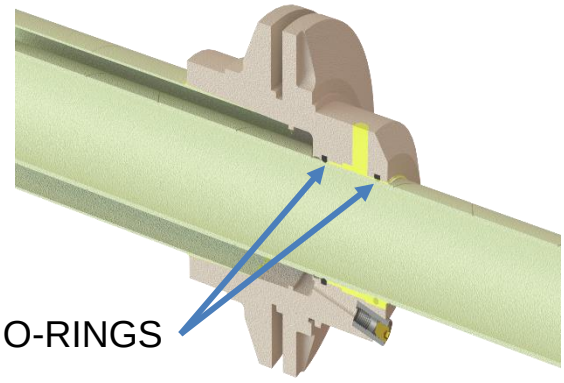
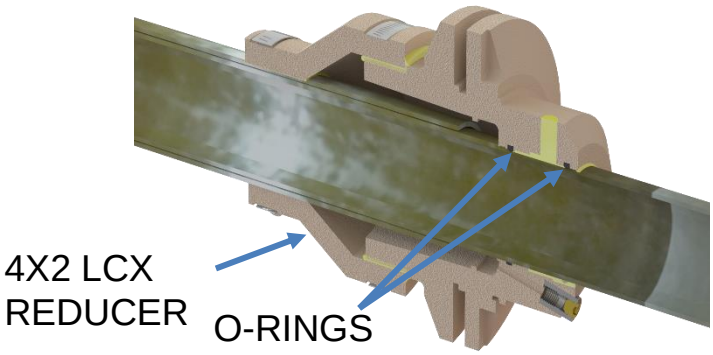
BRAVO
PROBLEM SOLVED

INSTALLATION GUIDE



Full-Body Series Threaded New Construction Fittings Singlewall and Doublewall Sumps

Part # F-32S-T-F (3”x2”)
F-32SL-T-F (2” LCX)



Step by step installation

Step 1 – Sump Wall and Pipe Preparation
Step 2 – Dry Fit Fitting and Epoxy Preparation
Step 3 – Fitting Placement and Adhesive Beading
Step 4 – Prepping Pipe for Installation
Step 5 – Epoxy Injection
Step 6 – Adhering Secondary Pipe
Step 7 – Prepping for Secondary Line Test
Step 8 – Doublewall Test
Step 9 – Trouble Shooting Repair

Approved Adhesives (Epoxy)
Recommended is Bravo EP100
Acceptable alternative is Bravo-approved NOV Epoxy



Epoxy cure cycle and full cure cycles vary depending on site conditions. In weather conditions below 50°F, heat will be needed to cure epoxy used for the installation of Bravo full body fittings and test reducers. Do not heat the fittings above 150°F. Extremely high temperatures can damage entry fittings and cause test ports to leak. Do not test until full cure cycle has been achieved.

SAFETY FIRST

Safety First. S. Bravo Systems, Inc. recommends adherence to standard safety procedures and precautions provided by your company and to follow the regulations and compliances by OSHA, local, state and federal regulations regarding the use of this product.

UL LISTED UL 2447

UL2447 is the standard for secondary containment and covers sumps and lids, sump fittings and sump accessories. Products are tested in accelerated conditions that have long term use in environments with extreme heat and cold, aggressive biofuel and ethanol blends, and extreme soil environments.

Sump Wall and Pipe Preparation







Pipe Type/Application - 3” over 2”
Hole Saw Size – 4-1/2”

Step 1 - Sump Wall and Pipe Preparation

1. The Schrader valve and threaded plug are sent loose in a zip lock bag with the threaded full-body fittings; Schrader valve and plug should be installed after the cure cycle has occurred.
2. To determine the penetration position, factor in the shear valve mounting position and plate, length of the flex connector and pipe connection to determine the penetration location on the sump; verify site plans and mark the desired location to penetrate the sump.
3. Use the appropriate size hole saw to penetrate the sump wall.
4. Remove excess gel coat and sand both interior and exterior of the fiberglass sump.

If installation issues arise, contact Bravo immediately. Do not make modifications or alter the new construction fittings, pipe or sump. Any modifications to new construction fittings VOID the Bravo warranty.

