

SECTION FOUR: INSTALLATION

ENFUSION HAND HELD CONTROL UNIT

The IPEX Enfusion hand held control unit is supplied with a 33 ft (10m) output lead and a hand held control unit weighing approximately 2.2lbs (1kg). The hand held unit, along with the fusion processor, are stored in a durable plastic case for easy handling and transport.

Introduction

Proper installation is key to producing a reliable and long lasting acid waste system. If the installation is not done correctly, the system will not perform well and may actually fail.



Standard Enfield Electrofusion

To ensure professional installation, make sure all installers have undergone training by IPEX in the correct handling, joining and installation methods of IPEX thermoplastic products.

Enfield fittings are manufactured with an integral resistance wire, molded in place using a proprietary manufacturing process. The wire is electrically heated by means of a microprocessor controlled Enfusion Control Unit. This results in fusion and bonding of the pipe to the fitting. A permanent joint is achieved within minutes.



The Enfield joint achieves the optimum level of performance where it matters most — at the fitting socket / pipe spigot interface. There is a controlled fit, controlled temperature and controlled time. All of this is achieved by means of the Enfusion Control Unit, which ensures proper electrical connections, joint timing and input/output current levels. The combination of these features provides both simplicity of jointing and perfect control. The result is an unparalleled level of joint repeatability.

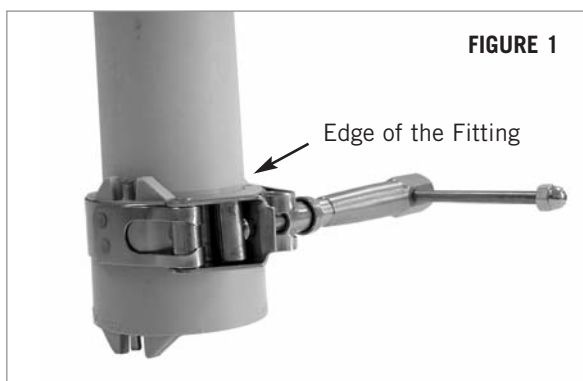
Job Site Precautions

1. Do not use unit in a gaseous environment as there is a **RISK OF EXPLOSION.**
2. The unit is a Class 1 device, and must be used with a grounded power supply.
3. Only use a hydrostatic test on the system.
TESTING WITH AIR IS DANGEROUS FOR A POLYPROPYLENE (PP) ACID WASTE SYSTEM.
4. Store pipe and fittings out of direct sunlight. If material is stored outside, it should be covered with a light colored opaque tarp. If the ambient temperature exceeds 100°F (37°C), make provisions to allow air to circulate beneath the tarp.
5. Handle the Enfusion Hand Held machine carefully.
DO NOT TAMPER! Call your IPEX representative for machine service.
6. **DO NOT MIX BRANDS.** Good joints can only be made using Enfield pipe, fittings and clamps. Mixing brands voids all warranties.
7. Software version V1.19 on the handheld Enfusion control unit will automatically adjust the fusion cycle time to the ambient temperature. The pipe, fittings and Enfusion control unit processor must all be allowed to acclimatise to the same temperature.

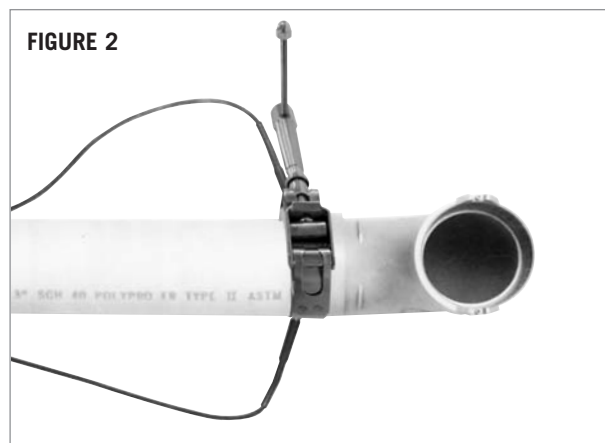
INSTALLATION

Before making the Enfield joint, it is important to check with an RMS meter, that the power source is providing between 96 and 162 volts @ 40 to 70 cycles with 11-amp capacity. The Enfusion hand held control unit provides for normal power variations, however generators should be checked to assure the correct output is always being provided.

1. Completely unwind all cables from the Enfusion hand held machine's case before use.
2. Using a suitable mitre saw/chop saw or tube cutter designed for plastic, cut the pipe square making sure to remove all burrs and loose material. **Do not chamfer.**
3. Using 60-grit emery cloth, prepare the end of the pipe by removing dirt and oil (important to obtain a good bonding surface) and roughing up an area equal to 1.5 times the fitting's socket depth. Clean the roughed up area with ethyl or isopropyl alcohol to ensure complete removal of grease and residue. **Once treated do not handle this area of the pipe or allow it to get dirty.**
4. Insert the pipe all the way to the stop at the bottom of the socket of the fitting.
5. Decide whether single or multiple joints are being made. In case of multiple joints consult the "Multiple Joints Fusion" section that follows for cable connections and maximum allowable number of simultaneous joints.
6. Loosely fit IPEX-supplied clamp(s) only over the hub(s) of the socket(s) to be fused (Figure 1).
7. Tighten the clamp(s). A tight clamp is essential to the quality of the joint. It should not be possible to rotate the pipe inside the fitting socket when the clamp is fully tightened.
8. Turn the Enfusion hand held control unit on and observe the copyright message and the software version being displayed as the machine runs a self-diagnostic test.
9. Following the "CONNECT LEADS AND FITTINGS" instruction on the display, connect the output leads (Figure 2). If required, connect link cable for multiple fusions.



