

PIPE FUSION MACHINE

User's Guide & Safety Manual

REVISION 1.0 • 11.01.02



Important Safety Instructions



This symbol calls attention to important safety instructions which, if not followed, could result in serious personal injury or death.

Read, understand and observe all safety information and instructions in this manual, and on safety decals on the Pipe Fusion Machine before using it. For safety reasons, read the operator's manual carefully and exercise caution while using the Pipe Fusion Machine. Please note specific safety requirements as explained by procedures called out in this manual. Failure to follow these instructions could result in serious personal injury or death.

All tools, materials and equipment manufactured and supplied by TT Technologies, Inc. are designed to be used by qualified and trained personnel only. TT Technologies, Inc. will not be held liable for any injury or damage to either people or property resulting from the misuse of TT Technologies equipment.

Please save this user's guide for future reference and have it available to all operating personnel. Personnel should thoroughly read this operating manual.

Favor de leer y comprender todas las instrucciones de operación y seguridad antes de usar la máquina. Si Ud. no comprende las instrucciones favor de consultarle a su jefe.



SAVE THESE INSTRUCTIONS

Follow all safety instructions concerning safety and possible danger.

Do not modify or remove the safety devices or warning labels of this machine. Keep all labels regarding safety and possible danger on the machine in good, readable condition. Special care is required before and during the safety check.

Every crewmember should fully understand the safety measures required for the operation and should be capable of following these regulations individually.

This Pipe Fusion Machine is manufactured to the current technical safety-relevant regulations. Nevertheless, the use of the machine may represent a danger to the health and life of users or third parties. Always ensure that you pay particular attention to warnings, safety labels and instructions.

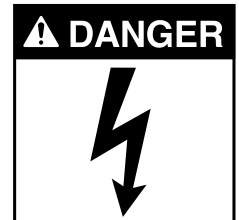


Read Operator's Manual

Before starting the machine, fulfill all safety related requirements. All personnel should thoroughly read this operating manual.

Follow all safety instructions concerning safety and possible danger. Do not modify or remove the safety devices or warning labels of this machine. Keep all labels regarding safety and possible danger on the machine in good, readable condition. Special care is required before and during the safety check.

Every crew member should fully understand the safety measures required for the operation and should be capable of following these regulations individually.



Electrical Equipment is Hazardous.

Train personnel to use basic safety precautions. Misuse can result in serious personal injury or death.



No Loose Clothes

Do not wear loose clothes or long hair. Danger of body injury by loose clothes or hair being caught in the moving parts of the machine.

Safety Equipment

The operating crew should always wear the appropriate safety equipment, i.e., safety shoes/boots, hard hat, safety glasses, gloves, ear protection etc.



Operation by Qualified Personnel Only

Operation of the Pipe Fusion Machine should be carried out by suitably trained, qualified, and certified personnel only. New operators or operators in training should be working under the constant supervision of a qualified person. Personnel operating the Pipe Fusion Machine should have sufficiently studied the operating manual.



Skin Burning Warning

The heat iron can be extremely hot. Do not touch as burns may result.

Sharp Edges

Facer tool contains blades with sharp edges. To avoid injury, make sure power is off and blades have stopped completely before handling. Do not pick up facer by the feet or cord.



SAVE THESE INSTRUCTIONS

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NO WARRANTY AS TO MANUAL

TT Technologies makes no warranty that the information provided in this manual is complete, accurate in all respects, or up to date. This manual should be used as a reference. Each particular situation is different. The user is responsible for providing the expertise and skill necessary to properly execute a given job. TT Technologies specifically disclaims all express or implied warranties concerning this manual, including the implied warranties of merchantability and fitness. In no event shall TT Technologies be liable for consequential, special or incidental damages or contingent liabilities (including, without limitation, lost profits or goodwill, whether such claim arises in tort, contract, negligence, strict liability or any other basis) arising in any way out of the use of this manual.

LIMITED WARRANTY AS TO PRODUCTS

TT provides a limited warranty to the original purchaser of its new products that new products will be free from defects in materials and workmanship for 90 days or 500 hours of actual use, whichever occurs first, provided they are properly maintained serviced and used for the intended purpose of the product. During the 90 day or 500 hours period, buyer's remedies are limited to repair or replacement, at TT Technologies' discretion.

TT Technologies makes no other warranty, express or implied, and makes no warranty of merchantability or fitness for any particular purpose. No person, representative or agent of TT Technologies has the authority to change this warranty in any manner whatsoever. Any oral or written statements inconsistent with this limited warranty shall not apply.

In no event shall TT Technologies be liable for consequential, special or incidental damages or contingent liabilities (including, without limitation, lost profits or goodwill, whether such claim arises in tort, contract, negligence, strict liability or any other basis) arising in any way out of the use of any product or any parts thereof.

