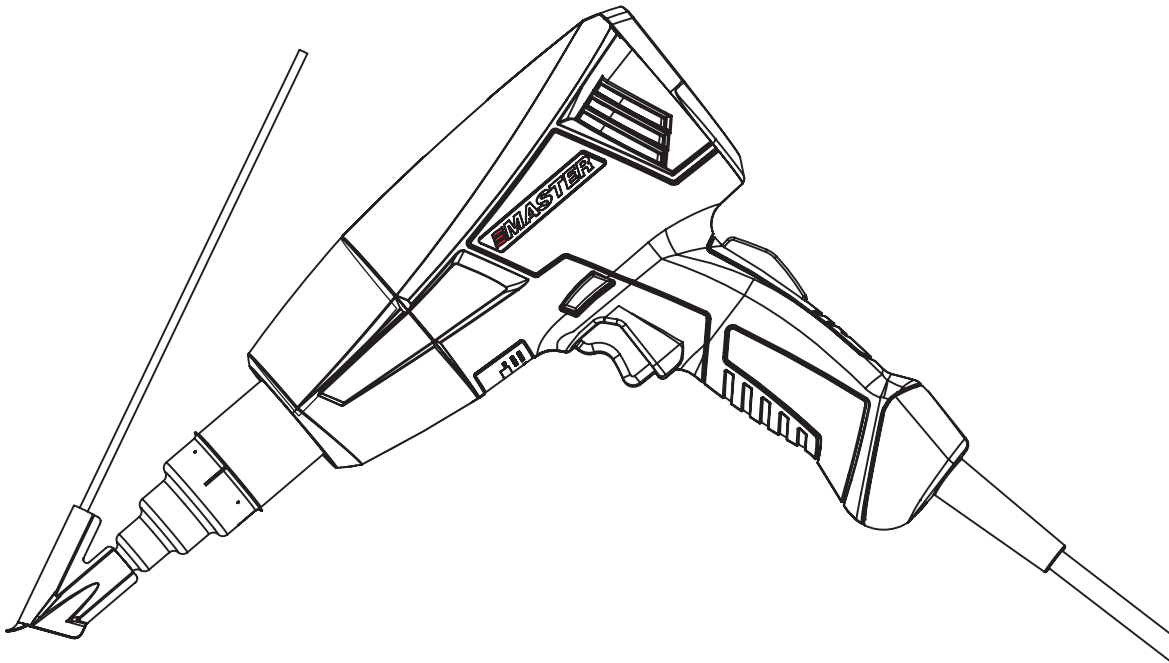




# ***PROHEAT®***

## ***Plastic Welding Kit***



***Welding Plastics***



**PH-1200A**  
Fan Speed: 4 LED lights  
Temperature: 6 LED lights



**PH-1400A**  
**Programmable**

### PH-1200A

- LED display of temperature and airflow settings, 4 airflow and 6 temperature settings.
- Variable temperatures from ambient temperature to 1,200° F.
- Variable airflow from 4 CFM to 18 CFM.
- Control system prevents overheating when using specialty attachments.

### PH-1400A

- Programmable LCD display of temperature and airflow settings (up to 5 programs).
- Variable temperatures in 10°F increments from ambient temperature to 1,200° F.
- Dial-in airflow from 4 CFM to 18 CFM.
- Control system prevents overheating when using specialty attachments.
- Temperature & airflow lock-in feature.