Note: The clamp should be positioned flush with the edge of the fitting. The clamp must be tightened sufficiently to prevent the pipe from rotating inside the fitting. Wheel handle clamps should not be used.



IPEX has developed a revision to its fusion machine software. Your machine will display the software version upon start up, the most recent version being V1.19 (2014). This revision removes the need to select a size range, and automatically adjusts the fusion time based on ambient temperature. Allow time for the machine pipe and couplings to acclimatise.

10. With software UPDATE V1.19 (2014)

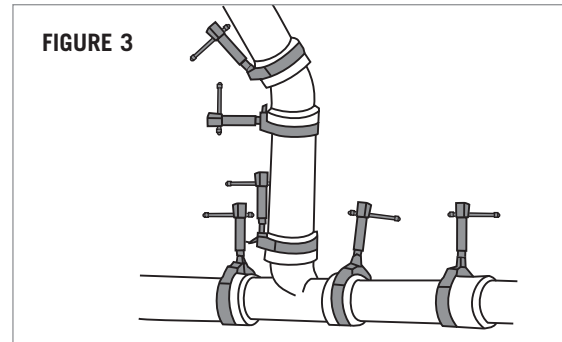
Once the leads are connected and you are ready to begin the fusion process. The machine will automatically check to ensure a connection is present and measure the ambient air temperature to set the fusion time.

Without software UPDATE

Machines that have NOT been updated will require you to "SELECT SIZE". IPEX recommends the use of the 3" to 12" size range for all fittings regardless of size. (example: 1.5" fittings should use the 3" to 12" selection)

11. To begin the fusion cycle press START. Time will begin to count down to zero.
12. Upon completion of the fusion cycle an audible alarm will sound and the message "WELD COMPLETE DISCONNECT LEADS" will be displayed. A 30 second rest period must be observed to allow the joint(s) to cool before disconnecting the leads. The Enfusion machine will automatically reset, ready for the next operation.

13. Allow five additional minutes before removing the clamps so that the joint can sufficiently cool and properly cure.



Note: If leads are accidentally disconnected during the fusion process "Reconnect Lead & Press Start" will appear and a 120 second countdown will begin on the Enfusion hand held control unit. Reconnect leads and press START to continue the fusion cycle fusion.

If leads are reconnected during the countdown, the fusion machine will automatically assess how long the fusion cycle must be depending on how long the leads have been disconnected. If the leads are not reconnected during the countdown the machine will sound an audible alarm and restart the fusion cycle time. Prior to re-fusing, 1-1/2" – 3" fittings should cool for 5 minutes and 4" – 12" fittings should cool for 7 minutes. The Enfusion Control Unit should be reset by shutting it off and following instructions from step 8 onwards.



V1.19 Enfusion Hand Held Control Unit

To obtain V1.19 on your hand held, please contact an IPEX representative.

L2600 (Old Style Machine) Software UPDATE

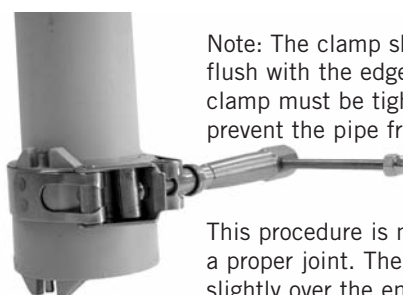
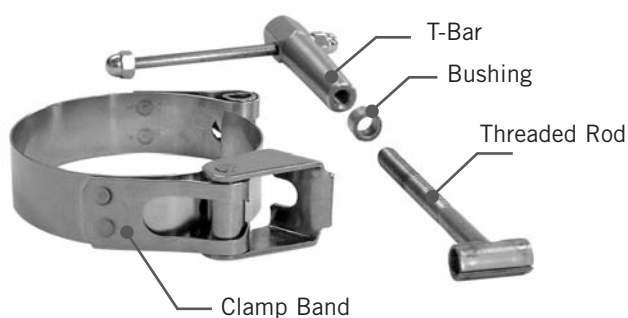


This machine cannot be reprogrammed with the software update mentioned above. Due to the age of the machine and its components IPEX can no longer support updates to the machine's components or software.

Note: It is recommended that you replace these (L2600) machines with newer models. Until such time that a machine can be purchased, all joints regardless of size must be fused using the 4" size selection. Contact your local IPEX representative.

SS T-Bar Handle Joint Hub Clamp for use during fusion of Enfield® electrofusion joints

- Redesigned T-bar handle for greater ease of use. (more efficient transfer of torque)
- Reduces the torque required to tighten the fitting on the pipe.
- Oil impregnated bushing reduces friction and resulting worker fatigue from repetitive tightening.
- Easy replacement of friction reducing bushings.
- Part of the IPEX Enfield® corrosive waste system of pipe, fittings and accessories.
- Replacement oil impregnated bushings available.
- Enfield® components should only be joined using Enfield® Electrofusion Control Units.
- IPEX components are dimensionally matched; do not install system of mixed brands without our express written consent.



