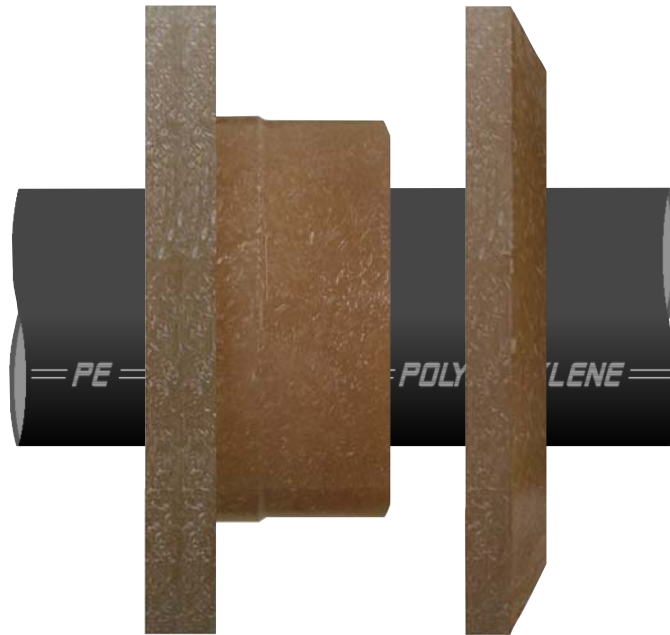


FPE-SERIES INSTALLATION INSTRUCTIONS

BRAVO FIBERGLASS ENTRY FITTING FOR SINGLE WALL FRP SUMPS

FOR POLYETHYLENE CONDUIT & SECONDARY PIPE ONLY



**BUILT LIKE
A TANK**

High-end materials match UST spec UL1316 to ensure longevity and fuel compatibility

Compatible when submerged in fuels, biofuels and alcohol blends up to E100 and B100

WWW.SBRAVO.COM/FS

READ THIS MANUAL FRONT TO BACK

Note: Actual products may vary in appearance from illustrations in this manual

1

ii-FPE-Series-SW-12A



WWW.SBRAVO.COM
800-AT-BRAVO



MANDATORY

The FPE-Series Fiberglass Fittings for Polyethylene Pipe **MUST** be installed by a **Bravo Certified Installer**. Get Certified at www.sbravo.com/cert

IMPORTANT

READ THESE INSTRUCTIONS - KEEP FOR FUTURE REFERENCE

TABLE OF CONTENTS

INCLUDED PARTS AND TOOLS.....p. 3
 WARRANTY WARNING.....p. 3
 FPE-Series Fitting specs.....p. 4
 A) Preparing the Fitting and Fiberglass Wall.....p. 4-5
 SANDING YOUR POLYETHYLENE PIPE.....p. 6
 WINTER WARNING FOR FIBERGLASS ADHESIVE.....p. 7
 BRAVO FIBERGLASS ADHESIVE - "ADHESIVE-EPOXY-KIT".....p. 8
 B) Gluing your FPE Fitting to the sump wall.....p. 9-11
 C) Gluing your Pipe to the FPE Fitting.....p. 12-13
 D) Testing your FPE-Series Installation.....p. 13

- Closely adhere to all directions and warnings indicated on the product or contained in these instructions.

- Warranty is void if there is any evidence of modification, abuse, negligence or improper installation.

If you have any problems with Bravo Systems components or accessories, Contact Bravo Systems Immediately:

1-800-28-BRAVO

1-323-888-4133

info@sbravo.com

SAFETY FIRST! S. Bravo Systems, Inc. urges you to adhere to the normal safety procedures and precautions followed by your company. Please follow the mandates and compliances decreed by OSHA, local, State and federal regulations regarding the use of this product.

WARRANTY

All containment systems sold by S. Bravo Systems, Inc. are warranted to be free from defects in material and workmanship for a period of one year from date of purchase. This warranty will be limited to the repair and replacement of Bravo parts only and will exclude all claims for labor or consequential damage. No other express warranties given and no affirmation of S. Bravo Systems, Inc., or its agents and/or representatives, by words or action, will constitute a warranty. **IT IS EXPRESSLY AGREED THAT THIS WARRANTY WILL BE IN LIEU OF ALL WARRANTIES OF FITNESS AND IN LIEU OF THE WARRANTY OF MERCHANTABILITY.**

This warranty is void if there is any evidence of modification, abuse, negligence, or improper installation. If any fittings or components, other than S. Bravo Systems approved fittings or components, are used in conjunction with any S. Bravo Systems product, the warranty pertaining to these products is immediately void.

Included Parts (Per fitting)

- A) 1x Fiberglass SingleWall FPE-Series Body
- B) 1x Fiberglass SingleWall Flange
- C) 1x Bravo 7oz **ADHESIVE-EPOXY-KIT** (chart on page 4)
- D) 1x 80 grit emery sheet
- E) 1x Tripod compression clamp

REQUIRED TOOLS (NOT PROVIDED)

Trichlorethylene or Acetone. Hole saws: 3", 4.5", 5.5", 6" & 8" diameters. 1/4" Drill bit to centralize.
Air Drill and/or sander. **Approved Adhesives:** Bravo Systems "ADHESIVE-EPOXY-KIT"

ADHESIVE-PE-KIT One (1) dual Adhesive Cartridge for FRP to PE bonding - **KEEP REFRIGERATED!**
MAN-GUN-FS-10 Manual dual adhesive gun for ADHESIVE-PE-KIT

EACH FPE-SERIES FITTING INCLUDES ADHESIVE FOR BONDING THE FITTING TO THE SUMP. THE PE PIPE ADHESIVE IS SOLD SEPERATELY AND REQUIRES A MANUAL GUN. PART NUMBERS ARE ABOVE. CONSULT CHART ON PAGE 4.

