



Ameron T-Lock[®]

Concrete Tanks & Structures

Description

Designed to become an integral part of concrete tanks and structures, Ameron T-Lock is cast into the concrete at the time of construction.

When sections of T-Lock are heat-welded together, a continuous plastic lining is formed which becomes a permanent part of the tank or structure.

Purpose

T-Lock for Tanks and Structures

Ameron T-Lock is normally delivered to the contractor in 4-foot by 8-foot sheets. (Special sized, factory pre-welded sheets are available on special order.) The sheets are flexible and are readily fit around corners and complex angles.

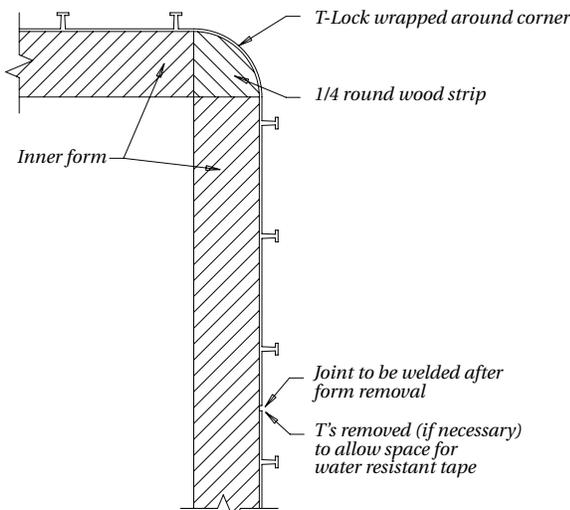
Shipping and Storage

Care must be taken in transporting, handling and storing Ameron T-Lock to prevent possible damage. After removing rolled sheets from their bundles, they should be stored flat and protected from contact with all sharp-edged objects. Care must also be taken in handling the sheets during cold weather since Ameron T-Lock becomes more rigid as temperatures decrease.

Application Instructions

To ensure complete success of an Ameron T-Lock lining installation, it is of prime importance that each step is performed in strict accordance with the following application instructions. Close inspection must be maintained throughout application of the sheets and during welding. Remember, the actual layout of T-Lock on the form can be accomplished in many ways. The procedures given here are only suggested guidelines.

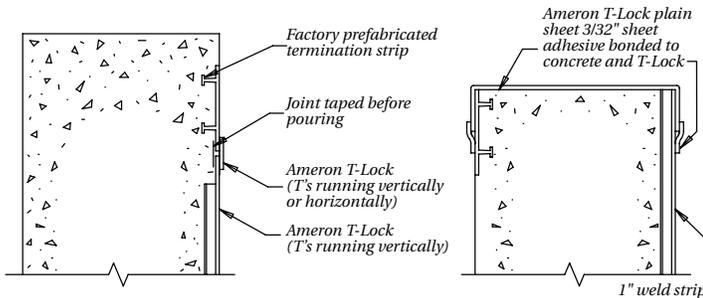
Application of T-Lock to Concrete Forms



Treatment of Vertical Corners—Plan View

1. The inner forms for the concrete structure should be made from plywood or good quality form lumber.
2. All slivers, nails or other sharp projections which might perforate the sheet must be removed.
3. All pipe, manhole rings or other metal inserts must be held solidly in place in the form.
4. Vertical corners must be true. The use of a 1/4-round wood strip or chamfer strip in corners is recommended to ensure a smooth corner rather than a sharp bend in the T-Lock sheet.
5. Steel forms may be used if provision is made for holding the T-Lock liner firmly in place or if steel strapping can be used.
6. The sheets are put in place with the smooth side next to the inner form and the T's on the outside so that they will embed into the concrete. In most instances, the sheets should be placed so that the T's run vertically.
7. Termination strips with two tees running horizontally shall be welded to the bottom edges of the vertical sheets. This attachment is the same method as shown on left detail, note #13.
8. T-Lock is applied to vertical corners first in such a manner that the sheet wraps around the corner and extends at least 1 foot along the forms on each side of the corner. The intention is to have no welds in vertical corners. The large, flat areas are then filled in with T-Lock, using full sheets wherever possible and planning the work to keep the amount of cutting and welding to a minimum.
9. T-Lock is then applied to the complex areas, such as around beams and wall openings, fitting and cutting where necessary. Where possible, the sheet should always be wrapped around corners to eliminate the necessity for outside or inside corner welds. In order to properly form the T-Lock around an outside corner, it may be necessary to notch or cut the T's to form a tight corner. Care should be taken to cut only the T and not to pierce the sheet itself.
10. All T-Lock sheets are either butted together or overlapped approximately 1/2 inch. The gap between the sheets shall not exceed 1/4 inch. Only the edges of the sheet are attached to the forms; 1-inch by 3/16-inch head stronghold nails are used for this purpose and are placed within 1/8 inch of the edge of the sheet. Use only as many nails as necessary to hold the sheet firmly in place. If done properly, the holes left by the nails when forms are stripped can be easily covered using the standard 1-inch weld strip.
11. The number of metal form ties must be kept to a minimum, and if at all possible, internally braced forms should be used. T-Lock sheet should be fixed to the forms before form ties are placed, since placement of the sheet will be extremely difficult if the form ties are already in place in the forms. All form ties must go through the sheet, keeping the holes made as small as possible.

