

# USER MANUAL



## MICROMOLDER - EVO

by: shopbotix



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## SAFETY:



# SAFETY FIRST



Warnings: The use and operation of this machine poses many hazards. Please read and understand all warnings and hazards outlined in this manual. Always wear the appropriate personal protection equipment when operating this machine. To ensure the safety of you and those around you, always be aware of your surroundings and pay close attention to the current operating state of the machine.

Although this machine is equipped with many safety features and functions it should always be considered highly dangerous. Before performing any operation or movement of the machine always check that safety sensors and functions are operational, that machine guards are in place where applicable, and that you the operator has a clear understanding of the user input - machine output relationship.

Never disable a safety feature on this machine.

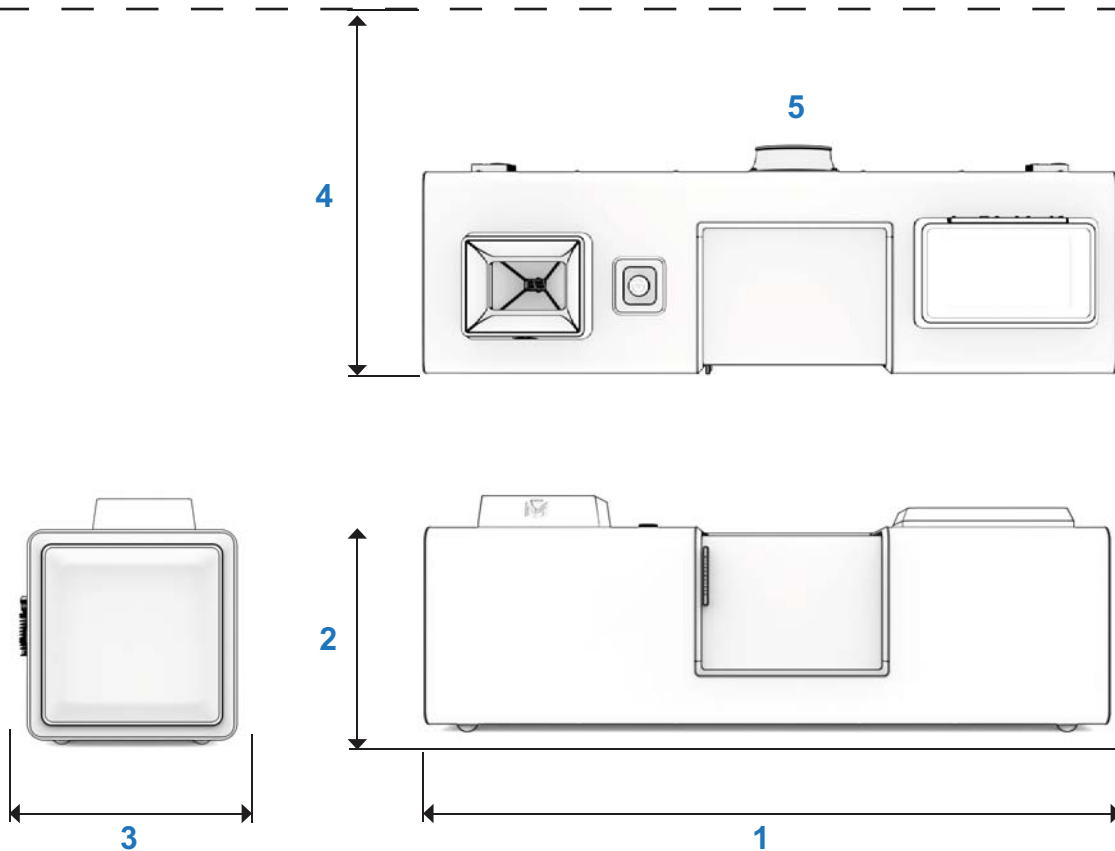
Never allow operation of this machine by un-trained or under-trained personnel.

Never allow children to interact with any part of this machine... Ever!

Maintenance and or repairs should be performed by qualified personnel only.

Never perform any maintenance task on this machine until the proper precautions have been met

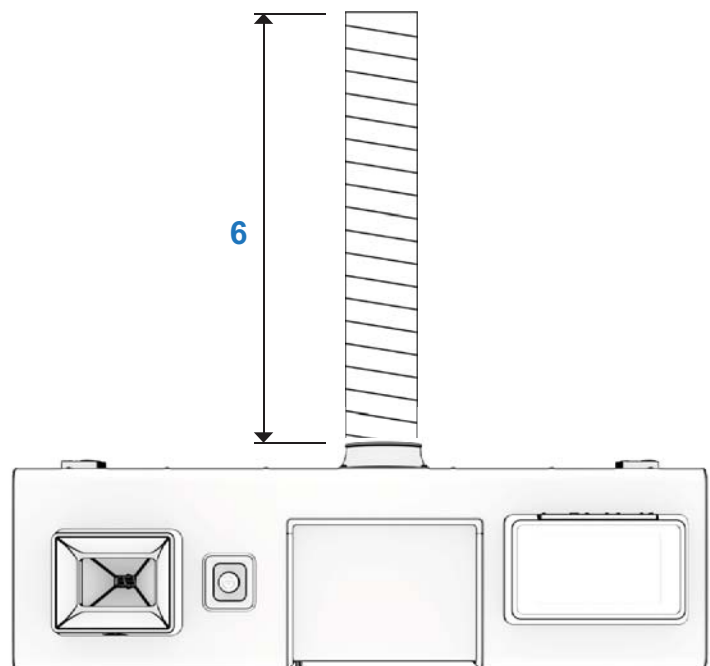
## PLANNING FOR INSTALLATION:



1. 34.73in (882.14mm)
2. 10.14in (257.68mm)
3. 12.07in (306.69mm)
4. Recommended Wall Clearance  
18.00in (457.20mm)
5. 4" O.D. Standard Exhaust Vent
6. Exhaust Fan Ducting Requirements:

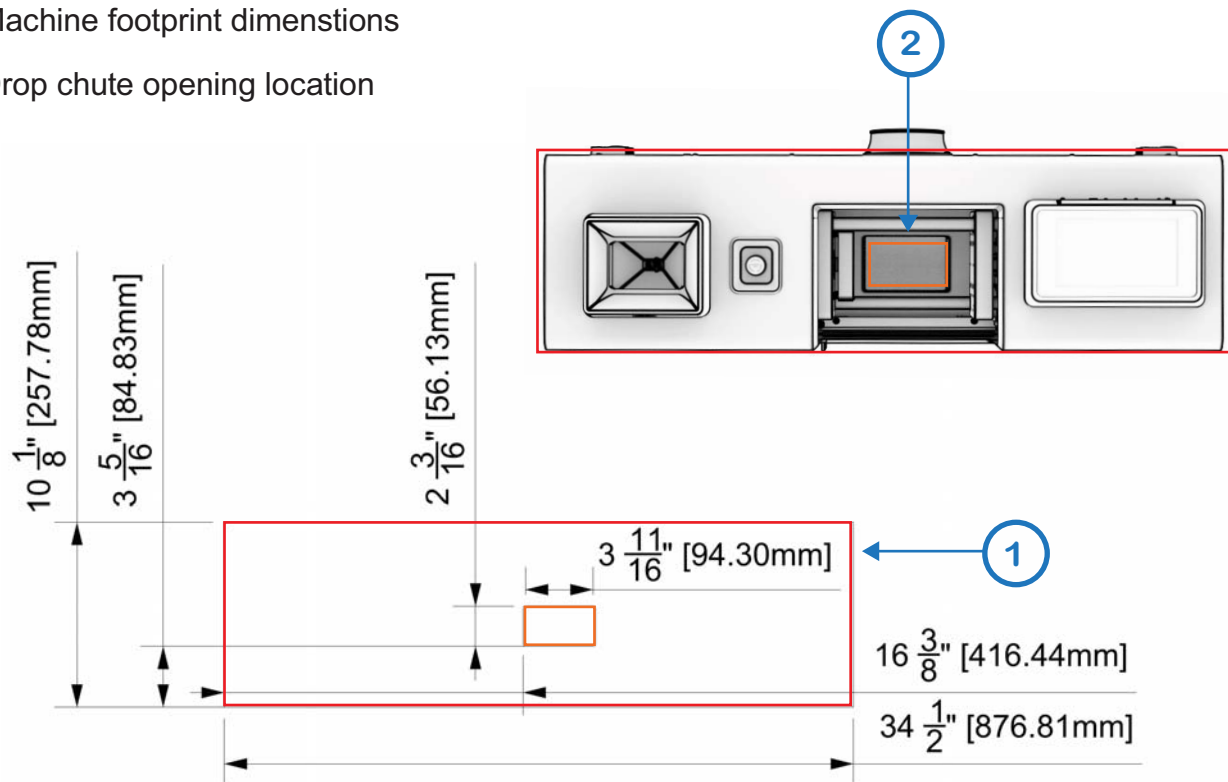
### Note:

If run length of exhaust ducting is greater than 6ft (1.82m) it is recommended that an in-line fan be used to supplement the on-board exhaust fan

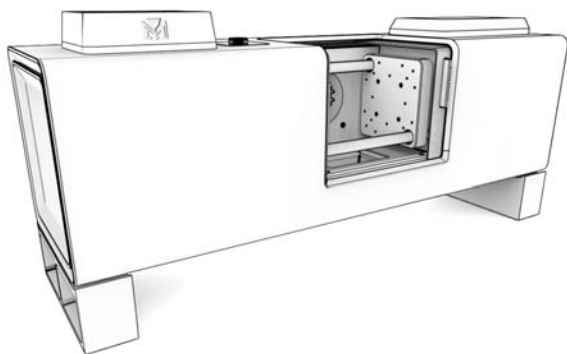


## PLANNING FOR INSTALLATION: CONT.

1. Machine footprint dimensions
2. Drop chute opening location



**Riser Block Setup**



**Bench / Table Setup**



**Note:**

Riser blocks can be 3D printed and design files can be found on the downloads section of [www.micro-molder.com](http://www.micro-molder.com)

# MACHINE SPECIFICATIONS:

## CHASSIS

- 34.5" L x 10.0" W x 10.0" H (87.63cm x 24.5cm x 24.5cm)
- Weight 90lbs (36.28 kg)
- Power 120VAC 60 Hz(North America) or 220VAC 50 Hz(EU, Asia, etc)

## WORKING AREA

- 6.00" max opening between platen plates
- 5.75" x 5.75" platens with universal bolt down clamp positions

## INJECTION PARAMETERS

- Dual heat zones injection barrel
- Tool temperature and heater connection ports (24vdc and 80 watt max)
- Compressed air inlet
- 1.0 oz max shot size (1.8<sup>3</sup>) (29.57<sup>3</sup> cm) for 3D printed tooling
- 0.75 oz max shot size (1.35<sup>3</sup>) (22.18<sup>3</sup> cm) for aluminum tooling
- Clamping: ~ 1.5 tons applied force ~ 8 tons clamping force
- Standard injection molding nozzles (user replaceable)
  - o 7/8"-14 thread, 1/2" rear opening, and a nominal 1/2" spherical radius

## CONTROLS

- Powered by a LattePanda
  - o 1.8 GHZ Quad-Core, 2 GB Ram, 32GB Flash Memory
  - o Windows 10 OS
  - o WiFi, Bluetooth 4.0
  - o USB 3.0
- 7-inch touch screen graphical user interface
- Factory installed and calibrated control program and firmware

## MACHINE FEATURES

- Optical part counter
- Injection error and part jam detection
- Automatic sleep and shutdown modes
- Plastic pellet hopper level detection
- Single Cycle or Auto Run modes
- Injection profile shaping
- Savable tool settings library
- Fume exhaust
- On screen touch and external mechanical emergency stops
- Safety door
- Over temperature shutdown
- Fully enclosed working area

## MACHINE SENSORS AND SENSOR FUNCTIONS:



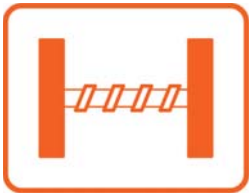
### **EJECT:**

- Counts parts when in Auto Run mode
- Detects injection errors if present
- Indicates error on GUI screen
- Unattended for >3 minutes, heaters are shut off and machine is put into an e-stop mode



### **HOPPER:**

- Detects presence of plastic pellets
- Indicates error on GUI screen
- Flashes Chassis LED lights



### **CLAMP:**

- Clamping pressure control jam detection
- Indicates error on GUI screen



### **INJECTION:**

- Detects jams
- If a jam is present in the injection system power is cut to prevent the motor from drawing excess current and on on screen indicator becomes active



### **TEMP:**

- Controls temperatures from all heating zones
- Over temp range detection
- Indicates error on GUI screen
- Turns off all heaters



### **DOOR:**

- Open door detection
- Stops machine motion if opened while running
- Prevents machine motion if open before starting
- \*User override required for experimental tooling that requires the door to be opened.

