

Assembly Instructions

for Amipox Taper / Taper Adhesive-Bonded Joints



Introduction

This guide provides recommendations for the installation of Amipox piping systems using the Taper-Taper Adhesive-Bonded Joints. Many of the skills, techniques and principles of steel pipe installation also apply to fiberglass piping. As you work with Amipox fiberglass piping, you will find that it weighs much less than steel and that it is more flexible, but it must be handled more carefully than carbon steel pipe. In addition, fiberglass pipe often needs protection against abrasion at points of support.

To accommodate these characteristics of Amipox fiberglass piping, the following installation recommendations should be followed. You are encouraged to contact Amipox for more help on specific problems or questions.

Receiving Amipox materials

Conduct an Inventory and inspect all incoming shipments of Amipox pipe and fittings. If the inventory does not exactly match the delivery receipt, recount the materials in the presence of the truck driver. Any discrepancy in the inventory and any obvious shipping damage must be noted on the receipt. Insist that the receipt be signed by the truck driver. If it is evident that materials have been lost or abused, damage claims must be initiated before accepting the shipment. Under customary shipping procedures, title and risk of loss pass to buyer upon delivery of material to carrier. The Standard Terms and Conditions of Sale require that the buyer promptly notify both seller and carrier of any damages or shortages.

Examine pipe and fittings carefully for shipping damage. In particular examine (a) key and O-ring grooves on pipe ends with damaged or missing end

protection, and (b) fittings received in damaged containers. Pads which are damaged or **suspected of being damaged** should be set aside and reported as stated above.

Unloading and handling

Pipe, except when crated, is normally unloaded as single lengths or bundles. To prevent damage to grooved pipe ends, do not drag or slide pipe in any way that abrades or dislodges the end protection. Do not bump pipe or grooved pipe ends. Pipe may be moved either by hand or by lifting equipment using nonmetallic ropes or straps. Two-point pickup is recommended for all sizes and lengths.

Caution: Do not throw or drop pipe or fittings. Amipox product packaging is not designed to withstand dropping from a truck onto the ground. Do not use a forklift to handle pipe unless forks are padded with carpeting or some other suitable material. **Liners can be damaged to the point of allowing leakage even though the outside surface shows no signs of mishandling.** Handle all material carefully at all times.

Storage

Pipe or pipe bundles may be stored for extended periods in stacks up to four feet (1.25 m) high. Pipe stacks must have side supports or blocks to prevent them from rolling or slipping. Pipe stored in stacks should be supported using bearing boards and spacer boards as shown in Table 1 on a level surface, free of rocks and other hard or sharp objects. Bearing boards under the stack and spacer boards between the pipe layers must ensure that bell and spigot ends remain round, not distorted by stack loads. Bearing and spacer boards should be at least three inches (75 mm) wide and cushioned with a suitable foamed plastic or other material.

Table 1

Support Spacing for Pipe Storage

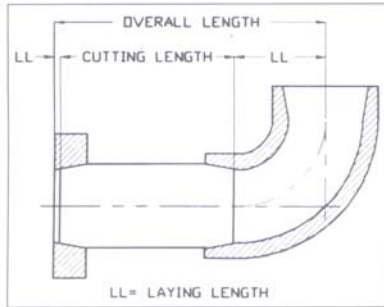
Pipe Length		Pipe Diameter		Support Distance from End of Stack	
(ft)	(m)	(in)	(mm)	(ft)	(mm)
30	9.0	all sizes		6	1.8

Fittings should be removed from cartons, closely inspected and stored on shelves, preferably inside a warehouse. Extended outdoor storage may impair the exterior appearance of fittings but will not affect their physical strength. Outdoor storage of cartons is not recommended since they are not weatherproof.

Adhesives must be stored indoors at temperatures below 100 °F (38 °C). Extended storage at higher temperatures will degrade the catalyst and the resin and reduce adhesive strength.

Each adhesive kit is stamped with an expiration date. In order to monitor the storage life remaining and to rotate the stock so that older kits are used first, all kits should be removed from shipping cartons and stacked upright so that the expiration dates are visible.

Cutting of pipe

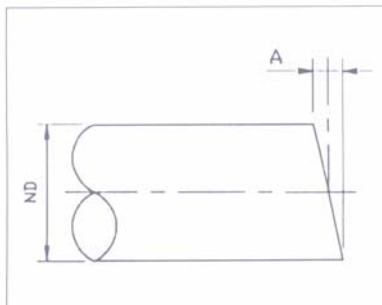


determining length

1. Determine the desired length.
 - a. Determine the cutting length as shown by subtracting the laying lengths of the fittings from the required overall length.



