

Polypropylene Socket Fusion**Introduction**

The McElroy Socket Fusion Tooling Systems is designed for socket fusion on 16mm to 125mm pipe.

With reasonable care and maintenance, these tools will give years of satisfactory service.

Before operating these tools, please read this instruction sheet thoroughly, and keep a copy with the tools for future reference. This manual is to be considered part of your Socket Fusion Tooling System.

General Safety**Safety Alerts**

The safety alert sign appears in this manual.
When you see this sign, carefully read what it says.
YOUR SAFETY IS AT STAKE.

You will see the hazard alert sign with these words: **DANGER**, **WARNING**, and **CAUTION**.



Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.



Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.



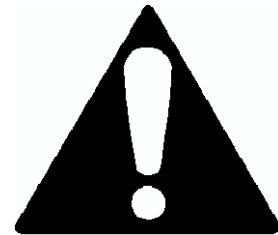
Indicates a hazardous situation which, if not avoided, may result in minor or moderate injury.

In this manual you should look for two other words:
NOTICE and **IMPORTANT**.

NOTICE: can keep you from doing something that might damage the machine or someone's property. It may also be used to alert against unsafe practices.

IMPORTANT: can help you do a better job or make your job easier in some way.

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**Read and Understand**

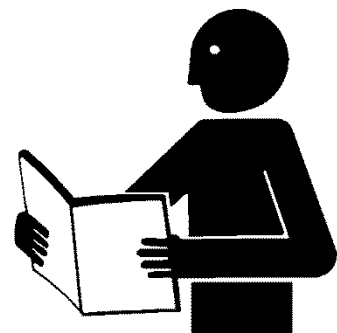
Do not operate this equipment until you have carefully read, and understand all the sections of this manual, and all other equipment manuals that will be used with it.

Your safety and the safety of others depends upon care and judgment in the operation of this equipment.

Follow all applicable federal, state, local, and industry specific regulations.

McElroy Manufacturing, Inc. cannot anticipate every possible circumstance that might involve a potential hazard. The warnings in this manual and on the machine are therefore not all inclusive. You must satisfy yourself that a procedure, tool, work method, or operating technique is safe for you and others. You should also ensure that the machine will not be damaged or made unsafe by the method of operation or maintenance you choose.

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Polypropylene Socket Fusion**General Safety**

Safety is important. Report anything unusual that you notice during set up or operation.

LISTEN for thumps, bumps, rattles, squeals, air leaks, or unusual sounds.

SMELL odors like burning insulation, hot metal, burning rubber, hot oil, or natural gas.

FEEL any changes in the way the equipment operates.

SEE problems with wiring and cables, hydraulic connections, or other equipment.

REPORT anything you see, feel, smell, or hear that is different from what you expect, or that you think may be unsafe.

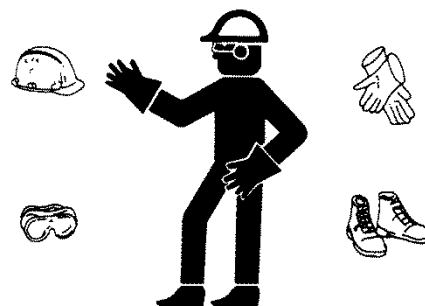
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**Wear Safety Equipment**

Wear a hard hat, safety shoes, safety glasses, and other applicable personal protective equipment.

Remove jewelry and rings, and do not wear loose-fitting clothing or long hair that could catch on controls or moving machinery.

TX00032-4-7-93

**Heater Is Not Explosion Proof**

This heater is not explosion proof. Operation of heater in an explosive atmosphere without necessary safety precautions will result in serious injury or death.

When operating in an explosive atmosphere, the heater should be brought up to temperature in a safe environment, then unplugged before entering the explosive atmosphere for fusion.

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**Heater is Hot**

The heater is hot and will burn clothing and skin. Keep the heater in its insulated heater sling when not in use, and use care when heating the pipe.

NOTICE: Use only a clean non-synthetic cloth such as a cotton cloth to clean the heater plates.

TX00104-8-12-94



Polypropylene Socket Fusion**Fusion Procedures**

Obtain a copy of the pipe manufacturer's procedures or appropriate joining standard for the pipe being fused. Follow the procedure carefully, and adhere to all specified parameters.

NOTICE: Failure to follow pipe manufacturer's procedure could result in a bad joint. Always follow pipe manufacturer's procedures.