## UNBOXING:

### What's Included:

- (1) MicroMolder Evo Machine
- (1) LCD Touch Panel
- (1) Hopper
- (1 each) Cables:
  - AC Power
  - HDMI
  - USB
  - DC Power

MicroMolder Evo



Touch LCD



Hopper

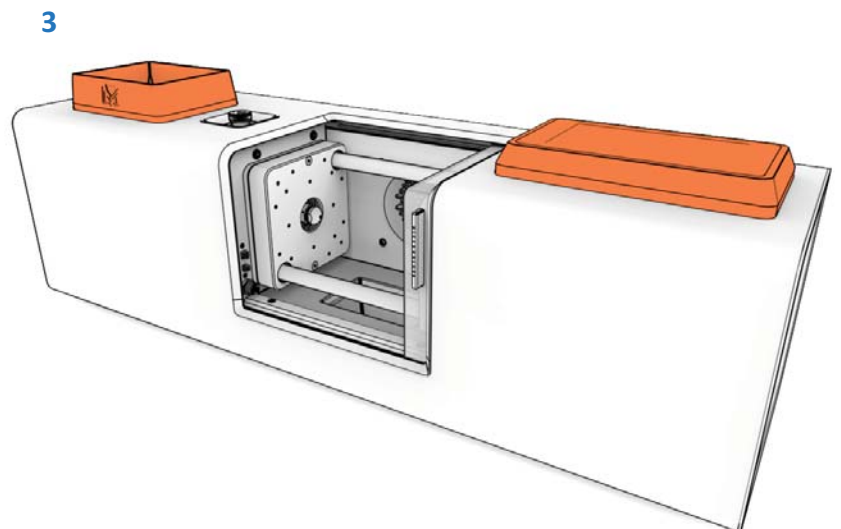
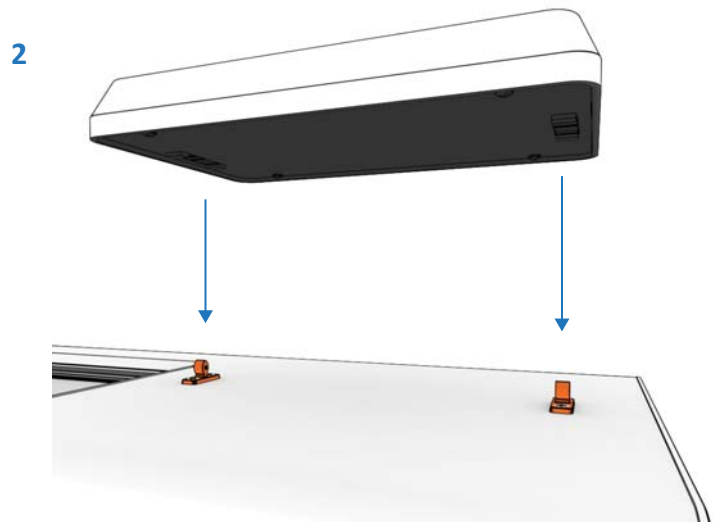
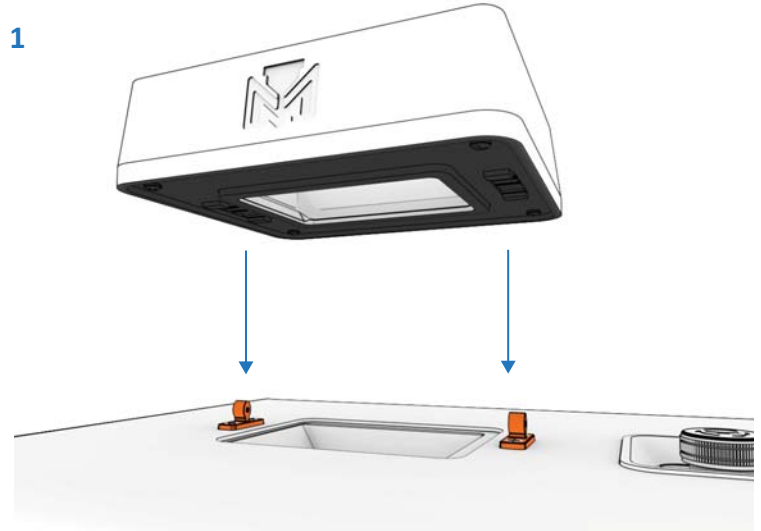


### CAUTION!

At 95+ lbs (43 kg), this box is not lightweight. Get help when carrying the package to avoid damaging contents.

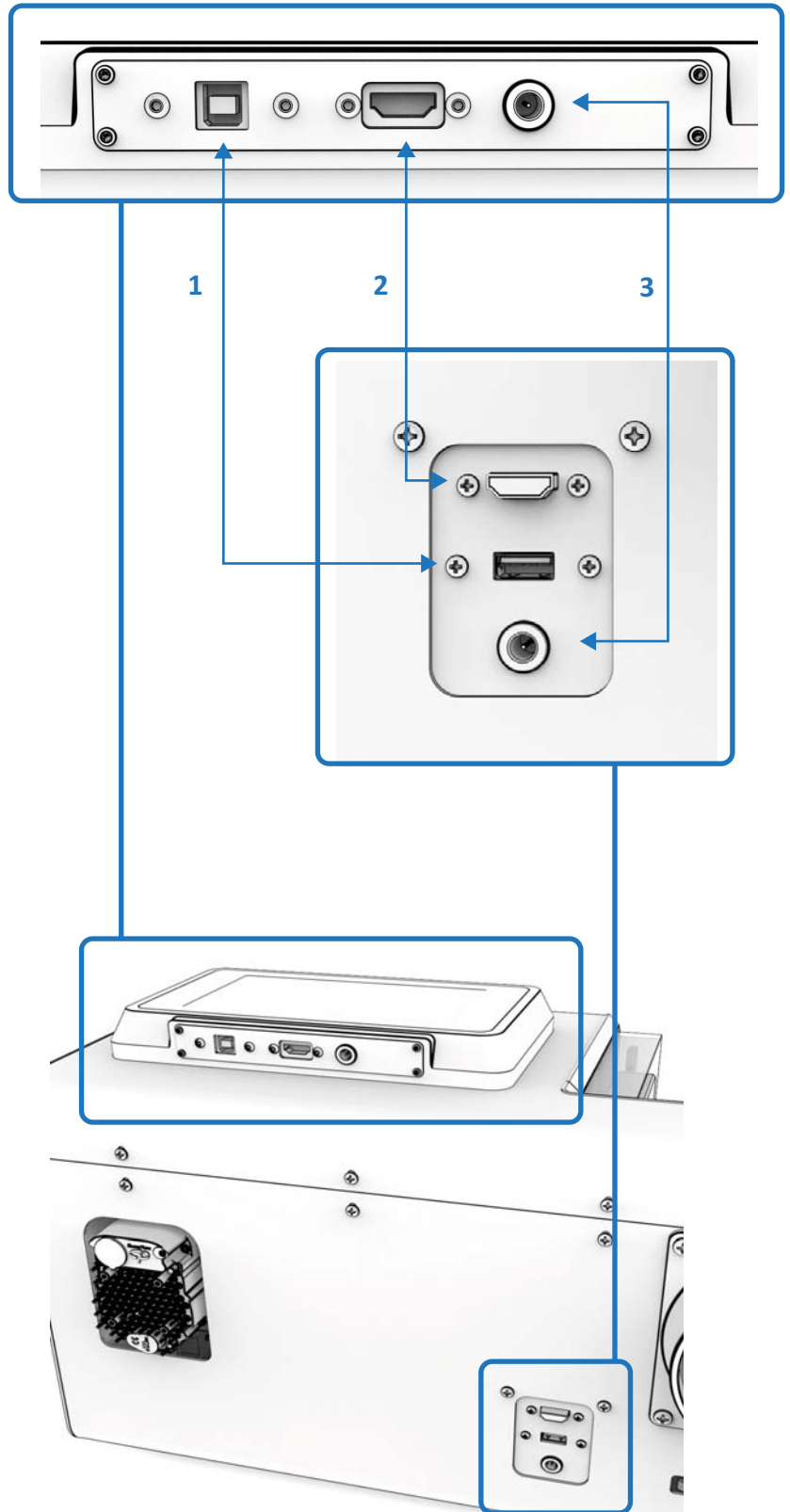
## SETUP

1. Attach the hopper to the top of the machine as shown. The hopper snaps onto the orange clips by aligning the hopper female clips and pressing down.
2. Attach the LCD touch display to the top of the machine as shown. The LCD display snaps onto the orange clips in the same manner as the hopper. Be sure to align it before pressing down.
3. The hopper and LCD display should appear as shown.



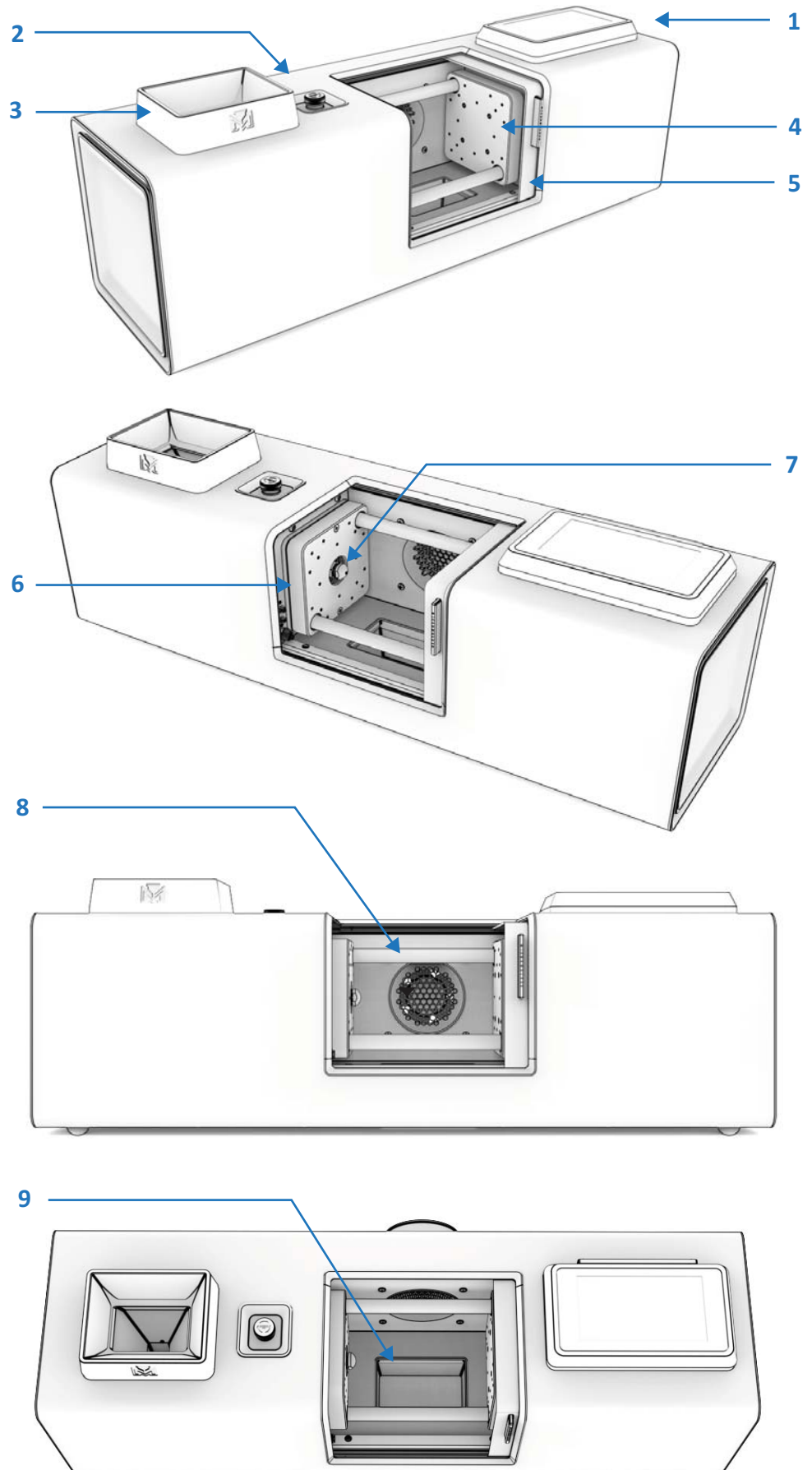
## SETUP CONT.

1. Connect the supplied USB cable between the LCD and the machine (rear ports on both).
2. Connect the HDMI cable between the LCD and the machine.
3. Connect the barrel power plug between the LCD and the machine.  
*Note: The barrel plug is non-polarized (orientation does not matter).*



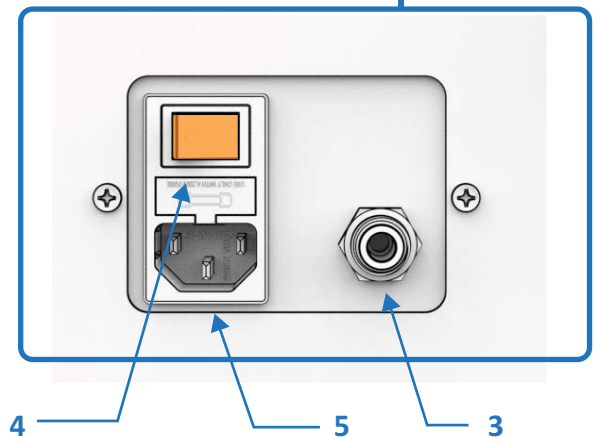
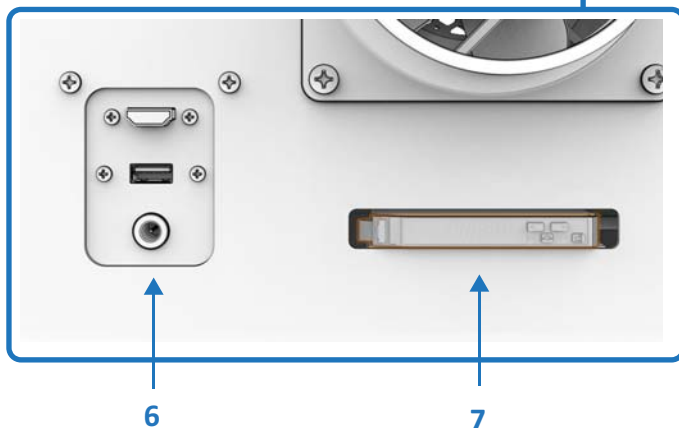
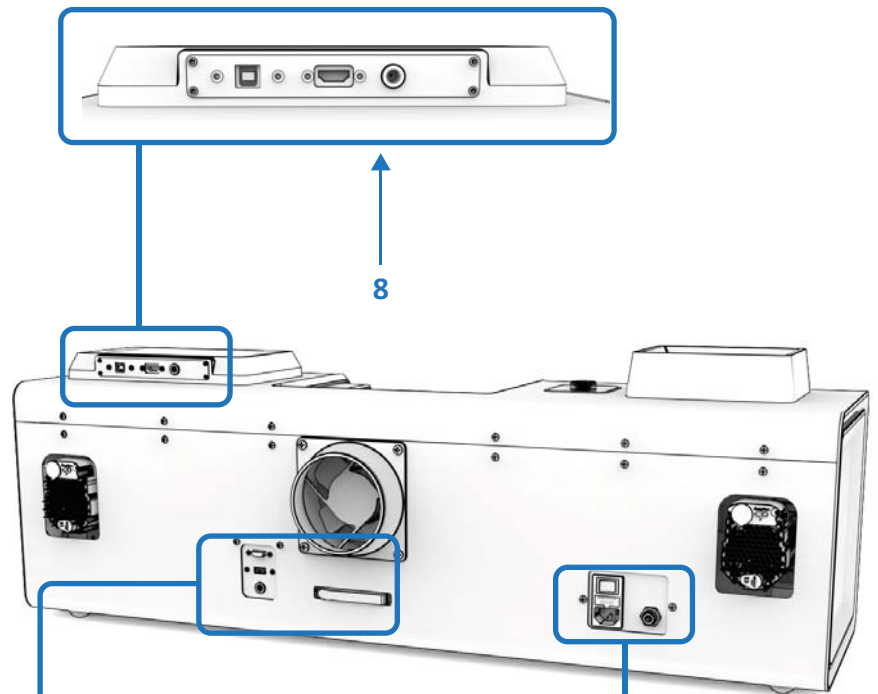
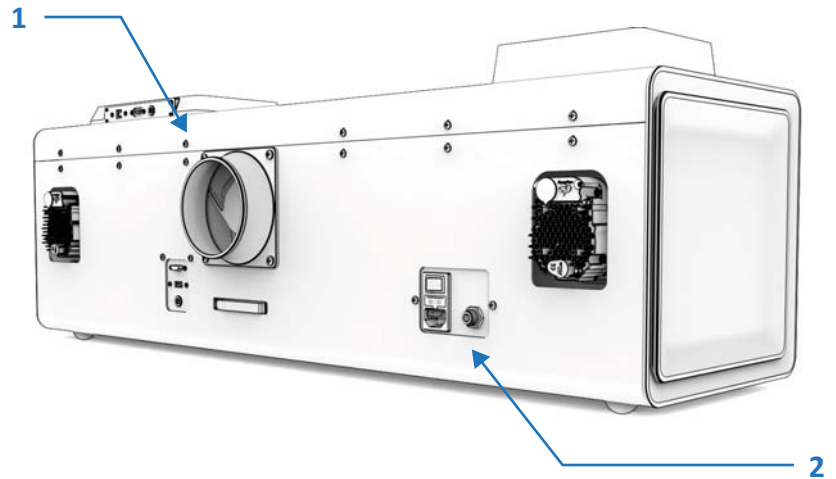
## ANATOMY OF MACHINE:

1. LCD Touch Screen
2. Emergency Stop Button
3. Material In-feed Hopper
4. B Side Platen Plate
5. Safety Window
6. A Side Platen Plate
7. Injector Nozzle
8. Exhaust Fan
9. Part Counter



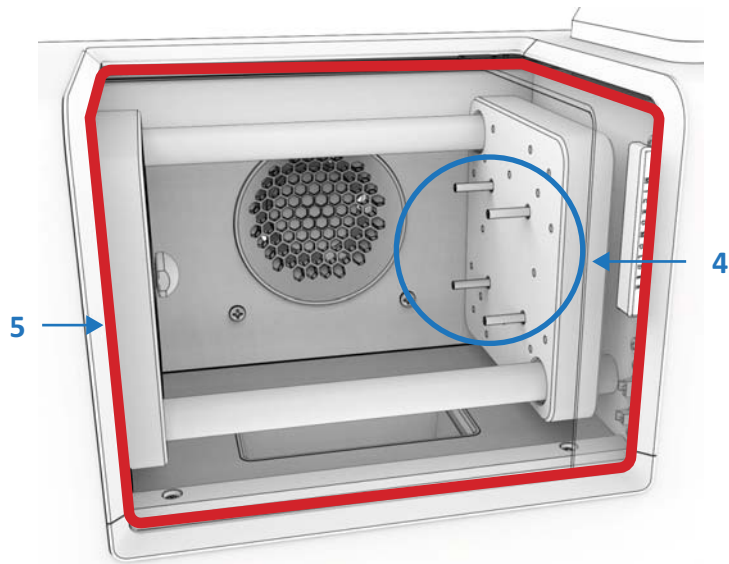
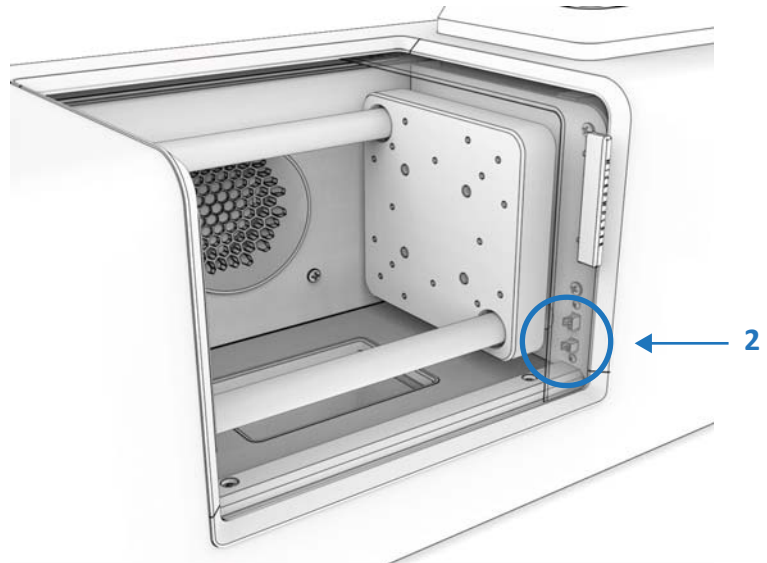
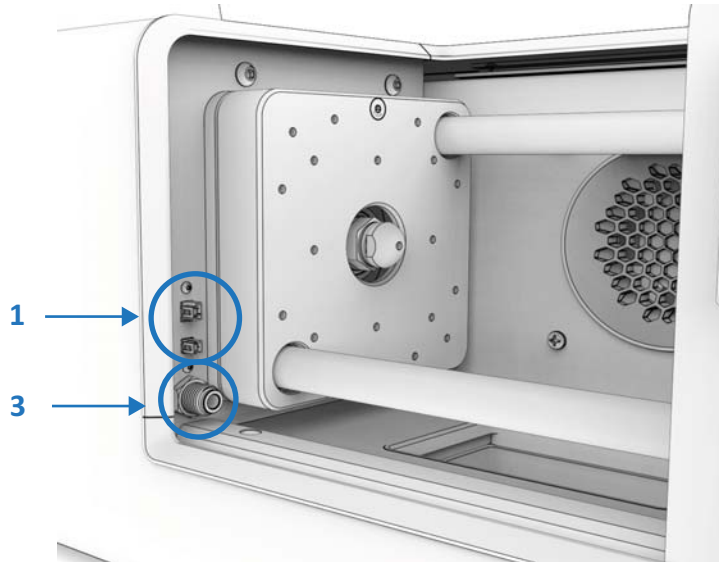
## ANATOMY OF MACHINE: CONT.

1. Exhaust Shroud
2. Electrical Connection / Power
3. 6mm Air Inlet Port
4. Power Toggle Switch
5. 120/220VAC Power Connection
6. Touch Display Connections
7. Part Counter Control Panel
8. Touch Display Connections



## ANATOMY OF MACHINE: CONT.

1. A Side Tool Heater and Temperature Probe Connections
2. B Side Tool Heater and Temperature Probe Connections
3. Compressed Air Outlet Fitting
4. Ejector Plate Push Rods
5. **CAUTION!** Live Tooling Area



## UNDERSTANDING MICROMOLDER EVO'S CAPABILITIES

Although MicroMolder Evo is an extremely powerful and capable machine, it has its limitations.

The machine has been designed with performance characteristics specifically tailored to the use of 3D printed tooling.

There are a few important distinctions between industrial equipment and a desktop solution worth noting.

The forces that can be applied to 3D printed tooling are significantly lower than those applicable to aluminum or steel tooling. The use of a MUD box is critical to the successful use of 3D printed tooling, as it helps distribute the forces applied during both clamping and injection.

Cycle times will significantly increase when using 3D printed tooling, as the material is an excellent insulator of heat.

Injected plastic must remain inside a 3D printed tool for a longer period to cool and harden before the tool can open and the next injection cycle can begin.

Even large industrial injection molding machines must be significantly tuned down when operating with 3D printed tooling.

Therefore, even if a machine can inject and clamp at extremely high forces, that extra force becomes unusable if it exceeds the capacity of the 3D printed tool.

We position MicroMolder Evo as “purpose-built” for 3D printed tooling, as it is more closely tailored to the requirements of 3D printed tooling than larger equipment.

When using 3D printed tooling, it is important to set the proper expectations regarding performance and capability (lower forces, longer cycle times, and shorter tool lifespan).

The advantages of 3D printed tooling greatly offset what some may perceive as drawbacks. It offers extremely fast tool lead times, the ability to iterate and solve tooling design challenges in real time, and a cost-effective way to produce short-run production-quality parts at an excellent rate of speed.

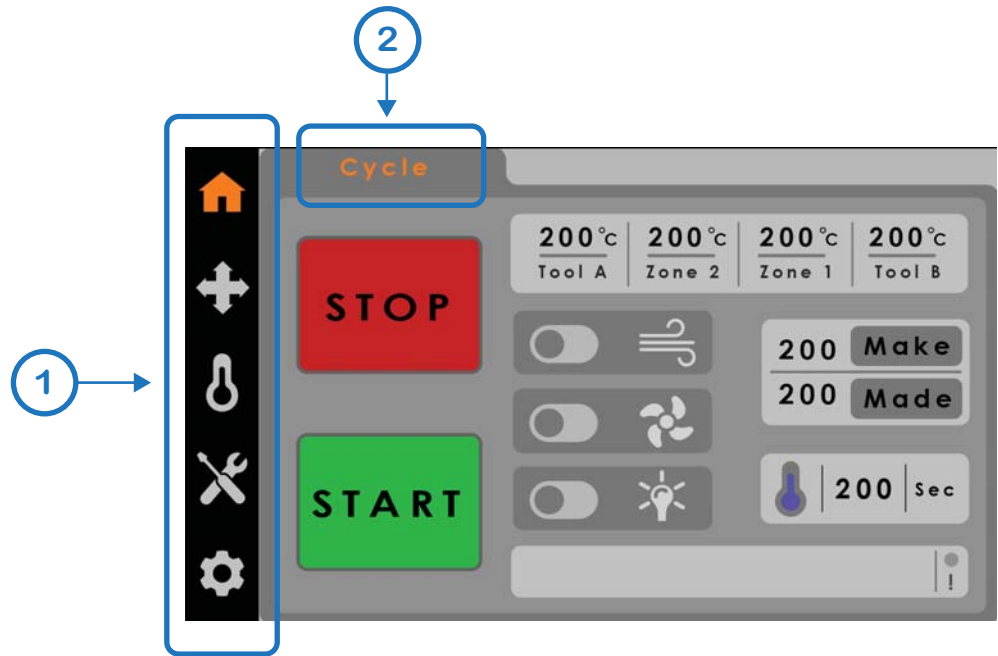
It is also worth noting that MicroMolder Evo performs exceptionally well with aluminum tooling and is not limited to 3D printed tooling. This flexibility in tooling materials allows users to be extremely creative in their tooling solutions.

# USER INTERFACE

## Navigational Structure

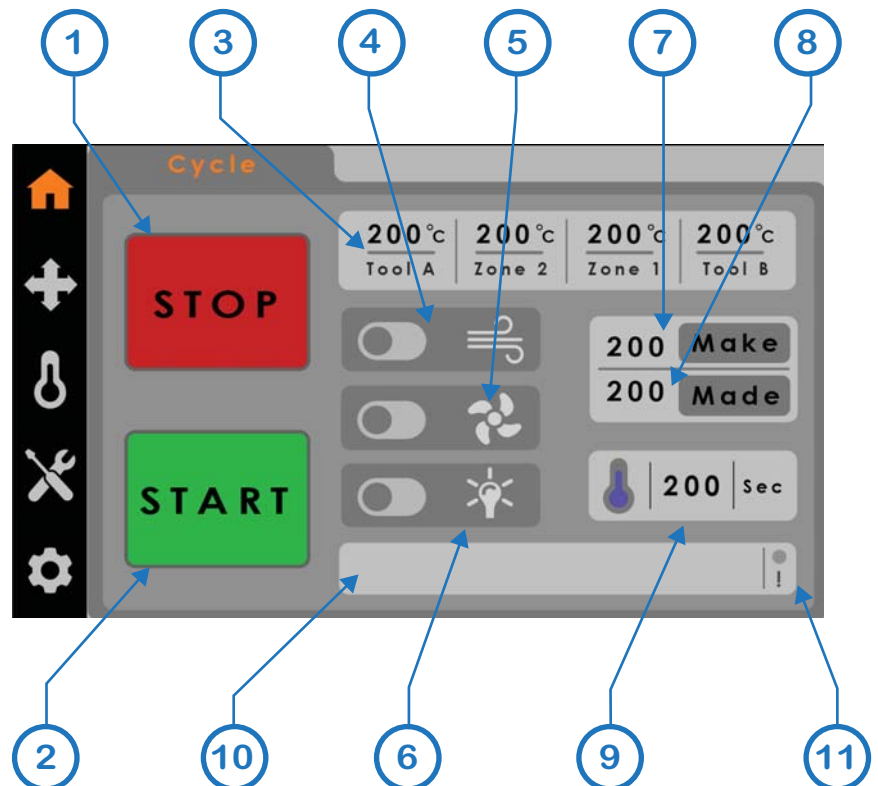
- 1) Main Menu
  - Cycle
  - Motion
  - Temperature
  - Tool
  - Settings

- 2) Page Tabs

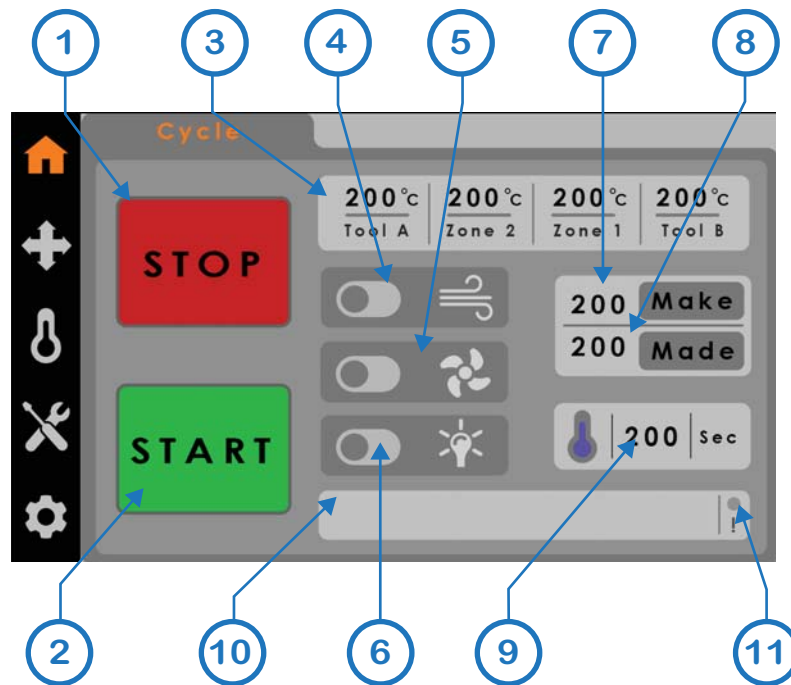


## Injection Cycle Page Functions

- 1) E-Stop/Cycle Stop
- 2) Cycle Start
- 3) Zone Temperature Readout
- 4) Compressed Air Relay Toggle
- 5) Fan On/Off
- 6) Work Area Light On/Off
- 7) Part to Make Count
- 8) Parts Made Count
- 9) Tool Cooling Time
- 10) System Message Display
- 11) Warning/Error Indicator



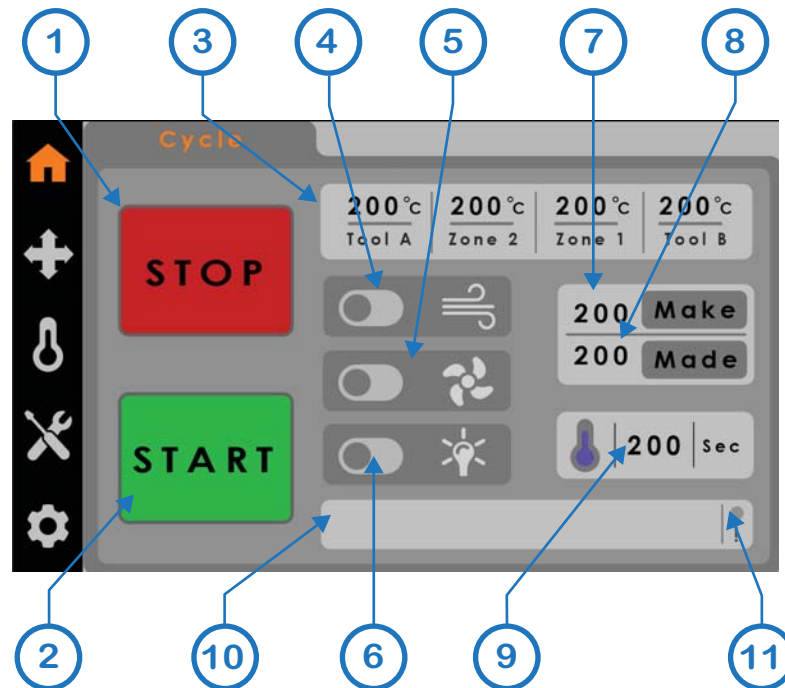
## USER INTERFACE: CONT.