Dry Fit Fitting and Epoxy Preparation







Step 2 – Dry Fit Fitting and Epoxy Preparation

1. Remove loose material with an acetone rag
2. Dry fit the fitting body to make sure there is no interference; threaded flange does not have to be installed during dry fit.
3. Use a piece of tape to cover the test ports so the threaded connection is not accidentally covered with epoxy during the installation.
4. To confirm there is no contaminates on the fitting that would affect bonding, sand the contact surfaces and wipe with acetone rag.
5. Mix Bravo EP100 thoroughly until a consistent texture and yellow color is achieved, stir top to bottom and in a circular manner until completely mixed.
6. Apply a generous amount of epoxy on the fitting body and wall; coat all threads with epoxy.
7. Liberally apply epoxy to the interior flange covering the surface with the peak of epoxy being in the interior of the flange.





NOTE: When installing on doublewall sump make sure the interstice is open to atmosphere before applying epoxy.

Fitting Placement and Adhesive Beading





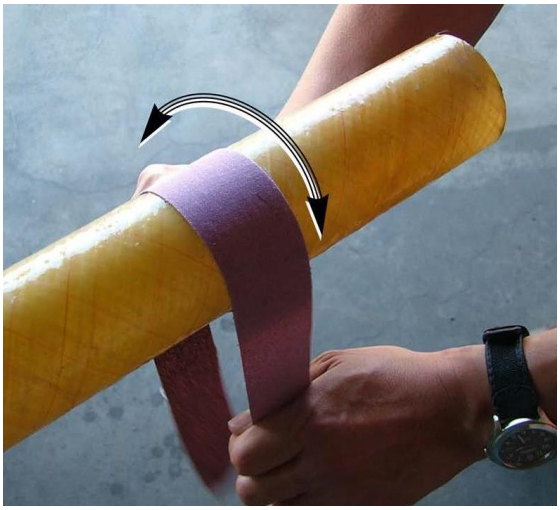
If site condition temperatures are below 50°F, use radiant heat to warm the fittings and apply Bravo Epoxy. Monitor applied heat constantly to ensure the temperate does not exceed 150°F.
Heat Bravo Epoxy to 100°F.

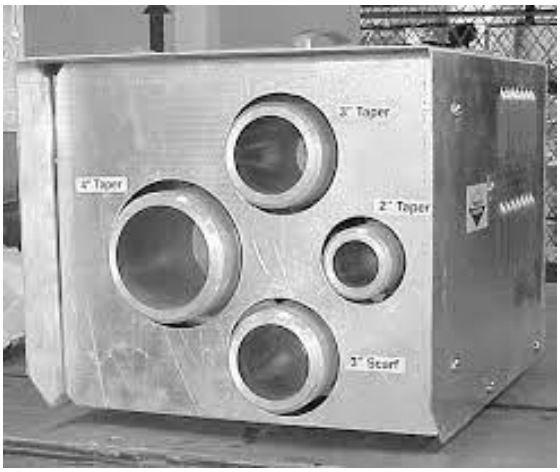
Step 3 – Fitting Placement and Adhesive Beading

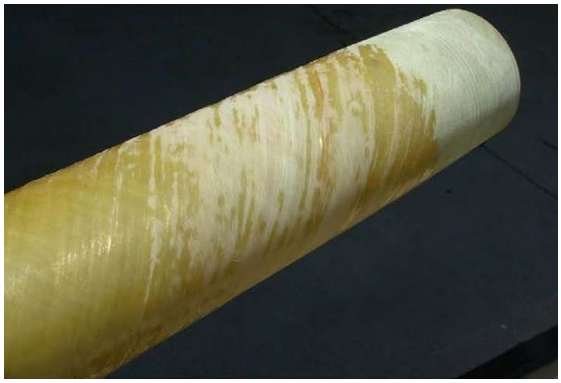
1. Install the epoxy coated fitting body from the exterior of the sump wall so that the ports are inside; with ports aligned in proper place, rotate the fitting while pushing it into the wall; apply adhesive on the fitting where it meets the wall inside of the sump.
2. Ensure the injection port is in the 12:00 position. This will place the indicator port at the 6:00 position
3. After verifying correct positioning hold fitting in place while using a tool to tighten the flange to the wall; a nut driver or screwdriver can be used to assist in achieving the desired tightness.
4. Epoxy should be oozing 360° from flange to wall, and flange to fitting body.
5. Remove excess epoxy and make a smooth bead with an acetone rag on all joints, creating a seal that will be easy to inspect later.
6. Inspect the fitting with an inspection mirror which allows a clear view from the 4:00 to the 8:00 position that is not visible from above.
7. Do not disturb the fitting until the full cure cycle is complete.