RECOMMENDED TOOLS (NOT PROVIDED)

Bravo Systems Sanding Kits. T-FF-SAND-F2, T-FS-SAND-F3, T-FS-SAND-F4



WARNING



WARRANTY IS VOID:

IF ANY OF THE FOLLOWING OCCUR

- A)** FPE-Series Fiberglass Fittings are **NOT** installed by a Bravo-Certified Installer.
- B)** The FPE-Series fittings are installed with adhesives not specified in this manual.
- C)** Any deviation from the specific instructions in this installation manual occurs.
- D)** The FPE-Series is installed to a Polyethylene containment sump.
- E)** The F-Series Fittings are applied to Fiberglass Sumps that are not **Third Party Approved**.



FPE FRP Fittings for Flat Fiberglass Walls

Model #:	Description:
F-40-PE *	FRP Fitting for 40mm (1.6") PE Conduit
F-50-PE *	FRP Fitting for 50mm (2") PE Secondary Pipe
F-63-PE *	FRP Fitting for 63mm (2.5") PE Secondary Pipe
F-75-PE *	FRP Fitting for 75mm (3") PE Secondary Pipe
F-90-PE *	FRP Fitting for 90mm (3.5") PE Secondary Pipe
F-110-PE *	FRP Fitting for 110mm (4.3") PE Secondary Pipe
F-125-PE *	FRP Fitting for 125mm (4.9") PE Secondary Pipe



FPE FRP Fittings for 42"- 48"ø Curved Fiberglass Walls

Model #:	Description:
F-40-PE-RND *	FRP Fitting for 40mm (1.6") PE Conduit
F-50-PE-RND *	FRP Fitting for 50mm (2") PE Secondary Pipe
F-63-PE-RND *	FRP Fitting for 63mm (2.5") PE Secondary Pipe
F-75-PE-RND *	FRP Fitting for 75mm (3") PE Secondary Pipe
F-90-PE-RND *	FRP Fitting for 90mm (3.5") PE Secondary Pipe
F-110-PE-RND *	FRP Fitting for 110mm (4.3") PE Secondary Pipe
F-125-PE-42RND *	FRP Fitting for 125mm (4.9") PE Secondary Pipe
F-125-PE-48RND *	FRP Fitting for 125mm (4.9") PE Secondary Pipe

*** EACH FPE-SERIES FITTING INCLUDES ADHESIVE FOR BONDING THE FITTING TO THE SUMP. THE PE PIPE ADHESIVE IS SOLD SEPERATELY AND REQUIRES A MANUAL GUN. PART NUMBERS ARE BELOW. CONSULT THE 'FITTING SPECS' CHART FOR QUANTITIES.**

Mandatory Tools for FPE-Series FRP Fittings

Model #:	Description:
ADHESIVE-PE-KIT *	One (1) dual Adhesive Cartridge for FRP to PE bonding
MAN-GUN-FS-10 *	Manual dual adhesive gun for ADHESIVE-PE-KIT

FITTING SPECS

Model #	Wall Type (AND CURVED DIA.)	Pipe Size and Type (INCHES ARE ROUNDED)	Maximum Outer Diameter	Length from interior sump wall	Bravo Adhesive Kits Included	* Fittings per PE Adhesive Cartridge
F-40-PE	Flat	40mm (1.6") PE	127mm (5")	44mm (1.75")	1	8
F-50-PE	Flat	50mm (2") PE	178mm (7")	44mm (1.75")	1	8
F-63-PE	Flat	63mm (2.5") PE	178mm (7")	44mm (1.75")	1	8
F-75-PE	Flat	75mm (3") PE	178mm (7")	44mm (1.75")	1	5
F-90-PE	Flat	90mm (3.5") PE	191mm (7.5")	44mm (1.75")	1	5
F-110-PE	Flat	110mm (4.3") PE	191mm (7.5")	44mm (1.75")	1.5	3
F-125-PE	Flat	125mm (4.9") PE	216mm (8.5")	51mm (2")	1.5	3
F-125-PE	Flat	125mm (4.9") PE	269mm (10.6")	51mm (2")	1.5	3
F-40-PE-RND	42-48"ø Curved	40mm (2") PE	127mm (5")	41mm (1.6")	1	8
F-50-PE-RND	42-48"ø Curved	50mm (2") PE	178mm (7")	41mm (1.6")	1	8
F-63-PE-RND	42-48"ø Curved	63mm (2.5") PE	178mm (7")	41mm (1.6")	1	8
F-75-PE-RND	42-48"ø Curved	75mm (3") PE	178mm (7")	41mm (1.6")	1	5
F-90-PE-RND	42-48"ø Curved	90mm (3.5") PE	191mm (7.5")	41mm (1.6")	1	5
F-110-PE-RND	42-48"ø Curved	110mm (4.3") PE	191mm (7.5")	41mm (1.6")	1.5	3
F-125-PE-42RND	42"ø Curved	125mm (4.9") PE	216mm (8.5")	41mm (1.6")	1.5	3
F-125-PE-48RND	48"ø Curved	125mm (4.9") PE	216mm (8.5")	41mm (1.6")	1.5	3

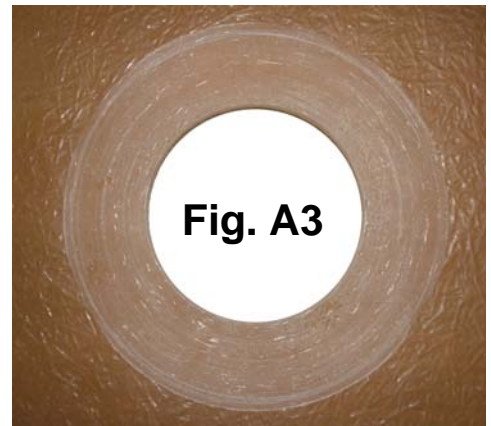
A) Preparing the Fitting & Fiberglass wall

A.1) FITTINGS: Prepare your fittings by identifying the parts. Do not lay them on dirt, water, debris or other contaminated surfaces. When dusting off, use a shop brush or compressed air. Bravo FPE-Series fittings ship with all contact surfaces (surfaces that contact the sump wall and pipe) factory abraded. As a precaution, Hand-sand the contact surfaces of all fittings, dust off and clean with acetone to remove any contamination. **Do not use rags, paper towels or any kind of cloth or fabric material.**

▲ CRITICAL DO NOT PLAN/MAKE HOLE SAW CUTS ON OR WITHIN 3" INCH OF CORNERS, EDGES, REPAIRS OR LAMINATED JOINTS.