## MASTER WELDING TIPS AND ATTACHMENTS



**35017**  
**1 1/4" Shrink attachment**  
Reflects air around surface's such as tubing or pipe



**35269**  
**Welding Shoe**  
For softening and spreading plastics and embedding mesh screen. Use with 3/8" reducer.



**35271**  
**Tack Welding Tip**  
For tack welding two pieces together before adding filler rod. Use with 3/8" reducer.



**35293**  
**5/8" (14 mm) Reducer**  
Concentrates air flow



**35294**  
**3/8" (9 mm) Reducer**  
Concentrates air flow. Also used with weld tips and free-hand "pendulum" welding.



**35295**  
**Speed Welding Tip**  
For welding rod up to 6mm. Use with 3/8" reducer



**35698**  
**Wire Mesh Screen, stainless**  
For reinforcing weld repairs. Size: 4" x 3". Qty 4 per pack.

## AVAILABLE ACCESSORIES ([www.masterappliance.com](http://www.masterappliance.com)):



**35016**  
**3" (75 mm) Spreader**  
Spreads air evenly over wide areas



**35266**  
**1 1/2" 40mm Angle Slit Nozzle**  
Lap welds roofing materials



**35267**  
**3" (75mm) Teflon Coated Butt Welding Heat Disc**  
For butt welding PVC pipes



**35268**  
**1 1/2" (40mm) Lap Welding Slit Nozzle**  
For lap welding PVC Sheeting



**35296**  
**3/4" (20 mm) Lap Welding Tip**  
For lap welding plastic materials, such as PE, PVC, or Vinyl tarpaulin. Use with 3/8" reducer.

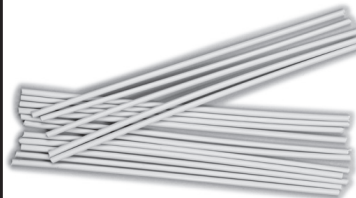


**35291**  
**Seam Roller with ball bearings**  
For lap welding, edging tape and roofing applications

## MASTER WELD RODS



**35297**  
**ABS Welding Rod**  
(Pkg. of 16)  
Round, 1/8" Dia. x 9" Long, Natural, for welding ABS plastics



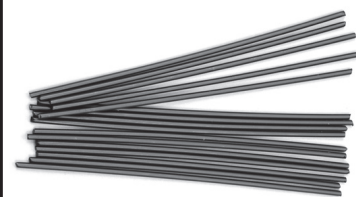
**35298**  
**PP Welding Rod**  
(Pkg. of 16)  
Round, 1/8" Dia. x 9" Long, Natural, for welding PP plastics



**35299**  
**PVC Welding Rod**  
(Pkg. of 16)  
Round, 1/8" Dia. x 9" Long, Grey, for welding PP plastics



**35300**  
**LDPE Welding Rod**  
(Pkg. of 16)  
Round, 1/8" Dia. x 9" Long, Natural, for welding LDPE plastics



**35301**  
**HDPE Welding Rod**  
(Pkg. of 16)  
Round, 1/8" Dia. x 9" Long, Black, for welding HDPE plastics



**35697**  
**Fiber-Flex Hot Melt Adhesive Rod**  
(Pkg. of 9)  
Round, 3/16" Dia. x 12" Long, Black, "Universal" rod, works best with PP and TPO plastics.

**SDS Sheets available upon request.**

**Warning:** These products contain chemicals known to the State of California to cause cancer and birth defects or other reproductive harm. Users should independently evaluate the suitability of the product for their application.

## PLASTIC WELDING

### Basic requirements for plastic welding. TIME, TEMPERATURE & PRESSURE

Most plastics used today are thermoplastics which can be softened by heat and then hardened again upon cooling. Thermoplastics are generally suitable for repair by welding. Thermoset plastics, on the other hand, do not soften by heating after their initial molding. Thermosets cannot be welded with heat.

Four basic rules for plastic welding are suggested:

- 1. Weld with like material.** Only like materials can be fusion welded, for example, PP rod on PP plastic. If material is unknown, then the fiber-flex hot melt adhesive rods can be used as described below. Fiber-flex is an adhesive and will not fusion bond with the base material so the rod should be used with a mesh screen if strength is required; otherwise, it can be used to fill gaps/holes where strength is not required.
- 2. Correct temperature.** The plastic should be pre-heated. Select the right temperature matched to the material being repaired.
- 3. Even pressure.** When welding with rods, the pressure is applied by pressing on the welding rod. For overlap welding of films and tarpaulins, the necessary pressure is applied with the help of the optional pressure roller.
- 4. Constant welding speed.** To achieve a good weld, an even working speed should be maintained. When welding plastics with the Master Proheat, the following three variables are critical to achieve a good weld.

