AMERON INTERNATIONAL
Protective Lining Products

Ameron T-Lock®

Concrete Pipe & Tunnels

Purpose

To line new concrete pipe and tunnels and rehabilitate old pipe and tunnels (T-HAB®) so as to provide long term corrosion protection against sewer gases and acids.

Description

Designed to become an integral part of concrete pipe and tunnels, 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 pipe or tunnel.

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.

Shipping and Storage

Care must be taken in transporting, handling and storing T-Lock Amer-Plate to prevent possible damage. After unrolling the sheets, 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 the sheet becomes more rigid as temperatures decrease.

Application of Ameron T-Lock to Pipe Form

1. The sheet is assembled on the form with the smooth side next to the interior pipe form while the form is in a vertical or horizontal position. Application methods will vary depending on the type of Ameron T-Lock sheet supplied. Sheet can be supplied in pipe sized flat rectangular shaped sheets, ready to be strapped onto the pipe form. Sheet can also be supplied in prefabricated pipe sized tubular shaped sheets, ready to lower onto your pipe form, whether the specifications call for 360° lining or less.
2. The form edges, ends and gate must be checked for sharp projections which might cause damage to the sheet during stripping.
3. If pipe sized flat sheets are used:

a. The sheet is wrapped around the form and “Signode” (or equal) steel strapping, 1/2-inch wide is placed in the strap channels provided on the sheet.

b. The steel strapping is drawn up with a strap-tightening tool so that the sheet is held snugly to the

form. Any wrinkles in the sheet must be removed before the clasps on the straps are locked.

4. If prefabricated pipe sized tubes are used, tube is lowered onto the form with a hoist or crane. A single strap may be placed around the top end to prevent concrete slurry from penetrating between the liner and the form.
5. Ameron T-Lock can be supplied in a tube even if the specified degree of lining is less than 360°. Detailed information regarding the manufacture and installation of tubes may be obtained through your Ameron representative.
6. After the sheet or tube is assembled on the form by either of the above methods, the steel reinforcing cage and exterior form are placed in the usual manner and the concrete placed.
7. The concrete must not be cured at a temperature higher than 150°F. in order to avoid damage to the Ameron T-Lock or tube.
8. The forms are stripped from the pipe. Care must be taken when removing the inner form so that no damage will occur to the sheet.
9. Any damage to the sheet during this operation must be repaired. This is done by welding a patch over the damaged area. See the section "Welding of Ameron T-Lock."

Turnbacks on Ameron T-Lock Lined Pipe

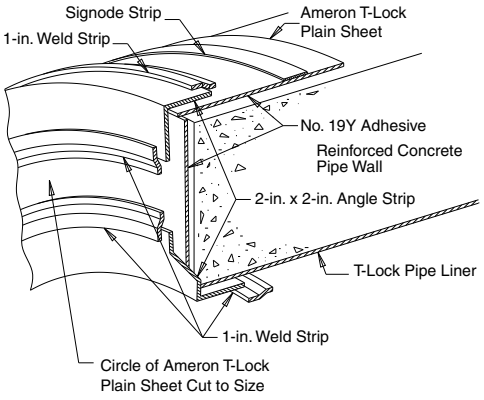
Wherever Ameron T-Lock lined pipe joins an unlined structure or whenever required by the plans or specifications, a turnback must be made to protect the end of the concrete pipe. Such turnbacks must be made on pipe sections cast with a flat surface on the end that joins the structure. Turnbacks can be constructed in the field using Ameron T-Lock Plain Sheet and accessory items.

Field Joints for Ameron T-Lock Lined Pipe

1. If required, the inside joint may be filled and carefully pointed with mortar in such a manner that the mortar is brought out flush with the adjacent pipe surfaces. These joints must be allowed to cure for at least 48 hours.

2. Where groundwater is encountered, the lining joints must not be welded until pumping has been discontinued and no visible leakage is evident at the joint.

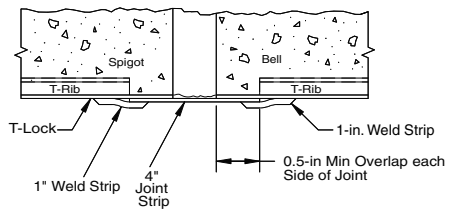
3. No welding of joints is to be started until after the trench has been backfilled and flooded. Joints must be dry before welding.



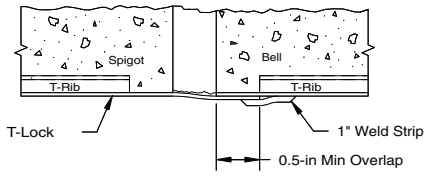
Schematic View of Field Fabricated Turnback

4. All mortar and other foreign materials must be removed from sheet lining surfaces adjacent to the joint, leaving them clean, dry and free from dust.
5. The joint flap or joint strip must overlap the adjacent lining by at least 0.5 inch.
6. In Type P-1 field joints, the 4-inch joint strips shall be heat-sealed to the lining on both sides and then fuse-welded on both edges to the liner with 1-in. weld strip.

Type P-1



Type P-2



Schematic Cross Section of T-Lock Field Joints

7. In Type P-2 field joints, the joint flap shall be heat-sealed to the lining and then fuse-welded on the edge to the liner with 1-in. weld strip.

