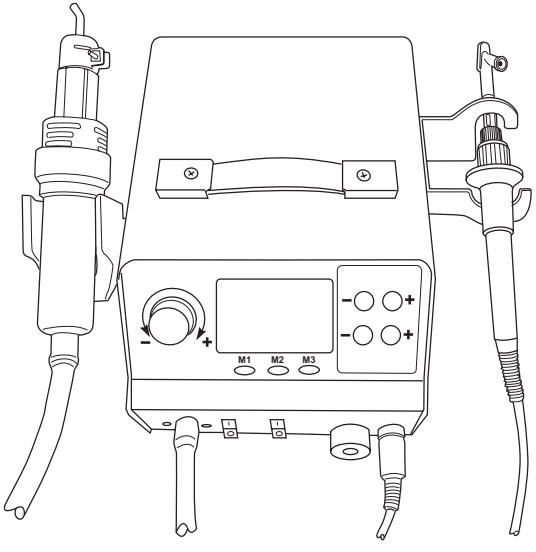
POLYVANCE
PART NO. 6180
MINI-FUZER HOT AIR PLASTIC WELDING STATION

USER MANUAL

Thank you for purchasing the Polyvance 6180 Mini-Fuzer Hot Air Plastic Welding Station. This product has both a hot air welder torch and an airless welder iron. The hot air torch has adjustable airflow and temperature, and the airless welder iron has adjustable temperature. This product is designed for welding plastic parts.

Please read this manual before operating the Polyvance 6180 Mini-Fuzer. Keep this manual readily accessible for reference



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1.0 WARNINGS, CAUTIONS, AND NOTES

This manual provides critical safety instructions on the proper operation, maintenance, and service of this tool. Failure to read, understand, and follow the instructions given in this manual may result in personal injury. The owner of this tool is solely responsible for its safe use. Polyvance recommends that all users read and understand the information in this manual prior to using the equipment. Polyvance will not be held liable for injury or property damage from negligence, improper training, machine modification, or misuse.

WARNING

This product contains materials that are known to the State of California to cause cancer, birth defects, or other reproductive harm. (Prop 65 warning)

GENERAL HAZARDS

Portable electric heating devices, such as this plastic welder, possess certain inherent hazards due to hot surfaces and hot air emissions.

Function of the hot air welder requires that the air inlet on the front of the welder to not be blocked or clogged. Replace filter element if it becomes clogged.

Fumes may be emitted during operation. Use in a well-ventilated area. Use a properly fitted organic vapors respirator if needed to prevent inhalation of fumes.

Hot air torch and airless welder iron should be returned to their holsters when the tool is not in use. Do not lay hot tools on any other surface when not in use.

This product is not intended for use in paint stripping operations.

FIRE HAZARDS

The temperatures necessary for their normal use are high enough to cause fire if the hot tool is left in contact with or near combustible materials.

Never use this tool near flammable liquids or vapors.

BURN HAZARDS

Do not touch hot metal parts! During normal operation, the metal parts of the hot air torch, the airless welder iron, and the airless welder holster are hot enough to cause severe burns even at the lowest possible temperature settings.

ELECTRICAL SHOCK HAZARDS

Tool is designed for indoor use only. Do not expose to rain or snow.

Do not use in or near water. Do not immerse in water. Do not use the tool in the rain. Do not use if the tool is wet.