A.2) SUMP WALL: DOUBLE-CHECK YOUR GRADE AND PIPE FALL MEASUREMENTS. Dust off Sump walls (inside and out) and **drill your pilot holes** centered on the planned fitting locations using a 1/4" Drill bit. Proceed when done to cut your holes with appropriate size hole saw with 1/4" centralizer. **See the hole saw size chart below.**

<u>HOLE SAW SIZE CHART</u>	<u>SAND KIT</u>
3" for size 40mm _____	T-FF-SAND-F2
4.5" for sizes 50, 63 & 75mm _____	T-FS-SAND-F3
5.5" for sizes 90 & 110mm _____	T-FS-SAND-F4
6" for size 125mm _____	Use grinder
8" for size 160mm _____	Use grinder



A.3) FLAT WALLS ONLY: OPTIONAL:

Use bravo Sand Kits of appropriate model to sand your wall absolutely flat and even, inside and outside. This tool is highly recommended to ensure the absolute best surface finish in preparation for bonding. Review the Sand Kit manual that came with your Sand Kit or call Bravo to obtain a copy.

MANDATORY: (FLAT / CURVED WALLS) If you do not use a Bravo Sand Kit **YOU MUST** sand the sump wall 2" out from each cut hole **inside and outside** until the surfaces are flat and even, and any paint, gel-coat or contaminants are removed and clean, open fiberglass is visible (**Fig. A3**).

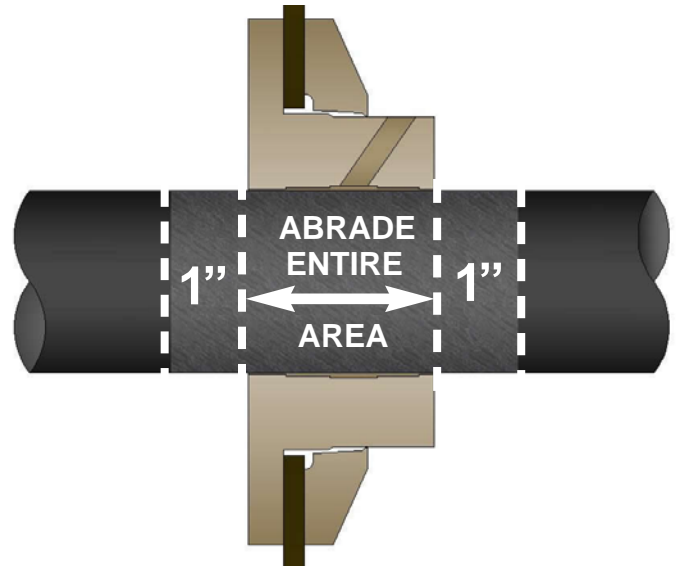
DO NOT OVERSAND!! MAINTAIN A **MINIMUM** WALL THICKNESS OF 1/8" INCH

A.4) DRY FIT your FPE-Series fitting to your sumps. Ensure the fitting is absolutely flat against the wall. The Sump wall should be abraded either by a Bravo Sand Kit or grinder.

FACTORY TIP! If you must use a manual grinder to prep the sump wall, use your loose flange and press it against the wall centered on the hole. Measure if there is any wobble and correct the sump wall where necessary. Your surface is as flat as it can get if your loose flange does not wobble.

A.5) Dry-fit the pipe to its planned location. You must rough up (hand sand) the area of the pipe that contacts the fittings **One Inch (1")** away from the face of the fitting, when dry fit, and the entire pipe surface within the fitting, 360°.

**DO NOT USE POWER TOOLS ON PIPE!
NEVER DRILL, TAP OR CUT ON THIS FITTING**



ROUGHING-UP YOUR PIPE WITH EMERY SANDPAPER

DO NOT USE ANY POWER TOOLS ON PIPE, EVER!

DO NOT USE SANDPAPER COARSER THAN 80 GRIT



CAUTION

WINTER WARNING

**FOR COLD WEATHER AT 50°F DEGREES OR LESS:
OBSERVE AND FOLLOW THE WARNINGS BELOW**

BRAVO SYSTEMS FF-SERIES FLANGE FITTINGS AND F-SERIES FITTINGS ARE THICKER THAN THE TYPICAL FIBERGLASS CLAMSHELLS COMMONLY INSTALLED IN FIBERGLASS PIPING APPLICATIONS. YOU MUST APPLY ADEQUATE HEAT TO THE PARTS AND BONDING ADHESIVES TO ALLOW A FULL CURE TIME DURING EXTREME COLD TEMPERATURES. FAILING TO ALLOW THE INSTALLATION TO FULLY CURE MAY CAUSE THE ADHESIVE BOND TO THE FITTING TO FAIL.