Note: The clamp should be positioned flush with the edge of the fitting. The clamp must be tightened sufficiently to prevent the pipe from rotating inside the fitting.

This procedure is necessary to complete a proper joint. The clamp may hang slightly over the end of the hub on certain fittings. If this occurs, please ensure that the fusion leads do not come into contact with the clamp.

Enfield® Electrofusion Joint Hub Clamp with New SS T-Bar Handle

Size (in)	Product Codes	Significant No.
1-1/2	257254	L26101
2	257256	L26102
3	257257	L26103
4	257258	L26104
6	257259	L26106
8	257260	L26108
10	257255	L261010
12	257262	L261012



Replacement Oil Impregnated Brass Bushings – Replace as Needed

Clamp Size (in)	Product Code	Significant No.
1-1/2 - 12	257094	L2610B

Stainless Steel T-Bar Handle for Hub Clamp*

Clamp Size (in)	Product Code	Significant No.
1-1/2 - 12	257125	L2610T



* To retrofit previously available black plastic wheel handles supplied on Enfield® Hub Clamps

MULTIPLE JOINT FUSION

Enfield Fusion Times

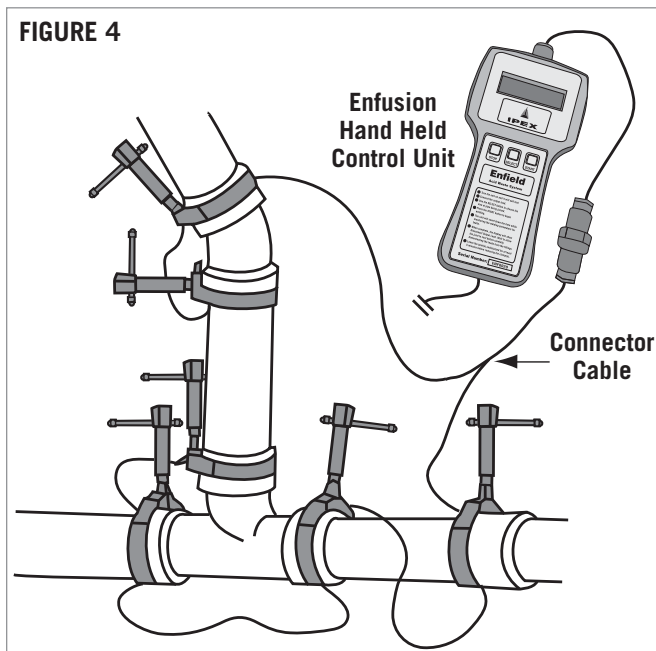
With the update to the fusion machine software (V1.19, 2014), fusion times are now standard across all sizes. Fusion times will however vary based on the ambient air temperature. As the temperature goes up the fusion time will go down, conversely, as the temperature goes down the time will go up. As a reference: at 73°F (23°C) the fusion time is 125 seconds.

The chart indicates the number of joints for each side that can be fused at one time.

Maximum Allowable Joints Per Size

Pipe Size (inches)	1-1/2	2	3	4	6	8	10	12
Max # of joints	8	6	4	3	2	1	1	1

Attach the connector leads and link cable leads to fitting terminals as shown in Figure 4. **The link cables should be connected in series.** Follow the fusion procedure, as outlined in steps 1-13, to complete the multiple fusion.



Note: Each joint being fused must have an IPEX T-Bar clamp flush with the other edge of the socket as shown previously in Figure 1.

Multiple Joints Across Different Sizes

With the update to the fusion machine software (V1.19, 2014), fusion times are now standard across all sizes, as such the combination of different size fittings that can be fused at the same time is much less restricted.

Any number of fittings or combination of sizes is now possible, provided that when you add the joint diameter sizes up – the total does not exceed 12.

Example A

$$1 \times 8" \text{ and } 1 \times 4" = 12. \quad \checkmark$$

Therefore one 8" fusion joint and one 4" fusion joint **could** be done at the same time.

Example B

$$1 \times 8" \text{ and } 2 \times 3" = 14. \quad \times$$

Therefore one 8" fusion joint and two 3" fusion joints **could not** be done at the same time.

Example C

$$2 \times 1.5" \text{ and } 2 \times 4" = 11. \quad \checkmark$$

Therefore two 1.5" fusion joints and two 4" fusion joints **could** be done at the same time.

Example D

$$1 \times 2" \text{ and } 2 \times 6" = 14. \quad \times$$

Therefore one 2" fusion joint and two 6" fusion joints **could not** be done at the same time.

