

Weldfast® 470 Cobalt-Free

Introduction

It is important that you read these instructions completely and follow all of the procedures very carefully. Please contact your local NOV Fiber Glass Systems authorized distributor if you have questions or need clarification regarding these instructions.

Safety Precautions

The adhesive, promoter and catalyst for this installation are **HIGHLY FLAMMABLE!** It is critical to personal safety that you isolate your work area from any source of open flames. Remember that the fumes from these materials are also **FLAMMABLE** and can travel or build up in poorly ventilated areas. The adhesive, promoter, and catalyst are slightly reactive. Other safety precautions:

- Always wear chemical splash goggles for eye protection when using the adhesive, promoter or catalyst. 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, promoter or catalyst. If direct contact should occur, wash immediately with soap and water.
- Never cover a container of mixed adhesive, promoter and catalyst.
- Material Safety Data Sheets (MSDS) are available upon request.

Contents of Adhesive Kits:

Displayed below are the contents of the Weldfast 470 Cobalt-Free Adhesive Kit:

1. Weldfast 470 Cobalt-Free, adhesive (Part "A")
2. Weldfast 470 Cobalt-Free catalyst (Part "B")
3. Weldfast 470 Cobalt-Free promoter (Part "C")
4. Plastic Putty Knife
5. Instructions



Storage of Weldfast 470 Adhesive Kits

Do not store Weldfast at temperatures above 90° F. Maximum storage life for the adhesive kit is three months at 90° F and five months at 75° F. Storing adhesive at temperatures below 40° F is recommended.

Bonding Environment

Surfaces to be bonded must be thoroughly sanded, clean, dry, oil-free, and in the right temperature range to ensure a proper bond.

Bonding procedures are based on temperature ranges of 70° F to 100° F. For bonding where conditions exceed these ranges, follow the Cold Weather or Hot Weather Installation Instructions. The recommended temperature limits of the Weldfast, and surfaces to be bonded, must be maintained in order to assure proper curing of the joints. All bonding surfaces and materials must remain completely dry and at temperatures above 70°F. **Note:** Air temperature is not the only factor affecting cure times.

Example: When the air temperature is 70°F and a pipe is exposed to direct sunlight, surface temperatures of the pipe may approach 100°F or higher. Conversely, at 70°F, a pipe exposed to a cold wind and no sunlight will affect adhesives as if conditions were colder.

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Cold Weather Instructions (Below 70°F)

The curing time for Weldfast adhesive kits is directly related to the temperature. Colder 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 application so they reach temperatures of 70° F to 80° F. **THE ADHESIVE, PROMOTER, AND CATALYST SHOULD NOT BE APPLIED AT TEMPERATURES ABOVE 100° F.**
2. Fabricate piping sub-assemblies in an inside area when possible.
3. Warm the pipe ends and fittings before joint makeup.
4. Apply the heat blanket to the joint and leave on according to the Cure Times Chart.

Hot Weather Instructions (Above 100°F)

Hot weather conditions will reduce the working time of the mixed adhesive, promoter, and catalyst. The following steps are recommended when fabricating in hot weather:

1. Avoid direct sunlight on the joining surfaces, adhesive, promoter, and catalyst.
2. Cool containers of adhesive, promoter, and catalyst 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 below.

Pipe Size (In.)	No. Kits per Joint
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 hand sanding. Do not use flapper wheels or belt sanders.
5. Heat gun and heat blanket may be required.

Tools for Cutting Pipe

Pipe should be at least 55° F before cutting and may be cut with several acceptable tools, including:

1. Circular power saw with an aluminum oxide abrasive blade, a grit-edged carbide blade, or a diamond tipped blade. **DO NOT** use toothed blades as they may damage the pipe corrosion barrier.
2. Band saw with 16 - 22 teeth / inch at speeds of 200' - 600' per minute.
3. Saber saw with carbide-tipped blade.
4. Chop saw with aluminum oxide blade.
5. Hack saw with 22 - 28 teeth / inch.