▲ CRITICAL JUST BEFORE EACH ADHESIVE APPLICATION
DRY FIT YOUR COMPONENTS ONE LAST TIME

- 1) PRE-HEAT THE SUMP TO NO MORE THAN 150°F TO ELIMINATE MOISTURE.
- 2) PRE-HEATING COMPONENTS IN EXTREME COLD WEATHER IS CRITICAL:
 - > PRE-HEAT THE FIBERGLASS FITTING THOROUGHLY TO ~100°F
 - > PRE-HEAT THE ADHESIVE TO ~80°F. DO NOT HEAT CATALYST!!
- 3) DO NOT ASSUME THE ADHESIVE IS CURED BECAUSE IT HAS HARDENED ON THE EXTERIOR. IT MAY ONLY BE A CURED “CRUST” IN THIS TEMPERATURE AND ANY MOVEMENT OR WATER TESTING MAY CAUSE DELAMINATION AND TOTAL FAILURE OF THE BOND.
- 4) DO NOT ADJUST, MOVE, SHIFT OR OTHERWISE DISTURB THE SUMP, FITTINGS OR PIPING DURING THE CURING PROCESS.
- 5) **▲ CRITICAL** YOU MUST ENSURE A FULL CURE BEFORE WATER TESTING. FOLLOW YOUR ADHESIVE INSTRUCTIONS FOR TEMPERATURE GUIDELINES.

BRAVO ADHESIVE FOR BONDING FITTING TO FIBERGLASS WALL

Your adhesive should be stored in a cool place until ready to be mixed. You should warm your adhesive and fiberglass fitting components if the ambient temperature is below 70°F.

DO NOT MIX MORE THAN ONE CAN TOGETHER AT A TIME

⚠ CRITICAL

USE ONLY BRAVO SYSTEMS ADHESIVE WHEN INSTALLING THIS FITTING TO A FIBERGLASS SUMP WALL

DO NOT SUBSTITUTE ADHESIVES, MIX THEM OR ADD LIQUIDS SUCH AS WATER. DO NOT ADD A FILLER. DO NOT USE ANOTHER CATALYST OTHER THAN WHAT IS PROVIDED.

⚠ CRITICAL

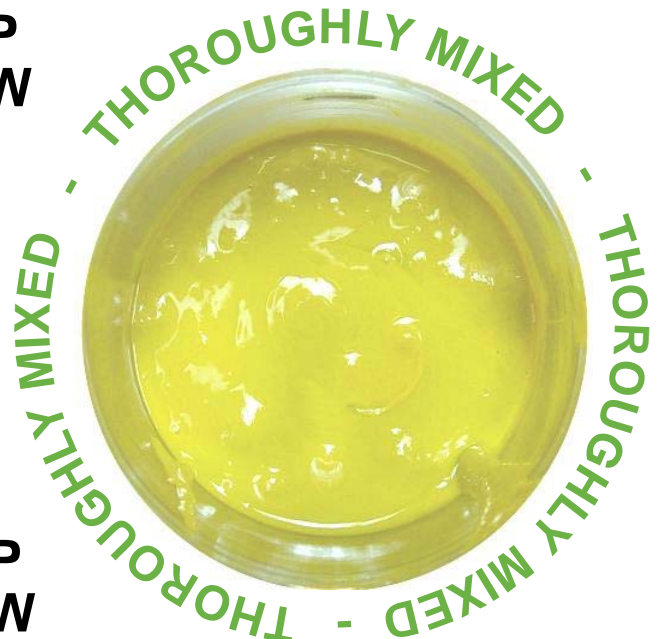
ADHESIVE HAS AN ACTIVE COLORANT

ADD CATALYST TO ADHESIVE AND MIX THOROUGHLY UNTIL THE COLOR IS EVEN AND CONSISTENT WITH NO SWIRLS



TOP VIEW

TOP VIEW



B) Gluing your Fitting to the sump wall

B.1) Your fiberglass sump wall and Bravo FPE-Series body and flange should be clean and **COMPLETELY DRY AT ALL TIMES**. All pre-abraded areas should be inspected. No dirt or other foreign material should be on or inside the fiberglass fitting components. **SEE A.1**

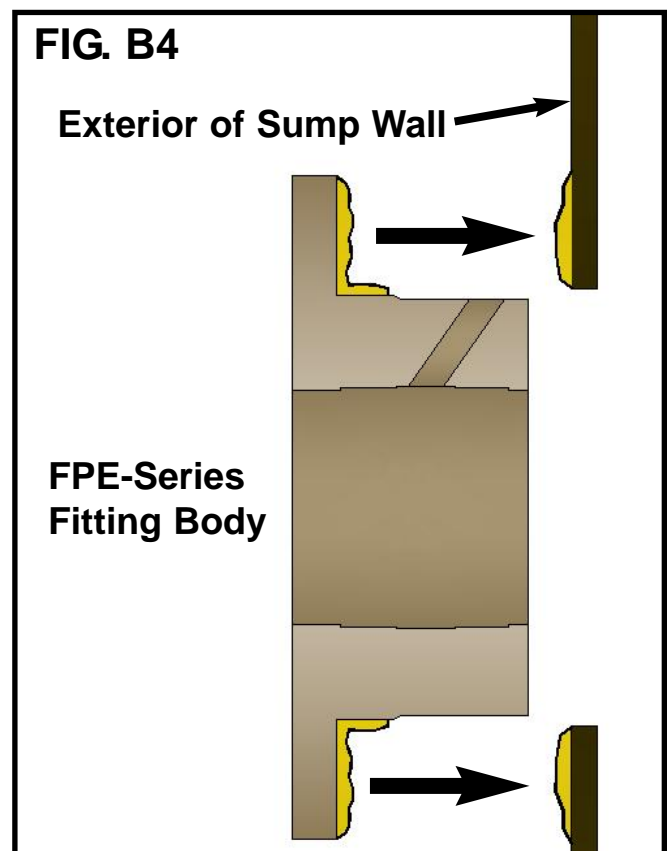
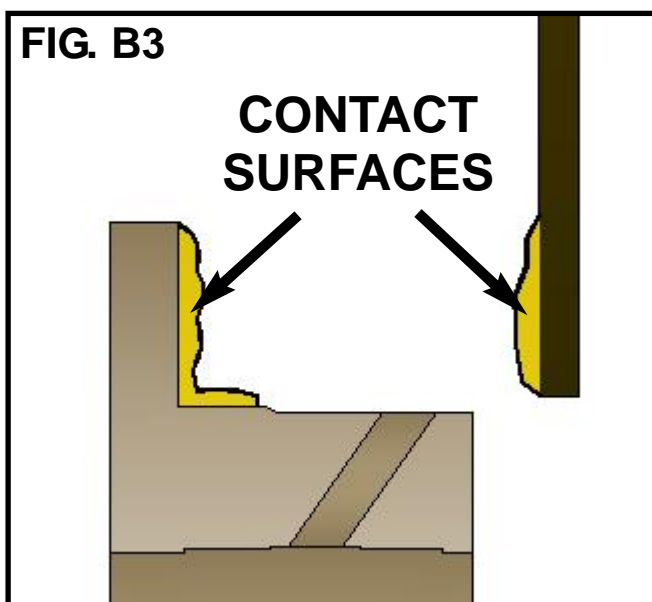
⚠ CRITICAL

