

Weldfast CL-100 Instructions

Fabrication instructions for F-Chem® Bell and Spigot Piping Systems

INTRODUCTION

Following these fabrication Instructions will enable you to make leak free, long-lasting joints on NOV Fiber Glass Systems vinyl Ester F-Chem and F-Chem-V Bell and Spigot Pipe.

It is important that you read these Instructions completely and follow all of the procedures 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 and catalyst used in making the installation are HIGHLY FLAMMABLE. It is critical to your personal safety that you isolate your work area from any source of open flames. Remember that the fumes from these material are also FLAMMABLE and can travel or build up in poorly ventilated areas.

The catalyst, or part "B" contains METHYL ETHYL KETONE PEROXIDE (MEKP). MEKP is a strong oxidizing agent. Proper safety measures should be observed when using products containing MEKP:

- Always wear chemical splash goggles for eye protection. If eye contact should occur, flush immediately with water and call your physician.
- Always wear impermeable gloves to avoid direct skin contact. If direct contact should occur, wash immediately with soap and water.
- Never cover a container of mixed catalyst and adhesive
- Material Safety Data Sheets (MSDS) are available on request.

CONTENTS OF WELDFAST CL-100 ADHESIVE KITS



Contents:

1. Weldfast CL-100, Adhesive (1 Qt.)
2. Weldfast CL-100, Catalyst (3 Tubes)
3. Wooden Stir Stick
4. Brush
5. Instructions

STORAGE OF WELDFAST CL-100 ADHESIVE KITS

Do not store Weldfast at temperatures above 90°F (32°C). Maximum storage life for the adhesive is three months at 90°F (32°C) and five months at 75°F (23°C). It is recommended that you store the adhesive at temperatures below 40°F (4°C).

BONDING ENVIRONMENT

Surfaces to be bonded must be lightly sanded, clean, dry, oil free, and the proper temperature to ensure a proper bond.

Bonding procedures are based on a temperature range of 60°F-90°F (15°C-32°C). When bonding outside this temperature range, the Cold or Hot Weather Installation Tips should be followed. 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 60°F (15°C).

Cold Weather Installation Tips (Below 70°F/21°C)

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- 80°F (21°C-27°C) .
2. Use all of the recommended catalyst.
3. Fabricate piping sub-assemblies in a warm area when possible. A heated portable shelter may be used.
4. Warm the pipe ends and fittings before joint assembly.
5. A heat blanket or space heater should be used to cure the joint. Cure according to the Cure Time Chart.

Hot Weather Installation Tips (Above 90°F/32°C)

Hot weather will reduce the working time of the mixed adhesive and catalyst. The following steps are recommended when fabricating to increase pot life in hot weather:

1. Use two tubes of Part "B" catalyst per quart of part "A" adhesive.
2. Avoid direct sunlight on the joining surfaces, adhesive, catalyst and fiberglass.
3. Cool containers of adhesive and catalyst in an ice chest over bagged ice.
4. Plan and organize the job to reduce working time.
5. Do not apply mixed adhesive when temperatures exceed 100°F (38°C).

SITE EQUIPMENT

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 sander.
5. NOV Fiber Glass Systems manual come-along kit consisting of two strap-clamp kits, 4 D-rings (two for each band), and two come-alongs. Hydraulic come-alongs maybe be required for 24 inch and larger pipe. Contact factory for recommendation.
6. Wooden blocks for pipe support, prop-up and alignment. See special handing recommendations below.
7. Hot air gun or heat blanket may be required.

SPECIAL HANDLING OF LARGE DIAMETER PIPE

It is essential to use canvas straps or padded slings, rather than chains or wire rope to avoid large contact stresses on the pipe. A cherry picker with a spreader bar is ideal. Wood blocks (skids) 6" to 12" thick may be required to support the pipe run and the length being joined. Several thinner boards, such as 1" X 4" can also be available for small height adjustments. Remove all blocks from around the pipe after fabrication is completed.

www.fgsipipe.com

2700 West 65th Street
Little Rock, Arkansas 72209
Phone: 1 (501) 568-4010

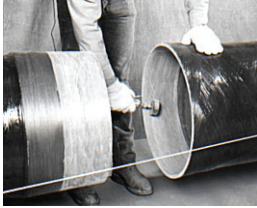
25 S. Main Street
Sand Springs, Oklahoma 74063
1 (918) 245-6651

NOV Fiber Glass Systems

SURFACE / END PREPARATION

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

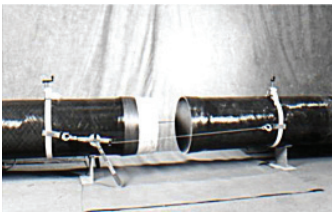
1. Prepare both ends of the pipe to be joined together, by sanding the bonding surface with 36 to 60 grit abrasive. The sanded area should extend at least 1/2" beyond the length of the socket.