Prepping Pipe for Installation



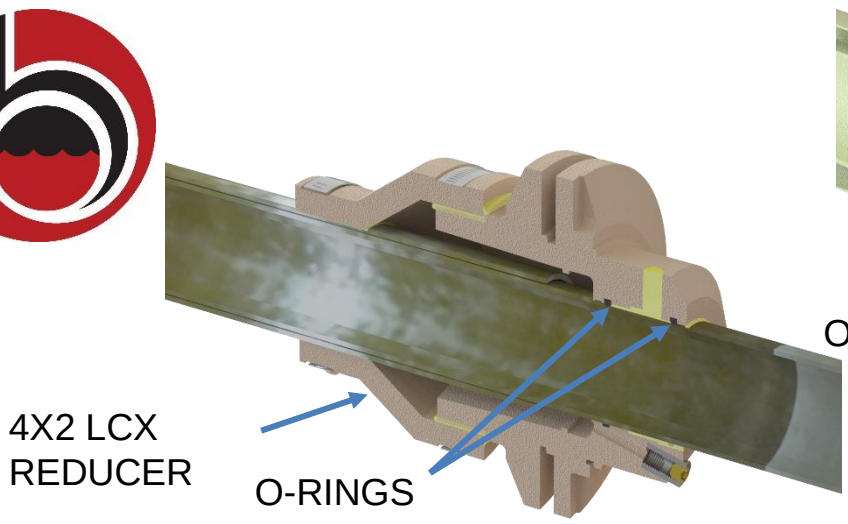


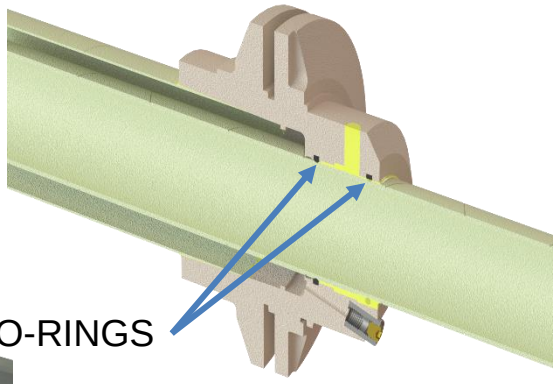


Step 4 – Prepping Pipe for Installation

1. The section of pipe that is going to contact or penetrate the fitting needs to be prepared so it will receive the epoxy and make a proper bond.
2. The “gloss” or “sheen” on the exterior of the pipe needs to be sanded or scuffed.
3. Use the pipe manufacturers tapering tool to create a taper for the desired end fitting prior to installation. Fitting is designed to work using the pipe manufacturers’ taper specifications.
4. Dry fit the pipe to the 90 or TEE and mark where the fitting body contacts the pipe.
5. Sand 1 ½” on either side of line to ensure good bond with epoxy.
6. If a fiberglass pipe is not fitting correctly, feel for any high spots on the OD of the pipe. The areas can be addressed with emery cloth or item specified by the pipe manufacturer.
7. Bond tapered section of pipe to 90 or TEE and allow to cure and then pass pressure test before bonding entry fitting to pipe.

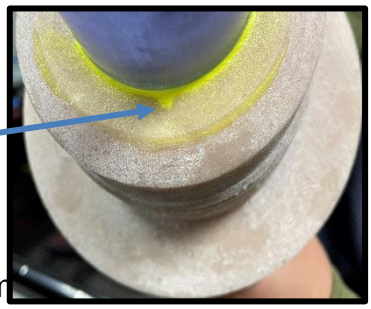
NOTE: Fiberglass pipe dimensions are the nominal pipe dimensions. There may be some outer diameter variations.





Step 5 – Epoxy Injection

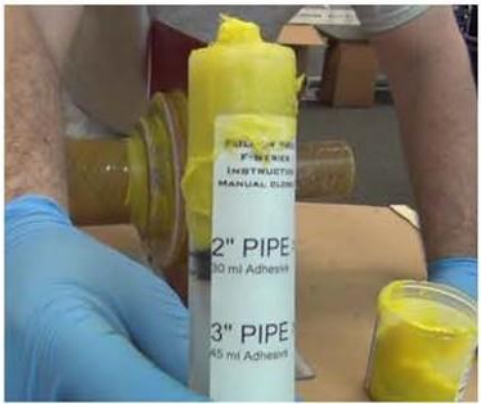
1. Relieve pressure on primary pipe to ensure a good flow of epoxy around pipe
2. Inject epoxy from the syringe into the fitting at a steady pace to allow adhesive to flow properly into the internal epoxy channel until a small amount comes out the indicator port at the 6:00 position.
3. Do a bead of epoxy around the pipe and fitting
4. Inspect the fitting with an inspection mirror which allows a clear view from the 4 o'clock to the 8 o'clock position that is not visible from above.
5. Inspect each entry fitting to make sure the injected epoxy is beaded at all critical pipe seams.
6. The epoxy must be fully cured prior to testing. The cure cycle will be dictated by site conditions and the type of epoxy that was used; follow manufacturers' guidelines. Testing prior to the full cure cycle being complete <u>will</u> compromise the joint.



