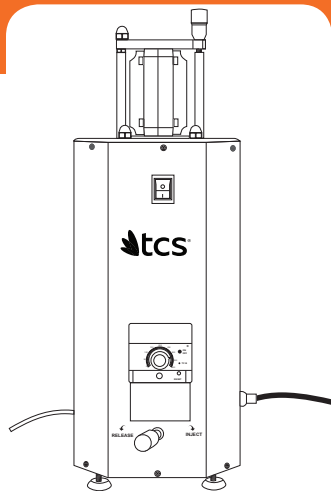


TCS Automatic Injector

Operating Instructions



The TCS Automatic Air Injector w/Built-in Furnace is used to melt TCS thermoplastic material and inject it into the flask.

Item #3525-01 (110V)

Item #3525-02 (220V)

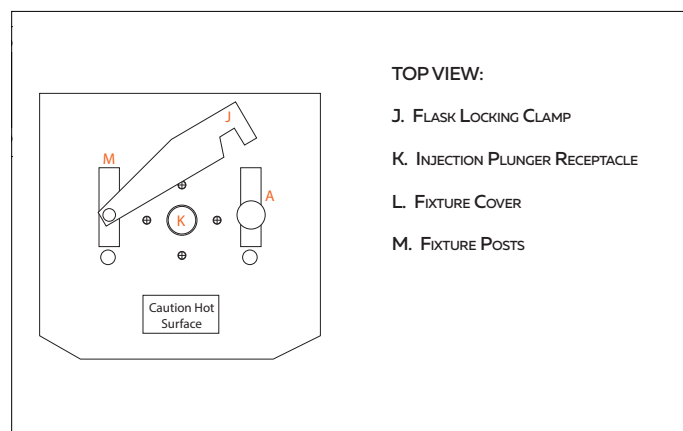
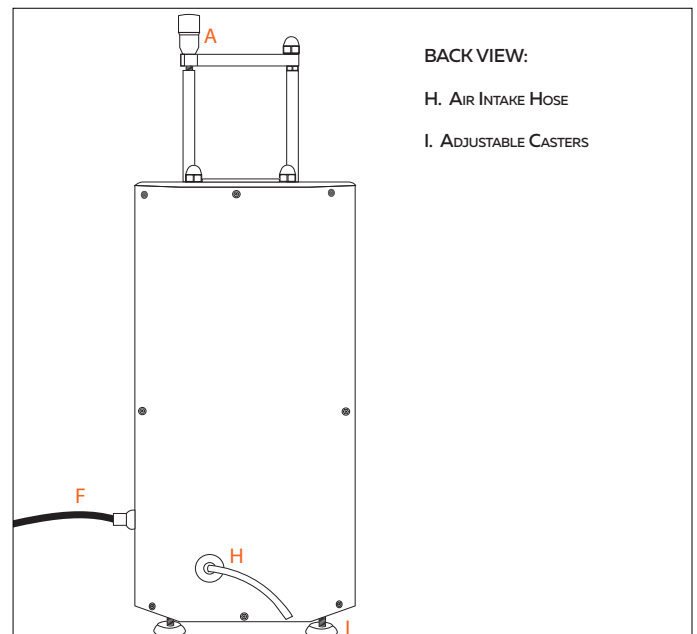
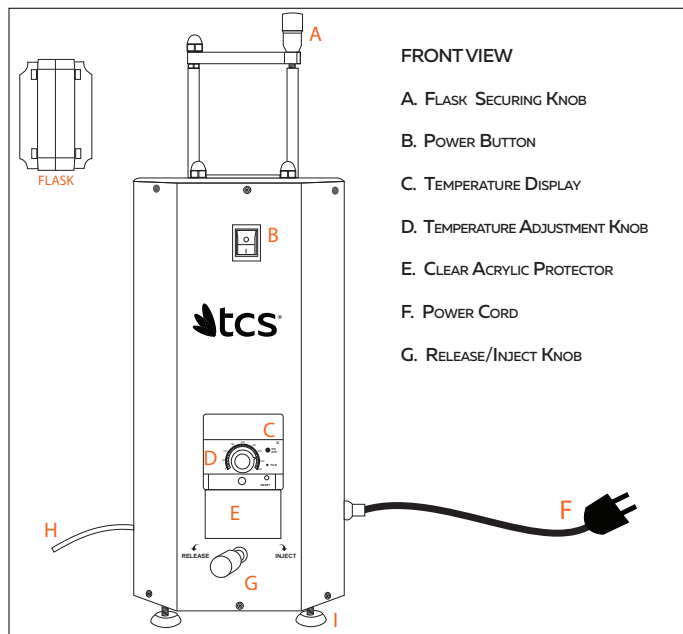