2. Never sand more than two hours before making 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.

COME-ALONG INSTRUCTIONS

Attach the strap-clamp kits to the pipe, and have the come-alongs and all other material ready, prior to mixing the adhesive and catalyst.



Place strap-clamp kits approximately 3' - 4' from the joint on both the bell and spigot pieces. Slip the D-rings into place on the horizontal center line, on both sides of the pipe, prior to attaching the couple hooks.

Unreel the come-alongs and attach to the strap-clamp D-rings. The come-alongs may be left unattached while applying adhesive.

MIXING WELDFAST CL-100 ADHESIVE

1. Shake the can of part "A" adhesive to fully disperse any liquid, which may have separated during storage. It should be a light purple color.



2. Add the recommended tubes of part "B" catalyst to the Part "A" adhesive can.
3. Mix thoroughly for a minimum of two minutes or until the color is a consistent light green. It will be the consistency of honey.

POT LIFE

Pot Life (working time) may vary with changes in temperature and humidity. See the Cure Times Chart.

APPLYING WELDFAST CL-100 AND BONDING PIPE

Use the brush to apply generous amounts of catalyzed adhesive to the bell end first, and then apply to the spigot end.



Align the joint and guide the spigot end into the bell. Attach come-alongs and pull joint together until tight. Check around the joint to be sure that it is even, which indicates proper alignment. Use brush to fill in any gaps in adhesive. Leave the come-alongs in place during initial cure (approximately one hour).

Bonds Per Kit	
Pipe Size, inch	Number of Joints
8	2 1/2
10	2
12	1 1/2
14	1 1/2
16	1 1/2
18	1
20	1
24	3/4
30	1/2
36	1/3
42	1/4
48	1/5

JOINT CURE

Cure according to the Cure Time Chart. Cure time can be decreased and joint strength increased by heating the joints to 175°F (79°C) to 225°F (107°C). Heat cure is strongly recommended for piping systems carrying fluids at temperatures above 120°F (49C).



HYDROSTATIC TESTING

NOV Fiber Glass Systems piping 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 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 air bleeds before draining the piping. This will prevent vacuum collapse of the pipe.

See **Manual 6080** for additional information.

COMPRESSED AIR \ GAS TESTING

Compressed air or gas testing of NOV Fiber Glass Systems piping 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 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 10 psig.

When pressuring 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 ½ the original pressure. Personnel then may enter the area to preform "soap testing" of all the joints.

If compressed air or gas testing is used, NOV Fiber Glass System 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 CL-100 Shelf Life, Pot Life, Gel & Cure Times

Temperature (°F)	Adhesive Part "A" Shelf Life (Months)	Catalyst Part "B" Shelf Life (Months)	Quantity Part "B" (Tubes)	Pot Life (Minutes)	Gel Time (Minutes)	Bell & Spigot Joint Cure Time (Hours)
40 to 60	6	12	3	N/R	N/R	N/R
60 to 70	5	12	3	40-90	60-180	48
70 to 80	5	12	3	30-50	40-70	24
80 to 90	3	9	2	20-40	21-41	24
90 to 100	2	4	2	8-15	10-17	24
200 & Greater*	-----	-----	-----	-----	-----	Contact Factory

* Heat Blanket, heat gun or other heat source required

N/R = Not Recommended

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

Example: When the air temperature is 60°F (15°C) and a pipe is exposed to direct sunlight, surface temperatures of the pipe may approach 100°F (38°C) or higher.

National Oilwell Varco has produced this brochure for general information only, and it is not intended for design purposes. Although every effort has been made to maintain the accuracy and reliability of its contents, National Oilwell Varco in no way assumes responsibility for liability for any loss, damage or injury resulting from the use of information and data herein nor is any warranty expressed or implied. Always cross-reference the bulletin date with the most current version listed at the web site noted in this literature.

www.fgspipe.com

2700 West 65th Street
Little Rock, Arkansas 72209
Phone: 1 (501) 468-4010

25 S. Main Street
Sand Springs, Oklahoma 74063
1 (918) 245-6651

NOV Fiber Glass Systems

© 2009, NATIONAL OILWELL VARCO
® Trademark of NATIONAL OILWELL VARCO
D4211 February 2009