12. All joints must be protected to prevent wet concrete from flowing under the sheet during pouring and vibrating. This may be accomplished either by welding an Ameron T-Lock weld strip to the “backs” (side against which concrete is to be poured) or by applying a water resistant pressure sensitive tape. (Gummed vinyl or polyethylene tape may be used for this purpose.) Tape should be applied only to flat sheet, not over the T’s. If the T’s are covered with tape, concrete cannot flow around them and anchorage of the sheet will be incomplete.
13. T-Lock may be terminated at the upper rim of an open tank by either of the two methods shown below. The method used will be determined by the end use of the tank and the severity of the chemical exposure.

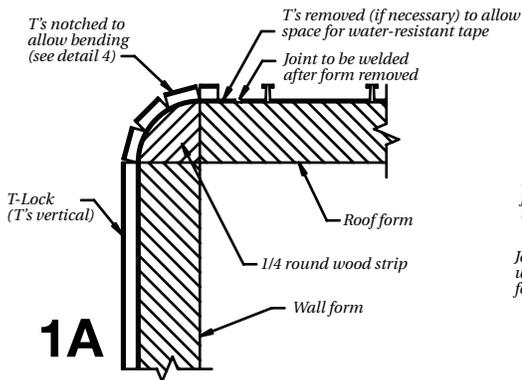


Methods of Terminating Ameron T-Lock at Upper Rim of Tank

14. Manhole or riser openings can be preformed of plywood and covered with T-Lock sheet before being set in place on the forms. The sheet is then joined by welding before the concrete is poured. It may be necessary to trim back some of the T’s in order to perform this welding.
15. The junction between wall and floor slab is a critical area in placing the T-Lock sheet. When forms are set on the floor slab and the T-Lock attached, care must be taken that the sheet meets the floor slab evenly and snugly. This will ensure a clean 90° angle between walls and floor and will prevent concrete leakage at the junction. If not done properly, it will be very difficult to make a sound joint between the wall and floor sheets.
16. When all sheets are placed and all welding and sealing is completed, the steel reinforcement may be put in place and the concrete poured.
17. Where the underside of a tank roof is to be T-Lock lined as well as the walls and floor, the sheet shall be carried around the corner between walls and roof. It is not practical to terminate the side and roof sheets at the junction of wall and roof and seal with inside corner weld strip due to the roughness normally found in concrete construction at this point. Whether the tank roof is poured with the walls, or whether the walls are poured first and the roof later, the same approach can be used. Where walls and roof are poured together, the T-Lock sheet is either carried up from the walls, around the corner between the roof and wall; or, from the roof, around the corner and down the wall (see drawings 1A and 1B). The welding is then done on either the underside of the roof or on the vertical wall, depending on which method is used. If the walls are poured first and the roof later, an extension of the T-Lock sheet on the walls is allowed to project approximately 12 inches beyond the termination of the wall pour (see drawing 2). When the roof forms are placed, this extension is

