

POLYMELT PP-R & PP-RCT pipe systems

# INSTRUCTION MANUAL

## SOCKET WELDING





# Instructions for socket fusion

## Introduction

Socket fusion is used for sizes between 20 and 125 mm and is performed by heating the outside surface of the pipe and the inside wall of the fitting for a specified heating time using a socket fusion iron. Once properly heated the pipe is pressed into the fitting and held together for a specified cooling time.

The resulting joint is as strong as the pipe itself. Note that Polymelt fittings cannot be dry fitted. This is on purpose. Polymelt fittings are designed to generate a specific interfacial pressure during insertion of the pipe into the fitting after heating. Likewise, you should not be able to dry-fit the pipe and fitting onto the cold fusion heads. If you can dry-fit the pipe and/or fitting into or on the fusion heads, make sure you are using the correct fusion heads.

## Welding temperature

The socket fusion iron temperature =  $260^{\circ} \pm 10^{\circ}$  C. Your iron should be set up and pre-heated to  $260^{\circ} \pm 10^{\circ}$  C prior to beginning the socket fusion steps. Heat soak times may vary depending on environmental conditions, but the socket fusion iron temperature should always be maintained at  $260^{\circ} \pm 10^{\circ}$  C

# Tools, equipment & preparation

## Tools for cutting the pipes:

Dimension 20-32 mm ratchet cutters with V-shaped blade

Dimension 40-125 mm chop saw or port-a-band saw

Dimension 63 mm and up: band saw or sawzall with pruning blade



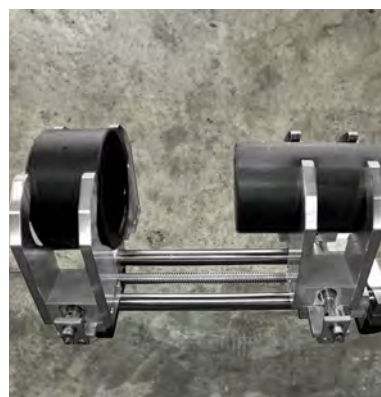
## Tools for welding the pipes & fittings



- 1) Hand irons
- 2) Fusion heads
- 3) Mounting accessories
- 4) Infrared temperature gun
- 5) Iron holder bracket



## Tools for working overhead



## Preparation

### Pre-clean tools, pipes and fittings

Only use 91% or higher isopropyl alcohol and a lint-free cloth. Cleaning must be carried out before each welding process. The following must be cleaned:

- the pipe and fitting surfaces
- Welding heads
- Other tools that may come into contact with the welding surfaces

### Preheating the welding machine to the correct temperature

Welding irons should be preheated to the temperatures listed below.

In addition to preheating, ALWAYS check the temperature before each melting process.

- Socket welding =  $260^{\circ} \pm 10^{\circ} \text{ C}$
- Outlet welding =  $260^{\circ} \pm 10^{\circ} \text{ C}$
- Butt welding =  $210^{\circ} \pm 10^{\circ} \text{ C}$



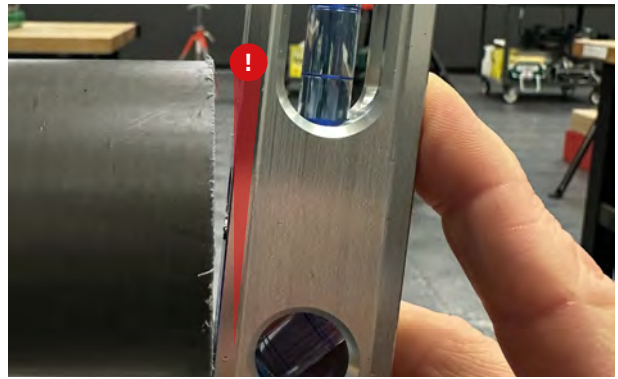
Check both the fitting and the pipe fusion heads.

## Steps



### Step 1 Cut

Make sure to cut the end of the pipe square. It is recommended that the cut be no more 1° out of square, but never be more than 5° out of square. After cutting, inspect the inside and outside of the cut end of the pipe to make sure there is no damage. If damage is found, re-cut past the damage.



**!** The cut must not deviate more than 5° from the right angle

### Step 2 Debur

Once the pipe has been successfully cut, use a deburring tool to remove pipe fragments left from cutting the pipe so that the pipe edges are smooth.



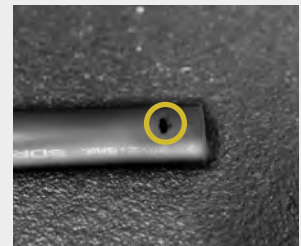
### Step 3 Clean

The surfaces to be fused on the pipe and fitting should be thoroughly cleaned using 91% or higher isopropyl alcohol (IPA) and a clean rag or paper towel that will not leave lint or residue.



### Step 4 Mark

Socket Fusion requires the pipe to be inserted into the fitting to a specific depth during fusion. The diameter of the pipe determines the insertion depth. Use a depth gauge as illustrated to mark your insertion depth.