### Injection Cycle page function definitions:

- 1) Stop/E-Stop Button  
Stops all motor movement when pressed.  
This is a latching type button. (When pressed it remains active until pressed again).  
When blinking, the button is latched and all machine movement is disabled.
- 2) Start Button  
Starts injection cycle sequence  
The "Make" field must be greater than the "Made" field for an injection cycle to start
- 3) Heating Zone temperature readout  
Displays barrel zone and/or tool heating temperatures (in Celsius).  
A red LED — will blink indicating the control relay on/off status when heaters are active.
- 4) External air supply relay on/off button  
When compressed air is supplied to the machine this will toggle on/off the air flow.
- 5) Fan control button  
Opens a sub menu to turn on/off the exhaust fan and/or the injection system cooling fan
- 6) Work area light button  
Turns on/off platen work area light bar

## USER INTERFACE: CONT.



### Injection Cycle page function definitions: Cont.

#### 7) Parts to Make input field

Manually populated via a keyboard or click the “make” button to bring up a touch screen numeric keypad.

#### 8) Parts Made counter field

Tabulates completed parts as they pass through the part sensing zone.  
When “Made” is greater than “Make” the “Make” field will automatically be set to zero.  
Pressing the “Made” button will set any tabulated count to zero.

#### 9) Cooling time indicator

Indicates time remaining in the cooling sequence of an injection cycle.  
The cooling time value is set on the Tool Settings menu  and not in this field.

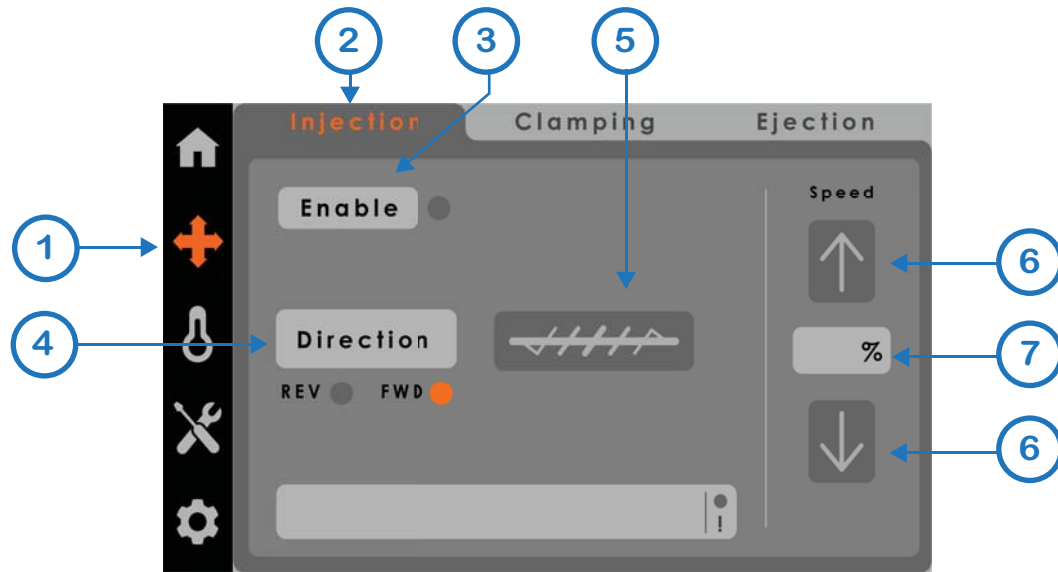
#### 10) Message Box

System warning and status messages are displayed in this field when they occur.

#### 11) Warning and/or error indicator LED

LED  will blink if a warning or error has been triggered in the system.  
Pressing on the LED when it is blinking will take the user to the Status Page.

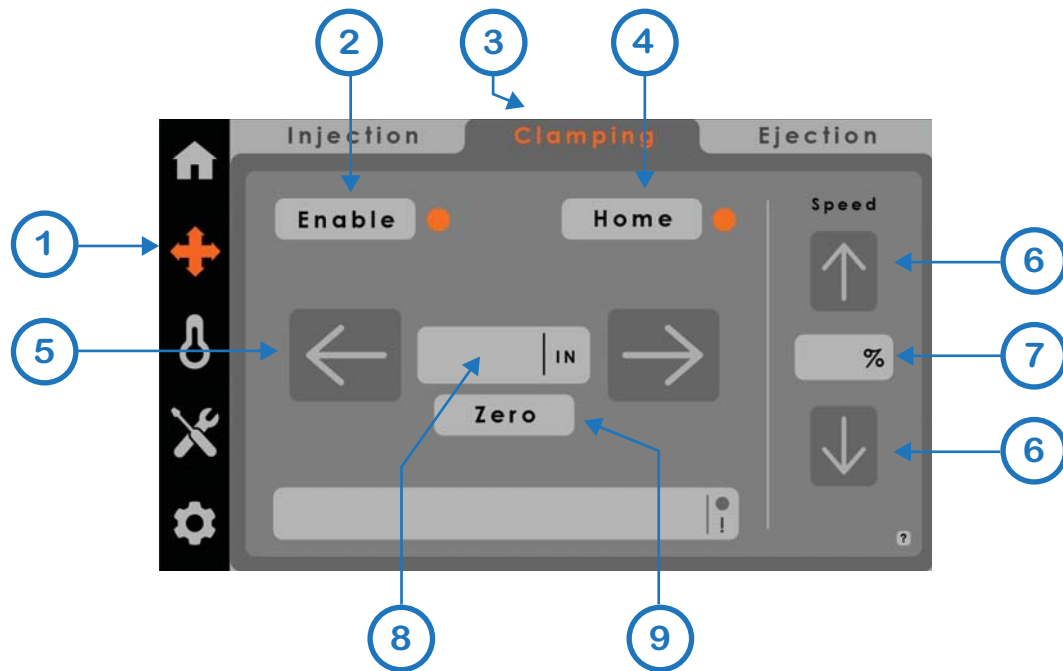
## USER INTERFACE: CONT.



### Machine Motion page function definitions:

- 1) Page menu button  
Opens the Machine Motion main page
- 2) Motion function tab  
Each tab in the Machine Motion menu opens the specific motor control page, Injection, Clamping or Ejection
- 3) Motor Enable button  
Button press enables or disables machine motor  
An orange LED will illuminate to indicate that the motor is enabled.
- 4) Motor rotation direction button  
Button press will change the direction of motor movement of the injection screw
- 5) Motor rotation button  
Button press will cause the motor to rotate  
Motor must be enabled to activate rotation  
Motor will rotate in the selected direction
- 6) Motor speed increase/decrease buttons  
Button press will increase/decrease motor speed by 5% for each press of the button. 0% to 100% are the limits
- 7) Motor speed percentage value  
Displays the motor set speed

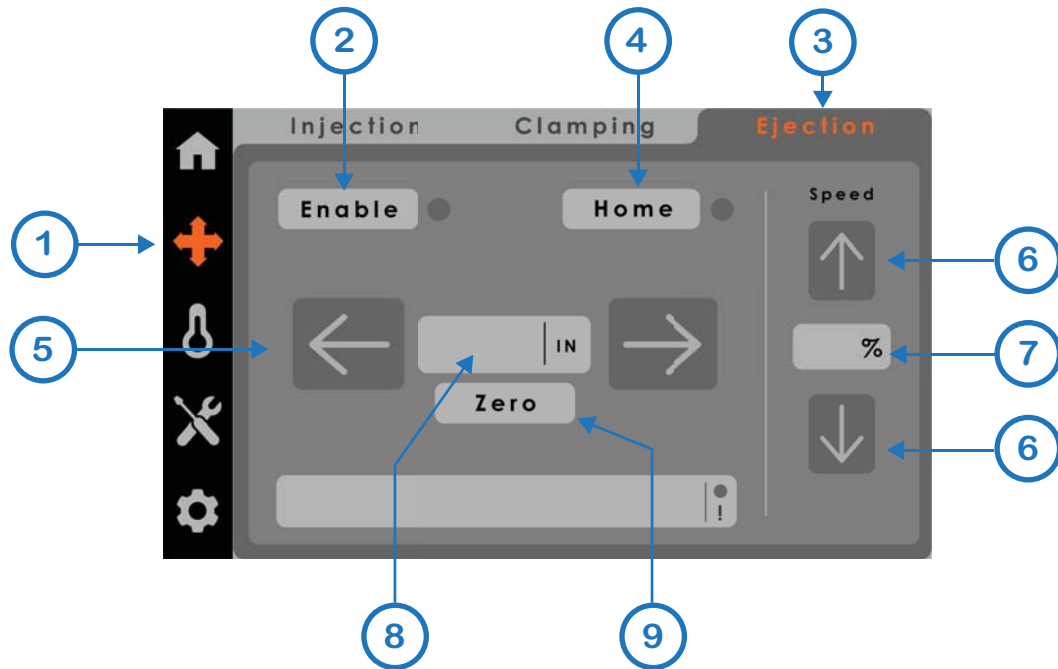
## USER INTERFACE: CONT.



### Machine Platen Clamp Movement:

- 1) Page menu button  
Opens the Machine Motion main page.
- 2) Motor Enable button  
Button press enables or disables platen clamp motor  
An orange LED ● will illuminate to indicate that the motor is enabled.
- 3) Motion Function tab  
Opens the Platen Clamping Page.
- 4) Motor Home button  
Button press will initiate the motor to move the clamp plate away from the nozzle to the “home” switch.  
Once the machine has homed the LED will turn orange indicating that the machine now has a home reference coordinate. Homing the Platen Clamp must be done on each new machine startup.
- 5) Motor Movement buttons  
Button press will move the clamp motor in the direction of the arrow on the button.  
← = toward the nozzle  
→ = away from the nozzle
- 6) Motor Speed increase/decrease buttons  
Button press will increase/decrease motor speed by 5% for each press of the button. 0% to 100% are the limits
- 7) Motor Speed Percentage Value  
Displays the motors current set speed
- 8) Linear Distance Readout  
The numbers displayed in this readout are the inch or millimeter distances that the clamp system as moved.
- 9) Zero button  
Button press will zero out any current measured linear value displayed.

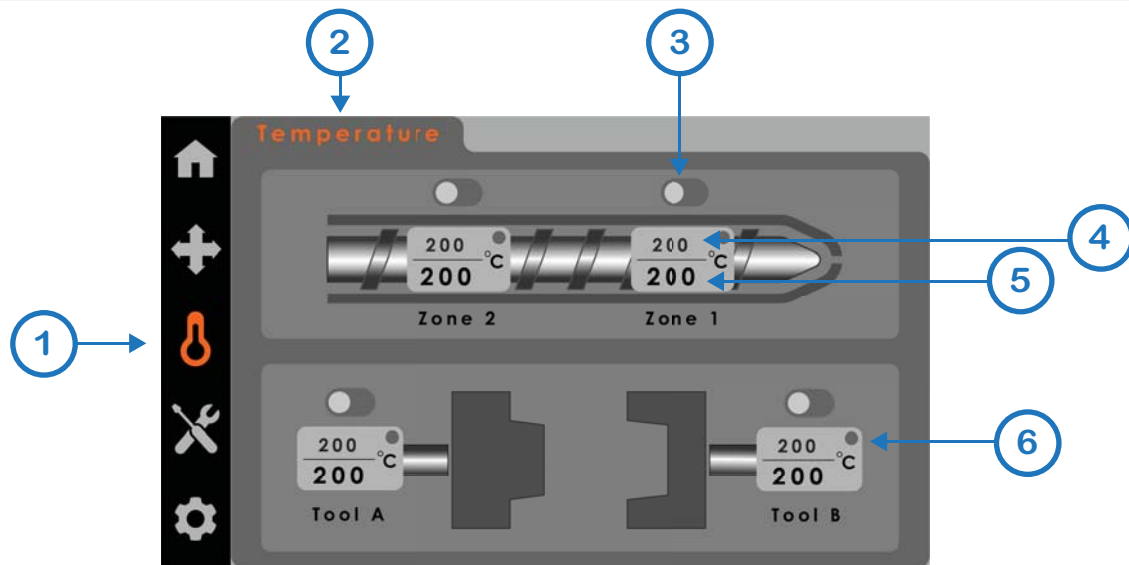
## USER INTERFACE: CONT.



### Machine Ejection Rod System Movement:

- 1) Page menu button  
Opens the Machine Motion main page.
- 2) Motor Enable button  
Button press enables or disables Ejection Rod motors  
An orange LED ● will illuminate to indicate that the motors are enabled.
- 3) Motion Function tab  
Opens the Ejection Rod Page.
- 4) Motor Home button  
Button press will initiate the motors to move away from the nozzle to the “home” switch.  
Once the machine has homed the LED will turn orange indicating that the machine now has a home reference coordinate. Homing the Ejection Rod System must be done on each new machine startup.
- 5) Motor Movement buttons  
Button press will move the ejection rod motors in the direction of the arrow on the button.  
← = toward the nozzle  
→ = away from the nozzle
- 6) Motor Speed increase/decrease buttons  
Button press will increase/decrease motor speed by 5% for each press of the button. 0% to 100% are the limits
- 7) Motor Speed Percentage Value  
Displays the motors current set speed
- 8) Linear Distance Readout  
The numbers displayed in this readout are the inch or millimeter distances that the ejection system has moved.
- 9) Zero button  
Button press will zero out any current measured linear value displayed.