### TIME, TEMPERATURE & PRESSURE

- **Time.** If you move the heat tool too fast or too slow, the quality of the weld will be compromised. Maintain constant speed during the welding process.
- **Temperature.** Set the welding temperature for the plastic that you are welding. Adjust the temperature and airflow to obtain the best setting combination for the plastic you are working with. Locking-in the setting enables you to maintain the set temperature throughout the welding process. The Master Proheat Model PH-1400A has the ability to tightly control and lock-in the temperature through an on-board electronically controlled temperature and air speed system. See the heat gun instruction manual on how to lock-in settings.
- **Pressure.** Pressure is applied by pushing down on the welding rod while welding or, if butt welding, on the two edges that are being welded together. Master Appliance Corp. manufactures precise welding tips that help the welder apply equal pressure throughout the welding process.

### Thermoplastic welding temperatures.

There are different types of plastic so it is important to identify the type you are working on to ensure the proper welding rod is being used. Thermoplastics can be formed with heat and can be easily welded. Thermosets (Duroplastics and Elastomers) cannot be welded. Thermosets are hardened with heat but, once hardened, their shape cannot be changed with heat. Elastomers (rubber) can be formed with heat but cannot be welded.

The following tables list approximate temperatures and air flow settings. The user should practice on a scrap piece of plastic to verify before starting the repair project.

**PH-1400A**

Material	For Use with 3/8" Reducer 35294	For Use with Speed-Weld Tip 35295
ABS	Temp: 520°F, Fan Speed: 6	Temp: 520°F, Fan Speed: 4
PP	Temp: 580°F, Fan Speed: 6	Temp: 580°F, Fan Speed: 5
PVC	Temp: 530°F, Fan Speed: 6	Temp: 540°F, Fan Speed: 4
LDPE	Temp: 550°F, Fan Speed: 6	Temp: 550°F, Fan Speed: 5
HDPE	Temp: 580°F, Fan Speed: 6	Temp: 580°F, Fan Speed: 4
Fiber-Flex	Temp: 400°F, Fan Speed: 4	Not recommended

**PH-1200A**

Material	For Use with 3/8" Reducer 35294	For Use with Speed-Weld Tip 35295
ABS	Temp: 3, Fan Speed: 3	Temp: 3, Fan Speed: 2
PP	Temp: 3, Fan Speed: 3	Temp: 3, Fan Speed: 3
PVC	Temp: 3, Fan Speed: 3	Temp: 3, Fan Speed: 2
LDPE	Temp: 3, Fan Speed: 3	Temp: 3, Fan Speed: 3
HDPE	Temp: 3, Fan Speed: 3	Temp: 3, Fan Speed: 2
Fiber-Flex	Temp: 2, Fan Speed: 2	Not recommended

**PH-1200A Approximate Temperature versus LED Display (Total of 6 LED lights):**

0 = No Heat, 1 = 160°F, 2 = 360°F, 3 = 550°F, 4 = 750°F, 5 = 950°F, 6 = 1200°F.

**Testing the weld rod:** Temperature setting is correct when the rod becomes soft and tacky. If the rod starts to liquefy the temperature setting is too hot.

**Practice:** Actual temperature may vary from the set temperature of the Proheat® heat gun, based upon distance from the nozzle of heat gun. Welding plastics takes patience and repetition to become proficient.

### Plastic Welding

Clean the damaged area with warm soapy water and dry off. Align parts to be joined as needed for welding, using clamps if possible to keep parts from moving. Break the edges of the parts to create a V-shaped groove to provide space for weld fill. Install the appropriate welding tip onto your Master Proheat® heat gun. Preheat the heat gun for approximately 1 minute to desired temperature before starting the welding process. Use extreme caution. Read and understand the instruction manual before use of this tool.