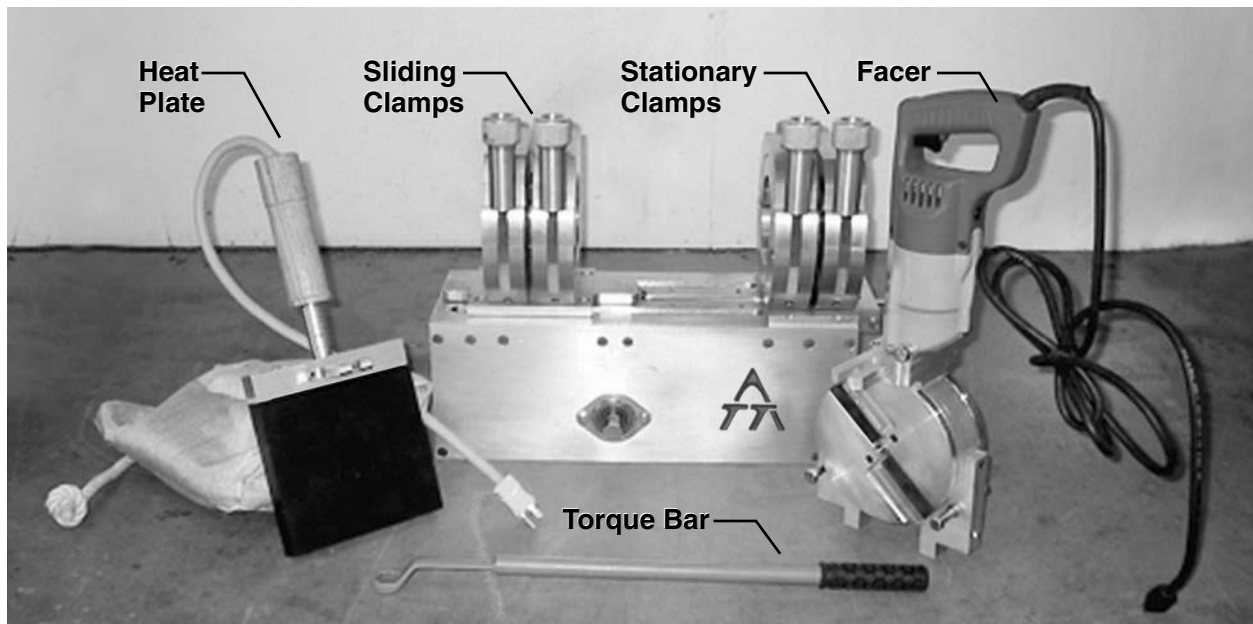
General Information

A. ABOUT TT TECHNOLOGIES, INC.

For more than 40 years, TT Technologies has been a leader in trenchless replacement systems. Today, with more than 200 patents worldwide, TT Technologies' tools are used in trenchless applications ranging from pipe pulling, pipe bursting, slip-lining, directional drilling, and pipe ramming.

As with all construction operations, safe operational procedures must be observed. The safety alert symbol is used in this manual to advise you of the potential to bodily injury or death.

B. PIPE FUSION MACHINE COMPONENTS



Preparation

A. SITE PREPARATION

Clean inside and outside of both ends of pipes to be fused a minimum of 1 foot or 300 mm from the pipe ends, with a clean dry lint free cloth.

Insure that all equipment is clean and in good operating condition.

Plug approved heating iron into 120-volt service and place into heat bag.

Install appropriate pipe clamp inserts for the specific pipe size to be joined.

Pipe Fusion Procedure

3.

A. SECURE PIPE SECTIONS

Insert the longer length of pipe into the stationary clamps and tighten down with the lockdown knobs. $\frac{3}{4}$ -inch to 1-inch of the pipe should protrude from the clamps for facing.

Note: *The other section of the pipe may need to be supported to ensure proper alignment.*

Insert the other pipe to be fused into the sliding clamp with $\frac{3}{4}$ -inch to 1-inch protruding. Tighten down the locking knobs. This pipe needs to be able to slide freely for fusion. (Figure 1)

Note: *Make sure both pipes are properly supported, level and in alignment to achieve a quality pipe fusion.*

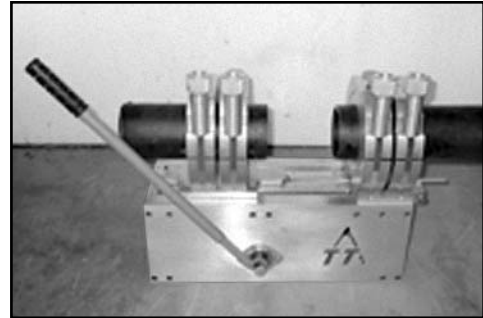


Figure 1.

B. PIPE FACING

1. Place facer onto fusion machine between pipe ends. Do not pick up facer tool by the cord. The facer feet will fit into lower slot grooves and the pipe clamps will support facer bracket. The facer will be held in alignment by the pins mounted on top of the clamps. (Figure 2)

2. Once in position, start facer. Bring the pipe ends together using the torque rod. (Figure 3) When ribbons of faced pipe begin to build up, stop facer tool, retract pipes and clean ribbons from facing area. Continue facing until the limiting stops have made contact to the clamps.