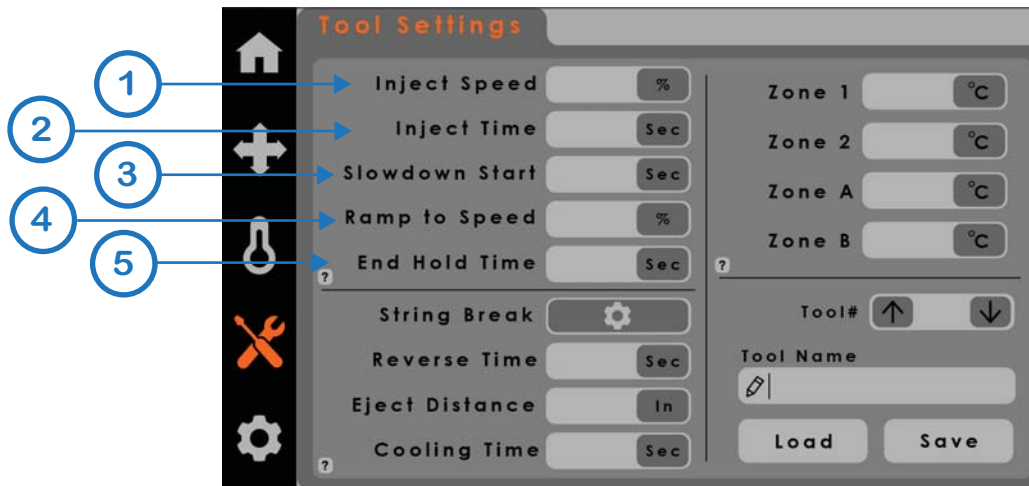
## USER INTERFACE: CONT.



### Temperature Control:

- 1) Page menu button  
Opens the Temperature main page.
- 2) Temperature Function tab  
Opens the temperature control tab.
- 3) Heater control buttons  
Button press will enable or disable each specific heating zone. Switch will illuminate orange when on.  
The setpoint temperature must be greater than the realtime temperature reading for that zone to activate the heater.
- 4) Setpoint temperature readout  
Value displayed in this field correlates to the temperature setting value assigned on the Tools menu page.  
Setpoint temperature values are not assigned or adjusted on this page.
- 5) Realtime Temperature readout  
Displays the current temperature of each specific heat zone area. (Zone 1, Zone 2, Tool A, Tool B)
- 6) Solid State Relay status  
Heating control for MicroMolder Evo is done via independently running PID algorithms preset in the firmware of the machine.  
The PID control system regulates heat by turning on/off the heaters at measured intervals to achieve the desired heat setpoints.  
The red LED will blink randomly when this system is activating and deactivating the machines heating elements.

## USER INTERFACE: CONT.



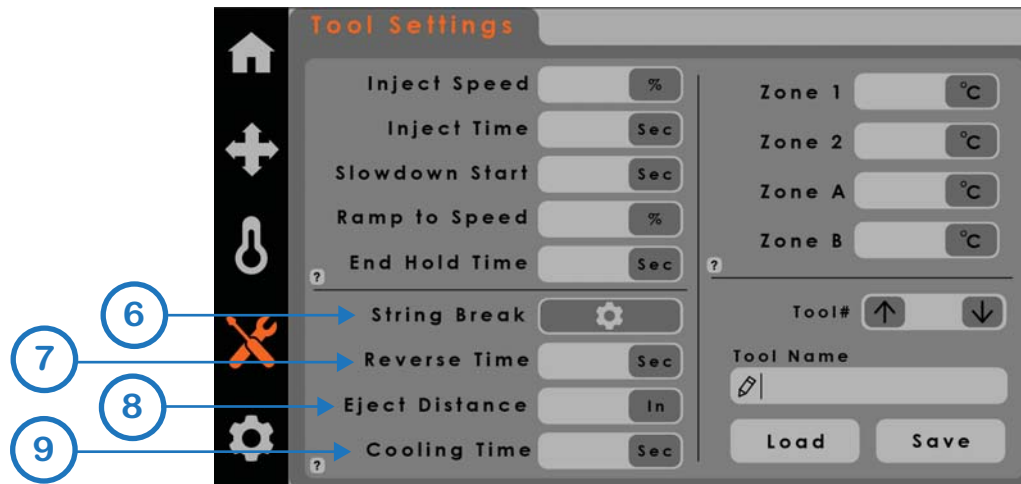
### Tool Settings page function definitions:

- 1) Injection Speed:  
The starting injection speed (0–100% of maximum output).
- 2) Injection Time:  
The total time of the injection cycle from start to finish.
- 3) Slowdown Start:  
The time duration point when the injection begins to slow from the initial speed.
- 4) Ramp to Speed:  
The reduced injection speed (%) after Slowdown Start begins. Injection speed will ramp down from the Injection Speed setting value to the Ramp to Speed value.
- 5) End Hold Time:  
The time to maintain the reduced (ramp) speed before injection stops.

#### Note:

- Injection Speed and Injection Time are the only required parameters. All others are optional.
- Injection speed, Injection Time, Slowdown Point, Ramp to Speed, and End Hold Time will vary depending on material, mold design, and part geometry.

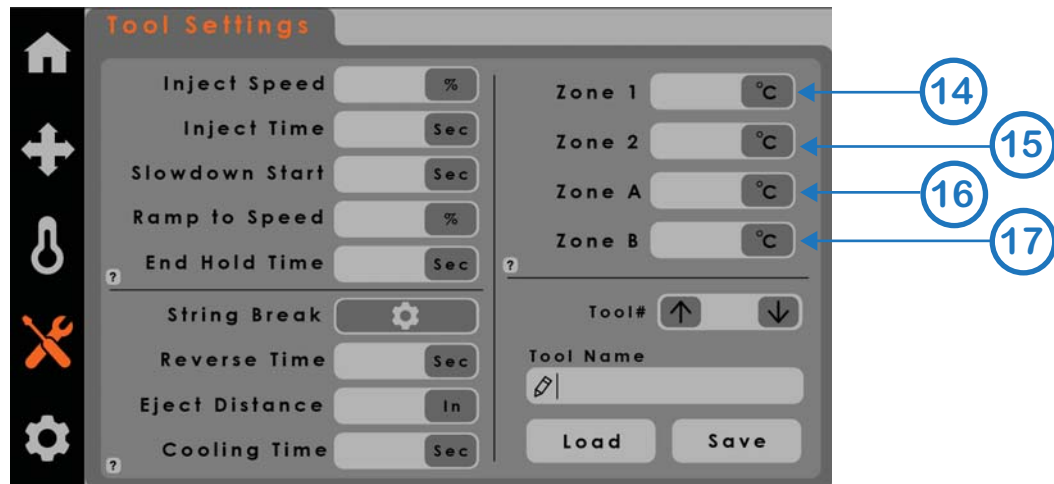
## USER INTERFACE: CONT.



### Tool Settings page function definitions: Cont.

- 6) String Break:  
Runs a user-programmed post-shot routine to help cool and snap stringing plastic after injection.  
See next pages for String Break settings
- 7) Reverse Time:  
How long the screw rotates in reverse after injection to pull plastic back and reduce nozzle drool.  
Do not exceed ~2 seconds when used with general purpose nozzle.  
**\*Not used with anti-drool nozzle.**
- 8) Eject Distance:  
How far the red push rods extend past the side B platen in the home position to engage with a molds mechanical ejection system.  
**\*This setting is only used with molds that have ejector features designed into the mold.**
- 9) Cooling Time:  
How long the mold remains closed after injection to allow the plastic to solidify before ejection.

## USER INTERFACE: CONT.



### Tool Settings page function definitions: Cont.

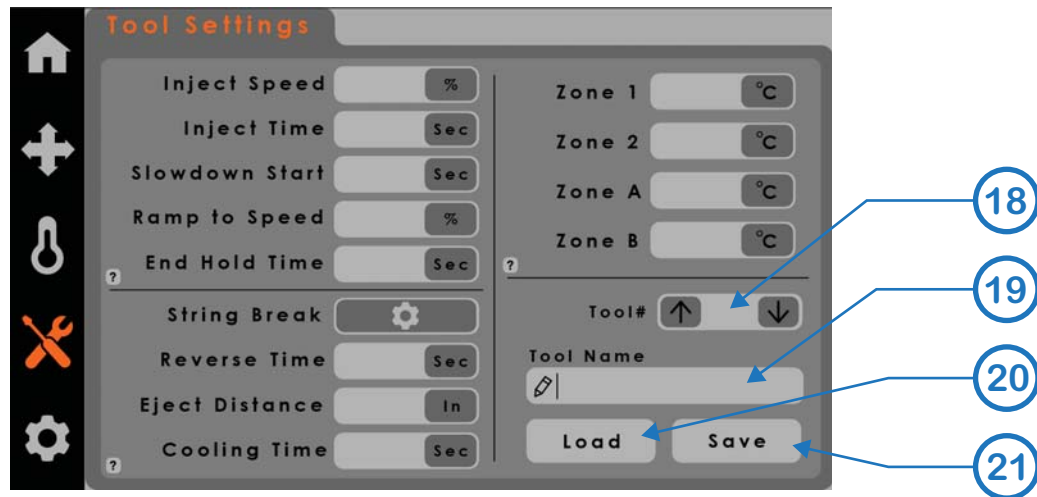
- 14) Zone 1 injection barrel heating set point:  
Maximum Temperature: Do not set the temperature above 310°C.  
Over Temperature Shutdown: The system will automatically shut down if the temperature exceeds 320°C for more than 3 minutes.
- 15) Zone 2 injection barrel heating set point:  
Maximum Temperature: Do not set the temperature above 310°C.  
Over Temperature Shutdown: The system will automatically shut down if the temperature exceeds 320°C for more than 3 minutes.
- 16) Tool A heating set point:  
The maximum allowable temperature for tool heaters should not exceed 120°C.
- 17) Tool B heating set point:  
The maximum allowable temperature for tool heaters should not exceed 120°C.

#### Note:

*Temperature Variations: The PID heater control system may cause short-term temperature fluctuations of up to 5°C above the target set point during operation.*

*Tool heating: Achieving and maintaining temperature can be challenging due to the varying properties of different tool materials and sizes. The heating times and the ability to sustain stable temperatures are influenced by the dynamic thermodynamic processes involved in injection molding. During operation, the tool will be subjected to significant temperature fluctuations as hot molten plastic is injected and subsequently cools within the mold. These variations can make it difficult to keep the tool heater at a consistent temperature.*

## USER INTERFACE: CONT.



### Tool Settings page function definitions: Cont.

- 18) Active Tool Number:  
Indicates the active tool number. The up and down arrow buttons will cycle the tool number incrementally.
- 19) Tool Name:  
Tool names or short descriptions can be assigned to any given tool number. Tool names are not required but can be helpful in managing multiple tool setting data sets. Pressing the pencil icon will open a dialog box to add/edit the tool name.
- 20) Load button:  
To load a previously saved tool data set use the tool number arrows to change the tool number. Once the desired tool number is selected press the Load button. If tool data has been stored to the selected tool number, all the tool setting fields will be populated with the saved data. If no tool data was stored to the selected tool number, all the fields will be populated with a zero value.
- 21) Save button:  
To save tool settings data use the tool number arrows to select the desired tool number slot. Enter a tool name if desired and then press the Save button.



### String Break Settings:

- 1) Decompression Distance:  
Linear distance (in or mm) that the platen retracts to relieve mold compression.
- 2) Decompression Delay:  
Time (seconds) the mold remains at the decompressed position.
- 3) Nudge Forward Distance:  
Linear distance (in or mm) that the platen moves forward after decompression.
- 4) Nudge Delay:  
Time (seconds) the mold remains in the nudge forward position.
- 5) Back:  
Returns to the Tool Settings main page.

### Note:

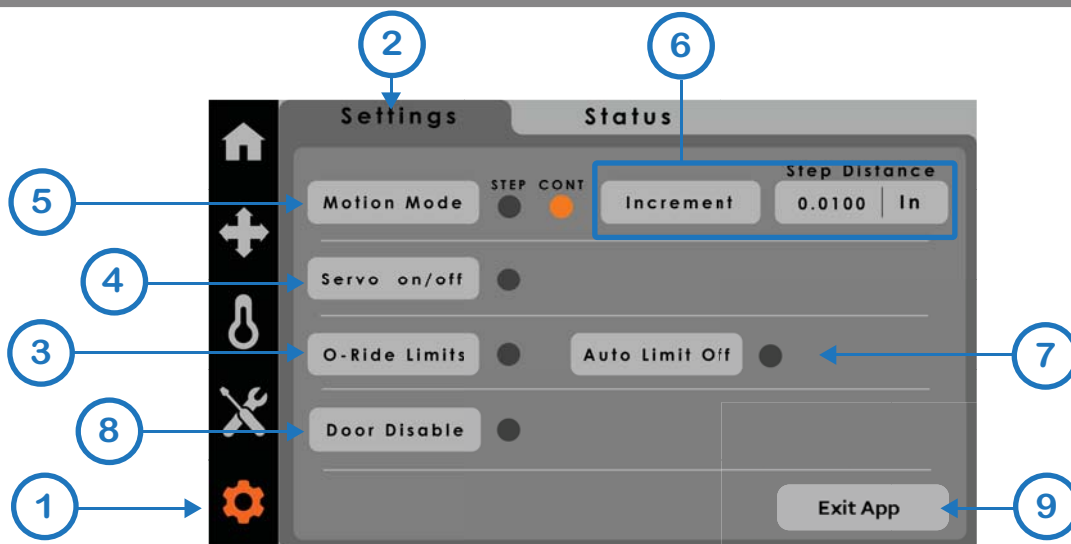
*This feature applies a programmable mold open/close sequence after the cooling cycle to reduce stringing.*

*Certain plastics can form long strands during mold opening that interfere with part ejection or the next injection cycle. The string break routine helps cool, stretch, and separate these strands.*

*Depending on the material, either decompression alone or a combination of decompression and nudge may be required. This function is not guaranteed to eliminate stringing in all cases; however, with proper tuning, it can achieve a high level of effectiveness. Optimal values vary—some materials respond best to longer distances and delays, while others require shorter, quicker movements. Tuning is application-specific and requires experimentation.*

*\*The String Break function is optional setting and not required during the injection cycle.*

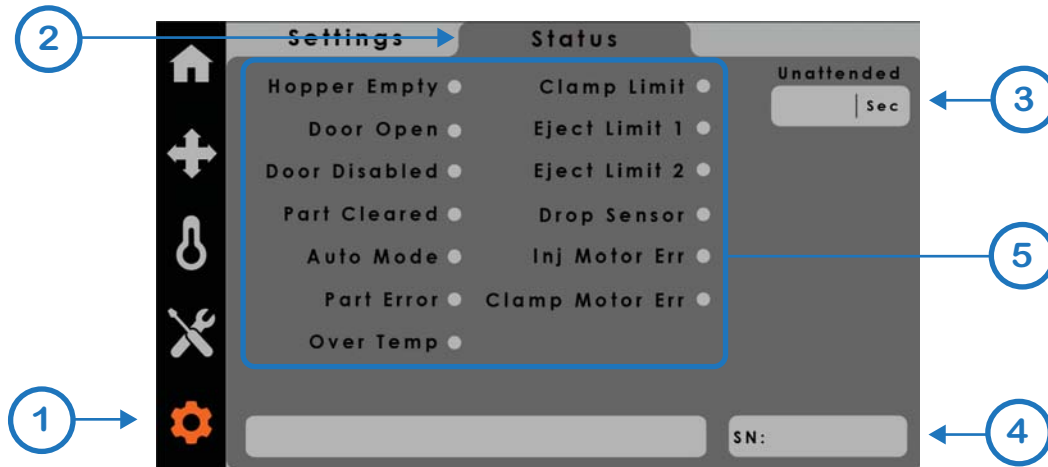
## USER INTERFACE: CONT.