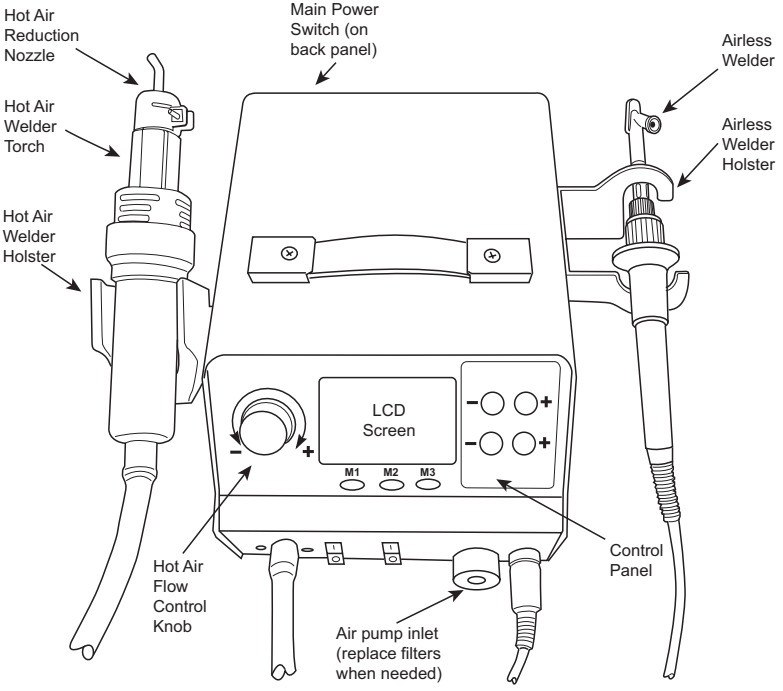
Do not use if cord, switch, or heating element are damaged.

Unplug tool before servicing. Never attempt to service the tool while it is plugged into a power source.

Warning: Electric shock hazard, where the appliance is used without the ground (earth) connection.

警告：機器を接地しないで使用すると感電する危険がある。

2.0 TOOL SCHEMATIC



3.0 SPECIFICATIONS

Power Requirements

Rated Voltage Range (see placard on back of tool)	North America: 110 - 127 V / 60 Hz (~3.0 amp) Japan: 100-110 V / 60 Hz (~3.7 amp) Rest of World: 220 - 240 V / 50 Hz (~1.5 amp)
Rated Power	370 W
Certification Duty Cycle	15 minutes maximum continuous use of hot air welder outside of holster / 5 minutes OFF. Always return hot air welder to holster when not in use to engage auto-cooldown mode.

Physical Specifications

Cabinet Size	253 mm x 186 mm x 124 mm (10 in x 7.3 in x 4.9 in)
Weight	5.13 kg (11.3 lb)
Ambient Working Conditions	1-40°C (32 - 104°F)

Display Type	LCD

Hot Air Welder Specifications

Air Pump Type	Diaphragm pump
Airflow	0 - 28 liters per minute (0 - 1 CFM)
Temperature Range	100 - 480°C (212 - 896°F)
Temperature Stability	±1°C
Torch Hose Length	1.8 – 2.1 m (71 - 82 in)

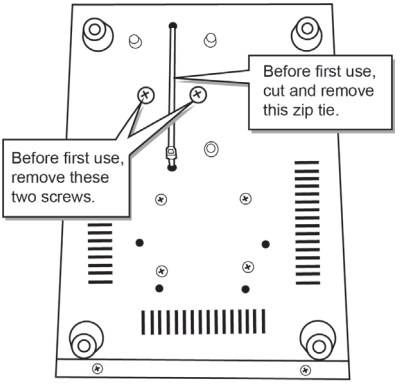
Airless Welder Specifications

Temperature Range	100 - 480°C (212 - 896°F)
Tip to ground voltage	< 2 mV
Tip to ground impedance	< 2 Ω
Welder Cord Length	1.8 - 2.1 m (71 - 82 in)

4.0 INITIAL SETUP

Remove all components from the box.

Remove the two screws marked in red on the bottom of the welding machine as shown in Fig. 1. Cut the plastic zip tie and remove it. These components secure the diaphragm pump during shipping and may be discarded upon installation.



Bottom view of welding machine

Figure 1

Using the two screws on the left side of the machine, install the hot air torch holster as shown in Fig. 2.

Using the two screws on the right side of the machine, install the airless welder holster as shown in Fig. 3.

Attach the airless welder to the welder on the front panel by lining up the notch at the top of the plug with the socket, then turning the nut to secure the plug in place.

Install the reduction nozzle to the end of the hot air torch.

Plug the power cord into the back of the welder, then plug it into a power source that matches the requirements of the placard on the back of the welder.