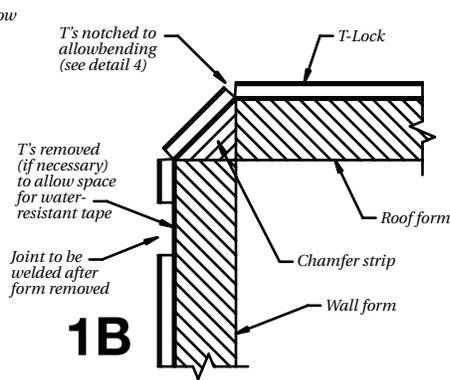
then bent around the corner and onto the roof forms. Additional T-Lock sheets are then placed on the roof forms as required and the joints covered with water resistant tape to prevent concrete leakage. All welding is performed after removal of forms. If the T’s are placed vertically in the walls, it may be necessary to cut or notch them at the 90° bend between wall and roof.

18. Metal inserts, such as steel pipe, which project through the form and are to be cast into the concrete, must be covered with T-Lock using the procedures described in Application of No. 19Y Adhesive System. The exact steps are as follows:
 - a. The smooth side of a piece of T-Lock is secured to the exterior of the insert with Ameron T-Lock No. 19Y adhesive system. T’s are trimmed back to leave a flap of approximately 1 1/2 inches protruding beyond the end of the insert.
 - b. One-inch weld strip is heat-welded over the butt joint (along the insert) by the method described in Welding of Ameron T-Lock.
 - c. If a hole can be cut in the form, a disc equal to the diameter of the insert is cut from both the main sheet of the T-Lock and the form, and the flap inserted through it. Next, water resistant tape is placed over the adjoining surfaces to prevent slurry from getting under the sheet. After the concrete has been poured and the forms removed, the flap is cleaned using Ameron T-Lock No 19Y thinner/cleaner. Projecting flap is softened by heating with hot air, flared back against the T-Lock sheet and heat sealed into the main sheet of T-lock with the hot air welding tool. Excess adhesive is then removed by scraping, and the joint is welded with 1-inch weld strip. If no hole can be cut in the form, the flap is softened by hot air and bent outward so that it will lie flat against the main sheet of T-Lock. (It may be necessary to cut away some of the T’s in the main sheet so that the insert can be placed flush against the sheet.) Next, the insert is fastened in position preparatory to pouring the concrete, and water resistant tape is placed over the adjoining surfaces to prevent slurry from getting under the sheet. Finally, after the forms are removed, a hole is cut in the sheet and the flap pieces are pulled through and folded back once more so that they are on top of the main sheet. The flap is then heat-softened, flared over the main sheet and heat sealed onto the main sheet of T-Lock with the hot air welding tool.
 - d. A final piece of 1-inch weld strip is then heat-fused over the joint between the flap and the main sheet. The extreme outer edge of the flap should be skived off at an angle with a “Red Devil” scraper in order to give a smooth contour for welding, taking care not to damage the sheet.
 - e. If for some reason the insert cannot be heat-softened and flared as outlined above, the flap may be slotted in four or five places so that it can be bent at an angle. The pie-shaped voids resulting from the slots made in the flap are then filled with wedge-shaped pieces of weld strip or Plain Sheet Ameron T-Lock, and additional pieces of weld strip are heat-fused over these joints.
19. The same procedure is followed for covering PVC and clay sewer pipe which projects through the form and is to be cast into concrete, except that it is not necessary to sandblast as for metal inserts.



