around the entire thread length beginning with the number two thread from the end. The tape should slightly overlap itself going in the same direction as the threads to prevent the tape from unravelling when the male end is tightened into a female adapter. Overlapping in the wrong direction and/or the use of too much tape can affect tolerances between threads and generate undue stress in the wall of female fittings.
2. After applying the tape, the threaded joint should be started carefully and hand tightened. Fittings should be threaded together until hand-tight, followed by 1 to 2 turns with an appropriate wrench. Tighten the male adapter into the female adapter taking care not to cross-thread the fittings.



## NOTICE

DO NOT overtighten the threaded joint.



## NOTICE

When connecting to AquaRise threaded adapter fittings, use PTFE (Teflon™) tape only, with a minimum of two wraps as the thread sealant.

## NOTICE

Use PTFE (Teflon™) tape with a minimum thickness of 2.5 mil.

## NOTICE

Make certain no solvent cement, primer, or cleaner is on the threaded portion of the adapter fitting.

## NOTICE

It is imperative that solvent welded connections for AquaRise threaded adapter fittings be given sufficient time to cure to withstand possible pulling and torsion forces.

## NOTICE

Do not wrench or clamp the plastic portion of the adapter fitting. Use an 18" pipe wrench or smaller with sufficient clearance between the wrench and the plastic during installation.

### NOTICE

Threading or grooving of AquaRise pipe is not permitted.



### CAUTION

Do not connect AquaRise products directly to a hot water heater or boiler. When AquaRise piping is connected to a gas-fired or electric water heater, use a metal nipple to ensure AquaRise piping is a minimum 12" away from the appliance.

**NOTE:** Verify Code requirements prior to installation.



### CAUTION

AquaRise must be installed at least 6" away from any external heat source with a surface temperature greater than 160°F (71°C).



### SYSTEM ACCEPTANCE (HYDROSTATIC PRESSURE) TEST

After the AquaRise system has been installed, it is important to test and inspect it for joint integrity. Leave all concealed pipe and fittings uncovered until the required test is completed and approved by the local Authority Having Jurisdiction.

Generally, a test pressure of 1.5 times the system working pressure for the pipe installed is adequate to a maximum test pressure of 150 psi (1,034 kPa). It is recommended that hydrostatic testing be carried out before commissioning the line into usage. The following hydrostatic test procedure should be followed after all the solvent welded joints, in the section to be tested, have been allowed to cure fully (see page 14 for Average Joint Cure Schedule).

Pressure testing with compressed air is strictly prohibited with AquaRise.

Prior to testing, precautions must be taken to protect personnel and property in case of test failure.

### HYDROSTATIC TEST PROCEDURE

1. Where possible, visually inspect the installed piping for evidence of physical damage or deficiencies.
2. Slowly fill the pipe section with water, preferably at a velocity of 1.0 ft/s or less. Any entrapped air must be evacuated by venting from the high points. Do not pressurize at this stage.
3. Leave the section for at least 1 hour to allow equilibrium temperature to be achieved.
4. Check the system for leaks. If clear, check for and remove any remaining air and increase pressure up to 50 psi (345 kPa). Do not pressurize further at this stage.
5. Leave the section pressurized for 10 minutes. If the pressure drops, inspect for leaks. If the pressure remains constant, slowly increase the hydrostatic pressure to 1.5 times the system working pressure but do not exceed the maximum working pressure of any system components.
6. Leave the section pressurized for a period not exceeding 1 hour. During this time, the pressure should not change if the test is successful. 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. All air must be removed before further testing.
7. Any joint leaks should be repaired and allowed to cure fully before re-pressurizing and testing. For more details, refer to the Joint Set and Cure schedules on page 14.



## WARNING

- **NEVER** use compressed air or gas in AquaRise pipe, fittings and valves.
- **NEVER** use or test AquaRise with compressed air other gases. Do not use air-over-water boosters.



Use of compressed air or gas in AquaRise pipe, fittings, and valves can result in explosive failures and cause severe injury or death.

## NOTICE

**Do not exceed the maximum working pressure of any system components including pipe, fittings, valves, threaded adapters, unions, maintenance couplings or flanges.**

- The pressure rating of all components must be reduced at temperatures above 73°F (23°C). Refer to de-rating chart in the AquaRise Technical Manual.
- Exceeding the maximum working temperature or pressure of the system may result in system failure and/or property damage.



### GENERAL MAINTENANCE

Building maintenance staff and or Plumbing/HVAC maintenance staff should perform routine inspection of piping systems within the building. For AquaRise, ensure that system operating conditions do not exceed the maximum allowable operating temperature and pressure ratings for the AquaRise system. Make system adjustments as needed and contact IPEX for further assistance if operating conditions exceed AquaRise limitations.

Ensure that no materials or chemicals that may be incompatible with AquaRise have come into contact with the AquaRise system. For additional information contact IPEX for further assistance.

Ensure that no other piping systems, accessories or elements of the building are hung from the AquaRise piping system. All other systems, accessories and building materials must be properly anchored and supported in accordance with local Plumbing and Building Codes.