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**Overview****Theory of Heat Fusion**

The principle of heat fusion is to heat two surfaces to a designated temperature, and then fuse them together by application of force. This pressure causes flow of the melted materials, which causes mixing and thus fusion. When the thermoplastic material is heated, the molecular structure is transformed from a crystalline state into an amorphous condition. When fusion pressure is applied, the molecules from each thermoplastic part mix. As the joint cools, the molecules return to their crystalline form, the original interfaces are gone, and the fitting and pipe have become one homogeneous unit. A strong, fully leak tight connection is the result.



The principal operations include:

- | | |
|-------------------|---|
| Clamping | The pipe and fitting must be held firmly to allow all subsequent operations to take place. |
| Cleaning | The area of pipe that the fitting will come in contact with must be cleaned. |
| Aligning | The fitting, heater adapters, and pipe must be properly aligned. |
| Heating | A melt pattern must be formed that penetrates into the pipe and into the fitting. |
| Joining | The pipe and fitting must be joined and the pipe fully seated within the fitting. |
| Holding | The molten joint must be held immobile until adequately cooled. |
| Inspecting | Visually examine the entire circumference of the joint for compliance with standards established by your company, customer, industry, federal, state, or local regulations. |

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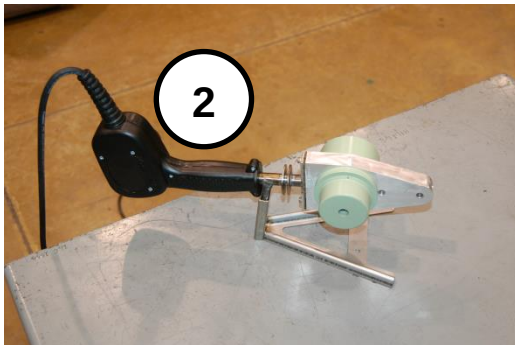
Polypropylene Socket Fusion

Operation

Nomenclature

- 1 **Heater Sling** - Sling used to hold the heater that protects and insulates the heater.
- 2 **Heater and Heater Stand** - Used with heater adapters in order to heat the pipe and fitting so that they can be fused.
- 3 **Heater Adapters** - Used with the heater and should be installed to match the fitting and pipe being fused.
- 4 **Pipe Cutter** - Used to cut the pipe to remove any damaged or misshaped material.
- 5 **Socket Fusion Toolbox** - Holds the heater, heater adapters, pipe cutters, heater stand, and has a fusion chart attached.

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Prepare Pipe End

Cut off damaged or oval ends of pipe squarely with a pipe cutter. Remove shavings and burrs inside pipe end.



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Polypropylene Socket Fusion

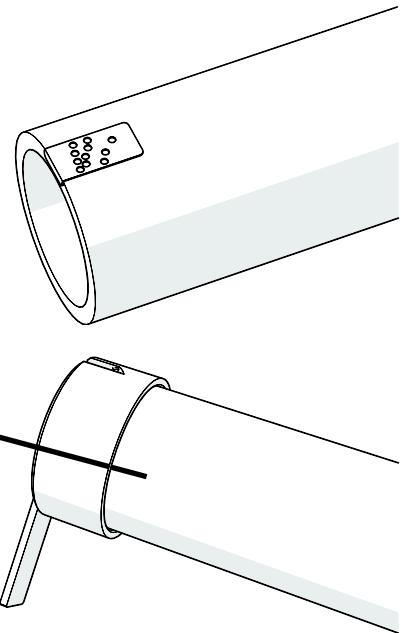
Mark Insertion Depth

Use a marking instrument and mark the insertion depth according to the appropriate joining standard. The mark can be made using the insertion depth gauge. This mark is the insertion depth used when fusing the pipe and fitting.

The chamfer/depth gauge tool may be used to chamfer the end of the pipe as well as determine the insertion depth. The cold ring tool is used to clamp against the chamfer/depth gauge to mark the insertion depth. The chamfer/depth gauge and cold ring tool are pipe size specific.

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Cold ring tool is attached here against depth gauge.

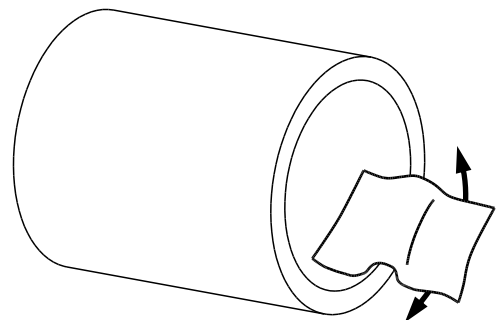
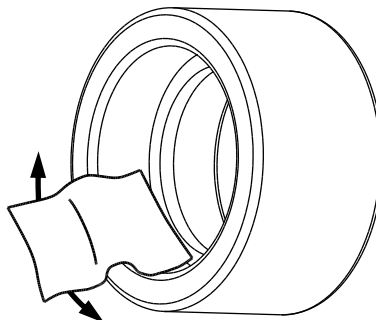


Clean Fitting and Pipe

Fitting and pipe must be clean and dry. Use a clean cloth to wipe the mating surfaces.