Important: Do not put excessive force on the feed against the facer tool.

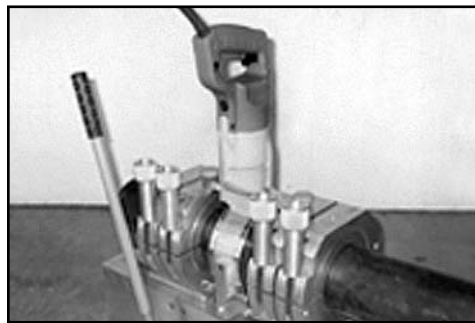


Figure 2.

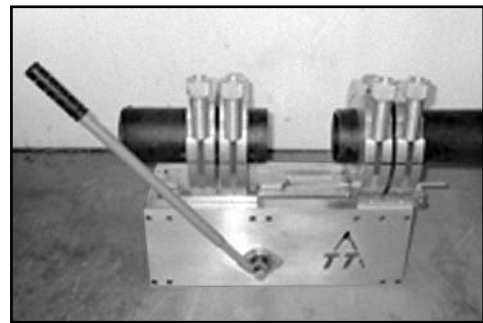


Figure 3.

WARNING: Facer tool contains blades with sharp edges. To avoid injury, make sure power is off and blades have stopped completely before handling.

3. When the trimming operation is completed, remove the facer tool and all shavings from the work area. Bring the pipe ends together by using the torque bar and inspect the joint area for alignment, gaps and uneven areas. Alignment may be fine-tuned by tightening the clamp lock down knobs. Gaps between pipe ends indicate further facing is required to square pipes up to each other and the operator should reinsert the facer and repeat the facing operation.



Important: Do not touch newly faced pipe ends with hands or any foreign objects that could contaminate the fusion surfaces.



C. PIPE FUSION

1. Check the heat iron temperature. The gauge should read 500° F (+/- 10° F). Move the sliding clamp with the torque bar and carefully place the heating iron between the pipe ends so that the bracket on the heating iron fits on the pins on top of the clamps. Do not pick up heating iron by the cord. (Figure 4)

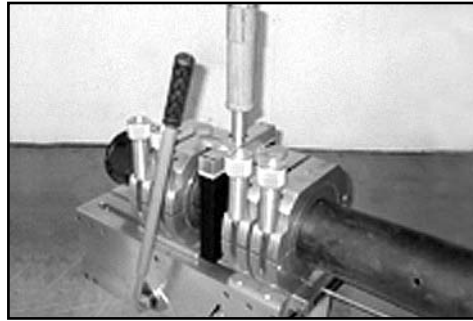


Figure 4.

Important: Be careful not to touch the pipe ends with the heating iron before the iron is in proper position.

Note: Some types of pipe may require a fusion temperature of 340° F–425° F. Consult your pipe manufacturer's specifications and adjust the heating iron.



2. Bring the pipe ends together against the heating iron with the torque wrench. Use only sufficient force to produce a small bead of melt material around the circumference of the pipe ends.

Note: Excessive force can push the melting bead away from the joint area.

3. Once the initial melt bead has formed, reduce the pressure and begin timing the heat cycle according to the specified times given by your utility or pipe manufacturer. During the heat cycle only apply light pressure to the torque bar, sufficient to maintain contact between the butt ends of the pipe and the heat plate.

Note: Visual observation should be used in conjunction with the recommended heat cycle times and fusion pressures to obtain a consistent, proper pipe fusion joint. Weather conditions can become a factor in changes of your heat cycle times

4. Move torque bar towards the sliding clamps in a snapping motion to separate the pipe end from the heater face and remove heat iron from fusion machine. Place the heating iron safely back into heat bag. Immediately bring the pipe end together by moving the torque bar toward the stationary clamps to form a double roll back bead joint area.

WARNING: The heat iron can be extremely hot. Do not touch as burns may result.



5. Continue pressure until complete roll back of melt bead is obtained on both sides of the pipe. Engage pipe lock to hold pressure on jointed pipes. (Figure 5) Maintain this pressure for the recommended cooling times as outlined by the pipe manufacturer.

6. After completing the required cooling cycle in the butt fusion machine, release the clamps and the machine from the pipe. Inspect the joint for a uniform, double roll back bead. Allow 5 to 15 minutes for the pipe to cool further (depending on pipe SDR and diameter) to ambient temperature before subjecting the joint to high bending stresses, pressure testing, burying, or rough handling.

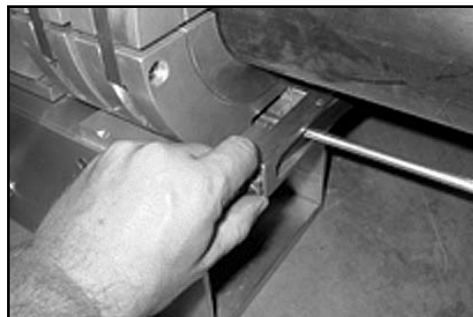


Figure 5.



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