

WELDFAST™ ZC-275 Adhesive

Fabrication Instructions for Centricast™ RB and Z-Core™ Piping Systems

Note: Weldfast ZC-275 may be used on Green Thread™ HP and Red Thread™ HP Saddles and Fillet Adhesive with 8088 Repair Kits. Refer to Matched Tapered Bell & Spigot Joint Manual for information.

Introduction

These instructions must be followed for fabrication of RB and Z-Core piping systems. Please contact your local NOV Fiber Glass System distributor if you have questions or require clarification.

Safety Precautions

Warning: Heat is generated when adhesive and hardener are mixed together. Wear gloves to protect hands when mixing and using mixed adhesive. Any unused mixed adhesive may bubble and smoke slightly after the pot life is exceeded. Allow a can containing unused adhesive to cool prior to discarding. The hardener itself is slightly corrosive and should be handled with care.

Always wear chemical splash goggles for eye protection when using the adhesive and hardener. If eye contact should occur, flush immediately with water and call your physician.

Always wear impermeable gloves to avoid direct skin contact with the adhesive and hardener. If direct contact should occur, wash immediately with soap and water.

Never cover a container of mixed adhesive and hardener.

Safety Data Sheets (SDS) are available on request.

Contents of Weldfast Epoxy Adhesive Kit

1. Weldfast ZC-275, Adhesive (Part "A")
2. Weldfast ZC-275, Hardener (Part "B")
3. Wooden Stir Stick
4. Plastic Putty Knife
5. Instructions



Storage of Weldfast Epoxy Adhesive Kits

Do not store Weldfast at temperatures above 90°F. The maximum storage life for the adhesive kit is two years at room temperature. The adhesive can be refrigerated to extend storage life but should not be stored below 40 °F (5 °C)

Bonding Environment

Surfaces to be bonded must be dry, clean, oil-free and thoroughly sanded. All bonding surfaces and the Weldfast adhesive must remain completely dry and at temperatures of 70°F (21°C) to 100°F (38°C) to ensure a proper bond. When bonding at temperatures outside this range, follow the Cold Weather or Hot Weather Installation Instructions.

Note: Air temperature is not the only factor affecting cure times.

Example: When the air temperature is 70°F (21°C) and a pipe is exposed to direct sunlight, surface temperatures of the pipe may exceed 100°F (38°C). Conversely, at 70°F (21°C), a pipe exposed to wind and no sunlight will affect adhesives as if conditions were colder.

Cold Weather Installation Instructions

(Below 70°F/21°C)

The curing time for Weldfast adhesive increases as the temperature decreases. Cold temperatures can result in uncured adhesive joints.

The following steps are recommended when fabricating in cold weather:

1. Adhesive kits should be placed in a warm room for 6 to 12 hours before the application so they can reach temperatures of 70°F to 80°F. THE ADHESIVE AND HARDENER SHOULD NOT BE HEATED TO TEMPERATURES IN EXCESS OF 100°F.
2. Fabricate pipe sub-assemblies in a heated area when possible.
3. Warm the pipe ends and fittings before joint make up.
4. Apply the heat blanket to the joint and leave on according to the Cure Times Chart.

Hot Weather Installation Instructions

(Above 100°F/38°C)

Hot weather conditions will reduce the pot life and viscosity of the mixed adhesive. The following steps are recommended when fabricating in hot weather:

1. Avoid direct sunlight on the joining surfaces, adhesive, and hardener.
2. Cool unopened containers of adhesive and hardener in an ice chest with ice.
3. Plan and organize the job to reduce working time.

Site Equipment

Each Weldfast kit contains the correct amount of materials for the size and number of joints specified in the table.

Number of Bonded Joints per Kit

Pipe Size inch	Joints
1	12
1½	10
2	8
3	5
4	3
6	2
8	1
10	1/2
12	1/2
14	1/3

In addition to the material supplied in each kit, the following items should be on hand:

1. Clean, dry rags or paper towels.
2. Impermeable gloves.
3. Chemical splash goggles.
4. Drum, or disc sander, with 36 to 60 grit abrasive. 36 to 60 grit emery cloth may also be used for sanding. Do not use flapper wheels or belt sanders.
5. A heat gun or heat blanket may be required.