PLEASE READ MANUAL PRIOR TO USE

IMPORTANT

Be sure the release/inject switch is in the **RELEASE** position before connecting the compressor to the injector.

Get to Know Your Machine



Specifications
 Yield: Approximately 30 cases per day
 Weight: 40 lbs
 Dimensions: Width 8" / Height 23"/ Depth 13.5"
 Available in 110V & 220V
 Requires a minimum of 135 psi
 Warranty: 1 year

Unpacking and Safety

Your safety and the safety of others are very important. We have provided many important safety messages in this manual. Please read these messages carefully. A safety message alerts you to potential hazards that could hurt you or others. Each safety message is associated with a safety alert symbol. The definition of these symbols are described below:



General Safety Hazard: Refer to the instructions for details on the specific hazard.



Caution: Hot surface Warning



Caution: Electrical Shock Hazard



Technical Symbol: All operations marked with this symbol are to be performed by qualified maintenance personnel only.

Ventilation Clearance:

AREA	MINIMUM REQUIRED CLEARANCE
Back of the unit	10 cm / 4 inches
Sides of the unit	20 cm / 8 inches
Above	30 cm / 12 inches
Below	N/A

Getting Started



Caution: High voltages are present. The line power connections must have a functioning ground connection and over voltage protection in the form of a fuse or circuit breaker.



** DO NOT DEFEAT THE GROUND WIRE ON POWER PLUG

** TURN OFF INJECTOR BEFORE DISCONNECTION OR CONNECTING ELECTRICAL PLUGS



IMPORTANT

Be sure the release/inject switch is in the **RELEASE** position before connecting the compressor to the injector. **FIG 1**

1. Plug the injector's power plug into a grounded, three prolonged outlet. **FIG 2** Make sure the line power matches the voltage and frequency rating on the power cord label.

Note: The four resting feet at the bottom of the injector can be adjusted for balance. **FIG 3**

2. **Pneumatic Connection:** Connect an air line to the Air Intake Hose on the backside of the injector. Make sure to fasten it securely using the appropriate hardware. **FIG 4**

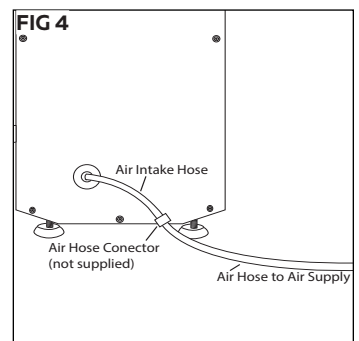
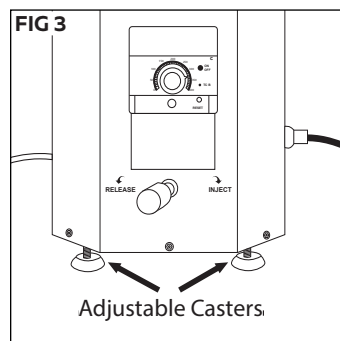
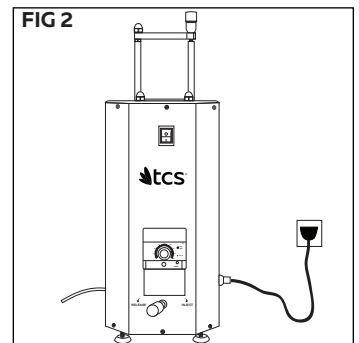
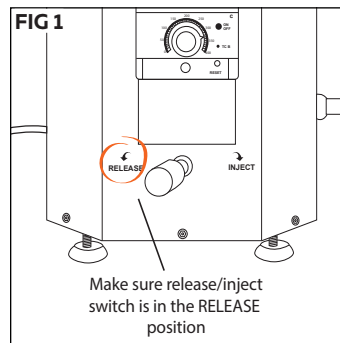
Note: Make sure that the hose is securely clamped in place with a screw tighten coupler.