USE BRAVO ADHESIVE-EPOXY-KIT ONLY FOR BONDING YOUR FITTING TO THE SUMP WALL

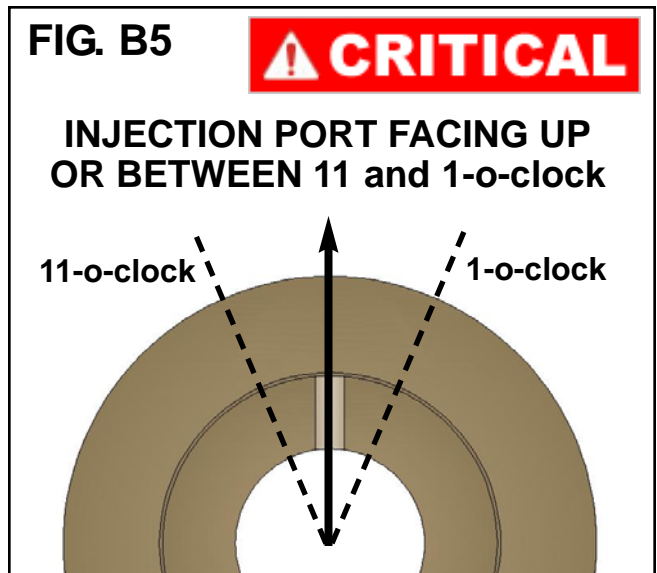
B.2) FOLLOW THE INSTRUCTIONS ON PAGE 8 TO MIX AND APPLY YOUR ADHESIVE

B.3) When all hole saw cuts have been made and piping has been tested, apply a **GENEROUS** amount of Bravo Adhesive to the contact surfaces of the Fitting Body and wall. (**Fig. B3**).

B.4) Push the FPE-Series Fitting Body through the hole in the sump wall with adhesive applied to all contact surfaces (**Fig. B4**) **NOTE THE ORIENTATION OF THE INJECTION PORT**. Ensure the Injection port is located between 11-o'clock and 1-o'clock. (**Fig. B5**)

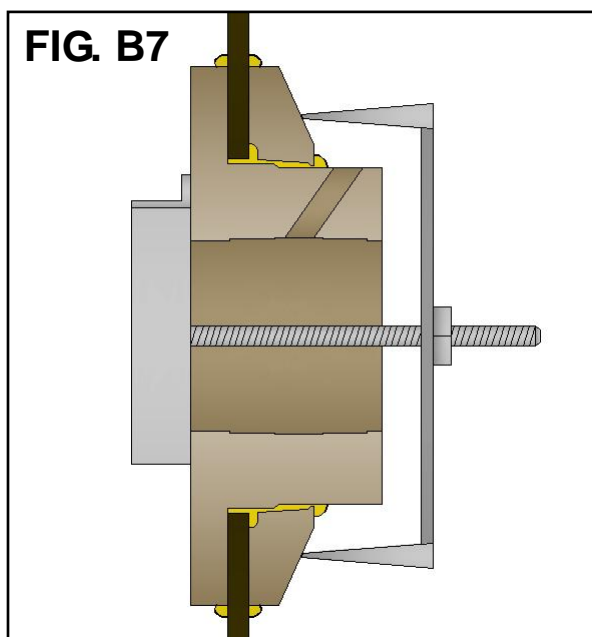
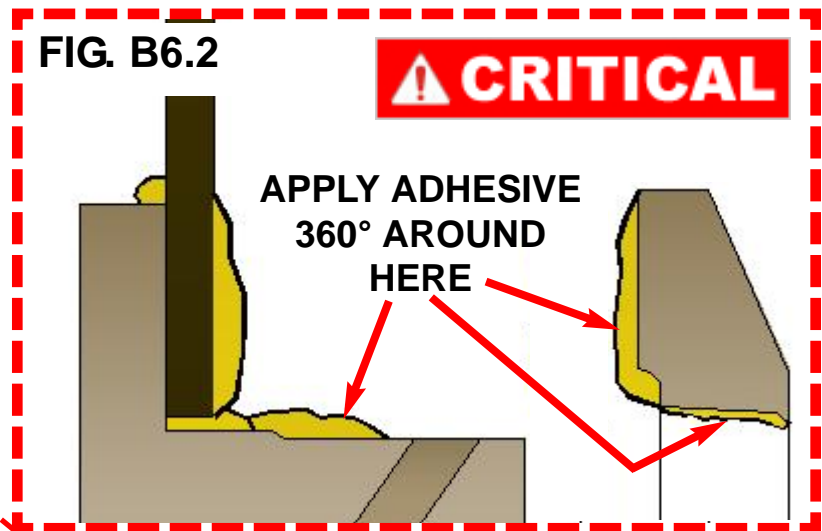
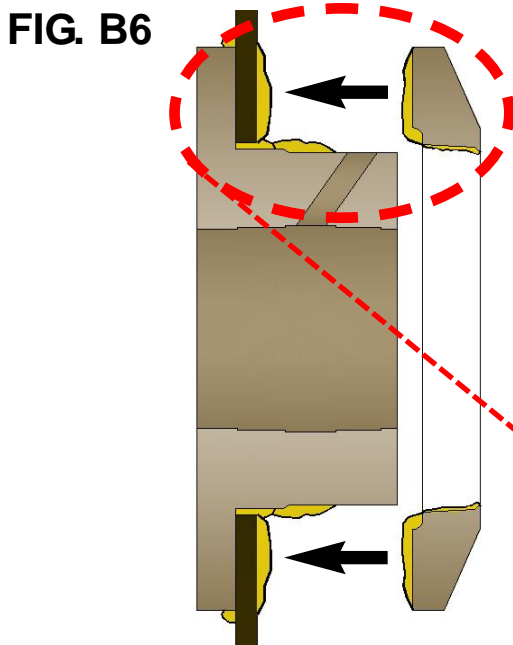