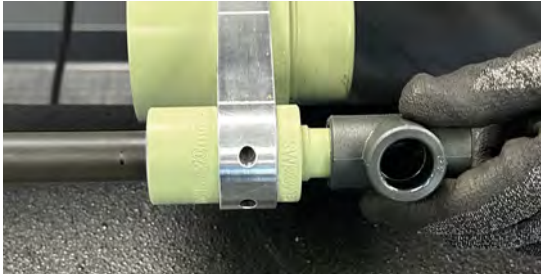
### Step 5 Heat soak

Insert the pipe into the pipe fusion head and the fitting onto the fitting fusion head using mild pressure until you reach your depth mark and fitting stop line as shown in the following picture. Do not apply too much pressure. Instead, let the heat do the work. Make sure to insert the pipe only to the depth mark and no further as this can create an internal bead resulting in a flow restriction. Once you have fully inserted the pipe to the depth mark and fitting to the stop line on the fusion head, start a timer for the specified heat soak time as shown in the chart following step 7.



**Step 6**  
Transition

Once the heat soak time is complete, immediately remove the pipe and fitting from the fusion heads and insert the pipe into the fitting until the beads formed during heat soak just make contact and are even around the circumference of the joint.



**Caution:** Make sure not to under insert the pipe into the fitting as this will result in a weakened joint. Make sure the fitting and pipe are aligned during fusion. Likewise, make sure to not over insert the pipe into the fitting as this will create a large internal bead resulting in a flow restriction. NEVER twist the pipe into the fitting.

**Correct and incorrect connections**



✓ *Proper socket fusion with two even beads (just contacting each other) around the circumference of the joint, and visible depth mark.*



✗ *Improper socket fusion with under-insertion (left) and misalignment (right).*

**Step 7**  
Fusion/cool

Once the transition has been properly performed, the joint must be held immobilized either by hand or by a socket assist tool for the full fusion/cool time shown in the chart on the following page. Once the full fusion/cool time has been achieved, the joint can be placed under full system pressure.



## Socket Fusion Heat Soak and Fusion/Cool Times

Pipe diameter OD (mm)	Insertion depth (mm)	Heating time		Transition time (sec)	Cooling time (min)
		above 5°C	below 5°C		
20 mm	14 mm	5 sec	8 sec	4 sec	2 min
25 mm	15 mm	7 sec	11 sec	4 sec	2 min
32 mm	16.5 mm	8 sec	12 sec	6 sec	4 min
40 mm	18 mm	12 sec	18 sec	6 sec	4 min
50 mm	20 mm	18 sec	27 sec	6 sec	4 min
63 mm	24 mm	24 sec	36 sec	8 sec	6 min
75 mm	26 mm	30 sec	45 sec	8 sec	6 min
90 mm	29 mm	40 sec	60 sec	8 sec	6 min
110 mm	32,5 mm	50 sec	75 sec	10 sec	8 min
125 mm	35 mm	60 sec	90 sec	10 sec	8 min

## Fusing an outlet



### Introduction

Polymelt currently offers fusion outlets from 20mm up to 125mm. When fusing outlets in the field, the branch diameter can be up to a maximum of half the diameter of the main pipe. Outlet fusion is performed by heating the outlet and the main pipe at the drilled branch location until specific visual indicators are present. Once the visual indicators are present, the fusion outlet is pressed into the main pipe for a specified fusion/cool time.

# Tools and preparation

## Preparation

### Pre-clean tools, pipes and fittings

Only use 91% or higher isopropyl alcohol and a lint-free cloth. Cleaning must be carried out before each fusion process. The following must be cleaned:

- the pipe and fitting surfaces
- Fusion heads
- Other tools that may come into contact with the fusion surfaces

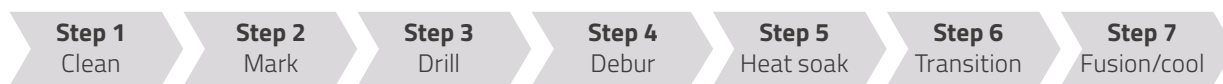
### Preheating the fusion machine to the correct temperature

Fusion irons should be preheated to the temperatures listed below.

In addition to preheating, ALWAYS check the temperature before each melting process.

- Socket welding =  $260^{\circ} \pm 10^{\circ} \text{ C}$
- Outlet welding =  $260^{\circ} \pm 10^{\circ} \text{ C}$
- Butt welding =  $210^{\circ} \pm 10^{\circ} \text{ C}$

## Steps



### Step 1 Clean

Clean the main pipe on which the branch is to be installed and the welding saddle. Also clean the drill bit and the deburring tool before use.



### Step 2 Mark

Use a center-punch or similar tool to mark the center point on the main pipe of where you want to create the branch line.



### Step 3 Drill

Drill the hole for the branch line using the appropriately sized Polymelt drill bit. Polymelt bits are slightly undersized so that the correct interfacial pressure can be achieved during fusion. Make sure to keep the drill perpendicular to the main pipe while drilling.