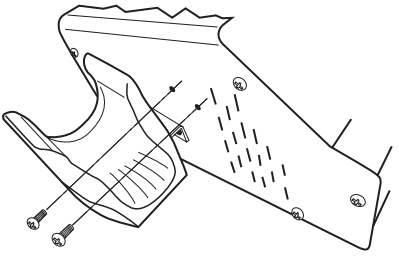


Fig. 2 - Install hot air welder holster

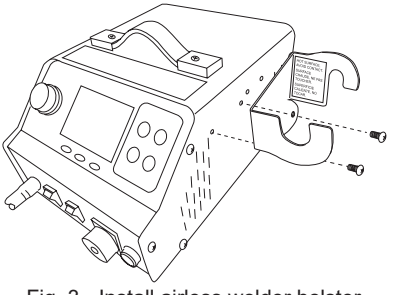
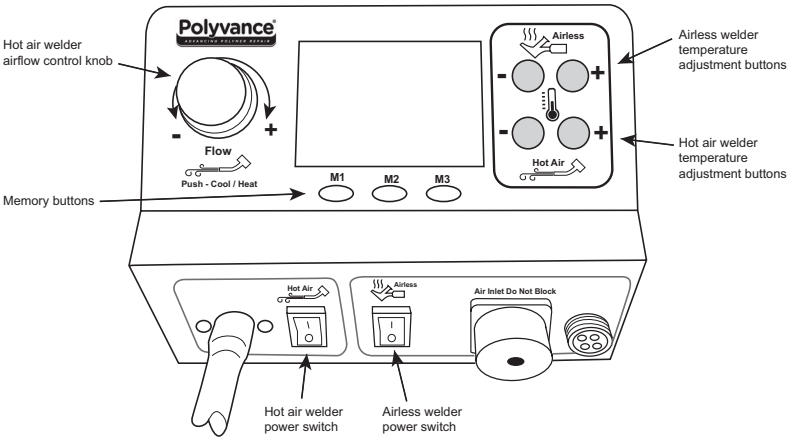


Fig. 3 - Install airless welder holster

5.0 CONTROL PANEL



6.0 WELDER OPERATION

Main Power On - For safety, prior to turning on the main power, make sure the hot air welder and the airless welder switches on the front of the welder are turned off. Turn on the main power switch on the back of the welder. You will hear a beep and the LCD screen will turn on, showing two sets of three dashes.

Main Power Off - Do not turn the main power off until the hot air welder cooldown cycle is complete and the air pump turns off. Damage to the hot air welder may occur if the main power is switched off before the cooldown cycle is complete.

6.1 Airless Welder Operation

Turn on the airless welder switch on the front of the welder. The LCD screen will briefly show the temperature setpoint (factory setting 400°C), then you will see the actual temperature of the heating element as it increases toward the setpoint. Allow about five minutes for the welder tip to reach full operating temperature.

The airless welder will automatically turn off if it is not used within the number of minutes shown above the “SLEEP” indicator on the LCD screen.

When the airless welder turns itself off, the display will flash between “SLP” (for “sleep” mode) and the low temperature point (100°C or 212°F).

If the airless welder is in sleep mode, when you pick it up out of its holster, it will start to heat up again. Note that additional time is required to heat up the metal of the tip; the actual metal temperature of the tip lags behind the indicated temperature on the LCD screen.

6.2 Hot Air Welder Operation

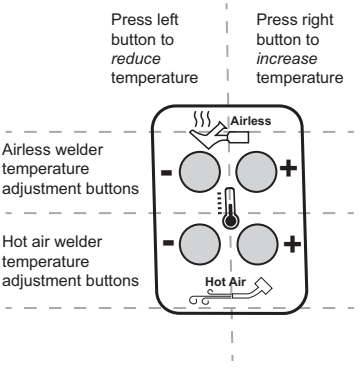
Make sure the hot air welder torch is in its holster.

Turn on the hot air welder switch on the front of the welder. The LCD screen will briefly show the temperature setpoint (factory setting 400°C), then you will see three dashes and the words “HOT AIR” underneath indicating that it is ready.

Pick up the hot air welder torch from the holster. You will hear the air pump operate and see the temperature rise toward the setpoint as it heats the air. When the temperature reaches the setpoint, the welder is ready to use.