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Steps for Cutting Pipe

1. Measure the pipe, remembering to allow for fitting dimensions.
2. Scribe a cutting guide around the pipe to ensure a perpendicular cut for proper fit.
3. 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.
4. 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 to 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 fittings to be joined together, by sanding the bonding surfaces with 36 to 60 grit abrasive (see Site Equipment, Item 4).
The sanded area should be completely roughened and extend $\frac{1}{2}$ " beyond the length of the socket or fitting.
2. Never sand more than two (2) 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 470 Cobalt Free Adhesive

Caution: Follow Safety Precautions on Page 1. Use only the supplied plastic putty knife for mixing this adhesive.

1. Thoroughly mix the Weldfast Part "A" adhesive to fully disperse any liquid which may have separated during storage.
2. Add the entire Part "C" promoter to the Part "A" adhesive can.
3. Immediately mix for a minimum of two minutes or until the color is consistent. Check for unmixed adhesive in the bottom and around the edge of the can.
4. Add the entire syringe of Part "B" to the pre-mixed "A" and "C".
5. Immediately mix for a minimum of two minutes or until the color is consistent. Check for unmixed adhesive in the bottom and around the edge of the can.



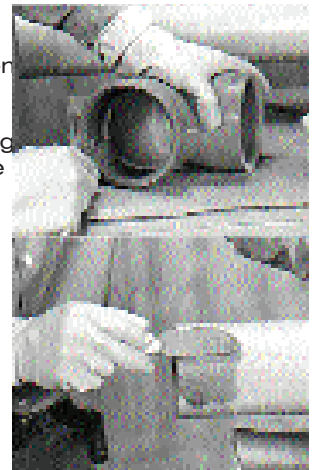
1", 1½" & 2" Pipe

Small diameter adhesive socket joints may be obstructed by excessive adhesive if the following instructions are not followed.

1. Apply adhesive to the fitting socket forcing it into the sanded surface. Make sure all of the bonding surfaces are completely coated with adhesive.
2. Remove the adhesive with the applicator leaving only a very thin film to wet all the bonding surface. Any excessive adhesive left in the fittings socket will be forced into the pipe during joining and may obstruct fluid flow in the system.
3. Wet the end of the pipe leaving a small bead of adhesive. The adhesive will prevent chemical attack of the pipe end.
4. Apply a thin film of adhesive to the pipe forcing it into the sanded bonding surface.
5. Next coat the bonding area of the pipe only with adhesive at least $\frac{1}{4}$ " 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

1. Apply a thin layer of mixed adhesive to the fitting socket, then add more adhesive and build up to no more than $\frac{1}{16}$ ". Excessive adhesive in the fitting will cause an obstruction in the piping.
2. Repeat this procedure with the pipe, but build up the adhesive to no less than $\frac{1}{8}$ ". Too little adhesive on the pipe will cause voids and result in a weak joint. Make sure you coat any cut edges of the pipe to seal the pores of the fiberglass.



1" - 14" Fittings

1. Use a square or level to make sure the fitting is positioned properly.
2. Create a fillet of adhesive at the end of the fitting using the 45° bevel on the putty knife.
3. 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 uppermost edge to the pipe and / or to 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 to 225° F to 275° F.

After the fillet has become tacky and hard to the touch, 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. Then, apply the heat blanket to the joint, referring to the Cure Times Chart for the appropriate curing time.

Applying the heat blanket before the adhesive is tack-free can cause bubbling of the Adhesive. Heat cure is highly recommended for piping systems carrying fluids at temperatures above 120° F. The joint must be hardened before moving the piping. Completely cure the joint per the Cure Times Chart before pressurizing the system.

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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 bleed 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 not be more than 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 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.

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.

Weldfast 470 Cobalt-Free Cure Times Chart

Temperature (°F)	Pot Life (Min)	Gel Time (Min)	Bell & Spigot Cure Time	Couplings and Other Fittings Joint Cure Time (Hrs)
40-60	N/R	N/R	N/R	N/R
60-70	20-30	25-35	N/R	N/R
70-80	15-25	20-30	24 Hrs	24 Hrs
80-90	10-16	12-20	24 Hrs	24 Hrs
90-100	6-12	8-15	24 Hrs	24 Hrs
200 & Greater	----	----	1 Hr	1 Hr

N/R = Not Recommended

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 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

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