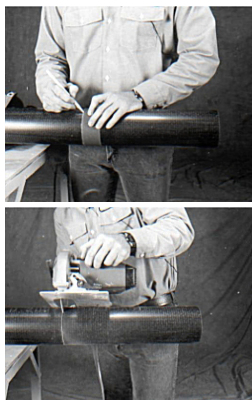
Tools for Cutting Z-Core & RB Pipe

The pipe may be cut with several acceptable tools, including:

Circular power saw or chop saw with an aluminum oxide abrasive blade, a grit-edged carbide blade, or a diamond blade. Do NOT use toothed blades as they may damage the pipe corrosion barrier.

Steps for Cutting Z-Core & RB Pipe

1. Measure the pipe length, remembering to allow for fitting makeup dimensions.
2. Scribe a cutting guide around the pipe to ensure a perpendicular cut for proper fit.
3. **WHEN CUTTING Z-CORE, THE PIPE I.D. MUST BE WARMED TO A MINIMUM OF 100°F PRIOR TO CUTTING. PREHEAT WITH A HEAT BLANKET.**
4. When cutting RB pipe, the pipe must be at least 55°F. Preheat with a heat blanket.
5. Hold the pipe firmly. If chain vises or other mechanical holding devices are used, care should be taken to prevent crushing or point loading the pipe.
6. Saw the pipe as smoothly as possible. Coarse sawing with the wrong tool can result in damage to the chemically resistant inner surface of the pipe.



Surface/End Preparation

Note: It is essential for good fabrication that pipe and fitting surfaces be sanded, clean, dry, and free of oil, grease, and solvent contamination.

1. Prepare both ends of the pipe, or pipe and fitting to be joined together, by sanding the bonding surfaces with 36 to 60 grit abrasive (see Site Equipment). The sanded area should be completely roughened, gloss free and extend ½" beyond the length of the fitting socket or pipe bell.
2. Never sand more than two hours before making the joint.
3. Wipe the sanded area with a clean, dry, lint-free cloth, and avoid touching the surfaces with bare hands or dirty gloves. **Do not use solvents.**



Mixing Weldfast Epoxy Adhesive

Weldfast ZC-275 Mixing Instructions:

1. Thoroughly mix the Weldfast Part "A" adhesive to fully disperse any liquid which may have separated during storage.
2. Add the entire Part "B" hardener to the Part "A" adhesive can.
3. Immediately mix for a minimum of two minutes or until the color is consistent. When properly mixed, the adhesive becomes **dark gray or black**. Check for unmixed tan streaks of adhesive in the bottom and around the edges of the can.



Pot Life

Pot life (working time) of Weldfast adhesive may vary with changes in temperature and humidity.

Temperature °F	Temperature °C	Pot Life Minutes
40-60	5-15	*
61-70	16-21	30-40
71-80	22-26	25-36
81-90	27-32	15-25
91-100	33-38	10-15

* Pre warm before use

Applying Mixed Adhesive & Bonding Pipe

1", 1½", & 2" Centricast Pipe

Small diameter adhesive socket joints may be obstructed by excessive adhesive if the following instructions are not followed. Apply adhesive to the fitting socket forcing it into the sanded surface.

Make sure all of the bonding surfaces are completely coated with adhesive. Remove the adhesive with the applicator leaving only a very thin film to wet all the bonding surfaces.

Any excessive adhesive left in the fittings socket will be forced into the pipe during joining and may obstruct fluid flow in the system. Wet the end of the pipe leaving a small bead of adhesive. The adhesive will prevent chemical attack of the pipe end. Apply a thin film of adhesive to the pipe forcing it into the sanded bonding surface. Next coat the bonding area of the pipe only with adhesive at least ¼" thick. Make sure there is not excessive adhesive on the end of the pipe or in the pipe bore before placing the fitting on the pipe.

3" - 14" Pipe

Apply a thin layer of mixed adhesive to the fitting socket, then add more adhesive and build up to no more than 1/16". Excessive adhesive in the fitting will cause an obstruction in the piping.



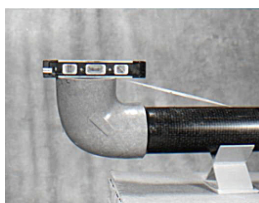
Repeat this procedure with the pipe, but build up the adhesive to no less than 1/8". Too little adhesive on the pipe will cause voids and result in a weak joint. Make sure you coat the cut end of the pipe with adhesive to seal exposed fiberglass.