When you return the torch to the holster, the welder will start its automatic cooldown process. The air pump remains on to cool the heating element. You will see the temperature reduce. Once it returns to 100°C (212°F), the air pump will automatically turn off. The LCD screen will return to showing three dashes and the words “HOT AIR”, indicating that the torch is ready to use once you pick it up from the holster.

6.2.1 Adjusting Welder Temperature - To adjust the welder temperature, push the appropriate buttons on the control panel as shown in the image to the right.



6.2.2 Adjusting Hot Air Welder Airflow - Rotate the airflow control knob clockwise to increase flow and counterclockwise to reduce flow. The graphic on the LCD screen gives a visual indication of the relative flow rate. The flow rate may be adjusted to suit the thickness of plastic being welded. Typically, thicker plastics will need higher flow and thinner plastics will need lower flow.

6.2.3 Toggling Hot Air Welder Power - Pushing the airflow control knob will toggle power to the hot air torch. Push the knob once and you will see the words “HOT AIR” on the LCD screen turn off and you will see the temperature readout start to come down. The air pump will remain on until the heating element is cooled down. Push the knob again and the words “HOT AIR” on the LCD screen will turn on and the temperature will start to rise toward the setpoint. Returning the torch to the holster will start the automatic cooldown process, so toggling the power with the knob is not needed in most situations.

7.0 SETTING MEMORY BUTTONS

You may save your preferred welder settings with one of the three memory buttons, labeled M1, M2, and M3. To save preferred welder settings, adjust the welder’s parameters (airflow, hot air welder temperature, airless welder temperature, and C°/F°) to the settings you want to save. Press and hold the memory button to which you would like to save these settings for two seconds, until you hear a beep. These settings are now saved to that button.

Airflow setting depends on the thickness of the plastic you are welding. Reduce airflow when welding thin plastics. Increase airflow when welding thick plastics.

Temperature setting depends on the type of plastic you are welding. Use the settings in the below table as a guide for welding various common plastics. Adjust up or down as necessary to suit your need.

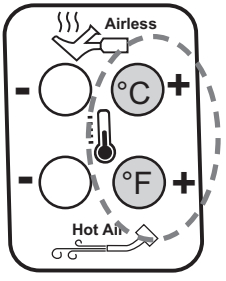
Plastic Type	Hot Air Temp. Setting	Airless Temp. Setting
ABS - acrylonitrile butadiene styrene	325°C / 620 °F	325°C / 620 °F
HDPE – high density polyethylene	400°C / 750 °F	400°C / 750 °F
LDPE – low density polyethylene	375°C / 700 °F	375°C / 700 °F
PA – polyamide (nylon)	450°C / 840 °F	450°C / 840 °F
PC - polycarbonate	350°C / 660 °F	350°C / 660 °F
PP – polypropylene	400°C / 750 °F	400°C / 750 °F
PUR - polyurethane	(do not use hot air on PUR)	290°C / 550°F

8.0 WELDER FUNCTION SETUP

Several welder functions can be adjusted by pressing and holding two buttons simultaneously for about four seconds until a beep is heard.

8.1 Celsius / Fahrenheit Temperature Display

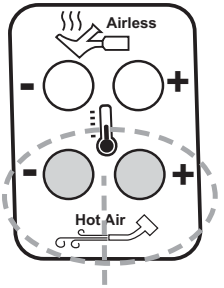
The default temperature display from the factory is in Celsius (°C). To change to Fahrenheit (°F) display, press and hold the two buttons until a beep is heard. You will see the °C/°F indicators flash. While the indicators are flashing, press the bottom button to change to °F. Press the top button to change to °C. After about five seconds, the indicators will stop flashing and the preferred temperature readout will be selected.



Push and hold these two buttons simultaneously to change temperature readout between °C and °F

8.2 Hot Air Welder Auto/Manual Mode Selection

The factory setting for the hot air welder is “AUTO” mode. This means that the welder will automatically cool down when the torch is placed into the holster. The torch will also heat up automatically when the torch is removed from the holster. Polyvance recommends that you leave it in Auto mode because it is the safest and most economical setting. Also, the heat-up time for the hot air torch is very short, so it will not reduce your productivity by leaving it in Auto mode.