### Machine Settings:

- 1) Page menu button:  
Opens the Settings main page.
- 2) Settings main menu tab:  
Opens the settings control tab.
- 3) Override Limits button:  
Pressing this button when a limit switch is triggered will allow you to move off/away from the triggered switch. This is a temporary override and will deactivate once the limit switch is no longer triggered
- 4) Servo on/off button:  
Enables or disables the servo motor power supply.
- 5) Motion Mode:  
Toggles the motion mode from continuous motion or incremental motion. Continuous motion is the primary mode to be used. Incremental can be used for determining eject distance settings.
- 6) Incremental Motion Step Distance:  
Toggles the step distance resolution between 1.000 through 0.0001.
- 7) Automatic Limit Off button:  
Pressing this button will deactivate triggered limit safeties and automatically allow motion to proceed after a limit is triggered.
- 8) Door Disable button  
Disables the door sensor allowing for machine functions to operate with the door open.
- 9) Application Exit button:  
Closes MicroMolder control application.

## USER INTERFACE: CONT.



### Machine Status:

- 1) Page menu button:  
Opens the Settings and Status main page.
- 2) Status main menu tab  
Opens the status control tab
- 3) Unattended Counter field:  
Timmer that counts to 160 seconds (3 minutes) when a part error occurs. Safety controls are enabled at the end of this 160 seconds.
- 4) Machine Serial Number field:  
Each machine has a unique serial number
- 5) Sensor and system status dashboard:

#### Hopper Empty:

Blinks when the hopper is empty. Orange endcap plastic bezel covers will also blink with a 2 second interval when the hopper is empty

#### Door Open:

Indicates that the safety door is open

#### Door Disabled:

Indicates that the door sensor override is active.

#### Part Cleared:

Indicates that a complete injection molded part has fallen through the drop doors

#### Automatic Mode:

Indicates that multiple parts to "Make" is active

#### Part Error:

Indicates that a part did not complete injection and that an error has occurred someplace in the injection cycle.

#### Over Temperature Error:

Indicates that the system has reach an over temperature state.

#### Clamp limit trigger:

Indicates that the clamp limit sensor has be activated.

#### Eject Limit 1 and 2

Indicates that the ejection system limits 1 and/or 2 have been activated.

#### Drop Sensor

Indicates that the drop sensor has been triggered

#### Injection Motor Error

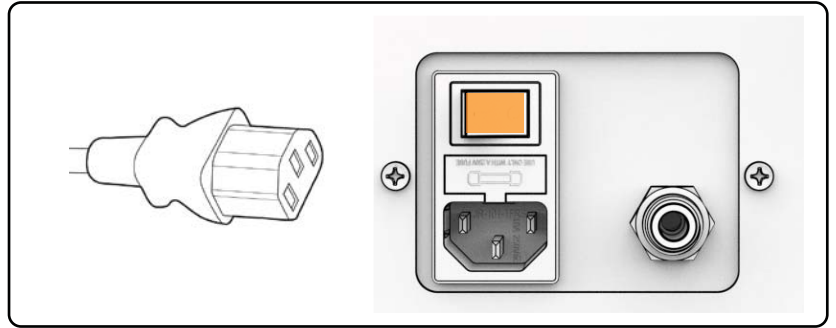
Indicates that the injection servo motor has detected a fault condition

#### Clamp Motor Error

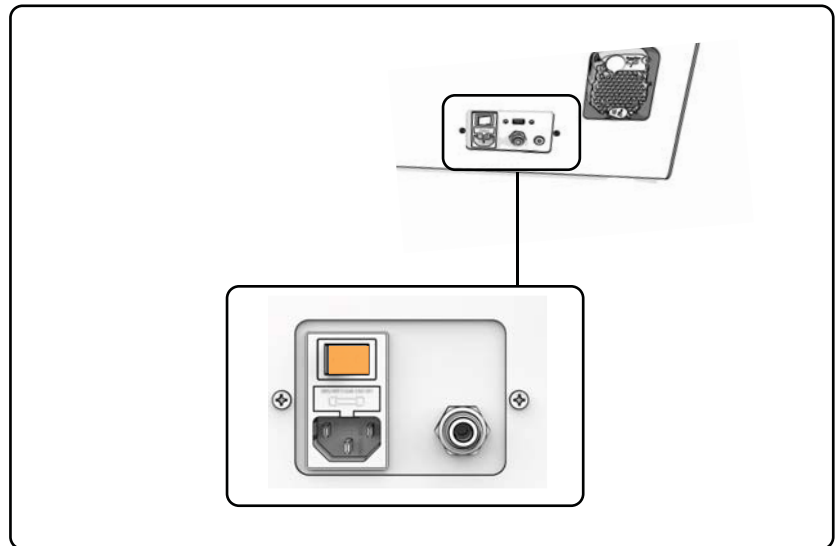
Indicates that the clamp servo motor has detected a fault condition

## STARTUP PROCEDURE:

Begin by plugging the machine into an appropriate outlet, note the power requirements listed on the specifications page.



Turn the machine on by pressing the toggle switch located directly above the power cord.



Once the on-board computer has booted, you will see the standard Windows desktop on the display screen with 2 shortcut icons.

(Initial boot can take a minute or two).



## STARTUP PROCEDURE: CONT.

Once the machine is powered on and the system has finished loading, two MicroMolder control app shortcuts will be visible on the screen—one for inch mode and one for metric mode.

Double-tap the desired unit profile to launch the application.

The ShopBotix splash screen will appear as the software initializes and connects to the machine.

Startup may take a short time. During this process, the screen may briefly turn white—this is normal.



## STARTUP PROCEDURE: CONT.

You will notice that the machine orange end cap LEDs turn on and the MicroMolder splash screen appears. Click anywhere on the screen to advance to the warning pages.



The first page presents a list of machine hazards that the operator must be aware of when operating the machine.



The second page presents you with a list of safety precautions to adhere to when operating the machine.

Once you have read the warnings and agree to continue click the “I understand these warnings” button to advance. Note that there are two warning pages.



## STARTUP PROCEDURE: CONT.

You are now by default directed to the Cycle tab of the machine controller software. Note that the Stop (E-Stop) button is triggered on launch indicated by the blinking “STOP” button.

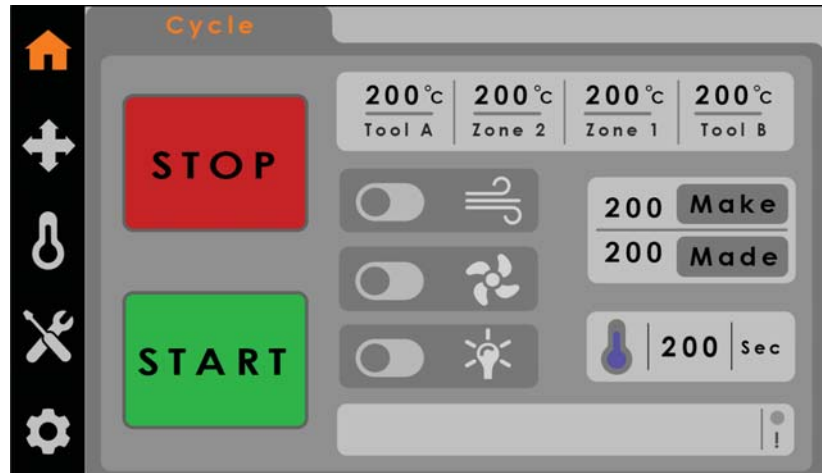
The MicroMolder Evo is equipped with a built-in physical E-Stop button.

Pressing the physical E-Stop button or tapping the STOP button on the screen will immediately trigger an emergency stop, halting all machine movement.

*Always press the physical E-Stop button when working within the live tooling area.*

Before continuing to interact with the machine, please refer to the system check section of this manual. It is highly recommended that you perform a system check at every startup of the machine to help ensure that all basic features and safety functions are operating correctly.

*If you are unfamiliar with the functions and organization of the machine controller software, please refer to the GUI Overview part of this document before continuing.*



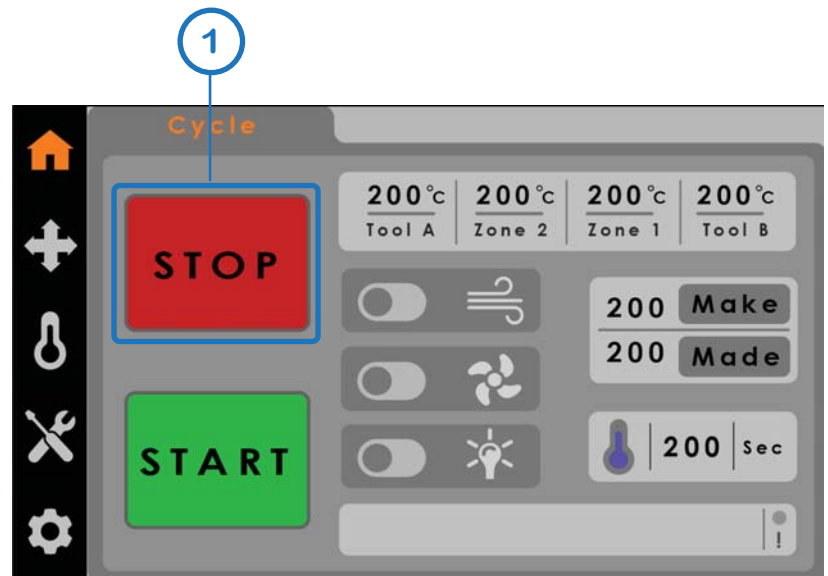
## STARTUP PROCEDURE: CONT.

Before performing this series of checks it is extremely important to put the machine into E-Stop Mode. This will prevent any machine movement during your interaction with the machine's live tooling area.

1) To put the machine into E-Stop Mode, navigate to the user tab and click the "STOP" button. The Stop Button should be blinking red and the status bar should read "ESTOP BUTTON PRESSED"

If The E-Stop was active before pressing the stop button it will deactivate it. If this is the case simply press the button again and confirm that the status bar reads "ESTOP BUTTON PRESSED"

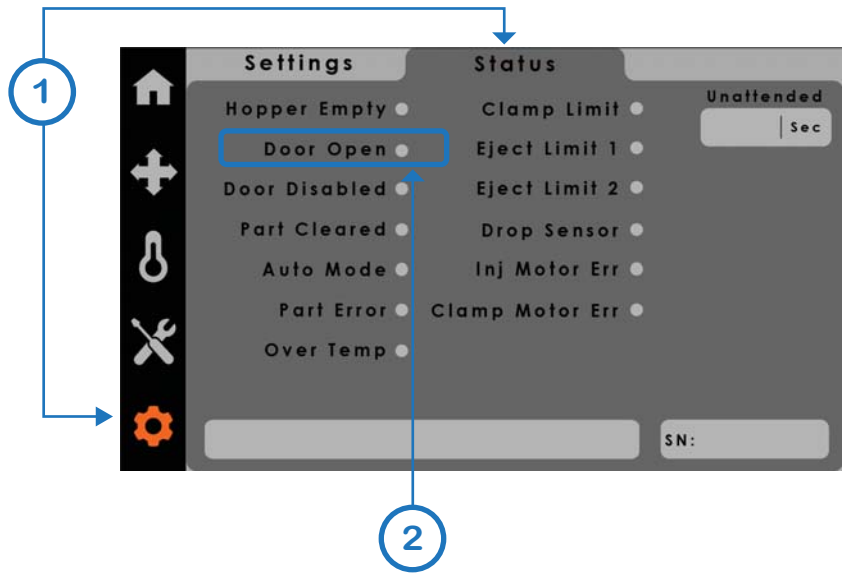
Blinking Stop button = Active Estop  
Solid Stop button = Inactive Estop



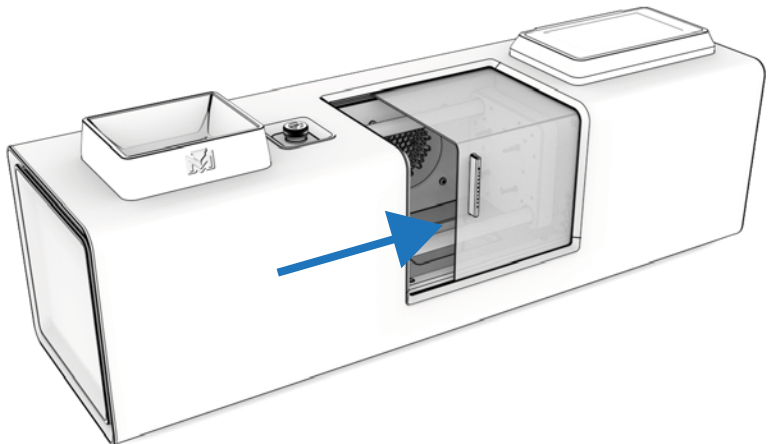
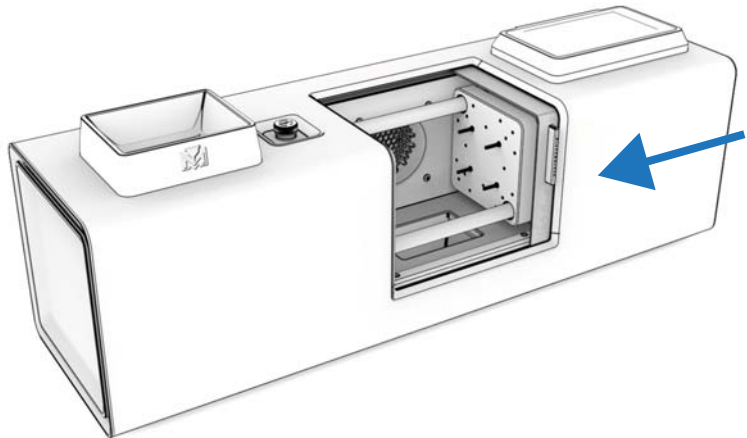
## SYSTEM CHECK: DOOR OPEN

1) Navigate to the Status Tab by clicking on the gear icon on the main navigation menu. Then click on the “status” tab header at the top of the screen.