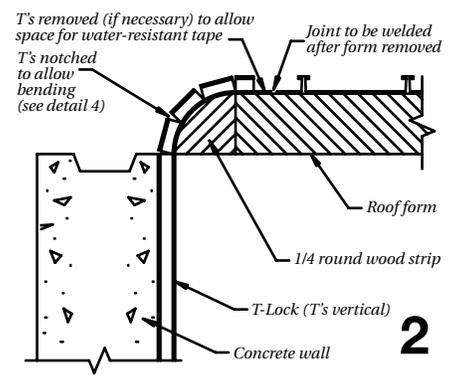
1A

Monolithic Pour Vertical Sheet Carried onto roof



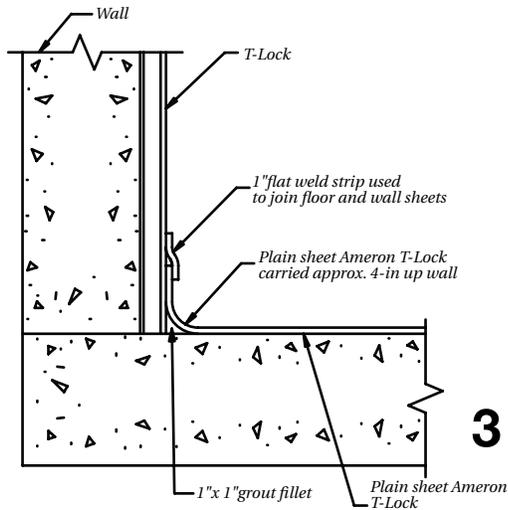
1B

Monolithic Pour Roof Sheets Carried onto Vertical Monolithic



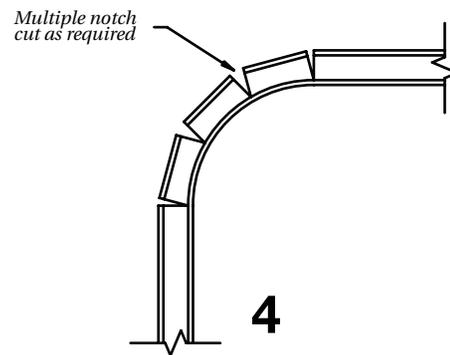
2

Walls Poured Before Roof



3

Sealing of Tank Floor to Tank Wall



4

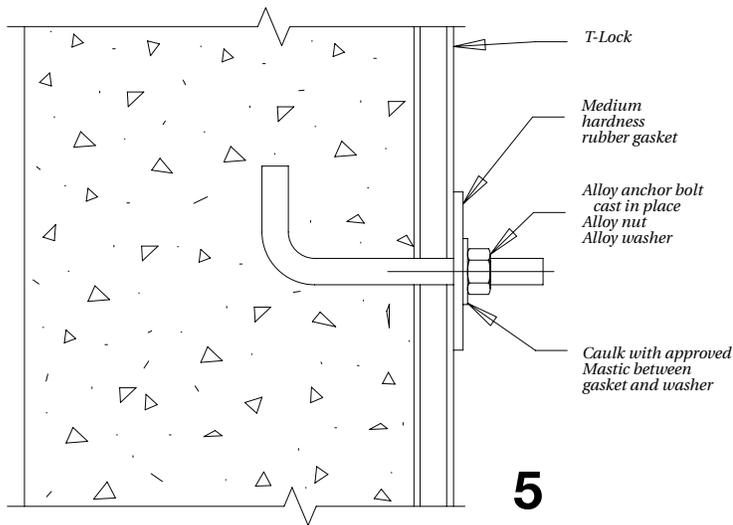
Notch Detail

Removal of Forms

1. The forms are removed by normal procedure, but care must be taken to protect the T-Lock from damage. Sharp instruments must not be used to pry the form from the T-Lock.
2. After all forms have been removed, any nails which still remain in the sheet must be pulled out. This can be done without tearing the liner if the sheet is firmly held down around the nailhead and the nail is bent sharply sideways with a pair of pliers.
3. All the form tie holes and any areas of damage in the liner must be marked with chalk before the stubs are broken off. When broken off, form tie rods or wires should not project beyond the surface of the concrete, and steel form tie washers should be removed. Sharp or pointed ends which occasionally result when form tie rods are broken off must be ground off or pounded flat, since under a hydrostatic load, these sharp points may puncture the T-Lock.
4. Small pits or voids in the concrete which may result when form tie rods are broken off need not be filled. However, voids larger than 3/4 inch in diameter or depth as well as holes left by the removal of tie rods should be grouted flush with cement grout.
5. All such damaged areas are later repaired by welding, as outlined in "Welding of Ameron T-Lock."