IMPORTANT NOTE: Check the compressor to insure that the accurate amount of air pressure is used. If your laboratory does not have a compressor, a nitrogen tank can be used with a regulator, (these tanks are normally available at welding supply houses). A medium size nitrogen tank will yield approximately 200 injections, and larger nitrogen tanks will yield approximately 500 injections.

WARNING: The air supply to the TCS Automatic Injector must meet the following specifications:

- Maximum pressure = 140 psi
- Minimum pressure = 130 psi

The air supplied must be dry and filtered to prevent dust and particles from deteriorating the injector mechanism.



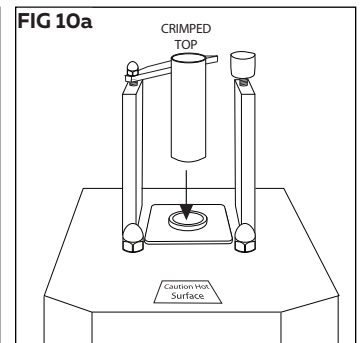
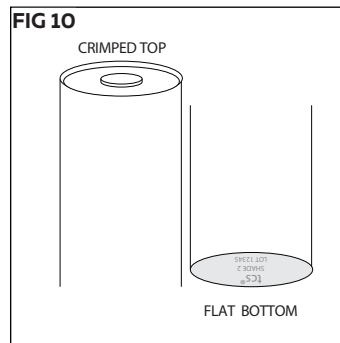
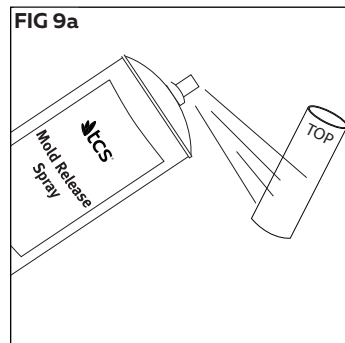
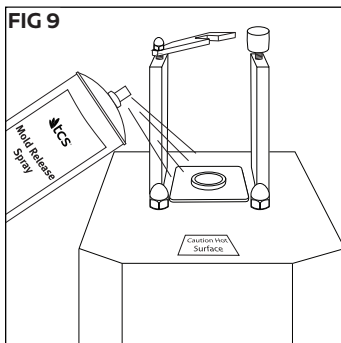
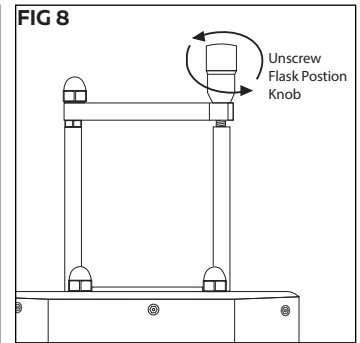
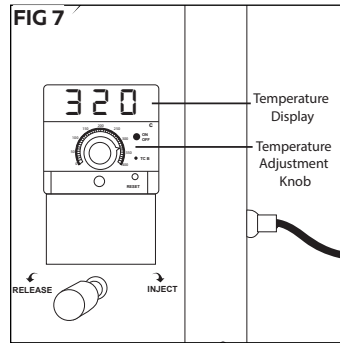
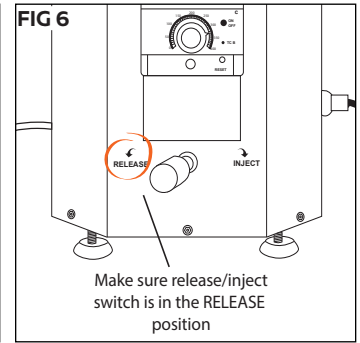
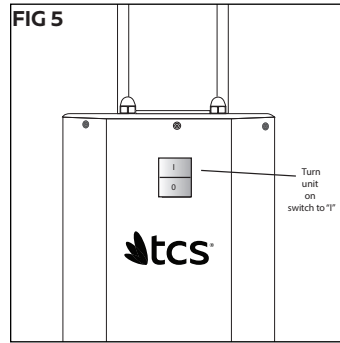
Operating the Injector Unit