2. Mark the pipe using a pipe fitter's wrap-around.
 - a. When holding the pipe in a vice, use rubber padding or similar to protect the pipe from damage.



squareness tolerance

3. Cut the pipe.
 - a. Use a hacksaw or an abrasive wheel.
 - b. Ensure that cut ends remain within the tolerances as shown in table A.
 - c. These tolerances can be checked by using e.g. the arbor of the shaver flush with the cut end of the pipe.

Table A: Maximum tolerance on squareness of cut spigot end

Pipe Size Range		Tolerance	
(mm)	(inch)	(mm)	(mm)
80 - 100	3 - 4	1.5	
150 - 400	6 - 16	3.0	
400 - 600	16 - 24	5.0	

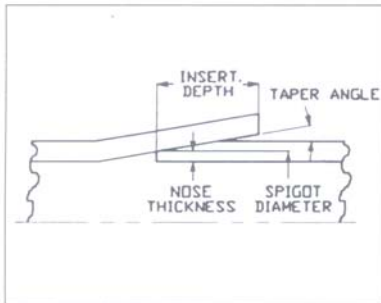
Shaving of the Cut End of the Pipe



1. Support and hold the pipe in position firmly.
 - a. Contaminated pipe surfaces should be cleaned prior to shaving the pipe ends.
 - b. When holding the pipe in a vice, use rubber padding or similar to protect the pipe from damage.



2. Carefully insert the arbor into the pipe.
 - a. Fix the arbor to the inside of the pipe by turning the central tensioning bolt clockwise.



3. Adjust the shaver to the required spigot diameter.
 - a. Be sure to use the correct taper angle.
 - b. Take care when shaving the first layer, because the pipewall may not be equally thick on all sides.
 - c. For shaver information and operation instructions refer to the applicable "Amipox Pipe Shaver Operation Instructions".
 - d. Refer to Table C below.

Table C: Shaving Dimensions per Pipe Series								
Pipe Size		taper angle	nose thick	spigot diam	nose thick	spigot diam	nose thick	spigot diam
mm	inch	degrees	Mm	mm	mm	mm	mm	mm
			Series AT10		Series AT12		Series AT14	
80	3	1.2	2	84	2	84	2	84
100	4	1.2	2	104	2	104	2	104
150	6	1.2	2	154	2	154	2	154
200	8	1.2	2	204	2	204	2	204
250	10	1.5	2	254	2	254	2	254
300	12	1.5	2	304	2	304	2	304
350	14	1.5	2.1	354.2	2.1	354.2	2.1	354.2
400	16	1.5	2.1	404.2	2.1	404.2	2.2	404.2
500	20	2	2.3	504.6	2.3	504.6	2.3	504.6
600	24	2	2.5	605	2.5	605	2.5	605

**Table C:
Shaving Dimensions per Pipe Series**

Pipe Size		taper angle	nose thick	spigot diam	nose thick	spigot diam	nose thick	spigot diam	
mm	inch	degrees	Mm	mm	mm	mm	mm	mm	
				Series AT16		Series AT20		Series AT25	
80	3	1.2	2	84	2	84	2	84	
100	4	1.2	2	104	2	104	2	104	
150	6	1.2	2	154	2	154	2	154	
200	8	1.2	2	204	2	204	2	204	
250	10	1.5	2	254	2	254	2	254	
300	12	1.5	2.4	304.8	2.4	304.8	2.4	304.8	
350	14	1.5	2.6	355.2	2.6	355.2	-	-	
400	16	-	-	-	-	-	-	-	
500	20	-	-	-	-	-	-	-	
600	24	-	-	-	-	-	-	-	



4. Shave the taper spigot.

- a. Maximum shaving depth / feed is 2 mm.
- b. Repeat the shaving action until the required spigot diameter / spigot nose thickness is achieved (table C).
- c. Due to possible tolerance spreading, it is recommended to use a nominal sized dummy bell end. This may avoid too long or too short assembly lengths. If the insertion depth in the dummy is too small, the spigot end to be shaved has to be adjusted.



5. Sand all bonding surfaces.

- a. Thoroughly sand within 2 hours from assembly.
- b. Use flapper wheel sanders with a small drilling machine (1700 - 2000 rpm) or emery cloth with a grid of 60.



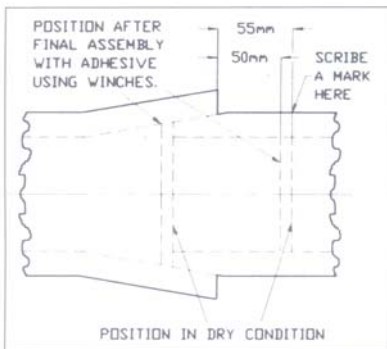
- c. Bonding surfaces must be dry and clean before sanding.
- d. Sanded surfaces must have a dull, fresh finish, not a polished look.