Application of Ameron T-Lock to Tank Bottoms

1. It is possible to install Ameron T-Lock into concrete floors by means of pressure-grouting. Or, floors requiring protection can be lined with Plain Sheet Ameron T-Lock (3/32 inch or 3/16 inch) using Ameron T-Lock No. 19Y adhesive system as directed in Application of No. 19Y Adhesive System. Floor sheets can also be mechanically attached using a Ram set or other similar device. Any mechanical fasteners must be sealed with an appropriate patching strip.
2. Another method to protect concrete floors is by the Arrow-Lock Sheet Lining system.
3. All welds between joints of Plain Sheet Ameron T-Lock on floors and between floor and wall sheets are made as directed in "Welding of Ameron T-Lock."
4. Floor sheets of Plain Sheet are laid using Ameron T-Lock No. 19Y adhesive with sheets butted. The gap between sheets shall not exceed 1/4 inch; lap joints are not satisfactory.
5. Floor sheets are carried up 4 inches over sheets on the side walls. The fit of the floor sheets into corners is particularly important; and, if properly done, will greatly simplify subsequent welding.
6. The final joint between wall and floor is made using 1-inch weld strip fused over the junction of the floor sheet and the T-Lock on the sidewall (see drawing 3).
7. Floor sheets can also be terminated at the sidewall.



Method of Installing Anchor Bolts for Brackets, Ladders, etc., through T-Lock Ameron T-Lock Lining

The final joint between the wall and floor is made by using 2" x 2" Angle Strip and 1" weld strip.

Application of No. 19Y Adhesive System

Ameron T-Lock No. 19Y adhesive is used to bond Plain Sheet Ameron T-Lock to itself and to metal or concrete surfaces. Metal or concrete must first be primed with Ameron T-Lock No. 19Y primer after recommended surface preparation. Mechanical fasteners are often required on Ameron T-Lock Plain Sheet to provide a more permanent bond with the 19Y on concrete surfaces.

Surface Preparation Concrete

Concrete surfaces must be clean, dry and free of previously applied coatings and disintegrated or chalky material. Form release agents, concrete curing compounds or hardeners must not be specified where cement grouting is to be applied. If such materials have already been employed, specific recommendations should be obtained of the manufacturer; otherwise, no assurance of a satisfactory job can be given.

Grouting Procedure

All concrete imperfections, such as water and air pockets in poured concrete surfaces, must be filled with cement-mortar grout as follows:

1. Smooth concrete surface, breaking down all rough protrusions.
2. Apply cement-mortar grout (2 parts fine sand and 1 part cement) by sacking or by working the grout into the surface with a hand stone.
3. Cure three days, keeping the surface damp at all times.
4. Lightly stone the cement-mortar grouted surface with a carborundum brick to remove any rough areas and to ensure a pore-free surface. Rough areas or pinholes in concrete allow penetration of—and corrosion by—chemical reagents.

Etching/Water Blasting

All concrete surfaces—original or cement-mortar grouted—should be acid-etched to remove glaze and concrete laitance.

1. Etch with a solution of 1 part hydrochloric (muriatic) acid and 2 parts clean water. Apply the acid solution to the concrete by brush or garden spray until the solution runs.

2. Concrete should be fully wetted with acid. It will bubble for 20-30 seconds and stop, at which point the acid is neutralized.
3. When etching is complete, wash the surface with clean water using a garden hose. Brush during washing with a stiff brush to remove concrete salts.
4. A properly etched surface should be slightly granular and free of glaze.
5. On very dense, machine-troweled surfaces, several applications of acid may be required to obtain proper "tooth," or a slightly granular surface.
6. Water blasting of all concrete surfaces for surface preparation and to remove glaze and laitance is an acceptable alternate method.
7. **Dry surface thoroughly.** A moist surface will not allow proper adhesion of the primer.

Metal

Metal surfaces (such as inlets and other tank accessories) must be sandblasted, leaving the surface free of all mill scale, rust, grease, old coatings, moisture or other impurities.

Sand Blasting Procedure

1. Use an air source with a minimum 200 cfm at 100 psi per blast nozzle.
2. Use a graded flint or silica sand, 16-30 mesh with 0% retained on 16-mesh screen, 100% retained on 30-mesh screen.
3. Maximum speed and most effective cleaning is obtained by systematic, even blasting. Block out work in 1-foot squares and blast evenly until the entire surface has been blasted.
4. Any weld spatter should be removed and all rough welds ground smooth.
5. When blasting is completed, the surface must be an even, gray-white color as defined by the Steel Structures Painting Council in "Surface Preparation Specification No. 5, Blast Cleaning to 'White' Metal." Blotchy surfaces indicate incomplete blasting and are not satisfactory.
6. Since blasted surfaces rust (oxidize) rapidly, apply No. 19Y primer as quickly as possible after blasting is complete (within three hours). Do not leave the bare metal surface unprotected overnight.