NOTES

FAULT CODE ANALYSIS

FAULT NUMBER AND CODE		ACTION
0	WELD OK	No Fault, weld completed OK.
1	STUCK BUTTON ON START UP	This fault shows when the power is first switched on. Either the Stop, Start, or a keypad button is stuck in. Free the button to clear the fault.
2	OUTPUT FAULT BEFORE WELD START	This fault shows when the power is first switched on. The unit will check the output relay to make sure it is working correctly. If this fault happens, then the internal power relays have pulled in to the closed position. Return unit for service.
4	NO CALIBRATION	This fault happens when the unit has no calibration. This normally not show, and if the unit has been calibrated, would be caused by a fault with the internal memory. Return unit for service.
7	AMBIENT TEMPERATURE TOO HIGH	If this ambient is measured at over +50°C (122°F) then this fault will show.
8	AMBIENT TEMPERATURE TOO LOW	If the ambient is measured at below -20°C (-4°F) then this fault will show.
9	AMBIENT TEMPERATURE FAULT	This fault is shown if the temperature is measured as less than -100°C (-148°F) or more than +100°C (212°F). This effectively means a short circuit or open circuit sensor.
10	LOW SUPPLY FREQUENCY <40HZ	The unit has detected that the supply frequency is below 40 Hz. This will normally be caused by a poor quality generator. If this fault happens, then check the supply or change the generator.
11	HIGH SUPPLY FREQUENCY >70HZ	The unit has detected that the supply frequency is above 70 Hz. This will normally be caused by a poor quality generator. If this fault happens, then check the supply or change the generator.
12	HI SUPPLY VOLTAGE >140V	The unit has detected that the supply voltage is more than 140 volts. Check the supply voltage and if necessary use a different generator.
13	LOW SUPPLY VOLTAGE <95V	This fault can be caused by a few problems. It could be that the generator is running slowly and so the supply voltage is low. Try speeding the generator up or use a different generator. It could also be caused by a generator that is too small. If a large fitting is welded, then a large amount of power will be needed from the generator. If it can not supply this power, then it will stall and the voltage will drop away. Check that the generator is the correct size, if needs be try another generator. It could be caused by the use of long extension leads. If a large fitting is welded, then a high current will be taken from the supply. If extension leads are used, there will be a volts drop down the lead making the unit sense a low supply voltage. Try not to use extension leads with the unit. If you have to, then use just 30 feet of cable, the same size fitted to the unit.
14	RELAY FAILED TO LATCH ON WELD START	This fault could happen when the start button is pressed. If the main power relays do not operate correctly, then this fault will be shown. Return unit for service.
20	WELDING CURRENT EXCESSIVE (>150%)	This fault will happen if the welding current is more than 50% high for more than 0.3 seconds. This fault is normally caused by a fault with the unit, a short circuit triac. Return unit for service.
21	WELDING CURRENT HIGH (>125%)	This fault will happen if the welding current is more than 25% high for more than 1 second. This fault is normally caused by a fault within the unit, a short circuit triac. Return unit for service.
22	WELDING CURRENT HIGH (>112.5%)	This fault will happen if the welding current is more than 6.25% high for more than 2 seconds. This fault will normally be caused by a poor quality generator with the supply voltage fluctuating. Try a different generator.
23	WELDING CURRENT HIGH (>106.25%)	This fault will happen if the welding current is more than 6.25% high for more than 2 seconds. This fault will normally be caused by a poor quality generator with the supply voltage fluctuating. Try a different generator.
24	WELDING CURRENT HIGH (>101.5%)	This fault will happen if the welding current is more than 1.5% high for more than 3 seconds. This fault will normally be caused by a poor quality generator with the supply voltage fluctuating. Try a different generator.
25	USER STOP BUTTON PRESSED	The operator has pressed the stop button.
26	RELAY UNLATCHED	During welding, if the main power relay disconnects, then this fault will be shown. It could be caused by the unit being knocked or a temporary dip in the power supply.
27	FITTING OPEN CIRCUIT	This fault is shown if the output lead disconnects from the fitting while welding. Follow the guidelines from this manual to reconnect the lead and try welding again.
28	WELDING CURRENT LOW (<98.5%)	This fault will happen if the welding current is more than 1.5% low for more than 3 seconds. This can be caused by a generator that is not big enough to supply the required power to the fitting. Check the size of the generator and if needs be try another generator. It can also be caused by using long extension leads with the unit. It is recommended that only 30 feet of extension are used, and the cable should be the same thickness as the input lead on the unit.
29	WELDING CURRENT LOW (<50%)	This fault will happen if the welding current is more than 50% low for more than 1 second. It can be caused by a faulty fitting. Try another fitting. If this doesn't clear the fault then there is a problem inside the unit. Return unit for service.
127	POWER OFF FAILURE	If the power is turned off while the unit is welding, this fault will be recorded to the catalogue.

Repair Information

There are no user serviceable parts inside the welding unit. If an internal fault happens with the unit then it must be returned to IPEX for repair. Please contact your local IPEX distributor for instructions on the proper return of your enfusion unit.

Specification

Operating Mode	Enield Automatic
Operating Language	English
Operating Temperature	0°F to 120°F
Input Voltage	120 V ac 95V to 140V
Input Current	10.5A
Input Frequency	50 Hz 40 Hz to 70 HJz
Input Power	100 VA to 1250 VA
Output Current	18 A ac true rms
Output Voltage	3 V to 50 V ac true rem
Output Power	50 W to 900 W
Output Stability	+/-1.5%
Welding Temperature	0°F to 120°F
Power Factor	0.72
Unit Weight	33 lb
Hand Held Weight	2.2 lb
Size	15.7" x 12.6" x 6.3"
Environmental Protection	IP65
Lead Length (to power case)	16.5 ft
Lead Length (to hand held unit)	33 ft
Lead Length (to fitting)	6.6 ft

ENFIELD TESTING



WARNING

Use of compressed air or gas in PP or PVDF pipe and fittings can result in explosive failures and cause severe injury or death.