B.5) While applying the fitting body to the sump wall control the orientation of the Adhesive Injection Port. It must be facing UP or anywhere between 11-o-clock and 1-o-clock to ensure that you have adequate access to perform the adhesive injection process.



⚠ CRITICAL

BEFORE GLUING FLANGE TO THE WALL, ADD ADHESIVE GENEROUSLY 360° AROUND THE BODY NEAR THE WALL AND THE FLANGE INTERIOR



B.6) With your injection port orientation in the correct position, apply Bravo Adhesive to the following critical contact surfaces (**Fig. B6 & B6.2**):

- > The sump wall where the flange will contact it
- > The fitting body approximately 1" from the sump wall
- > The flange face where it will contact the sump wall
- > The interior I.D. of the flange (**THIN COAT HERE**)

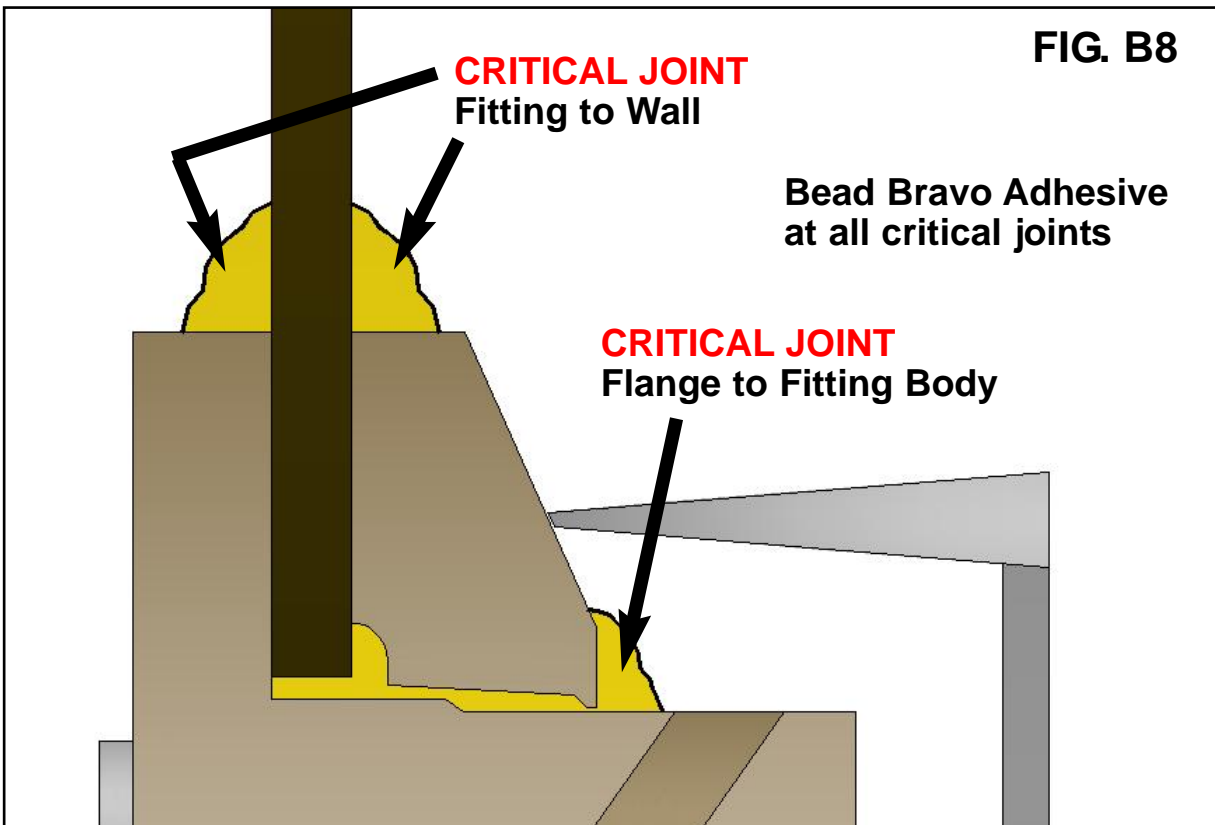
After adhesive application, slide the flange over the fitting body until flat against the sump wall.

B.7) After your body and flange has been joined together on the sump wall, install the provided 3-prong clamp to the fitting. The 3-point component must press against the loose flange on the inside. (**Fig. B7**)

B.8) After your clamp is installed and tightened, Adhesive should ooze from the seams between the two fitting components.