NOTICE: Do not touch fusion area with hands.

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Heater Is Not Explosion Proof

This heater is not explosion proof. Operation of heater in an explosive atmosphere without necessary safety precautions will result in serious injury or death.

If operating in an explosive atmosphere, the heater should be brought up to temperature in a safe environment, then unplugged before entering the explosive atmosphere for fusion.

Use a clean nonsynthetic lint free cloth to clean the heater adapter surfaces.

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Polypropylene Socket Fusion**Heater Temperature**

Set the temperature of the heater per appropriate joining standard.

Use a pyrometer to check the temperature on the socket faces.

If the temperature needs to be adjusted, refer to "Adjusting Heater Temperature" in the Maintenance section of this manual.

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**Heating The Pipe and Fitting**

Firmly seat the socket fitting on the male adapter of the heater.

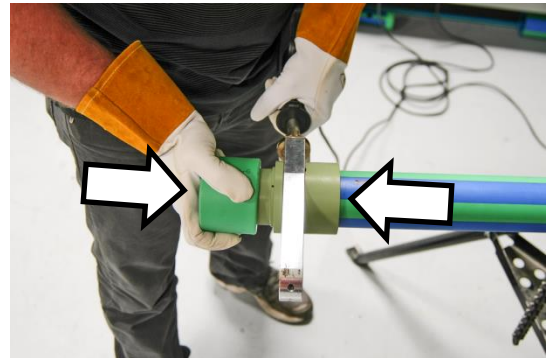
Simultaneously place the female adapter of the heater over the end of the pipe, up to the marked insertion depth.

Heating time starts when the heater is inserted to the proper insertion depth.

Heat fitting and pipe for the time specified by appropriate joining standard.

NOTICE: Do not twist fitting, pipe or heater

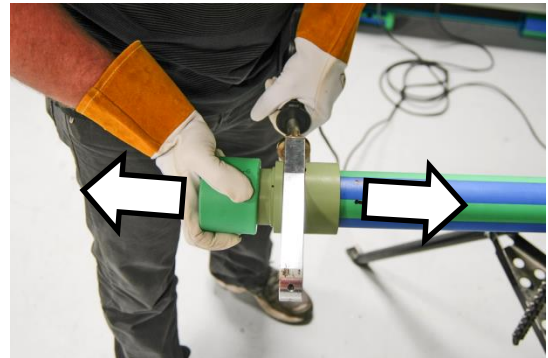
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**Remove Heater**

Remove the pipe and the fitting from the heater.

NOTICE: Do not twist fitting, pipe or heater.

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**Inspect Melt**

Quickly inspect the heated parts to make sure all surfaces have been melted properly.

If melt is not complete, cut off melted pipe end. Use a new fitting and repeat preparation and heating process.

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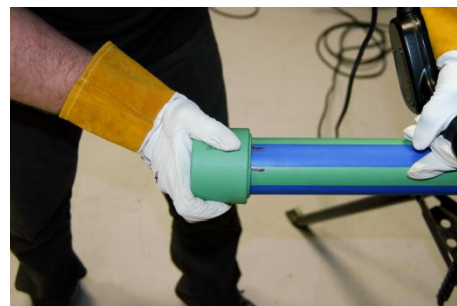
Fusion and Cooling

After the heater has been removed, firmly push the melted fitting squarely onto the pipe to the marked insertion depth. Be sure not to exceed the maximum time allowed by the manufacturer or joining standard for completion of the fusion joint.

NOTICE: Do not twist or rotate the fitting.

Hold the fitting firmly in place for the total cooling time specified by the pipe manufacturer or appropriate joining standard.

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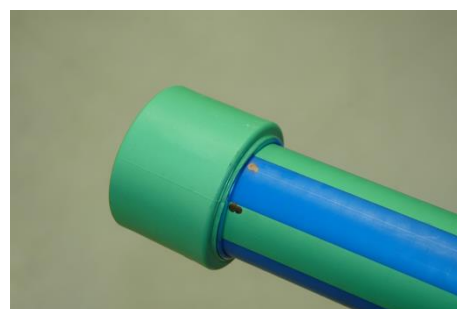
Inspecting Fusion Joint

After completing the specified cooling time, inspect the joint for compliance with the appropriate joining standard.