- NEVER use compressed air or gas in Enfield, Labline, or Plenumline pipes, fittings, or accessories.
- NEVER test Enfield, Labline, or Plenumline systems with compressed air or gas, or air-over-water boosters.
- ONLY use Enfield, Labline, or Plenumline systems for approved chemicals.



The purpose of a site pressure test is to establish that all joints have been correctly made.

Hydrostatically (water) test in accordance with local plumbing code or with authority having jurisdiction; but not exceeding a maximum of 10 ft of head pressure. After making the first 20 or 30 joints, it is highly recommended that a test be applied to ensure that the joint-making technique is satisfactory. If a leak is discovered, follow the appropriate procedure below.

Hydrostatic testing of the joints can be performed 10 minutes after the final joint has been completed. The low pressure testing procedure detailed below should be strictly followed.

1. Fully inspect the installed piping for evidence of mechanical abuse and suspect joints.
2. Split the system into convenient test sections, not exceeding 1,000 feet. The piping should be capped off with an expandable plug at the end of the pipe section to be tested.
3. Prior to starting the test in below grade applications, straight lengths of pipe should be backfilled between fittings that are tested.
4. Slowly fill the pipe section with water, taking care to evaluate all trapped air in the process. Use air release valves in any high spots in the system. Do not pressurize at this stage.
5. Leave the pipe for at least one hour to allow an equilibrium temperature to be achieved.
6. Visually check the system for leaks.
7. Pressurize the system to a suggested maximum of 10 feet of head by means of a standard 10' standing water test using a 10' vertical riser, or a low-pressure hand pump.
8. Leave the line at 10 feet of head for a period of 2 hours, during which time the water level should not change (standing water test), nor should the pressure gauge reading change (hand pump test).
9. If there is a significant drop in pressure, or extended times are required to achieve the desired pressure, either joint leakage has occurred or air is still entrapped in the line. In this event inspect for joint leaks. If none are found, check for entrapped air – these air pockets must be removed prior to continuing the test.
10. If joints are found to be leaking, the system must be fully drained and the joints repaired. Dry, or marginally fused Enfield joints can be re-fused by following steps 5 through 13 in the Standard Enfield Electrofusion Installation procedure. To remove moisture from the joint, use the drying cycle.
 - To dry the Enfield joint using the handheld Enfusion machine with software V1.17 or earlier, the drying cycle can be accessed by starting and stopping a regular fusion cycle within 2 seconds.
 - To dry the Enfield joint using the handheld Enfusion machine with software V1.19, users need to connect the leads and fittings. The machine will prompt the user to "PRESS START". The user needs to press the "SELECT" button and then "START" button immediately after. The drying cycle will appear with a 45 second count down.
 - Allow the joint to cool.

ENFIELD TESTING

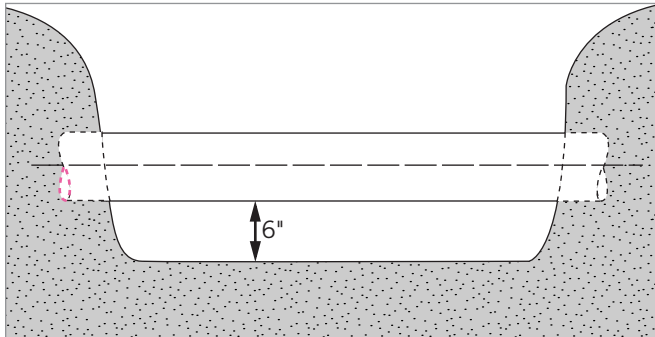
- Now re-fuse using the correct Enfusion machine settings for the size of pipe being joined following steps 5-13 of the Standard Enfield Electrofusion Installation procedure.
 - Should any of the re-welded fitting(s) fail the second hydro-test, the leaking joint(s) can be back-welded with a hot-air gun and welding rod. Should the back-welded joint(s) fail a third hydro-test, they will need to be cut out of the system and substituted with new fittings.
 - If a joint has to be cut out and replaced, the procedure for pipe modification detailed in this manual should be strictly followed.
11. Repeat the 10 feet head test after repairing any leaking joints, following the procedure described above.

ENFIELD PIPE REPAIR

In the unlikely event of a leak, Enfield piping systems can be easily repaired.

Procedure:

1. Determine exact location of leak. For below grade installation excavate the ground near the pipe leak, taking care not to cause damage to the piping system in the process. Hand digging is suggested. The ground should be excavated to a depth of at least 6" below the bottom of the pipe.