DO NOT REMOVE EXCESS ADHESIVE

KEEP IT ON THE FITTING. Bead adhesive generously so it is visibly built up on all joints. Do not use a paint brush to brush the seams clean or to brush away the adhesive. Allow the adhesive it's full cure time without disturbing the sump or the fitting.



!! DO NOT REMOVE EXCESS ADHESIVE !! Continue to build up the adhesive around every seam. This provides a visual indicator of a good application.

B.9) After a full cure: remove the 3-prong clamp and re-apply adhesive as necessary. Also begin to Dry-fit your polyethylene piping, preparing to seal the endpoints and begin pressure testing your primary lines.

B.10) Dry-fit your pipe lines into the FPE-Series entry fittings.

B.11) Fully Install and seal all endpoints of your polyethylene pipe. Follow your pipe manufacturers' installation guidelines on cleaning, cutting and bonding your polyethylene pipe. Pressure test piping system per pipe manufacturers instructions while observing all local, state and federal codes. **DO NOT SEAL THE PIPE TO THE FITTING YET!!**

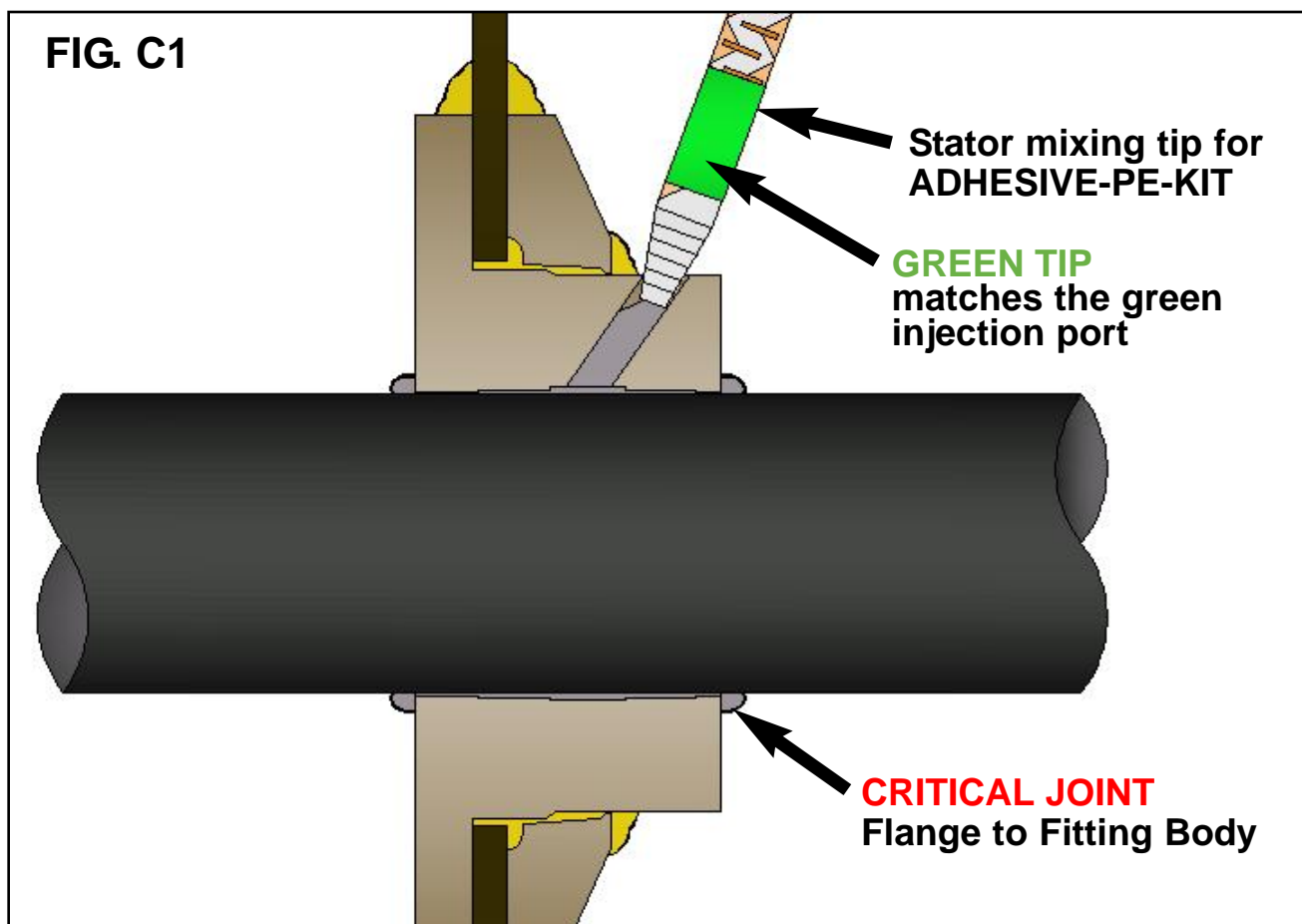
C) Gluing your pipe to the FPE Fitting

The Bravo ADHESIVE-PE-KIT material is toxic. Wear goggles, gloves and mask.