There should be no gaps or voids between the fitting and the pipe.

If the joint is not acceptable, cut off the joint and re-fuse the joint.

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Maintenance

Installing Socket Fusion Heater Adapters

The heater body of this assembly is not coated. Coated heater adapters are available for all fusion applications.

Heater adapters are installed with stainless steel cap screws.

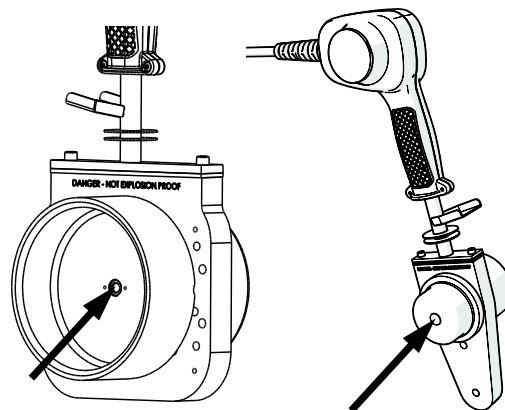
Care should be taken to assure that the heater adapters are seated on the heater body, and that there is no foreign matter trapped between these surfaces.

IMPORTANT: Do not over-tighten the bolts.

The surface of the heater adapters are coated with an anti-stick coating.

NOTICE: Only install heater adapters when the heater is cool.

TX01413-6-17-10



Adjusting Heater Temperature

Turn knob to desired temperature. Measure the heater surface temperature with a pyrometer. Any variance must be corrected to the pyrometer reading.

Loosen setscrew in the knob. Turn knob to point to the same temperature as the pyrometer. Tighten setscrew in the knob.

Turn knob to desired temperature. Allow heater to stabilize at the new temperature (5 to 10 minutes) after adjusting.

The thermometer on the heater body indicates internal temperature and should be used as a reference only.

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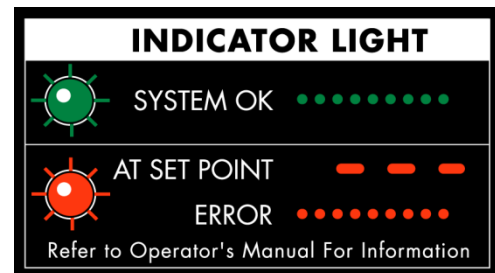


Polypropylene Socket Fusion**Heater Indicator Light**

The heater has a green indicator light which will flash on and off. This indicates that the controller is operating normally. If the green indicator is not flashing then the controller may not be operating properly. If this occurs, disconnect power and have the heater repaired by an McElroy Authorized Service Center.

The heater has a red indicator light on the handle at the bottom of the temperature scale. When the heater is plugged in and preheating the red light glows steadily until the set temperature is reached. The red light then goes off and on as the heater maintains temperature.

If the heater is not operating properly, the control will attempt to turn the heater off and the red indicator light will flash rapidly. If this occurs, disconnect the power and take it to a McElroy Authorized Service Center for repair.



TX04036-4-12-10

Specifications

The McElroy Socket Fusion Tooling System is designed for socket fusion of 16mm to 125mm pipe.

Heater:

16mm - 63mm Socket Heater Power: 100V - 120V, 50/60Hz, 700 Watt, 1Ph

Large Socket Heater Power: 100V - 120V, 50/60Hz, 1600 Watt, 1Ph

Weight:

16mm - 63mm Socket Heater: 3.5 lbs. (1.6 Kg)

Larger Socket Heater: 5.5 lbs. (2.5 Kg)

Toolbox Dimensions:

Length: 24" (609.6mm)

Width: 10" (254mm)

Height: 9.5" (241.3mm)

INSTRUCTION SHEET REVISION HISTORY LISTING

PART NO: SW2080101
DESCRIPTION: POLYPROPYLENE SOCKET FUSION
CHECK: SWB APPRV'D: JAL RELEASED: 10/26/15

<u>CHK/APR</u>	<u>REV</u>	<u>DATE</u>	<u>BY</u>	<u>DESCRIPTION OF REVISION</u>
SRB/JBC	A	4/4/18	RLT	ON SHEET 8 REVISED THE McELROY LOGO AT THE END OF THE DOCUMENT TO REFLECT THE CURRENT LOGO.