EPOXY INJECTION CHART
2" Primary - **30 ml** Epoxy

Tip: To clear air from the syringe point it up and depress the plunger to remove air pockets. Make sure the required amount of epoxy remains.

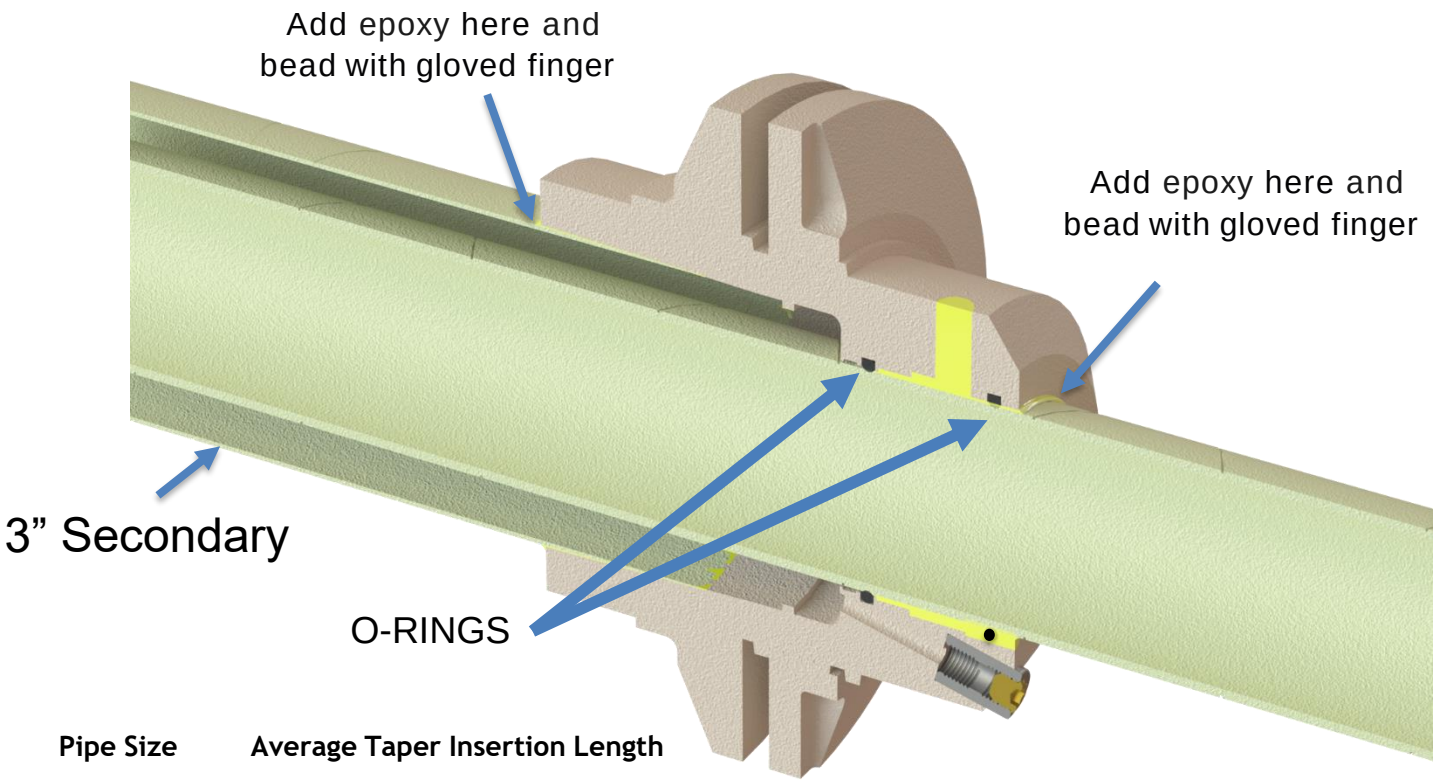




Step 6 – Adhering Secondary Pipe

1. Use machine taper to join the secondary pipe to the fitting. Do not use manufacturer's taper on the pipe.
2. Apply thoroughly mixed Bravo Epoxy (EP100), or approved NOV adhesive, to the tapered end of the secondary pipe and the inside of the entry fitting.
3. Insert pipe into the tapper joint of the exterior portion of the fitting.
4. Rotate the pipe while inserting it in the fitting to achieve proper fit.
5. Epoxy should ooze from the tapered joint; additional epoxy should be applied to create a smooth finger bead 360° at this joint.

NOTE: The secondary pipe is installed but not testable until the epoxy injection is complete and passing test is obtained on primary pipe



Pipe Size		Average Taper Insertion Length	
in	mm	in	mm
2	50	1 -7/8	25 - 48
3	80	1-1⁄4 - 2	32 - 50
4	100	1-1⁄4 - 2	32 - 50
6	150	2-1⁄8 – 3-1⁄4	54 - 83

Prepping for Secondary Line Test

Step 7 – Prepping for Secondary Line Test



1. After the epoxy has reached full cure, test the secondary pipe per manufacturers' guidelines and/or local, state or federal codes and regulations.
2. Apply UL approved thread sealant onto hex plug and Schrader valve. Carefully thread in Schrader valve and hex plug to finger tight, then 2-3 turns with a wrench, not to exceed 10 foot-lbs.

Step 8 – Testing (SW)

1. Before hydrostatic testing, remove debris from interior of the sump.
2. Using soap solution, spray pipe connections and fittings and look for leaks at the sealed joint, fittings, and all edges and corners.
3. Sump must be supported from the bottom, 2" min. of pea gravel. Fill with water to 4" above the highest penetration or side wall seam.
4. Monitor for one hour and if the change is more than a 1/8" the integrity test is failed, and further investigation is required. (PEI RP 1200)

Testing (DW)

DW - POSITIVE PRESSURE TEST (See sump manufacturers' instructions for testing.)

1. Verify what testing is recommended by the Sump or UDC manufacturer prior to performing testing.

Step 9 – Trouble Shooting Repair

Results of positive pressure test/identified leak location; there is not any liquid in the interstice when the repairs are performed.