Ensure that no electrical wires or data cabling are wrapped around or in contact with AquaRise pipe and fittings. The plasticizers contained in the plastic jackets of these wires and cables may not be compatible with AquaRise. Remove any wires that are in contact with AquaRise and contact IPEX for further assistance.

Ensure that AquaRise pipe maintains straight alignment and do not bend or snake after the piping system is commissioned. This movement after installation signifies that expansion and contraction forces may not be properly accounted for in the piping system. This movement can cause excessive stresses on solvent welded joints, flange connections, pipes, fittings and lateral branch lines. Contact IPEX for recommendations and assistance if this misalignment is observed.

### AGING OF TEMPRIITE® TECHNOLOGY

Like all materials, TempRite® Technology ages during its operating life. TempRite® Technology aging can result in changes to physical characteristics such as increased brittleness and the reduction in impact resistance. This can be caused by prolonged elevated operating temperatures or prolonged exposure to UV light. As a result, avoid any forcible contact or impact with the piping system to reduce the chance of cracks or fractures occurring.

### SYSTEM REPAIR

Inspect pipes for any damage such as cracking and deep gouges. Locate the end of any pipe cracks and be sure to cut at least 2" beyond the crack line to ensure it is removed.

Carefully inspect any fittings for damage and remove and replace them accordingly.

Additional precautions must be taken when modifying or repairing aged products made with TempRite® Technology as they may be subject to a reduction in impact resistance (increased brittleness) making them more prone to cracking.



## CAUTION

When modifying or repairing aged CPVC pipe use only wheel cutters or fine tooth saws that are new and sharp.  
Do Not use ratchet style cutters.

Repairs can be made by solvent welding new sections of pipe and fittings. However, installation conditions during a repair vary greatly when compared to a new installation. Repairs or cut-ins to an existing system are typically done in confined spaces, on closed end piping systems, and often have more humidity present. All of these factors can inhibit the evaporation of the solvent leading to increased set and cure times. As such, IPEX recommends that the standard set and cure times be increased by 50% for repairs or cut-ins. Refer to set and cure tables on page 14.

When a repair cannot be scheduled or delayed, Maintenance Couplings in conjunction with pre-solvent welded assemblies can get a system back to service in a shorter time.

## NOTICE

Removal of threaded connections: Use a rubber strap wrench to grip the stationary fitting while backing out the threaded component. Failure to do so will put torque stresses on the pipe and may damage the piping system.



### GENERAL REQUIREMENTS

- (a) AquaRise is a thermoplastic piping system to be used in hot or cold potable water distribution systems only.
- (b) Operating temperature for AquaRise shall not exceed 160°F (71°C).
- (c) Installation practices shall conform to manufacturers' guidelines.
- (d) Installers shall consult with IPEX to resolve any uncertainties before proceeding with installation.
- (e) Pipe and molded fittings (couplings, tees, elbows, bushings and caps) are third-party certified to CSA B137.6, made to Iron Pipe Size (IPS) Outside Diameter with a wall thickness of SDR 11 (Standard Dimension Ratio).
- (f) Cold water pressure rating of pipe and fittings with only solvent welded joints, Threaded Adapter Fittings, Full Pressure Flange Kits and Maintenance Couplings shall be 400 psi at 73°F (2,758 kPa at 23°C).
- (g) AquaRise True Union Ball Valves in nominal sizes 1/2" through 2" are rated to 232 psi at 73°F (1,600 kPa at 23°C).
- (h) AquaRise Flanges and unions are rated to 150 psi at 73°F (1,034 kPa at 23°C).
- (i) All of the above pressure ratings shall be reduced at elevated temperatures. The maximum AquaRise operating temperature must not exceed 160°F (71°C).
- (j) All solvent weld joints shall be made in nominal pipe sizes 1/2" through 2" using AquaRise One-Step Cement. For sizes 2-1/2" through 4", AquaRise Two-Step Cement shall be used in conjunction with AquaRise Primer. Specific usage instructions can be found in this manual and on the container labels. No alternatives shall be accepted.

### BUILDING CODE REQUIREMENTS

- (a) AquaRise pipe and fittings shall be listed to ULC S102.2 to exhibit a Flame Spread Value (FSV) of not greater than 25 and a Smoke Developed Value (SDV) of not greater than 50.
- (b) The above listing shall be achieved without the use of external pipe insulation or filling of the line with water during testing.
- (c) All penetrations of fire-rated separations (i.e. ceilings and wall) shall be sealed with a fire stop device or system which has been listed for use with AquaRise for the specific substrate being penetrated. Fire stop listings shall be tested in accordance with ULC S115 and shall include a 50 Pa pressure differential in the test assembly where required by local building codes.
- (d) Refer to local building code requirements and the local Authority Having Jurisdiction for the suitability of AquaRise within Vertical Service Spaces.
- (e) AquaRise may be used in all areas of buildings classified as Combustible Construction and in most areas of Noncombustible Buildings including Plenums (Sec. 3.6.4.3) and in High Building Construction (Sec. 3.2.6).

### ABOUT THE IPEX GROUP OF COMPANIES

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.

Markets served by IPEX group products are:

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