Fittings

Align the fitting to minimize its rotation and movement after the fitting is in place. More than one inch rotation and excessive movement can cause joint leaks. Push the fitting onto the pipe until it is fully engaged. Do not scrape the sides of the socket when placing the fitting on the pipe.

Use a square or level to make sure the fitting is positioned properly.

Create a fillet of adhesive at the end of the fitting using the 45° bevel on the putty knife. Make sure the fitting is held level by supporting it while it cures. One way is to use fiberglass reinforced tape stretched from the fittings outermost edge to the pipe and/or the table.



Joint Cure

The joint will cure in 24 hours at ambient temperatures from 70°F to 100°F. Cure time can be decreased and joint strength increased by heating the joint from 225°F (107°C) to 275°F (135°C).

Use a heat gun held 8" to 10" from the fillet to start the heat cure process. Constantly move the gun over the fillet to prevent burning. Use the heat gun to harden the joint surface to the point that it is tack-free. Apply the heat blanket to the joint, referring to the Cure Time Charts for the appropriate cure times.

Heat cure is highly recommended for piping systems carrying fluids at temperatures above 120°F (49°C).



Before moving the piping, the joint must be hardened completely. Cure the joint per the Cure Time Charts before pressurizing the system.

Cure Time Chart for ZC-275

Temperature °F	Temperature °C	Gel Time Minutes	Cure Time Hours
40-60	5-15	> 50	*
61-70	16-21	40-50	*
71-80	22-26	30-40	24
81-90	27-32	20-30	24
91-100	33-38	15-20	24
Heat Assisted		Cure Times Hours	
1" - 14"		1	

* Heat assist required for 1 hour with FGS approved Heat Blanket.
 - Heat assisted curing can be done at any temperature to decrease cure.

Hydrostatic Testing

Piping systems should be hydrostatically tested prior to being put into service. Avoid water hammer during testing to prevent serious damage to the piping system. All anchors, guides, and supports must be in place prior to testing the line. Hydrostatically test the line as follows:

1. Water should be introduced at the lowest point in the test section and the air bled off through partially open valves or loose flanges at all the highest points. Slowly introduce water into the system to prevent water hammer. Slowly close the bleed points when all the air has been forced from the system.
2. Bring the system gradually up to the test pressure. Test pressure should be 1½ times the working pressure of the piping system, and must never exceed 1½ times the rated operating pressure of the lowest rated component in the system.
3. When testing is completed, open all of the high point air bleeds before draining the piping through the fill lines. This will prevent vacuum collapse of the pipe.

Compressed Air / Gas Testing

Compressed air or gas testing of fiberglass piping systems is **not** recommended. When air or compressed gas is used for testing, tremendous amounts of energy can be stored in the system. If a failure occurs, the energy may be released catastrophically, which may result in property damage and personal injury.

Warning: When system contamination or fluid weight prevents the use of hydrostatic testing, use compressed air or gas testing with extreme caution. To reduce the risk of air testing, pressurize the system to no more than 15 psig.

When pressurizing the system with compressed air or gas, the area surrounding the piping must be cleared of personnel to prevent possible injury. Hold the pressure for one hour; then reduce the pressure to one half the original pressure. Personnel may then enter the area to perform "soap testing" of all the joints. If compressed air or gas testing is used, NOV Fiber Glass Systems will not be responsible for any resulting injury to personnel or damage to property, including the piping system.

Compressed air or gas testing is done entirely at the discretion and complete risk of the customer, contractor and user.

Adhesive Disposal: Once the adhesive and hardener have been mixed and reacted, nothing can be extracted, and it is classified as non-hazardous material. Dispose of in a normal manner as other solid waste. Excess adhesive and hardener agent can be mixed, allowed to react, and disposed of as above. If extra jars of adhesive or hardener have accumulated without the other component to mix and react, contact your NOV Fiber Glass Systems regional manager. Hardener jars, when empty are not subject to EPA regulation and can be disposed of in a normal manner. These guidelines are based on federal regulations. State and local regulations and ordinances should be reviewed.

Call Chem Tel for chemical emergencies, spills:

Hotline/MSDS Fax Access 800-255-3924

Internationally Call +01-813-248-0585

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