Push and hold these two buttons simultaneously to change between Auto and Manual mode on hot air welder

Left button = Manual mode

Right button = Auto mode

If for some reason you want to change the hot air welder to “MANUAL” mode, press and hold the two hot air buttons simultaneously until a beep is heard and the Auto/Manual indicators flash. Press the left button to switch to Manual mode and the right button to switch to Auto mode. After about five seconds, the indicators will stop flashing and the preferred hot air welder mode will be selected.

8.3 Airless Welder Sleep Time Setting

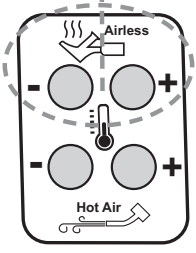
The factory setting for the airless welder sleep time is 10 minutes. This means that, if the airless welder remains unused in the holster for 10 minutes, it will turn itself off and go into sleep mode. When you pick up the airless welder, the airless welder will begin to heat back up to the setpoint.

Unlike the hot air welder, it may take several minutes for the tip of the airless welder to reach the setpoint. So increasing the sleep time of the airless welder may improve your productivity.

To change the airless welder sleep time, press and hold the two top buttons simultaneously

Left button = Reduce time

Right button = Increase time



Push and hold these two buttons simultaneously to adjust airless welder sleep time

until a beep is heard. You will see the “SLEEP” indicator begin to flash. While the Sleep indicator is flashing, press the right button to increase the sleep time and the left button to reduce the sleep time. Sleep time may be varied in one minute increments from 0 to 99 minutes. After about five seconds, the indicator will stop flashing and the selected sleep time will be stored.

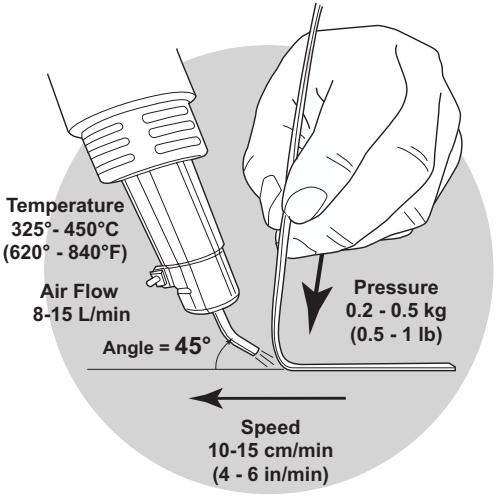
9.0 PLASTIC WELDING

The following instructions will explain how to weld plastic with both the hot air welder and the airless welder. The airless welder’s versatility allows you to weld thermoplastics, repair thermoset polyurethane, and melt in stainless steel wire mesh to reinforce your repair.

9.1 Hot Air Welder

The diagram shown here illustrates the orientation of the hot air welder and welding rod, along with some parameters to set and keep in mind during the process.

Welding with hot air involves the coordination of both hands; one controlling the torch and the other feeding the rod. During the process, melt the bottom surface of the rod and the top of the substrate. Don’t “puddle” the rod like in metal welding. This makes for a stronger repair because it leaves the basic structure of the rod intact. During the welding process, melt both the base material and the rod at the same time and fuse the melted surfaces together with a slight downward pressure on the rod as the pass is made.



- Set the temperature to the setting that matches the type of plastic being welded. Refer to the temperature chart on Page 6.
- The airflow should be set depending on the plastic’s thickness; less for thinner plastics, more for thicker plastics.
- An angle of 45° between the welder tip and the substrate is optimum. Aim the stream of hot air a little in front of the rod. The rod should be about a 90° angle to the base material.
- The distance of the welder’s tip to the work is important because the temperature of the gas stream drops quickly the farther away the tip is. Keep the tip about 5 mm (1/4”) to the work.
- Apply a light downward pressure on the rod to fuse the rod and base material. Keep a steady downward pressure on the rod and keep the rod moving slowly.

- The speed of the weld should be about 10-15 cm (4 to 6 inches) per minute. Move steadily while making sure the base material and the bottom surface of the rod are both melted before they come together.