1. Turn power on by pushing the power button to "I" position. **FIG 5**
2. Make sure the release/inject switch is in the RELEASE position and injector plunger is withdrawn into the receptacle. **FIG 6**
3. The furnace is calibrated from to the ideal temperature, approximately 320°C. You should not have to do any adjustment, however, if adjustment is necessary, do the following:
 - Open clear plastic cover on temperature display.
 - Slightly rotate temperature adjustment knob right or left to obtain desired temperature. **FIG 7**
4. Unscrew the flask position knob and swing clamp back. **FIG 8**

Note: Once the furnace reaches the desired temperature, let it stand for approximately 15 minutes prior to first injection. This is recommended to give the entire mechanism time to heat up.

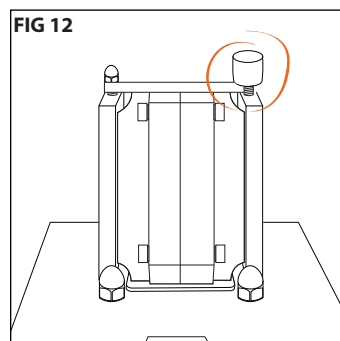
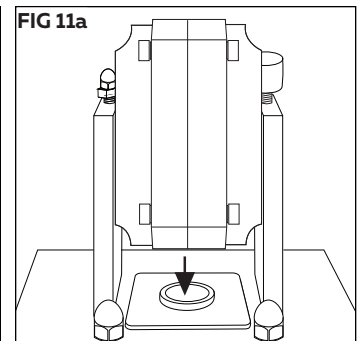
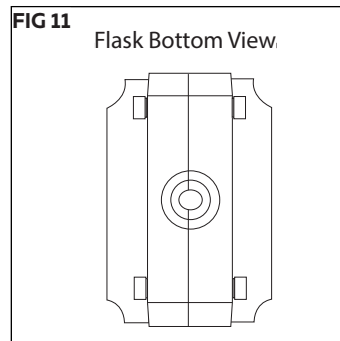
5. Lightly spray inside receptacle with TCS Mold Release Spray. **FIG 9**
6. Spray TCS cartridge with TCS Mold Release Spray. **FIG 9a**
7. Place a TCS cartridge into the receptacle with its cap end up. **FIG 10 & 10a**
8. Immediately set a timer for recommended melt time.
 - E.g. Unbreakable™ - 11 min.*

Note: The top of the cartridge is crimped and the bottom is flat. **FIG 10**



Caution: Hot Surface. Some of the components of the injector get very hot! Always use protective gloves, clothing and eye protection.

8. Approximately 2-3 minutes before injecting, insert injection flask into flask position fixture so that the bottom part of the injection =flask is down and the flask is firmly seated on the flask fixture. (Placing the flask at this point will allow it to heat up, eliminating the need for heat lamps). **FIG 11 & 11a**
9. Swing in the fixture cover and fasten it firmly in place by tightening the flask securing knob. **FIG 12**



Inject

When timer sounds immediately:

11. Switch release/inject knob to the inject position. Wait approximately 1 minute. **FIG 13**
12. Switch release /inject knob to the release position. **FIG 13a**



Caution: HOT! Wear Protective Gloves!