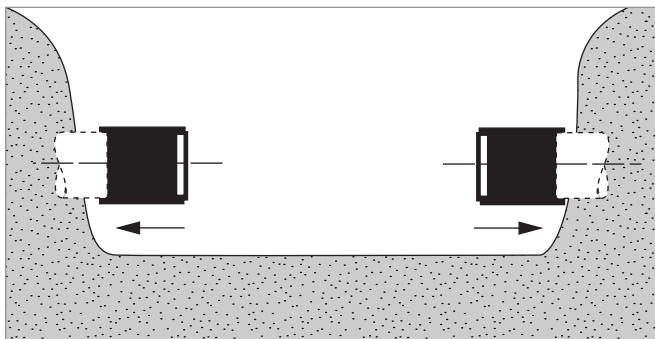


2. Measure the length of pipe to be removed then cut completely and SQUARELY through the pipe sections. Remove the damaged section of pipe.

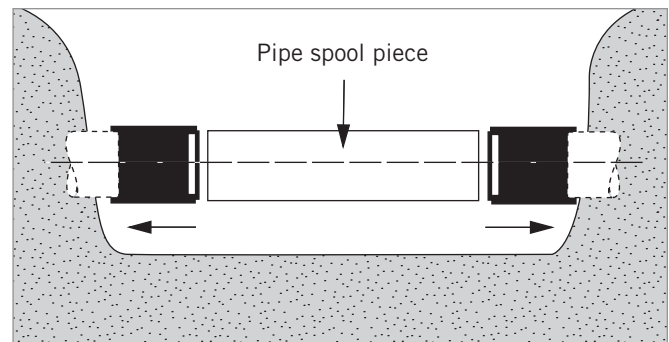
3. Mark a pencil line on the end of both open ends of the pipe to locate the joining position for the repair couplings. The pencil line should be at the following distance from the pipe ends.

Pipe Size (in)	Pencil Mark (in)
1-1/2	3/4
2	1
3	1-3/8
4	1-1/2
6	2
8	2-1/4

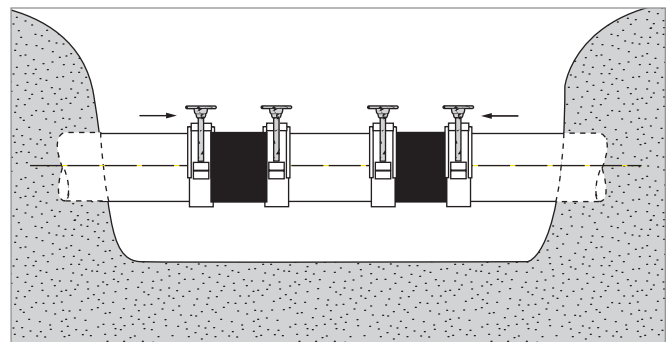
4. Slide one repair coupling over the exposed spigots of the two pipe sections.



5. Measure, prepare and insert a pipe spool piece into the line to be repaired.

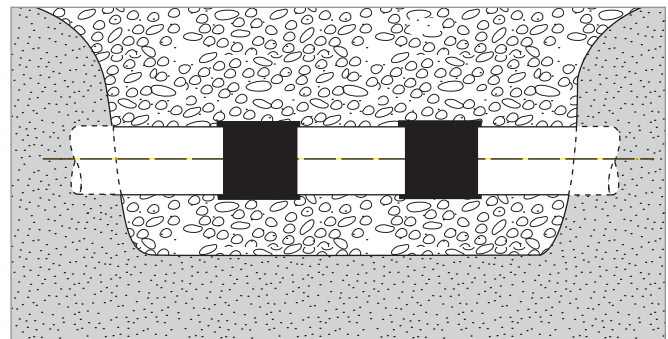


6. Slide the repair couplings into position between the pencil lines previously drawn on the pipe ends. Place the clamps over the repair couplings. Tighten the clamps and fuse the joints using the correct Enfuser machine settings.



7. Remove the hub clamps after allowing the joint to cool for 10 minutes.

8. If buried below ground, surround the pipe with pea gravel, then backfill and consolidate.



LABLINE AND PLENUMLINE JOINTS

To ensure professional installation, make sure all installers have undergone training by IPEX in the correct handling, joining and installation methods of IPEX thermoplastic products.

POINTS TO REMEMBER

a. **YELLOW & BLUE ELASTOLIVES DO NOT REQUIRE PRE-HEATING.**

If heated, maximum temperature should not exceed 175°F. (79°C)