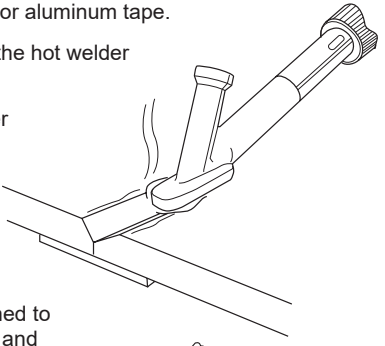
See instructional videos on www.polyvance.com or search for Polyvance on YouTube.

9.2 Airless Welder - Welding Thermoplastics

"Thermoplastics" are plastics that melt when heated and resolidify when cooled. Look for an identification symbol molded into the part, or do test welds with various welding rods to see which one sticks best.

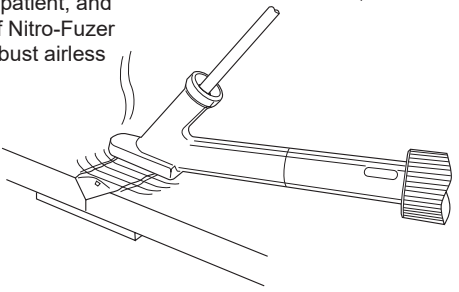
Line up the outer surface of the crack using clamps or aluminum tape.

Create a v-groove along the crack with the edge of the hot welder tip, or use a grinding tool. Pre-melt the v-groove.



With the airless welder temperature set at the proper level to match the plastic being welded (see table on Page 6), melt the filler rod into the v-groove for a length of about 25 mm (1 in.), then remove the rod from the tip and go back over the welded area to mix the base material and rod together.

DO NOT press down on the welding iron with excessive pressure. The heating element is not designed to resist heavy pressure. Use a light touch, be patient, and let the heat do the work. (Polyvance's line of Nitro-Fuzer professional-quality welders have a more robust airless welder handle design for greater durability.)



Allow weld to cool completely. Remove clamps or aluminum tape. Repeat the process on the opposite side.

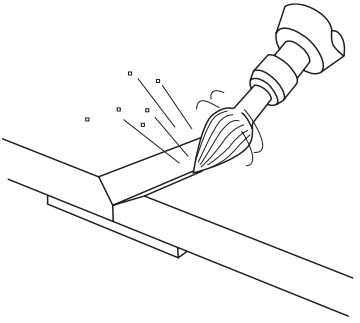
See instructional videos on www.polyvance.com or search Polyvance on YouTube.

9.3 Airless Welder - Welding Thermoset Polyurethane

"Thermosets" are plastics that do not melt. They are formed by a chemical reaction between two components to make a solid plastic material. The only thermoset plastic that can be repaired with the airless plastic welder is polyurethane (PUR) a common material for bumper covers in the 1970's through the 2000's, and is still used today.

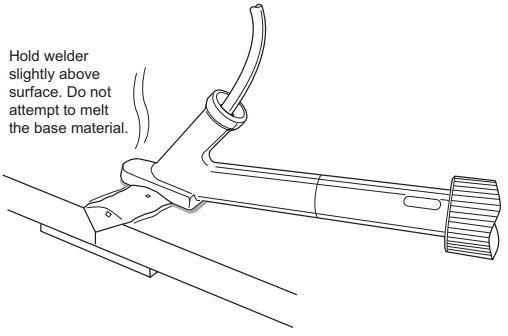
Line up the outer surface of the crack using clamps or aluminum tape.

Grind a v-groove about halfway through the plastic with a rotary tool. You cannot melt the v-groove in because PUR is not meltable.



Set the temperature of the airless plastic welder to 290°C (550°F) and feed the R01 urethane welding rod through the welder tip as shown. The rod should come out the bottom fully melted, but not smoking and bubbling. Adjust the temperature setting as needed.

Holding the welder's tip slightly off the surface of the plastic, melt the rod into the v-groove. Deposit no more than two inches (5 cm) of welding rod at a time. Remove the rod from the welder tip and use the hot welder tip to smooth out the weld. Do not attempt to melt the base material. The welding rod acts like a hot melt glue or a brazing rod when repairing thermoset polyurethanes. Allow the repair on the backside to cool completely, remove the tape, and repeat the process on the opposite side.

