

**These Installation Practices for Dualoy 3000/LCX coaxial fiberglass piping system with bonded clamshell fittings are an excerpt of the Manufacturer's documentation. The Contractor shall obtain official documentation from the Manufacturer and abide by those installation practices.**

**Training for Ameron Dualoy Piping Systems**

- Installation for Ameron Dualoy 3000/LCX piping systems, including secondary containment systems and Dualoy 3000/LCX, shall be done by a "Certified Installer."

**Glossary & Abbreviations**

SC - Secondary containment fittings or pipe	MV - Motor vehicle fuel
NV - Normal vent line tank	CF - Concentrated fuels
PC - Primary Carrier	HB - High blend fuels
PS - Primary/Secondary combined into one unit	AM - Aviation and marine fuels
VR - Vapor recovery	

**Pressure Ratings & Specifications of Products**

Dualoy 3000/LCX pipe specifications and ratings					
Pipe Size	Normal OD (inches)	Wall Thickness (inches)	Weight (lb/ft)	Pressure Rating (PSI)	Pressure Rating (PSI)
2	2.38	0.090	9.0	200	160
3	3.50	0.085	1.30	200	100
4	4.50	0.090	1.74	175	80

Dualoy 3000/LCX couplings & adapters ratings				
Pipe Size (inches)	Coupling (inches)	Adapters 2" (inches)	Adapters 3" (inches)	Adapters 4" (inches)
2	2.00	2.00	2.00	2.00
3	1.25	1.25	1.25	1.25
4	1.00	1.00	1.00	1.00

Dualoy 3000/LCX fittings & adapters ratings				
Pipe Size (inches)	45°/90° Elbow (inches)	Reducer Bushings (inches)	Tees (inches)	Adapters 6" (inches)
2	2.00	2.00	2.00	2.00
3	1.25	1.25	1.25	1.25
4	1.00	1.00	1.00	1.00

2-Piece Clamshell Fittings			
Pipe Size (inches)	Dualoy 3000/LCX Repair Coupling (inches)	Dualoy 3000/LCX Containment Fittings (inches)	Dualoy 3000/LCX Containment Fittings (inches)
2	80	50	50
3	40	50	50
4	30	50	20

**Listings/Approvals**

Dualoy 3000/LCX is Listed in the United States with Underwriters Laboratories for normal use underground piping for motor vehicle fuels (MV), concentrated fuels (CF), high blend fuels (HB). It can be used for Primary/Secondary (PS) services where both layers are combined into one unit under UL File No. MH 155595.

**Inspection, Handling**

Careful inspection of the secondary (layer) of pipe is especially important on coaxial containment installations. Since damage to the primary is not visible once the pipe is installed, it is essential to check the outer pipe jacket for damage. Testing and experience has proven that no damage will occur to the primary pipe without an indication of damage on the outer jacket.

Upon receipt at the job site, inspect the pipe fully. Locate, cut out, repair or replace damaged pipe. Impact damage is usually recognizable as rounded pale areas just under the surface or as deep gouges, scratches or cracks. Remove end protectors to inspect top surfaces for damage and then replace protectors.

**Handling**

Dualoy 3000/LCX has higher impact resistance than single-wall pipe, however, fiberglass pipe is susceptible to damage if handled improperly. Adhere to the following recommendations when handling:

- Do not transport pipe without proper protection against impact.
- Truck pipe racks should be padded with caps or this material to prevent damage.
- Tie the pipe down during transport to prevent it from bouncing on the racks.
- Do not use chains to tie down the pipe on a truck. Use nylon straps or hemp rope.
- Do not drop the pipe from truck bed when stringing. Lay the pipe down by hand.
- Rope loads that are properly separated and supported can be unloaded by padded forklifts.

**Storage**

Dualoy 3000/LCX pipe incorporates a resin-rich outer coating which provides outstanding UV resistance. Pipe stored out-of-doors for extended periods may assume a chalky appearance. However, this change in appearance is superficial and does not affect the pipe's performance. Protect stored pipe from impact damage by stacking on paddocks.

**Field cutting and tapering primary pipe**

Use a fine-blade hacksaw, radial out-off saw or circular saw with abrasive wheel to cut pipe in the field. The cut end must be square to within 7/16 inch (5 mm).

Hold pipe securely for all cutting and tapering. When using a pipe vise, always wear the pipe with a protective material such as a 1/2-inch thick rubber pad. Take care not to damage the pipe when tightening the vise.