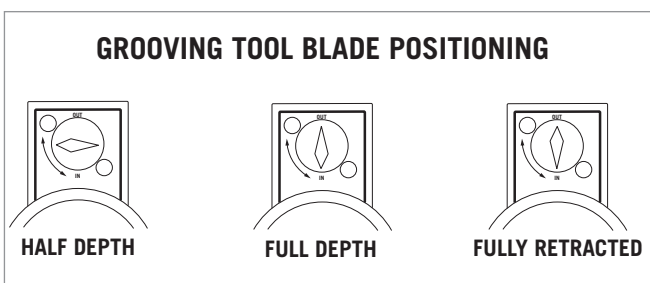
b. **YELLOW LABLINE AND BLUE PLENUMLINE ELASTOLIVES ARE NOT INTERCHANGEABLE**

- c. The pipe end should be clean and there should be no deep longitudinal grooves in it.
- d. It is desirable to use a chain vise to hold 3" and 4" pipe firmly during cutting and grooving operations. When grooving 1-1/2" and 2" pipe, a strap wrench should be used to hold the pipe to prevent its rotation.
- e. After grooving, the pipe should be kept clean so that foreign material is not introduced into the groove.
- f. Ensure the grooving tool has a sharp blade to make a clean-shouldered groove.
- g. The cutting blade should always be fully retracted whenever the tool is put on or taken off the pipe. If any resistance is felt when putting the tool onto the pipe or taking it off, the blade position should be checked.
- h. Each nut must be fully tightened as the installation progresses. Do not assemble the system loosely and tighten nuts last, as layout length errors will go undiscovered until such time as the nuts are finally tightened. Avoid misalignment.
- i. When tightening fittings, the dry fitting surfaces tend to bind against each other preventing the nuts from being fully tightened. To overcome this, either **IPEX Acid Waste Lubricant** or IPEX approved petroleum jelly should be used on fitting threads and elastolives. The lubrication allows the pipe and elastolive to glide smoothly into position against the fitting sealing area and enables the nuts to be tightened to their full thread capacity.
- j. Use two spanner wrenches when tightening fittings. This enables the nuts to be tightened to their full thread capacity without damaging the fitting.

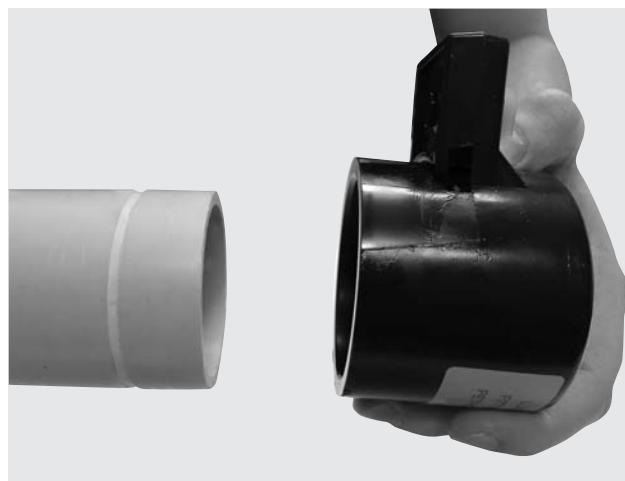
Procedure

1. Ensure each fitting is supplied with the correct number of elastolives (sealing rings) and nuts.
2. Verify the grooving tool is sharp. Cut the pipe to the desired length using a tubing cutter fitted with a wheel designed for plastic pipe. A handsaw and miter box may also be used. **Ensure pipe ends are square and trimmed free of burrs.**

3. Examine the grooving tool to ensure that the cutting blade is fully retracted. Insert the pipe into the grooving tool.

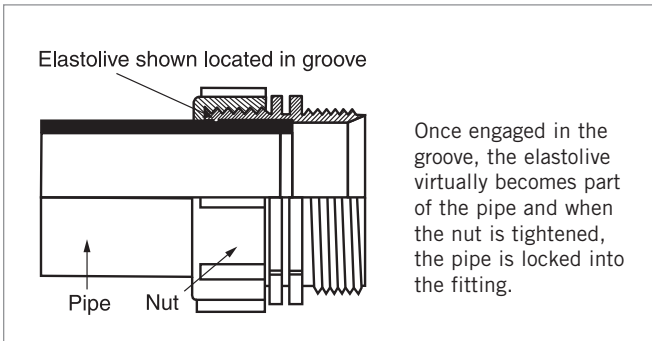


4. Set the grooving blade at the half-depth position and rotate the tool in a counter-clockwise direction. After one complete turn, set the blade at the full-depth position and again rotate the tool one full turn counter-clockwise. Fully retract the blade and remove the tool from the pipe. A shallow groove has now been formed around the pipe. Any material left as a feather edge in the groove should be removed. Care should be taken not to damage the square edge (shoulder) of the groove, particularly at the edge near the spigot end of the pipe as this is the primary sealing surface.

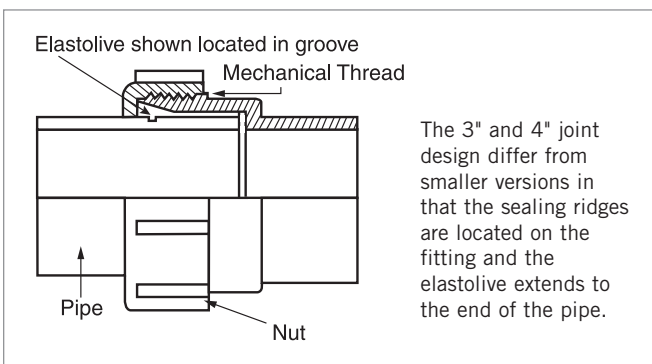


Feathered or rounded edges may indicate a worn tool and possible leakage. Make sure the groove shoulders are sharp.