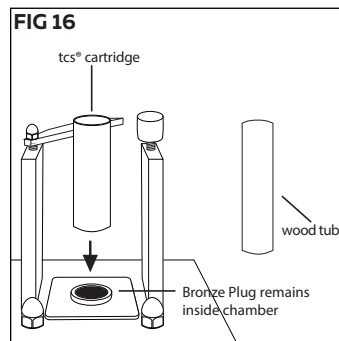
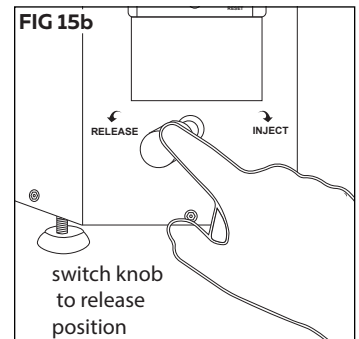
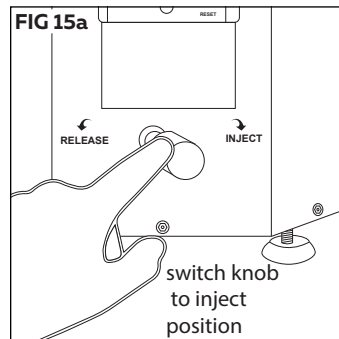
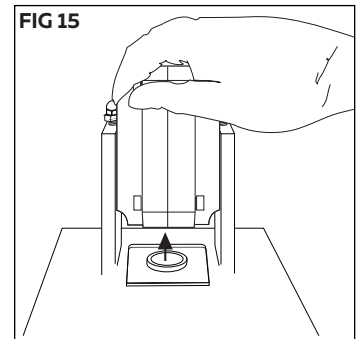
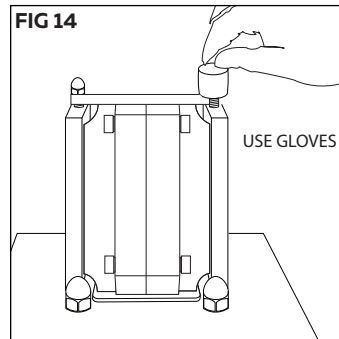
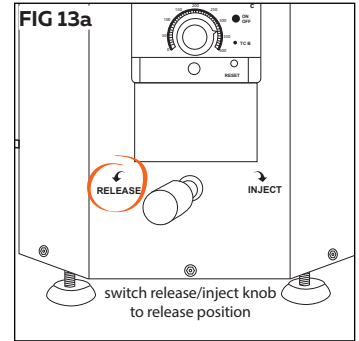
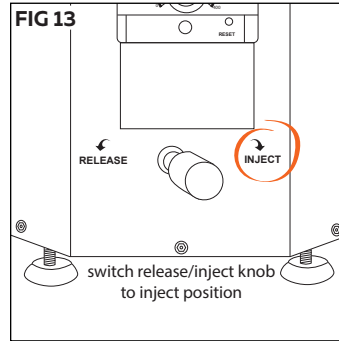
13. Loosen flask securing knob and swing out flask securing clamp. **FIG 14**
14. While you hold on to the flask with one hand (wearing protective gloves), switch release/inject knob to inject position again to help with the release of the flask. **FIG 15 & 15a**
15. Remove flask from injector unit and switch release/inject knob to release position. **FIG 15b**

Note: Always leave injector in the release position when not in use.

Let flask cool for the recommended time.

EXTREMELY IMPORTANT: Maintain the injector in the release position at all times to avoid deterioration of the sealing components.

16. At this point the bronze plug that is in the receptacle may stay up due to the unique design of the injector. With a small wooden tube (included) push the bronze down, or you may push it down with the next TCS cartridge you inject. **DO NOT push the bronze plug down while mechanism is cold.** **FIG 16**