2) Observe the outlined section of this tab and take note of any active indicator lights.



Gently close the window until it stops and note the change of the “Door Open” indicator light. It should no longer blink when the door is in the closed position. Open the window and note how the indicator light begins blinking.



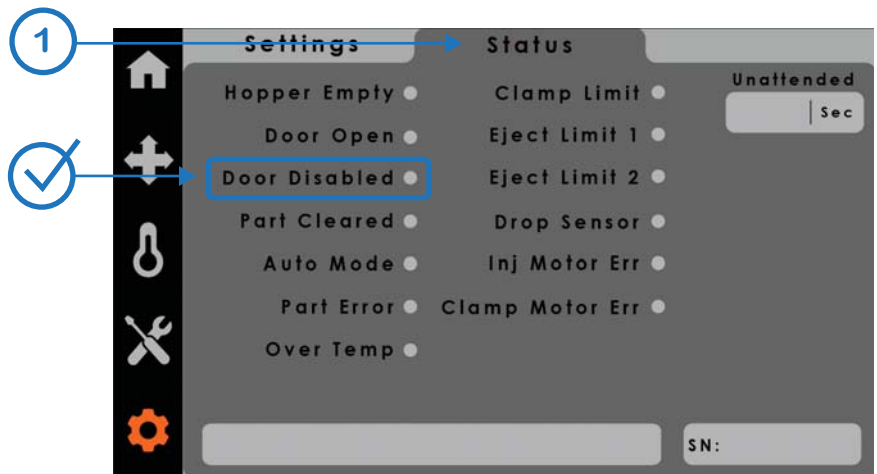
### Note:

*Although this may seem like a simple meaningless check, it is very important to ensure that the door safety switch is functioning properly as it can protect the operator and or onlooker from harm. If the machine is running and the safety window is opened, the machine will immediately be placed in E-Stop mode.*

## SYSTEM CHECK: DOOR OVERRIDE

1) While still on the status tab, we will perform another simple check of the status of the door override. The purpose of the door override is to allow the user to turn off the door safety switch in order to install and setup experimental tooling that may not fit with the door closed. Machine movement is allowed during door override only for this purpose.

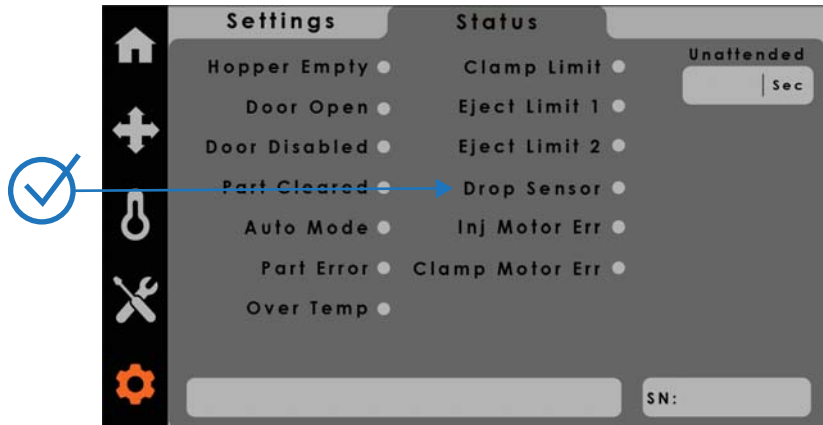
2) The Door Override Indicator light should be off by default. If it is currently on, navigate to the Settings tab and click on the “Door Disable” button. Note that the indicator next to this button will also turn off indicating that the Door Disable is NOT active. Confirm this by returning to the Status tab and verify that the Door Disable indicator light is now off.



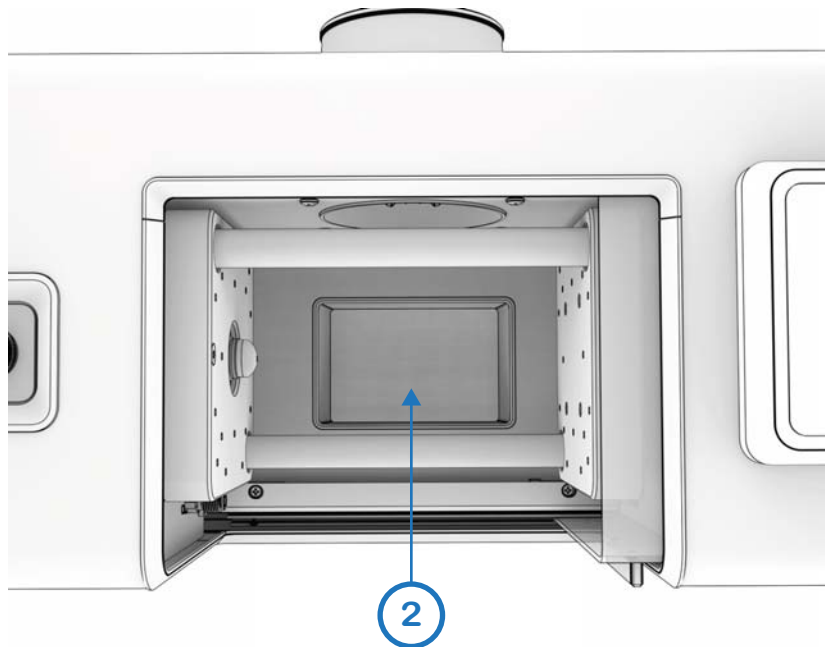
**Note:**  
Great care should be taken to ensure that you understand the operation of the door override feature and its intended purpose.

## SYSTEM CHECK: PART COUNTER

1) To test the part counter's function, observe the indicator light labeled "Drop Sensor". This indicator is activated by the movement of any object moving through the drop chute opening.



2) If an object blocks or passes through the opening a green indicator light will appear next to the Drop Sensor label and then the Part Cleared indicator.



**Note:**

*The function of the drop sensor is critical to trouble free operation while running the machine in auto mode. It is also a critical feature in part error detection during the injection cycle.*

## MACHINE MOVEMENTS: CLAMP HOMING SEQUENCE

The clamp platen moves along two linear rails allowing it to open and close the tool that is mounted to it. It is required at the beginning of every session to home the clamp platen and the ejector push rods so that the machine knows these positions. To home the clamp platen, close the safety window and go to the “Cycle” page (disable the E-Stop button if blinking).

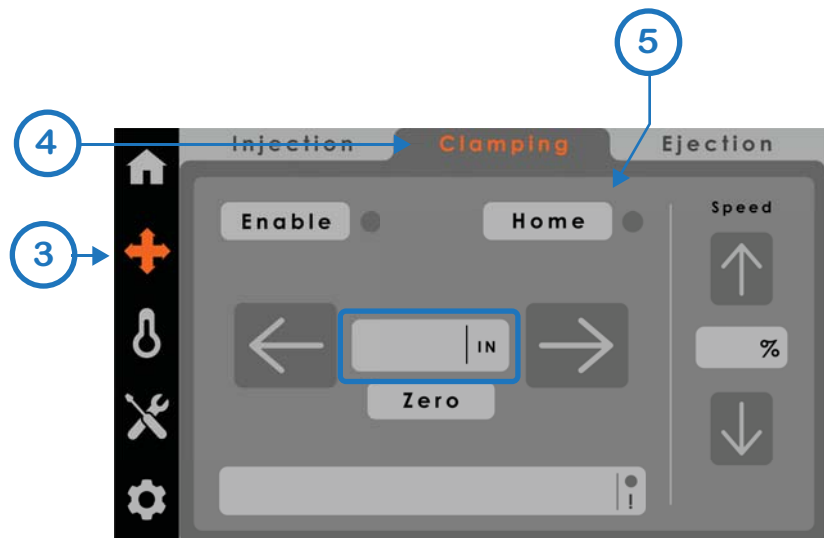
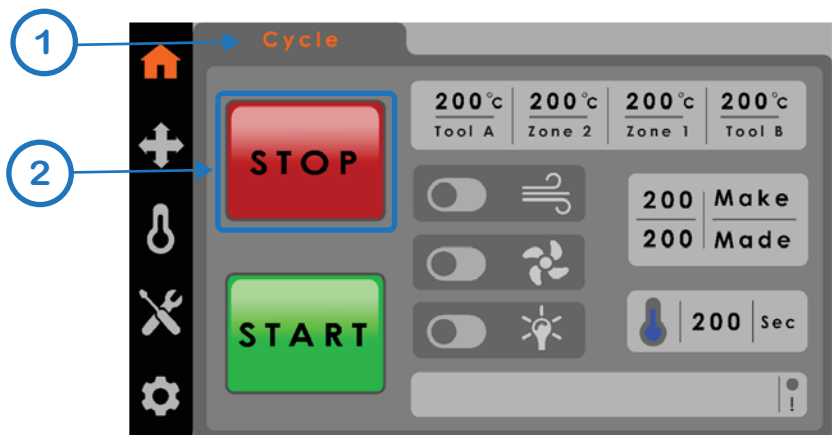
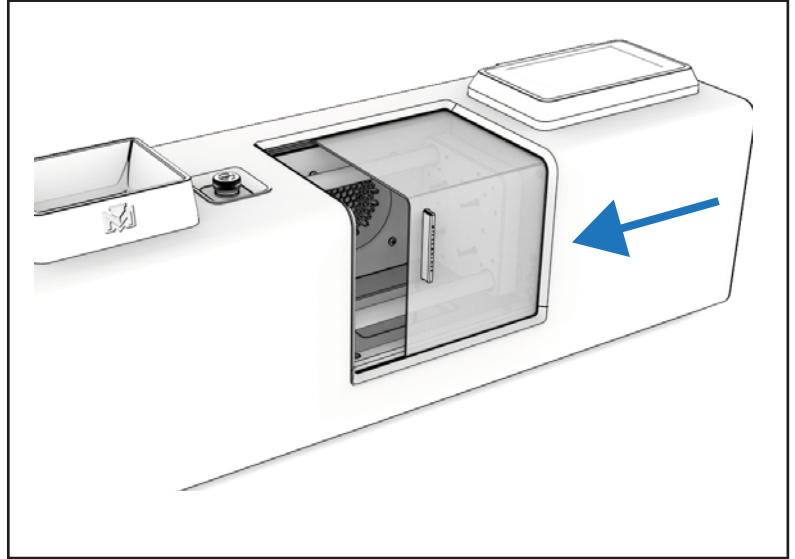
Now navigate to the Machine Motion Menu. Then to the “Clamping” tab page.

Enable the Clamp Motor by pressing the “ENABLE” Button and then press the clamp “Home” button.

The machine will move the clamp platen to its back limit. The orange LED next to the home button will illuminate to indicate the machine has been homed. Once homed it will remain illuminated.

The travel distance value should read 0.000 once homed.

*\*Note: this homing procedure must be performed on each new machine startup session for both Clamp and Eject!*



## MACHINE MOVEMENTS: EJECTOR PLATE HOMING SEQUENCE

The ejector rod system moves in and out on linear rails allowing the operator to set the an ejector pin travel depth.

To home the ejector plate, navigate to the Machine Motion page and then the Ejection tab.

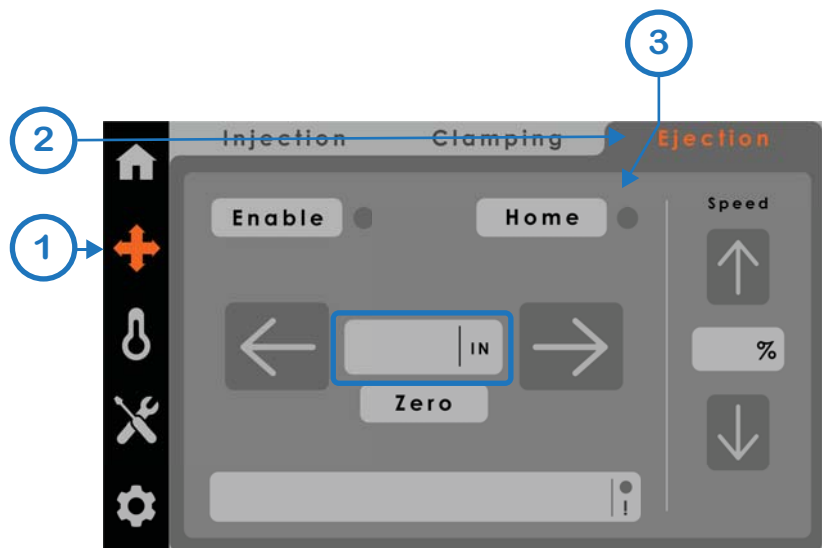
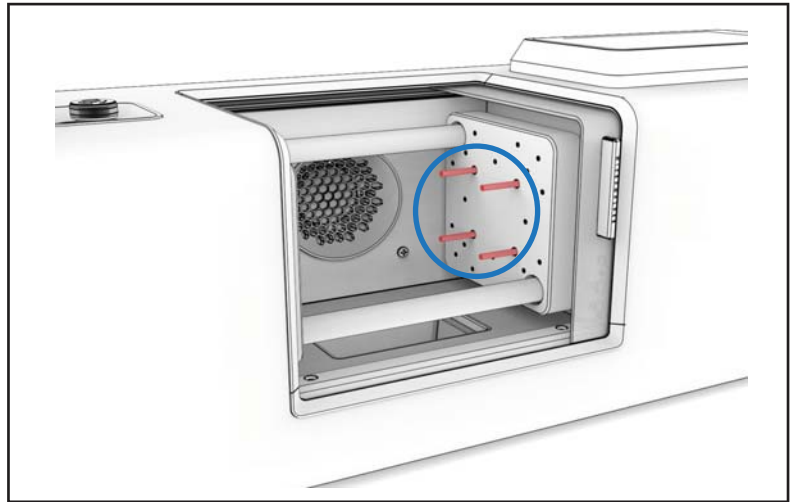
Press the Home Button.

The machine will drive the ejector rods system to its home position and stop. The orange LED next to the home button will illuminate to indicate the machine has been homed. Once homed it will remain illuminated.

The travel distance value should read 0.000 once homed

The Ejector Plate has now been successfully homed.