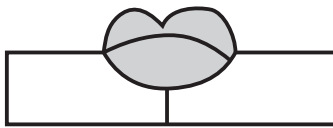
Weld rod should have a clean end to start welding. Once the heat tool is at the proper temperature, place the heated speed-weld tip on the surface of the plastic part you need to weld. When the surface of the plastic part begins to soften, feed your plastic welding rod into the preheated speed-weld tip and feed your rod in a steady motion moving your speed-welding tip along the repair joint. Do not pull on the rod, let the rod soften into the joint as you move steadily along the weld joint.

Watch the area where the rod meets the plastic part. You should see a small puddle of softened plastic flowing in front of the weld rod. This will confirm that you have the proper heat setting and speed. If the surface of the piece being welded starts to burn, pull the heat tool at a faster pace to avoid overheating.

At the end of the weld joint cut the rod off with knife or side cutter. Allow the weld joint to cool to room temperature before testing the strength of weld. Depending on the thickness of the rod and/or the base material, more than one pass may be necessary.

### Weld Types:

Many of the plastic welds are similar to metal welds and use some of the same welding techniques. Weld edges are grooved before welding to allow easy filling with weld rod.



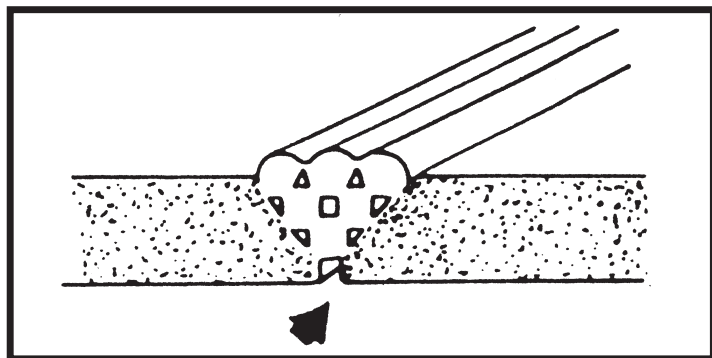
Edge Welds



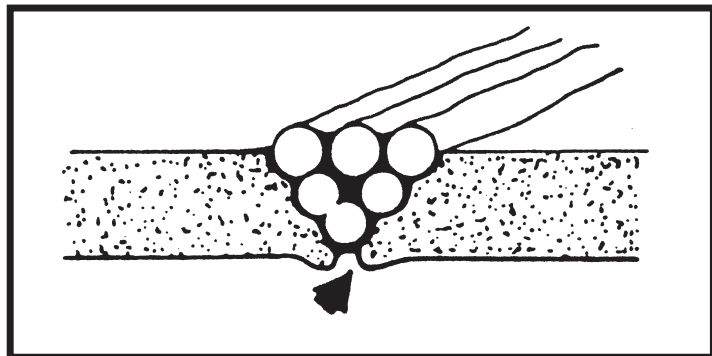
Butt Welds, note V groove preparation

### Proper and Improper Weld Illustrations:

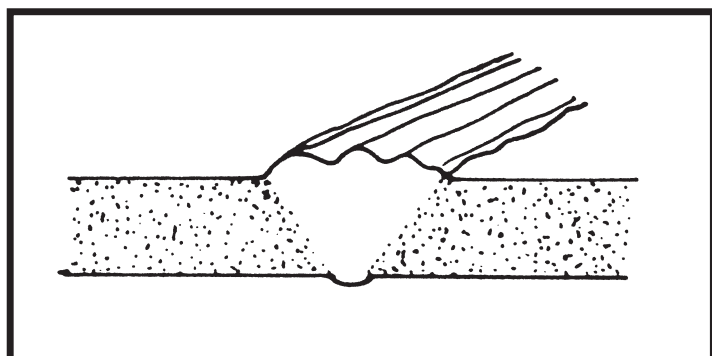
**No Bond:** rods not completely fused and weld can be pulled apart.