Equipment Required

1. Utility knife, or similar sharp knife, suitable for cutting Ameron T-Lock sheets.
2. Sharp putty knife—2-inch heavy blade.
3. High-quality, medium-length bristle brushes.
4. Infrared lamp or hot air blower.
5. Infrared lamp table—for heating the sheets.
6. Short-nap paint roller—for spreading the adhesive.
7. Four-inch hard rubber roller.
8. Leister Hot Air Welding Tool Model 1A, with Leister Nozzle, Model 30A1.
9. 110-volt extension cord.
10. Use a mixture of clean, warm water and detergent to clean Ameron T-Lock surfaces as needed.

Application of Ameron T-Lock No. 19Y Primer

1. After the metal or concrete surface has been properly prepared, it should be cleaned by dusting with a brush or clean cloth or by vacuuming.
2. Apply one coat of No. 19Y primer (at approximately 200 sq ft/gal.) to both the metal or concrete **and** the Ameron T-Lock Plain Sheet.
3. Allow to dry one hour minimum, seven days maximum (if protected from contamination) before applying the adhesive.

Application of No. 19Y Adhesive

1. Apply one coat of No. 19Y adhesive to both the primed metal or concrete and Ameron T-Lock sheet.
2. If thinning is required for workability, use only No. 19Y thinner/cleaner up to 1 pint/gal. of No. 19Y adhesive.
3. Coverage should be approximately 150 sq.ft/gal. Avoid local heavy spots, sags, runs or thin spots. One coat is generally sufficient.
4. Mating surfaces should be assembled in not less than 30 minutes and not more than 1 hour after application of the adhesive.
5. Should the prepared bonding surfaces dry to the point where they have insufficient bonding tack, apply a second coat of No. 19Y adhesive to each bonding surface.
6. If tack must be restored after a second coat of adhesive, the bonding surfaces may be reactivated by brushing with No. 19Y thinner/cleaner.

Application of Ameron T-Lock Sheets

Application will be facilitated by heating the sheets to approximately 110°-120°F (using infrared lamp) immediately before placing them in position. Care should be taken to avoid overexposure of the sheet to this temperature, or poor bonding may result.

1. Place one edge of the Ameron T-Lock sheet in position along the edge of the metal or concrete surface. Press down firmly, holding the remainder of the sheet up and away from the surface.
2. When the edge has been affixed, roll the remainder of the sheet into position (using a 4-inch hard rubber roller), taking care to avoid inclusion of air pockets.
3. After the sheet has been rolled into position, rub the surface vigorously with a soft cloth to press it firmly in place.

On Vertical Surfaces

On vertical surfaces application should be made from bottom to top, proceeding according to the above instructions for horizontal surfaces. Mechanical anchors are required when Ameron T-Lock plain sheets are installed on vertical surfaces.

Over Sharp Angles and Bends

Due to Ameron T-Lock's "plastic memory" (or tendency to revert to its original state), heat must be used to make the sheet conform to sharp angles or bends such as lips of tanks or flange returns. This is accomplished as follows:

1. Apply No. 19Y primer and adhesive to both mating surfaces as used in normal application.
2. Then, using hot air applied to the Ameron T-Lock, heat a 2-inch wide area, 1 inch along each side of the bend or angle.

Air temperature should be approximately 350 -400°F, or hot enough to make the heated area take on a high gloss and a soft, "chewing gum" consistency.

3. Immediately—while the heated area is still in a soft state—bend the Ameron T-Lock sheet firmly around the angled surface, stretching slightly (approximately 1/8 inch to each 2 inches) to destroy any "plastic memory." **Do not attempt to reform more than 4 to 8 inches at a time.**
4. Press the sheet into position by hand with a glove or cloth taking care to avoid inclusion of air pockets.
5. Hold the sheet taut until cool to the touch. The Ameron T-Lock sheet will then be reformed to conform permanently to the surface of the angle being covered.
6. Proceed to the next 4- to 8-inch section.