Maintenance

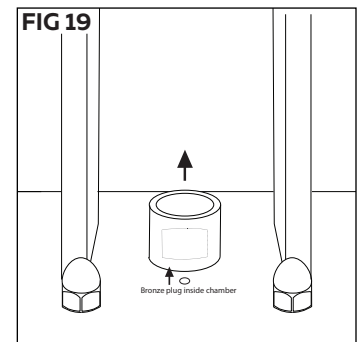
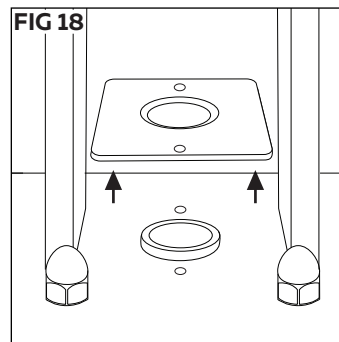
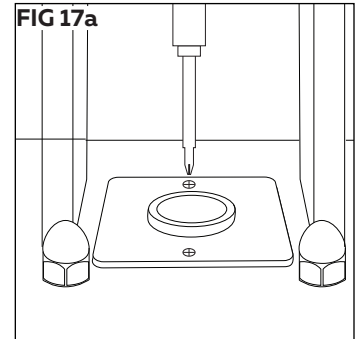
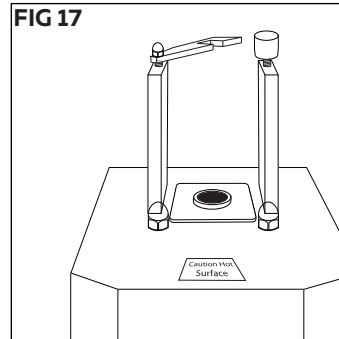
This injector was designed for easy cleaning and maintenance. It is inevitable that some thermoplastic residue will be released into the receptacle at some point throughout the use of the injector.

In order to have smooth injections, be sure that the cylinder is always free of residue. The best method is to clean the cylinder while it is hot with a metal rod and a rag. If this is done while the mechanism is hot, the residue will come off easily.

Note: If the cylinder gets clogged or a tube gets stuck in receptacle, do the following:

1. Unscrew the 2 small screws located at the top plaque. **FIG 17 & 17a.**
2. Remove the plaque. **FIG 18**
3. Remove the cylinder. **FIG 19**
4. Clean residue from the cylinder using a metal rod and a clean rag.

Note: The bronze plug is loose in the cylinder, if there is a lot of residue or a jammed cartridge, the bronze plug should come out with the cylinder. In case the bronze plug does not come out, the back part of the unit will have to be opened in order to get it.



FAQ's

Q: Can I use less than 135 PSI?

A: It is not recommended and may cause short castings.

Q: Can I use more than 140 PSI?

A: 1. It is not recommended, may cause open bites. 2. May cause damage to internal parts of the injector, e.g. blow out the hosing.

Q: Can I use nitrogen instead of air?

A: Yes.

Q: Can I use a shared compressor?

A: Yes, however, make sure that a minimum of 135 PSI is reaching the injector at the time of injection. If you encounter short casting issues, a pressure gage can easily be adapted on the unit to ensure pressure at the time of injection.

Q: Why do I have short castings?

A: 1. Make sure you are using correct temperature, time and that the PSI is at a minimum of 135. 2. Review waxing and spruing techniques. 3. Ensure recommended diameter of sprue is being used. 4. Check for air leaks in the unit.

Q: Can I inject other similar resins?

A: 1. As long as the cartridge diameter fits properly into melting chamber, 25mm. 2. Some thermoplastics may need more than 140 PSI, in that case, you may have short castings. 3. Contact the manufacturer of the thermoplastic and/or TCS.

Q: Can I inject full dentures?

A: Contact TCS.

Q: Do different size TCS cartridges require different time and/or temperature?

A: Different materials may vary in time and/or temperature (e.g. Unbreakable™, iFlex™, Karadent™), however, the same time and temperature is used regardless of the size of the cartridge (sml, med, lrg).

Q: Can I use other brands of flasks?

A: No, the TCS flask is designed specifically to fit precisely into place.

Q: Can I use the JP90 Hand Held Injector with this unit?

A: No, the JP90 needs to be used in the horizontal position only.

Q: Why is the temperature different using an external temperature controller?

A: The thermocouple is not reading the temperature in the same place.

Q: How many minutes do I have to wait between injections?

A: After injecting and removing the flask wait approximately 3 minutes before inserting the next cartridge. Also, check temperature reading to ensure that it is at the desired temperature.

Q: Unit will not turn on?

A: Check the fuse.