6. Dry fit and mark the joint.
 - a. Check the assembly length and mark pipe and fitting for alignment of elbows, flanges, etc.



- b. Measure back from the edge of the spigot the required insertion depth plus 50 mm and scribe a line. After assembly by pulling the joint together the scribe on the pipe should be 50 mm from the end of the bell.



- c. During final assembly the spigot may slip approximately 5 mm further into the bell, therefore the dry fitted assembly should be approximately 5 mm longer per joint.

position after assembly

Preparing for bonding



1. Install the band clamps.
 - a. Install the band clamps on both components keeping sufficient space for the winches when pulling the joint together. Normally 2 winches will suffice. If needed more winches can be used.
2. Dry the bonding surfaces.
 - a. If the relative humidity is higher than 75% or if the bonding surfaces are wet they should be dried.

- b. Amipox heating blanket can be used in drying the surfaces.
- 3. Pre-heat or cool down the bonding surfaces.
 - a. It is recommended to keep the bonding surfaces between 15°C and 40°C.
 - b. For warming up Amipox heating blankets can be used.
 - c. If the sun will heat up the bonding surfaces to above 40°C keep them in the shade if possible.
- 4. Re-sand.
 - a. If the sanded surfaces have been contaminated, or if initial sanding took place more than 2 hours before assembling, the surfaces should be re-sanded.
- 5. Clean the sanded surfaces.
 - a. Use a clean dry cloth or brush to remove sanding dust etc.
 - b. Do not touch the sanded surfaces after sanding and cleaning.

Applying the adhesive

1. Select the proper size adhesive kit.
 - a. Table D below shows the quantity of adhesive needed for one joint.
 - b. More joints may be assembled at the same time.
 - c. Make sure the adhesive is not expired. Refer to date stamp on the package.
 - d. Never split a package, always prepare complete kits.
 - e. Do not use damaged or leaking adhesive kits.

Table D: Adhesive kits per joint. (250 gram kit)

SIZE		10	12	14	16
inch	mm	bar	bar	bar	bar
2	50	0.1	0.1	0.1	0.1
3	80	0.1	0.1	0.1	0.1
4	100	0.2	0.2	0.2	0.2
6	150	0.2	0.2	0.2	0.2
8	200	0.3	0.5	0.5	0.5
10	25	01	1	1	1
12	300	1	1	2	2
14	350	1	1	2	2
16	400	2	2	3	3
18	450	2	2	3	3
20	500	2	3	3	3
24	600	2	4	3	4

2. Prepare the adhesive.
 - a. Add the curing agent to the resin.
 - b. Stir thoroughly until the mixture has an even color (after 2 to 3 minutes).
 - c. Table E below shows the recommended storing and mixing temperatures of the adhesive.

Table E: Storage and usage of adhesive

Storing temperature: Below 30°C.
 Recommended mixing temperature: 20 -35°C.
 Below 15°C, adhesive will not mix well and the adhesive mix cannot be easily spread.
 The mixture will cure too fast above 40°C.
 Minimum curing temperature of adhesive: 80°C

- d. Make sure that before mixing the adhesive, all preparations have been done and all parts to be bonded are ready for assembly, because mixed adhesive has a limited potlife subject to the ambient temperature (table F).
- e. Apply the adhesive immediately after mixing.

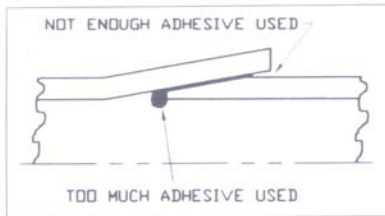
Table F: Potlife of mixed adhesive in minutes

Temperature in °C	20	25	30	35	40
Setting Time	30min	25min	20min	15min	10min

- f. Never use adhesive that has started to gel. This is the case when the mixture gets clotted and toughens.

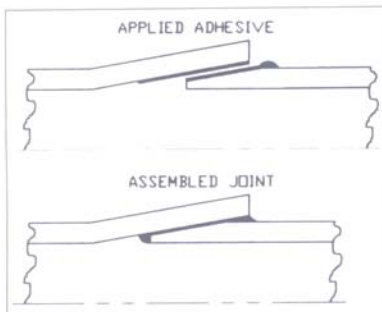


- 3. Apply a thin layer of adhesive
 - a. Use a spatula or an adhesive scraper for applying the adhesive.
 - b. All surfaces to be bonded (sanded area's) must be completely covered with adhesive, approximately 0.5 mm in the bell and 1 mm on the spigot.



adhesive improper applied

- c. A too thick layer of adhesive may result in flow restrictions.
- d. Make sure that also sufficient adhesive is applied on the cylindrical end of the spigot that will be covered by the bell.



adhesive surfaces

- 4. Insert the spigot in the bell.
 - a. When inserting the spigot pay attention to the marks and position and keep the joint together. Letting the spigot slip back or turning the spigot after complete insertion may result in a bad joint.
 - b. Hook the 2 winches in the band clamps and start pulling the joint further together in a smooth movement until the joint is firmly fixed together and there is 50 mm between the bell end and the mark.
 - c. It may be necessary to set a bridge (pieces of wood between winch cables and pipe outside) to simplify placing of the heating blanket.
 - d. Do not remove the winches until the adhesive has fully cured.