1-1/2" and 2" Joint Details

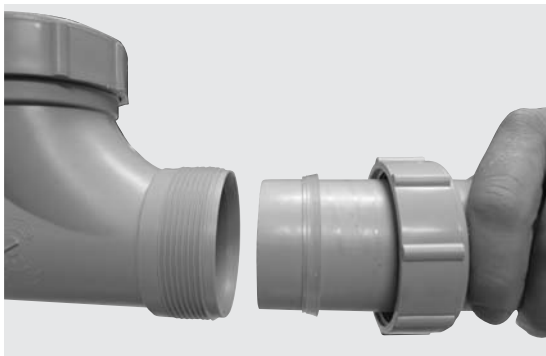


3" and 4" Joint Details



- Place the nut onto the pipe with the threaded side to the spigot end of the pipe. Take the elastolive, stretch it and pull it over the pipe with the thick edge first and the taper pointing to the spigot end of the pipe. Slide it down the pipe and onto the groove. Once on the groove "work it" a bit to make sure that the rib on the underside of the elastolive engages the full circumference of the groove.

Note: Use IPEX Acid Waste Lubricant on 3" and 4" elastolives to aid installation when sliding elastolives on to pipe.

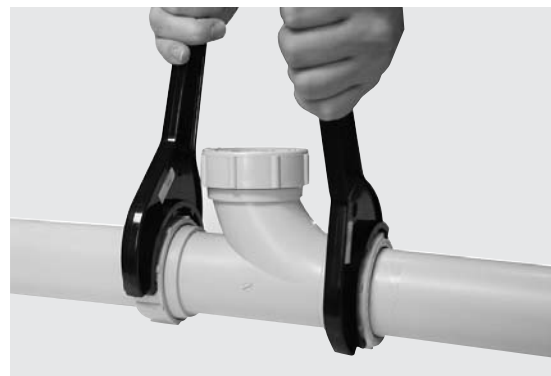


*If you are working on a job that has the old translucent non-elastic olives, consult your "heat olive" Technical Bulletin or call IPEX Customer Services for technical information.

- Apply IPEX Acid Waste Lubricant or IPEX approved petroleum jelly to both the thread and the elastolive then push the pipe squarely into the fitting.



- Hand-tighten the nut, then tighten, using two spanner wrenches. The nut must be tightened to its full thread capacity.



The joint is now ready for testing.

Average Number of Joint per kilogram of IPEX Acid Waste Lubricant*

Pipe size (in)	No. of Joints / kg
1-1/2	250
2	250
3	100
4	67

* The figures in the table are estimates based on laboratory tests

Note: Due to the many variables in the field, these figures should be used as a general guideline only.

LABLINE AND PLENUMLINE TESTING



WARNING

Use of compressed air or gas in PP or PVDF pipe and fittings can result in explosive failures and cause severe injury or death.

- NEVER use compressed air or gas in Enfield, Labline, or Plenumline pipes, fittings, or accessories.
- NEVER test Enfield, Labline, or Plenumline systems with compressed air or gas, or air-over-water boosters.
- ONLY use Enfield, Labline, or Plenumline systems for approved chemicals.



The purpose of a site pressure test is to establish that all joints have been correctly made.

Hydro test in accordance with local plumbing code or with authority having jurisdiction or with a maximum of 10 ft of head pressure. After making the first 20 or 30 joints, it is recommended that a test be applied to prove that the joint-making technique is satisfactory. If a leak is discovered, follow the appropriate procedure below.

Hydrostatic testing of the joints can be performed immediately after the final joint has been completed. The low pressure testing procedure detailed below should be strictly followed.

1. Fully inspect the installed piping for evidence of mechanical abuse and suspect joints.
2. Split the system into convenient test sections, not exceeding 1,000 feet. The piping should be capped off with an expandable plug at the end of the pipe section to be tested.
3. Prior to starting the test in below grade applications, straight lengths of pipe should be backfilled between fittings that are tested.
4. Slowly fill the pipe section with water, taking care to evaluate all trapped air in the process. Use air release valves in any high spots in the system. Do not pressurize at this stage.
5. Leave the pipe for at least one hour to allow an equilibrium temperature to be achieved.
6. Visually check the system for leaks.
7. Pressurize the system to a suggested maximum of 10 feet of head by means of a standard 10' standing water test using a 10' vertical riser, or a low-pressure hand pump.
8. Leave the line at 10 feet of head for a period of 2 hours, during which time the water level should not change (standing water test), nor should the pressure gauge reading change (hand pump test).
9. If there is a significant drop in pressure, or extended times are required to achieve the desired pressure, either joint leakage has occurred or air is still entrapped in the line. In this event inspect for joint leaks. If none are found, check for entrapped air – these air pockets must be removed prior to continuing the test.
10. If joints are leaking, tighten the nut 1/8 to 1/4 turn and wipe the fitting to remove excess water. This should normally cure the problem. If it does not, then the grooving or setting of the elastolive should be investigated. Drain the system and undo the suspect fitting. Test first that the elastolive feels tight on the pipe by attempting to turn it with reasonable pressure such as you might use to unscrew the cap of a bottle. The elastolive should not easily move around the pipe. If it does, it should be replaced. If the elastolive is tight, examine it, particularly at the front, for signs of bad grooving or shavings between the elastolive and the groove. If the front edge of the groove is damaged, the joint must be re-made and the piece of pipe replaced. When examining a leaking 3" or 4" joint, particular attention should be paid to possible misalignment, as this is the most likely cause of such a leak. Make sure any misalignment is corrected before re-testing.
11. Repeat the 10 feet head test after repairing any leaking joints, following the procedure described above.