**Removing containment with jacket cutting tool**

The jacket cutting tool is used to quickly remove the containment layer from the end of the pipe. The tool makes tapering of the pipe easier, reduces wear on the tapering equipment and provides a square finished edge to the containment. The tool consists of a pneumatic motor equipped with a diamond out-off wheel. It is adjustable to allow it to be set at the desired height to cut through the containment without any risk of cutting into the primary pipe.

The jacket cutting tool, the tool can either be clamped into a vise or can be hand operated. The pipe is clamped into a pipe vise. Remove the containment by activating the diamond wheel and the pipe into the housing.

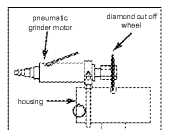


Fig. 5-1. Ameron 2" jacket cutting tool

Pipe Size (in)	Containment Layer Length To Be Removed (in)		Termination Sleeve Length (in)	
	Normal	To Bond Into a Fitting	Normal	To Bond Into a Fitting
2	5.0	2.75	7.0	4.50
3	8.0	2.75	7.0	4.50
4	10.0	3.50	9.1	5.75

When cutting the jacket of a pipe to be used with a termination sleeve, a longer out-of-jacket is needed to allow enough room to bond to both the primary and containment pipe. Minimum dimensions are shown in the table above.

Rotate the starting position and remove the pipe from the pipe vise. Physically remove the containment layer by prying it open slightly and pulling it off the primary. Use care to not damage the primary pipe or the termination sleeve.

Note: The out-of-wheel will wear down eventually and may need readjustment through the containment. To adjust, set the depth of the wheel head just above the layer and not into the layer of glass beads. This will minimize wear on the wheel. See Universal Jacket Cutter Operating Instructions for "Z" and "X" containment cutting and removal.

**Tapering with power tapering tools**

Pipe is most often tapered using one of several power tapering tools. Manufacturers names and part numbers should be obtained from Ameron distributors. Pipe tapering tools should be periodically checked against taper angle. The correct taper angle is used for Dualoy pipe.

**Observe the following practices when operating the Taper Maker.**

- Check blade and tapering factors before use. Adjust blade properly and adjust the tapering tool to the correct taper angle. If adjustments are needed, use the correct tapering tool.
- Adjust the tapering tool to the correct taper angle.
- Mark the taper length on the pipe. Refer to the tapering tool manual for taper length.
- Use the appropriate size collet and slide it onto the mandrel, making sure the key inside the collet engages the slot of the mandrel.
- Hold the collet and turn the collet control knob clockwise until the collet begins to expand. Note that it may be necessary to adjust the cutting head to accommodate different size collets.
- Insert the collet into the pipe until the back end is flush with the end of the pipe.
- Expand the collet to grip the inside of the pipe by turning the collet control knob clockwise.
- Lower the cutting blade until it contacts the pipe by turning the cutting head adjustment handle clockwise.
- Using the ratchet handle, turn the tool clockwise, gradually lowering the cutting blade by turning the cutting head adjustment handle clockwise. Continue until a smooth taper of the proper length is obtained. The thin edge of the completed taper should be no less than 7/16 inch (0.75 mm) thick.

For complete operating information, refer to the appropriate Taper Maker Product Data/Operating Instructions.

**Precise alignment and make-up**

The matched taper and spigot joint on the primary does not always result in a precise predictable insertion depth. This variation results from:

- Manufacturing tolerances in the bell
- Differences in length of tapers prepared on the job site
- Difference of insertion depth when dry fit and after adhesive has been applied.

**Flexible sump penetration fitting installation**

Measure to the appropriate height for the center of the hole, making sure to allow for the desired slope for the piping in the station layout. Mark the height across sump.

Measure and mark the location of each penetration on the line, on the flat panel.

Using a 6-inch hole saw or dispenser, 6-inch for tanks, cut hole for penetration fitting.

Sand and clean the edges to create a smooth surface to properly seat the fitting in the sump wall.

**Flexible sump penetration fitting installation (cont'd)**

The flexible penetration fitting has two sections, an outer ring and an inner boot. Unscrew the ring from the penetration fitting and apply a small bead of Bostik 920 to the inner surface of the ring flange.

Apply a bead of Bostik 920 around the hole on the inside surface of the sump wall. Place the ring into the sump wall from the outside with the threads inside the sump. Press the gasket into the groove on the inner part of the penetration fitting. From inside the sump, screw the penetration fitting onto the threads and tighten with adjustable pliers.

**Jump-overs and Cross-overs**

Assemblies for crossing lines can be made in one of two ways. For lines where the bonded 45° elbow need to be very close (a jump-over), the clamshell fittings can be cut at the top of the tapered portion on the branch of the tee and one leg of the elbow. A piece of single wall pipe of the next larger size can be used to connect the clamshell fittings (Fig. 6). For lines where there is sufficient distance between the tee and 45° elbow to allow for the full clamshell fittings, the cross-over can be made by simply bonding the fittings and clamshells to a piece of standard coaxial pipe (Fig. 6.7).