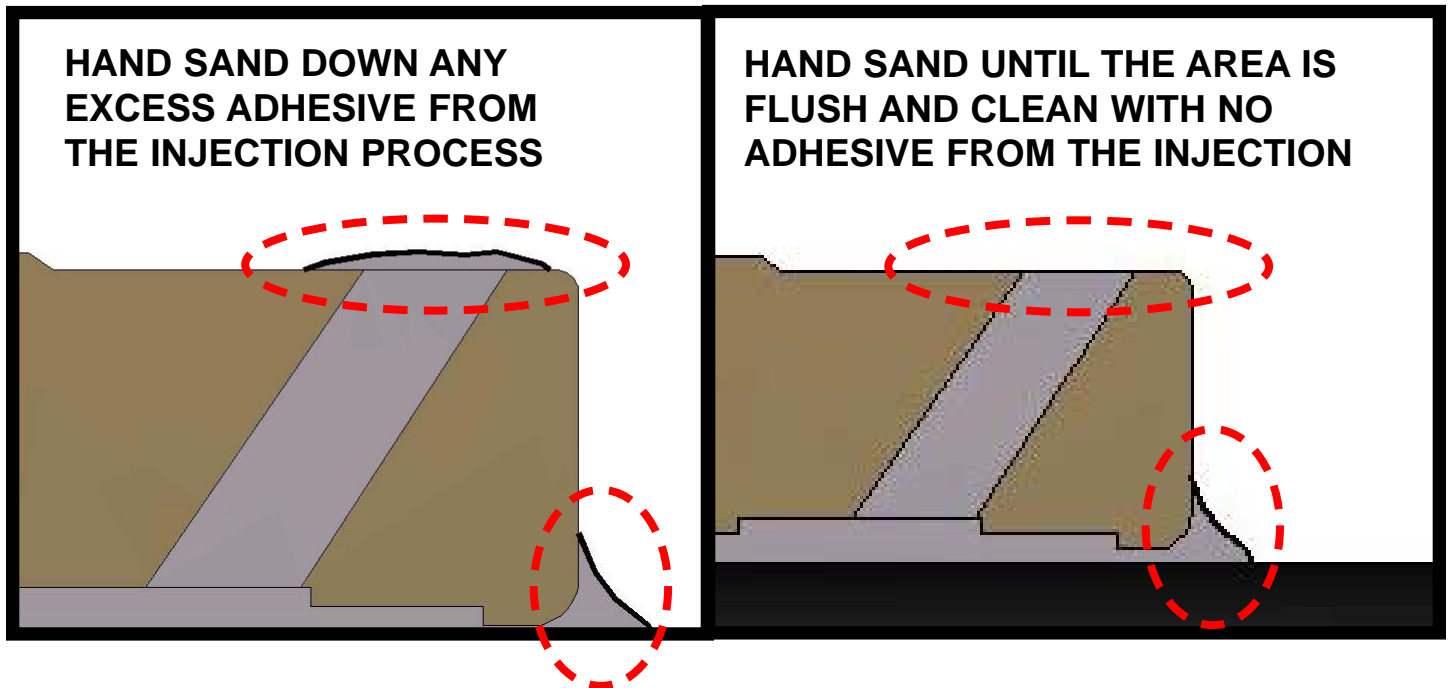
C.1) The pipe surface should be pre-abraded per Step A.5. Bring the Bravo ADHESIVE-PE-KIT out of refrigeration. It should have a **Neon-Green** label on it. Install the mixing tip and dispense adhesive until it flows evenly mixed from the tip. When ready, push the tip snug into the adhesive injection port on the body and pump adhesive slowly into the fitting until it oozes from the INTERIOR of the fitting at the pipe (**Fig. C1**). Your pipe is now sealed to the fitting. Bead the oozed adhesive from the interior face around the seam with a gloved finger, and apply a bead of the same adhesive to the exterior pipe seam. Allow a full cure time before conducting a water test, or pressure test on the pipe lines.

⚠ CRITICAL ⚠ CAUTION

USE BRAVO “ADHESIVE-PE-KIT” ONLY FOR INJECTION STEP.
DO NOT INJECT ANY OTHER FOREIGN MATERIALS!



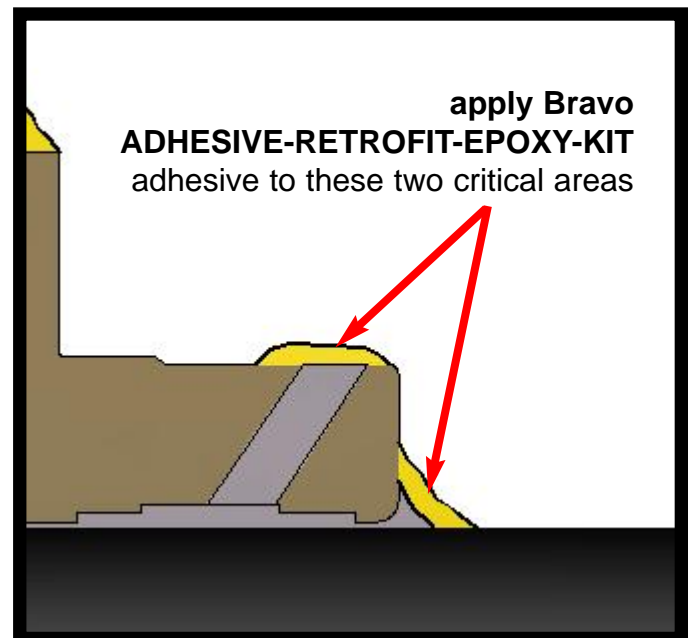
C.2) Pay special attention to the areas where the PE adhesive oozed from the fitting: The interior seam, the exterior seam and the injection port itself. Follow the directions below to prep this area for FRP adhesive application.



C.3) FINAL STEP. After Step C2 is complete, all sanded surfaces should be dusted clean and be completely dry.

Mix and apply Bravo ADHESIVE-RETROFIT-EPOXY-KIT over the top of the injection port, completely sealing it with adhesive. Also apply adhesive to the pipe seams over the existing PE adhesive, covering both the pipe and the face of the fitting. Expect your yellow adhesive bead to be approximately 1/2" thick or more to cover the PE adhesive.

Allow a full and complete cure time before water (lake) testing your fitting installation.



D) TESTING YOUR F-SERIES INSTALLATION

After all the FPE-Series Fiberglass Fittings are installed and have fully cured:

For SingleWall: Water level test to a maximum of 2" above the highest Bravo FPE-Series Fitting.