#### Step 4

Debur

Once the main pipe has been successfully drilled, use a deburring tool if necessary to remove any pipe fragments left behind from the drilling process. The pipe edges should be smooth inside and outside of the branch opening.



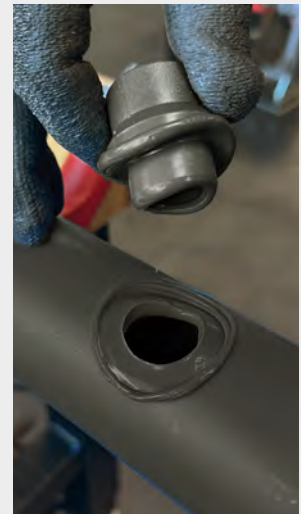
#### Step 5

Heat/soak

Begin by inserting the main pipe fusion head into the drilled hole in the main pipe, while at the same time inserting the outlet into the outlet fusion head using mild pressure until the fusion heads are fully seated as shown below. Do not apply too much pressure. Instead, let the heat do the work.

Once both fusion heads are fully seated, allow the fusion heads to melt the polypropylene until there is an even ring around the entire circumference of the drilled hole in the main pipe and even bead around the entire circumference of the fitting as shown below. Again, this is a visual rather than timed process. Do not allow the heat soak process to continue beyond this point as it could over-melt the pipe and fitting creating a flow restriction and/or compromised joint.

When fusing outlets by hand, it may be necessary to slightly tilt the fusion head around the hole in the main pipe to achieve a proper melt. Never roll the fusion head around the opening in the main pipe as this will increase the diameter of the hole and not allow the proper interfacial pressure to develop.



#### Step 6

Transition

Once you have achieved a proper melt (complete ring and bead), immediately remove the iron, and insert the fitting into the hole in the main pipe. Apply mild pressure until the bead around the circumference of the fitting is making even contact with the entire circumference of the ring on the pipe as shown. Always use mild pressure. At this point, you have a few seconds to level and align the outlet before the joint sets up. Hold the outlet in position by hand or with a fusion outlet assist tool for at least 25% of the full fusion/cool time.



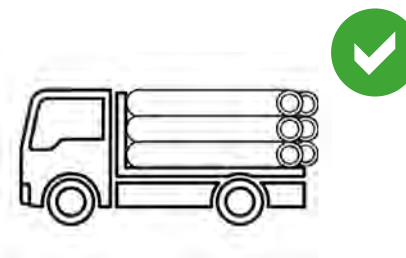
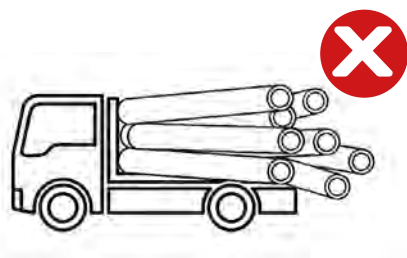
#### Step 7

Fusion/cool

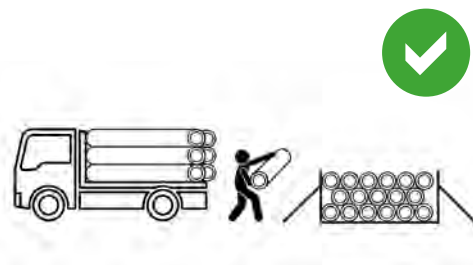
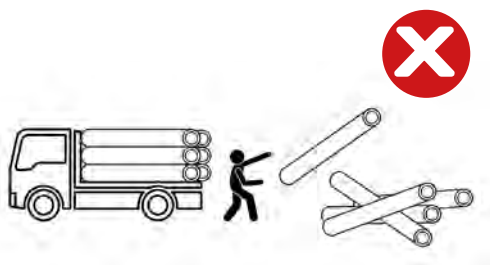
Full outlet fusion/cool time (the time at which you can place the joint under full system pressure) is determined by the branch diameter of the outlet and is 10 minutes for 20-63 mm branch size and 15 minutes for 75-125 mm branch size.

# General information for handling POLYMELT pipes

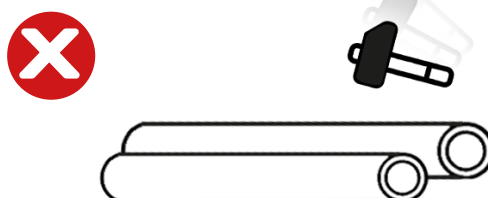
To ensure that our POLYMELT PP-R pipes operate perfectly and can be installed without any difficulties, we ask you to consider these basic points when transporting and storing the pipes.



To prevent damage to the pipes during transportation, the pipes should be loaded carefully and secured.



Lay down pipes or pipe bundles carefully (especially at low temperatures). Do not throw the pipes!



Do not use cracked or damaged pipes. Check the condition of the pipes and pipe ends before each installation.

Protect the pipes from falling objects. Avoid impacts on the pipes.

**POLYMELT Pipe Systems** GMBH  
Kirnachstraße 17, 87640  
Ebenhofen, Germany  
Tel. +49 8342 70060  
Fax +49 8342 700666  
mail@polymelt.com, www.polymelt.com



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