Application of Ameron T-Lock to Tunnels Including Rehabilitation of Old Tunnels (T-HAB)

Ameron T-Lock may be installed without difficulty in tunnels or other areas where working space is limited. Sheets are manufactured to the required circumferential dimension to achieve the specified degree of lining. The length of tunnel sheets should match the form length. Joints between sheets are usually made by overlapping one section of sheet over another, allowing a simple weld to be used to form a continuous lining after the forms have been removed.

Application of Ameron T-Lock to Tunnel Forms

1. Form edges, gates and hinges should be inspected for sharp projections to ensure that the sheet will not be damaged.
2. To facilitate installation to the tunnel form, sheets can be supplied with straps already attached. The sheet can also be rolled from each side toward the middle, in effect making a double roll.
3. The sheet is placed on top of the tunnel form with the tees running parallel to the length of the tunnel. The sheet is then unrolled down from the center over each side of the form.
4. The joint between sheets is overlapped approximately 1 inch and a steel strap is placed directly over the overlap.
5. All straps are pulled tight, making sure that the sheet is secure and smooth on the form.
6. The concrete is then placed by pumping, pressure grouting or pouring.
7. Forms may be removed following the initial cure of concrete.
8. Any damage to the sheet during these operations must be repaired. This is done by welding a patch over the damaged area.

Welding of Joints Between Ameron T-Lock Sheets

The lapped joint between sheets in tunnels must be thoroughly dry and free from any dirt, mortar or other extraneous material. One-inch weld strip must be heat-welded over the lapped joint, fusing the two sheets. The overlapped joint is similar to the P-2 joint shown in the schematic diagrams of field joints for pipe. For details of welding, see the section "Welding of Ameron T-Lock."

Welding of Ameron T-Lock

1. Clean the areas of the Amer- Plate sheets and weld strip prior to welding. Use a nonflammable, water soluble or dispersible cleaner such as Formula 409, or equal. wipe dry.
2. Adjust the welding tool to provide a hot air temperature of approximately 500°F. The welding tool should be equipped with a 1-inch wide slotted nozzle.
3. Hold the welding tool in one hand at a 45° angle to the sheet surface. Holding the weld strip in the other hand, position it over the joint to be welded. See Note No. 6 for guidelines on weld strip positioning.
4. Move the welding tool in a fanning motion back and forth across the intersection of the weld strip and the sheet. The tip of the nozzle should be not more than 1/4 inch from the intersection as you fan it back and forth.

CAUTION - Use good quality gloves to avoid burning fingers when welding.

5. The hot air will cause the weld strip and sheet to soften, become tacky and appear to be wet or glossy. When this occurs, press the weld strip firmly downward toward the sheet. A small bead of molten material will form in front of and on each side of the weld strip.
6. When welding butt joints, keep the weld strip centered over the joint seams as the weld progresses. When welding lap joints, position the weld strip slightly off-center to provide more fusing on the bottom sheet than on the top sheet.
7. When properly welded, a small bead of molten material should be visible and continuous along each edge of the weld strip.
8. When welding Ameron T-Lock attached to concrete, apply the major portion of the heat to the base sheet in order to get proper fusion of the weld strip to the sheet.

Testing

When installing 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 tested with an approved electrical holiday detector (Tinker & Razor, Model No. AP-W with power-pak or equal) with the instrument set at 18,000 to 22,000 volts. Any imperfections must be repaired before placing the lining in service.

Safety

Fumes emitted during the weld ing of Ameron T-Lock have been tested as non-toxic. However, it is important to provide proper ven tilation to move fumes away from the welder, and proper venting and exhaust to remove fumes from confined areas to avoid any poten tial health risks. If proper ventila tion cannot be attained, the use of respirator protection is recommend ed. See "Safety Precautions" Sheet.

Consult Code of Federal Regulations Title 79, Labor parts 1910, 1915 and 1916 concerning occupational safety and health standards and regulations, as well as any other applicable federal, state and local regulations on safe practices during, coating and lining operations.

Warranty

Ameron warrants that this product conforms to the specific description in Ameron trade literature as to character and quality of raw materials, workmanship and adaptability for recommended use. Within one year from date of purchase, Ameron shall supply replacement material for this product or any portion thereof, or at its option equivalent material, F.O.B. Ameron manufacturing facility, if it fails to meet the foregoing warranty, provided that installation and application of the product have been properly accomplished and that Ameron has been promptly notified of the defect.

The preceding constitutes the sole remedy of the Buyer and the sole liability of Ameron for product defect.

No other express or implied warranties, whether of merchantability or of fitness for any particular purpose or use, shall apply. Ameron shall not be responsible for consequential damages.

Ameron's Standard Terms and Conditions of Sale apply to purchase of this product.

This product data sheet and the recommendations for usage it contains were based on test data believed to be reliable, and are intended for use by personnel having skill and know-how, at their own discretion and risk, in accordance with current industry practice and normal operating conditions. Variation in environment, changes in operating procedures or extrapolation of data may cause unsatisfactory results. **Since we have no control over the conditions or service, we expressly disclaim responsibility for the results obtained or for any consequential or incidental effects of any kind. Also refer to Ameron "Safety Precautions," and Ameron International Corporation—Terms and Conditions of Sale.**

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Ameron Protective Lining Products
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Ameron Protective Lining Products
201 North Berry Street • P.O. Box 1629 • Brea, California 92822-1629 • 714/256-7755 • Fax 714/256-7750

E-mail: t-lock@ameron.com • www.amerontlock.com