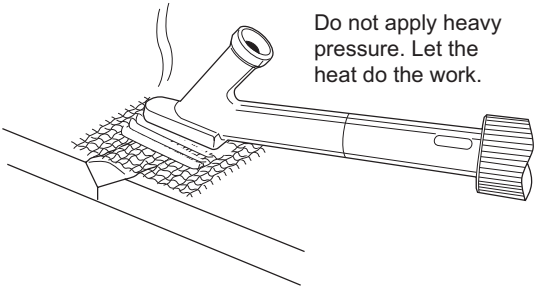


See instructional videos on www.polyvance.com or search Polyvance on YouTube.

9.4 Airless Welder - Melting in Reinforcing Wire Mesh

Thermoplastic (i.e. meltable) plastics may be reinforced by melting stainless steel wire mesh into the plastic. The mesh locks into the undamaged substrate in the area and transfers stresses across the crack into the substrate to increase the strength of the repair.

To reinforce a repair, cut a piece of mesh about 15 mm (5/8") wide and about the length of the crack using a pair of scissors or tin snips. Lay the mesh on the backside of the plastic and, using the hot airless welder tip, start at one end of the mesh and press the mesh into the surface.



DO NOT press down on the welding iron with excessive pressure. The heating element is not designed to resist heavy pressure. Use a light touch, be patient, and let the heat do the work. Once the mesh is embedded into the plastic, move the tip to the next section. Use a screwdriver or similar tool to apply pressure to keep the mesh embedded in the plastic until the plastic resolidifies.

10.0 TROUBLESHOOTING

10.1 Hot Air Welder Not Cooling Down

The hot air welder holster has two small magnets that trigger the sensor in the handle. If the hot air welder is not cooling down automatically when the handle is placed in the holster, first check that the rubber handle grip is slid all the way toward the nozzle. Then rotate the torch in the holster slightly until the sensor is triggered by the magnets in the holster.

If the hot air welder continues to malfunction or displays "S-E" (sensor error), contact Polyvance or your authorized distributor for instructions.

10.2 Airless Welder Barrel is Bent

The 6180 Mini-Fuzer is not designed for heavy-duty, professional, or industrial use. The airless plastic welder, in particular, cannot withstand heavy downward pressure on the handle. Use only a light downward pressure on the airless heating element. Bending of the airless plastic welder's barrel is excluded from the one-year warranty on this product (see below, Section 11.0)

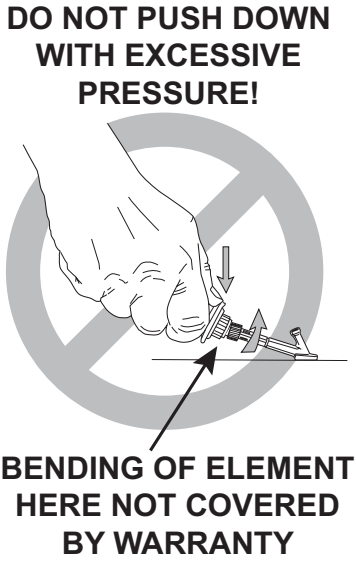
If you need a professional-quality, heavy-duty airless heating element, purchase one of Polyvance's plastic welders that feature a 6012 ceramic heating element, like the Nitro-Fuzer line of nitrogen plastic welders.

11.0 LIMITED WARRANTY

The 6180 Mini-Fuzer is warranted against defects in materials and workmanship for a period of one year from the date of purchase. Any part found to be defective during the warranty period will be repaired or replaced free of charge when returned prepaid with a copy of the original invoice showing the date of purchase. An RGA (Returned Goods Authorization) number must be obtained from Polyvance (or its authorized distributor in your country) prior to any repair or return.

Damage to the welder due to mishandling, impact, or other misuse is strictly excluded from this warranty.

Bending of the airless welder's barrel due to excessive downward pressure being applied to the handle is strictly excluded from this warranty.



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