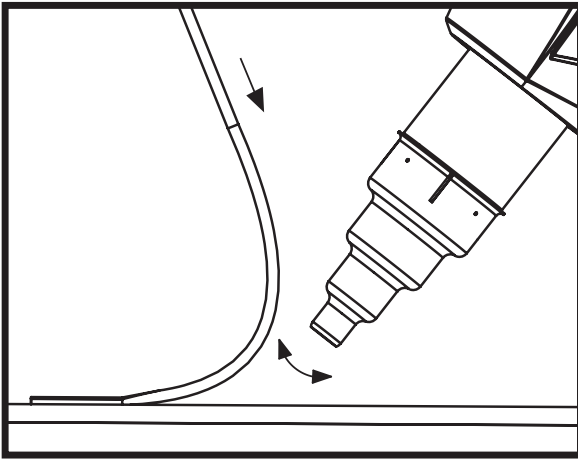
**Burned Weld and charred:** rods not completely fused (weak weld)



**Proper Weld:** rods fused.



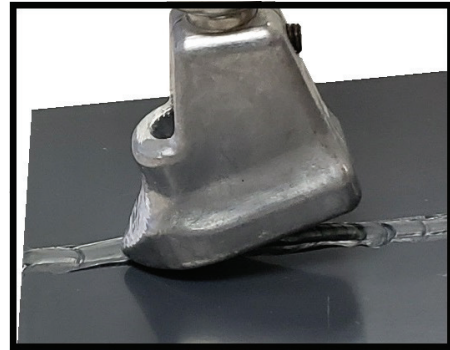




**Pendulum Weld:** Freehand welding. Slowly rotate the nozzle of the 3/8" reducer (35294) back and forth between the workpiece and the weld rod in a pendulum motion, while applying a slight, downward force on the weld rod. Heat both the rod and the workpiece evenly.

Start by cutting a pointed tip onto one end of the weld rod. Place the pointed tip onto the workpiece while holding the rod in a vertical position. Once the fusion process has begun (slight puddling of weld where the pointed tip is located), slowly begin to angle the rod as shown while maintaining downward pressure on the weld rod. Allow rod to cool for approx. 5 minutes before trimming end of rod.

**Weld Shoe 35269:** For best results, allow the weld shoe to heat for approx. 2 minutes. Set the PH-1400A to 1000°F and airflow of 7. Set the PH-1200A to a temperature of 6 LEDs and an airflow of 3 LEDs. Test on the plastic workpiece and adjust the temperature as needed.



**Wire Mesh Screen 35698:** Used for reinforcing and strengthening weld repairs. For best results, sink into the plastic workpiece until covered with plastic. Smooth the plastic evenly over the mesh with the welding shoe. Optional: use weld rod or fiber-flex to add extra filler material over the top of the wire mesh.



**Fiber-Flex Rod 35697:** For use with welding shoe 35269. Not recommended for use with speed-weld tip as rod is slightly rubbery and tends to clog the speed-weld tip. Set the PH-1400A to an initial temperature of 900°F and set the air flow at 5. Set the PH-1200A to an initial temperature of 5 LEDs and set the air flow at 4 LEDs. Allow the weld shoe to heat for approx. 2 minutes. Do not attempt to melt the base material together with the fiber-flex. Fiber-flex repair is similar to brazing.

Fiber-flex is a hot-melt adhesive with special additives to allow it to adhere to multiple thermoplastics and TPO materials, and to give it slight elasticity. Glass-filling is also added to give it strength. It does not fusion weld to the base plastic; instead, it adheres to the surface.

Prep the workpiece by removing the shiny outer surface with 50-grit or courser sandpaper or low-speed grinder. The rough surface will give the fiber-flex adhesive many, small hills and valleys to adhere to, effectively increasing the surface area for adhesion. Apply fiber-flex rod in layers at a thickness of approx. 1/16" for each layer, smoothing over the top of each layer until your desired thickness is achieved. After cooling, the fiber-flex can be sanded with progressively finer grit until the desired surface finish is achieved.

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