Leak around a fitting (flange to wall, flange to fitting body) -

1. Inspect the identified leaking location.
2. Abrade repair location per manufacturers' specification, this area should extend outside the identified leak by 1" on all directions.
3. Remove loose dust with acetone rag leaving the repair area free of debris.
4. Apply Bravo Epoxy EP100RF beveling epoxy from the wall to the installed fitting; use a rag with acetone to remove and smooth epoxy leaving a clean repair that can be inspected.
5. Using the Schrader valve apply and maintain 4"-6" Hg vacuum to piping interstice to draw in the epoxy into the void.
6. Inspect the repaired area and over-coat with additional epoxy to ensure the vacuum level did not create a hole in the repair. Allow to cure under vacuum.
7. Retest according to sump manufacturers' recommendations.

Leak at the fitting body to the pipe and/or secondary pipe if the fitting

1. Follow the steps in the repair above "leak around the fitting", except at step 6, pull vacuum from the secondary port of the fitting; ensure that the other end of the secondary pipe is closed. See pipe manufacturers' instructions.
2. Using the Schrader valve apply and maintain 4"-6" Hg vacuum to piping interstice to draw in the epoxy into the void.
3. Once the full cure cycle has occurred, the repair can be tested; ensure the repair has been successful by performing a positive pressure test.

WARRANTY

All Bravo products must be installed by a Bravo Certified Contractor. Information contained in all Bravo literature is subject to change without notice. Bravo does not assume responsibility for liability for loss, damage or expenses resulting from installation, operation use or maintenance from this manual. By installing this product, you agree to S. Bravo Systems warranty terms.

LIMITED WARRANTY

All Bravo products MUST be installed by a Bravo Certified contractor. Information contained in all Bravo literature is subject to change,to ensure you are viewing the current literate located on the Bravo website Bravo does not assume responsibility for liability for loss, damage or expenses resulting from installation, operation use or maintenance from this manual. By installing this product, you agree to S. Bravo Systems, Inc's warranty terms. All Bravo products are subject to complete warranty information located on the S. Bravo Systems; Inc. website located at www@sbravo.com.

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