5. Remove excess adhesive.
 - a. For removing excessive adhesive, also from the inside if possible (flanges), a spatula may be used.

Curing of the Adhesive Joint



1. Apply the heating blanket.
 - a. Wrap the required size Amipox heating blanket around the joint keeping the power supply cable free from the blanket.
 - b. Make sure the voltage is correct.
 - c. The blanket should be applied as indicated in the appropriate Amipox Heating Blanket Data sheet.
 - d. The blanket should be tied down using heat resistant wire.
 - e. Good blanket to pipe surface contact is essential for proper curing of the adhesive.
 - f. When the temperature is below 10°C or the wind has a cooling effect, insulation material should cover the heating blanket. Insulation material should overlap the sides of the blanket with at least 100 mm and should match to the pipe. It should not cover the thermostat.
2. Determine the curing time
 - a. Write starting time
 - b. For maximum chemical resistance, curing time is mainly subject to the distance (= wall thickness) between blanket and adhesive.
 - c. Table G shows the recommended curing time (Hours) for each pipe size and pressure class.

Table G: Curing time for taper pipe joints in hours

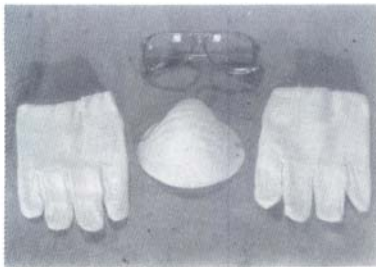
Series	AT10	AT12	AT14	AT16
Pipe Size (mm) (inch)				
50 2	1	1	1	1
80 3	1	1	1	1
100 4	1	1	1	1
150 6	1	1	1	1
200 8	1	1	1	1
250 10	1	1	1	1
300 12	1	1	1	1
350 14	1	1	1	1
400 16	1	1	1	1
450 18	1	1	1	1.5
500 20	1	1	1.5	1.5
600 24	1	1.5	1.5	2

3. Activate the heating blanket.
 - a. Apply electrical power to the heating blanket and check if it heats up.
 - b. Write down on the pipe next to the heating blanket the starting time.
 - c. During the time of curing the functioning of the heating blanket should be checked regularly; if a cold heating blanket is found, remedy the problem and start the complete curing cycle again.
 - d. During curing the joint should not be moved, vibrated or otherwise disturbed.

Recommended tools

- Amipox shaving tool(s)
- Electrical power drive (available from Amipox)
- Hacksaw, disc grinder or power jigsaw
- Small electrical or air hand drilling machine (6 mm drive and 1700-2000 rpm)
- Flapper wheel sanders (available from Amipox) and / or coarse emery cloth; grid 60.
- Pairs of winches or come-alongs (available from Amipox).
- Pairs of band clamps with puller rings (available from Amipox).
- Measuring tape and / or folding rule.
- Pi-tape with vernier division (available from Amipox)
- Clean cloth or clean brush
- Pipe fitter's wrap around, level and white paint pencil.
- Amipox heating blanket and eventual hot air blower.
- Insulation blankets.
- Pipe vice or stable supports (brackets) with pipe holding or clamping device with 6 mm
- Elastomeric pads.
- Gloves, dustmasks and goggles
- Tenting (subject to weather conditions).

Health and Safety



personal protection

- For health and safety data refer to appropriate Amipox Adhesive Product Data sheet.
- Wear at all time suitable protective clothing, gloves and eye protection. Dust masks should be used during machining and sanding.
- Use gloves when working with adhesive, the wet adhesive may cause irritation by skin contact.

Important notice

This product literature and the recommendations for usage it contains are based on test data reasonably believed to be reliable. It is intended that this literature be used by personnel having specialized training in accordance with currently accepted industry practice and normal operating conditions. Variation in environment, changes in operating procedures, or extrapolation of data may cause unsatisfactory results. We recommend that your engineers verify the suitability of this product for your intended application. Since we have no control over the conditions of service, we expressly disclaim responsibility for the results obtained or for any consequential or incidental damages of any kind incurred.

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