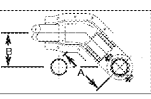


Fig. 6. Jump-over assembly made with clamshell fittings of next size up to span over section gap.

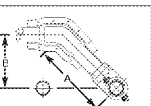


Fig. 6.7. Cross-over assembly made with clamshell fittings of next size up to span over section gap.

**Bonding Primary Systems**

**Joint preparation**

All tapered systems must be clean, dry and warm for a proper bond.

**Clean:** Pipe is shipped from the factory with end protectors. Avoid contamination from fingerprints, petroleum fumes, mist and condensation as these are adverse to good bonding. If a taper becomes dirty, sand it with emery cloth. Never touch the bonding surface with bare hands after cleaning or sanding as this will leave an oily deposit.

**Dry:** Adhesive will not bond to a wet surface. If the taper is wet or moist, dry it with a blow dryer or heat gun. Do not overheat or burn the pipe.

**Warm:** Below 50°F (10°C), warm the taper with a blow dryer or heat gun. For best results, adhesive should be at least 50°F when used. Do not store kits in areas above 100°F (38°C) below 32°F (0°C), or in the direct sunlight during warm weather. In cold weather, warm the resin to at least 50°F but not above 100°F to permit good mixing and easier application.

**Mixing Ameron adhesive**

Combine all of both components in the mixing container in the specified proportions.

**Never try to split a kit.** Mix thoroughly with the mixing stick until all streaks are gone and the adhesive has a smooth, uniform color. Mixed adhesive color is dark red. Do not allow moisture to get into the can.

Note: If the material in either container cannot be mixed, the kit should not be used.

**Applying Ameron adhesive**

PSXTM-20 and PSXTM-34 adhesives contain grit to aid in installation. Excessive amounts of adhesive may (1) cause flow restriction inside the pipe when the adhesive has cured, (2) block the opening of the containment pipe, or (3) result in hydraulic backout at the adhesive cures. Hydraulic backout is the failure of the adhesive to hold in place.

Push the pipe into (or onto) the tool to cut a longitudinal groove in the containment. When the end of the pipe reaches the stop at the back of the tool, rotate the pipe (or tool), cutting the containment circumferentially.

When cutting the jacket of a pipe to be used with a termination sleeve, a longer out-of-jacket is needed to allow enough room to bond to both the primary and containment pipe. Minimum dimensions are shown in the table above.

Rotate the starting position and remove the pipe from the pipe vise. Physically remove the containment layer by prying it open slightly and pulling it off the primary. Use care to not damage the primary pipe or the termination sleeve.

Note: The out-of-wheel will wear down eventually and may need readjustment through the containment. To adjust, set the depth of the wheel head just above the layer and not into the layer of glass beads. This will minimize wear on the wheel. See Universal Jacket Cutter Operating Instructions for "Z" and "X" containment cutting and removal.

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Hold the collet and turn the collet control knob clockwise until the collet begins to expand. Note that it may be necessary to adjust the cutting head to accommodate different size collets.

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For complete operating information, refer to the appropriate Taper Maker Product Data/Operating Instructions.

**Force curing adhesive**

All temperatures below 50°F (10°C) or if the temperature will not be above 50°F (10°C) during the entire period of cure, an external heat source must be used to force cure the adhesive. The adhesive and the bonding surfaces should be warmed to 50°F (10°C) before mixing and applying the adhesive.

Below 50°F (10°C) force cure the adhesive with an external heat source such as:

- Ameron LCX heating blanket
- Forced air heater if the trench is covered to contain the heat
- Hot air gun

**Ameron heating blankets**

The heating blanket reaches a maximum temperature of 250°F (100°C) which will cure the adhesive in approximately 30 to 40 minutes. Detailed instructions are included with the blanket. Observe the following points:

- Use one heating blanket per bond.
- Tie the blanket in place with nonconductive ties.
- Before connecting to a power source, inspect the blanket and cord for loose connections and bare wires.
- Do not plug the cord into a power source when standing in water or on a wet surface.
- Check that the heating blanket has the correct AC voltage rating for your locality. Do not use direct current.
- Mark the starting and disconnect time on the pipe with a grease pencil so that you will have a record of cure for each joint.

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**an adhesive**

me the hardener and resin are first mixed until the adhesives turn to a thick and harden and no longer can be used. Do not use adhesive once the

table below indicates the adhesive pot life under various temperature conditions. In weather, pot life may be extended by wiping a damp rag around the can of mixed