Welding of Ameron T-Lock

Individual Ameron T-Lock sheets are joined by fusing weld strip over the butt joints. On flat surfaces, use Ameron T-Lock flat weld strip. Where sheets join at corners of concrete structures, use Ameron T-Lock 2"x 2" strip with 1" weld strips. When sheets join at corners of steel tanks use inside corner weld strips. The procedure for using both types of weld strip is as follows:

1. Clean the areas of the sheets to be welded with water soluble cleaner such as Formula 409 or equal.
2. Adjust the hot air welding tool to approximately 500-600°F so that the effluent air will fuse the sheet and weld strip without charring.
3. Hold the welding tool approximately 1/4 inch from the surface to be welded at a 45° angle.
4. Move the welding tool back and forth across the intersection between the weld strip and the sheet, moving slowly enough to cause the sheet to appear wet or molten before the weld strip is pressed into place.
5. As the heat from the tool softens the sheet to the proper fusible condition, the weld strip should be moved continuously forward and pressed firmly onto the sheet while constant downward pressure is applied.
6. Pinholes may occur as a result of frequent stopping and restarting of this continuous welding process. To avoid this problem when restarting, care should be taken to pull back slightly on the weld strip to allow the welding tool to be directed upon the last section to be fused together.
7. When properly welded, a small bead of molten material will be visible along each edge of the strip. Note: Ameron T-Lock is permanently thermoplastic and may be re-welded at any time during its service life following the above procedures.

Testing

When installation and welding are complete, the entire lining and weld areas should be visually inspected and manually probed with a blunt instrument such as a putty knife and then should be tested with an approved electrical holiday detector (Tinker & Rasor, Model AP-W or equal) with the instrument set at a minimum of 20,000 volts. Any imperfections must be repaired before placing the lining in service.

Safety Information

Ameron T-Lock No. 19 primer, adhesive, and thinner/cleaner

Danger! Extremely flammable. Vapors may cause flash fire. Vapor harmful. May cause irritation. Contains ketones and petroleum distillates. Keep away from heat, sparks, and open flame. Vapors may ignite explosively. Vapors may spread long distances. Prevent buildup of vapors. Extinguish all pilot lights and turn off heaters, nonexplosion-proof electrical equipment and other sources of ignition during use and until all vapors are gone. Use only with adequate ventilation during application and drying. Avoid breathing of vapor. Avoid contact with eyes and skin. Excessive inhalation of vapor may cause headache, nausea, or dizziness. Use face protection, gloves and skin covering clothing to prevent contact. Keep container tightly closed and upright to prevent leakage when not in use.

Since improper use and handling of this product can be harmful to health and cause fire or explosion, consult U.S. Department of Labor Code of Federal Regulations Title 29 and applicable state and local regulations on safe practices in coating operations. Necessary safety equipment must be used and ventilation requirements carefully observed, especially in confined or enclosed spaces.

In case of fire—Blanket flames with dry chemical, carbon dioxide, or foam.

In case of spillage—Absorb and dispose of in accordance with local applicable regulations. Eliminate all sources of ignition.

First Aid—If affected by inhalation of vapor, remove to fresh air. If breathing is labored, start resuscitation and call physician. In case of skin contact, wash thoroughly with soap and water; for eyes, flush with plenty of water for at least 15 minutes and get medical attention.

If you do not completely understand these instructions or are unable to comply with them, do not use this product. Also refer to Ameron "Safety Precautions."

For industrial use only.

Ameron International Corporation is a multinational manufacturer of highly-engineered products and materials for the industrial, chemical, oil and construction markets. traded on the New York Stock Exchange (AMN), Ameron is a leading producer of high-performance coatings, fiberglass composite piping, concrete & steel pipe systems and specialized construction products. The company operates businesses in North America, South America, Europe, Australasia and Asia. It also participates in several joint-venture companies in the U.S., Saudi Arabia and Mexico.



Ameron Protective Lining Products

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Warranty

Ameron warrants its products to be free from defects in material and workmanship. Ameron's sole obligation and Buyer's exclusive remedy in connection with the products shall be limited, at Ameron's option, to either replacement of products not conforming to this Warranty or credit to Buyer's account in the invoiced amount of the nonconforming products. Any claim under this Warranty must be made by Buyer to Ameron in writing within five (5) days of Buyer's discovery of the claimed defect, but in no event later than the expiration of the applicable shelf life, or one year from the delivery date, whichever is earlier. Buyer's failure to notify Ameron of such nonconformance as required herein shall bar Buyer from recovery under this Warranty.

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