*\*Note: this homing procedure must be performed on each new machine startup session!*



It is critical that when tooling is being installed and the clamp platen is being positioned that the ejector plate be placed in it's home position. If tooling mounted on the clamp platen comes in contact with the ejector rod system that has not been homed sever machine damage will occur.

Always disable the ejector rod system motor control when not adjusting push rod positioning.

## MACHINE MOVEMENTS: MANUAL JOGGING CLAMP PLATEN

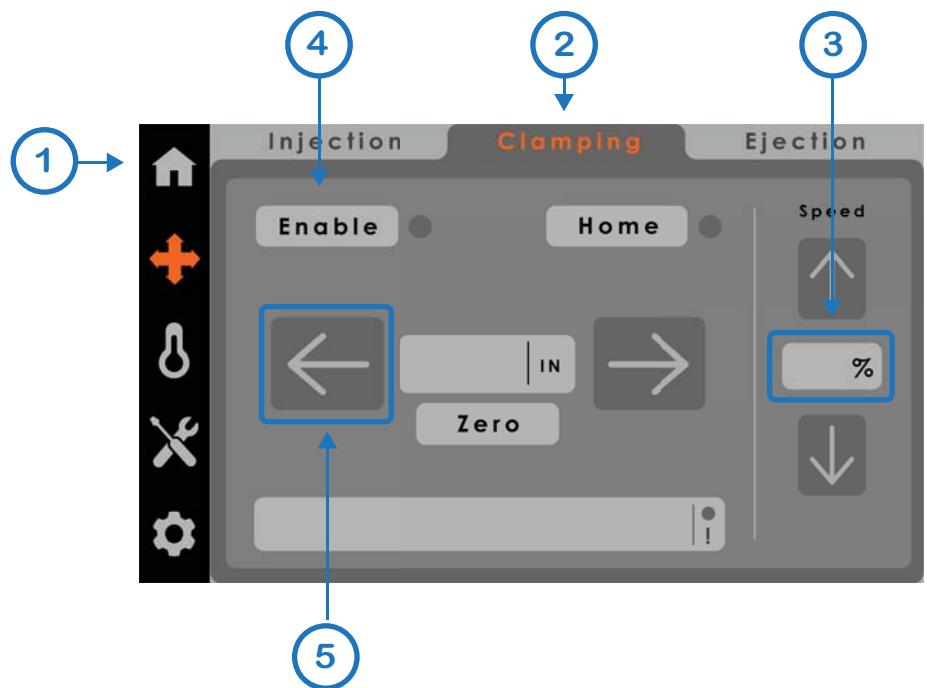
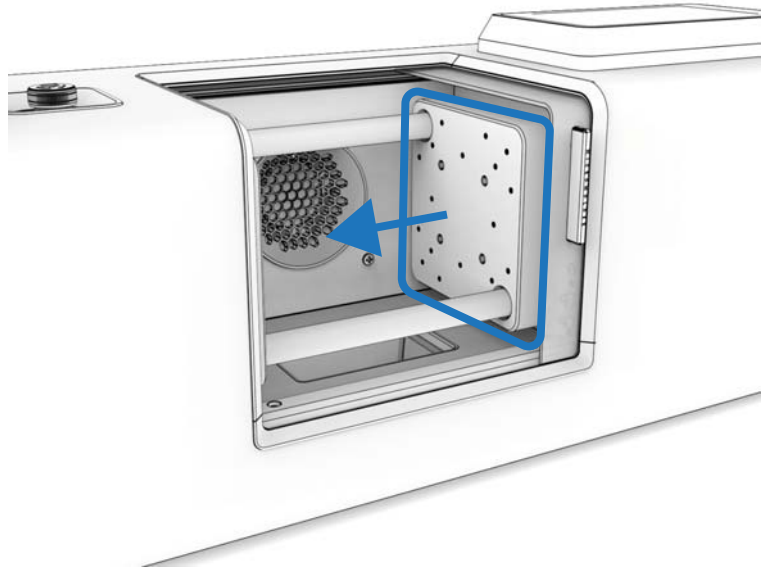
To manually jog the clamp platen, first complete the steps outlined in the Clamp Homing Sequence section then follow the following procedure:

Navigate to the Machine Motion page and then the Clamping tab.

Set speed to 50%.

Enable the clamping motor by pressing the Enable button, the orange LED will illuminate when the motor is enabled.

Manually jog the machine by pressing the Left Arrow button and sliding your finger slightly in the arrow direction, this will drive the clamp platen away from its home position at 50% of the maximum motor speed. Lifting your finger will stop the movement.



**Note:**

The orientation of the arrow relates to the corresponding movement direction of the clamp platen. With the left arrow corresponding to a positive direction (moving away from the home position) and the right arrow corresponding to a negative direction (moving toward the home position).

## MACHINE MOVEMENTS: MANUAL JOGGING CLAMP PLATEN: CONT

If you manually jog the Clamp to its negative limit, the machine will automatically be placed in E-Stop Mode. If this occurs, you must first disable the ESTOP, manually jog the platen away from the limit (positive direction) and re-home the machine.

Do not attempt to drive the Clamp passed the limit, machine damage will occur.

## MACHINE MOVEMENTS: MANUAL JOGGING EJECTOR PLATE:

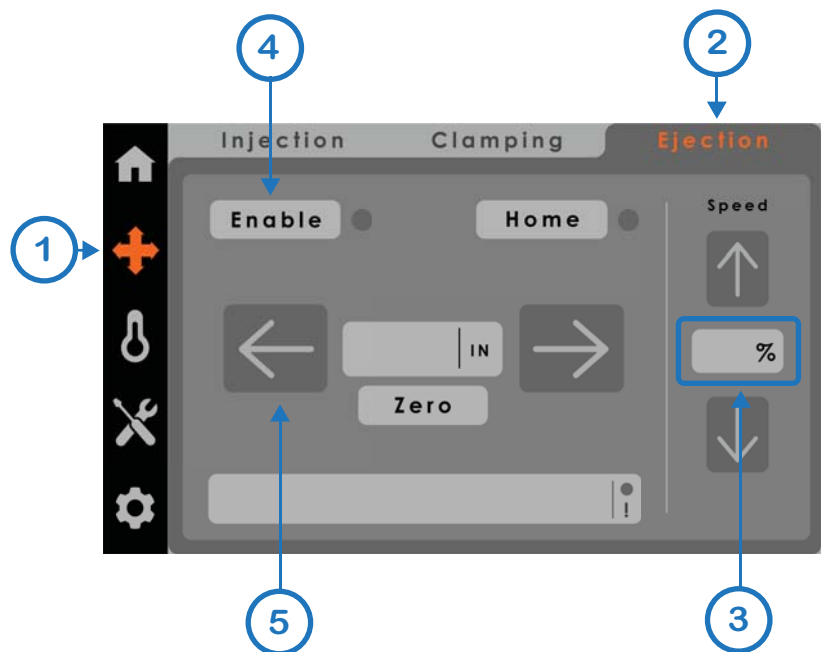
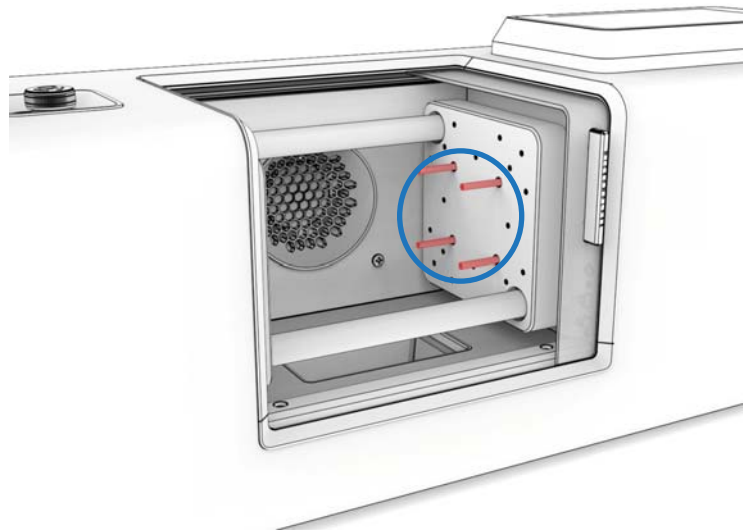
To manually jog the ejector plate, first complete the steps outlined in the Clamp Homing Sequence section then follow the following procedure:

Navigate to the Machine Motion page and then the Ejection tab.

Set speed to 50%.

Enable the Ejection motor by pressing the Enable button, the orange LED will illuminate when the motor is enabled.

Manually jog the machine by pressing the Left Arrow button, this will drive the ejector plate away from its home position at 50% of the maximum motor speed.



**Note:** The orientation of the arrow relates to the corresponding movement direction of the clamp platen. With the left arrow corresponding to a Positive direction and the right arrow corresponding to a negative direction.

## MACHINE MOVEMENTS: MANUAL JOGGING EJECTOR PLATE: CONT.

If you manually jog the Ejector Plate to its negative limit, the machine will automatically be placed in E-Stop Mode. If this occurs, you must first disable the ESTOP, manually jog the platen away from the limit (positive direction) and re-home the machine.

Do not attempt to drive the Ejector Plate passed the limit, machine damage will occur.

## MACHINE MOVEMENTS: MANUAL JOGGING INJECTION SCREW:

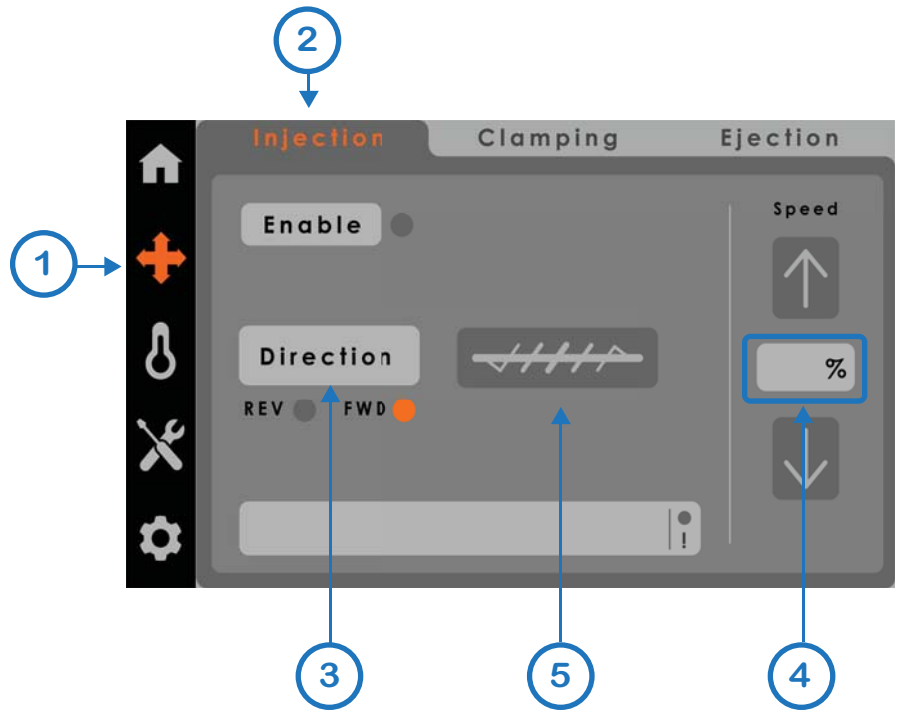
To manually jog the Injector Screw:  
Navigate to the Machine Motion  
Page and click on the Injection tab.

Set the rotation direction to forward  
by toggling the direction button.

Note: The active direction is  
displayed by the illumination of an  
orange LED on either Rev or Fwd.

Set the desired rotation speed by  
toggling the up or down buttons  
(speed is in percentage of maximum  
motor speed).

Close the machine safety window,  
manually jog the injection screw by  
pressing the Rotate button, this will  
rotate the injection screw.



### Important!

It is best practice to jog the Injection Screw manually only when the heaters are up to temperature. If plastic is present in the injection barrel and the heaters are off, the plastic will be solidified and will lock the injection screw in place. Any attempt to jog the injection screw during this state will cause the injection screw power supply to temporarily disable itself to prevent an over current condition.

Please refer to the Heating System section of this manual for information on enabling the heaters and setting heater temperatures.

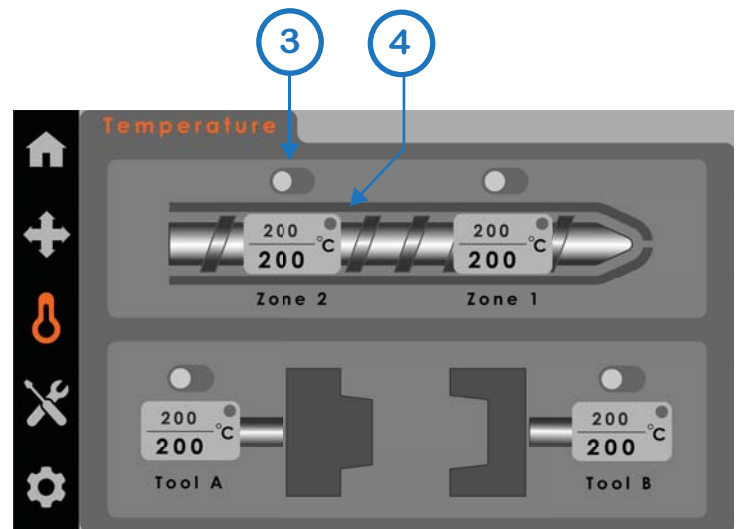
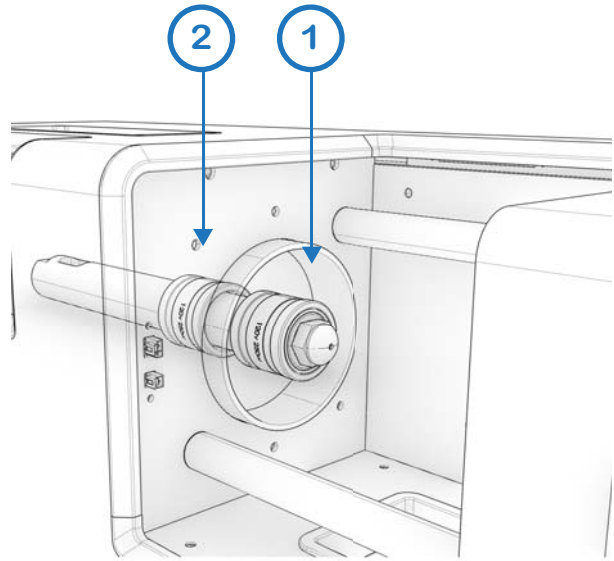
## MATERIAL HEATING SYSTEM:

- 1) Zone 1 barrel heater
- 2) Zone 2 barrel heater

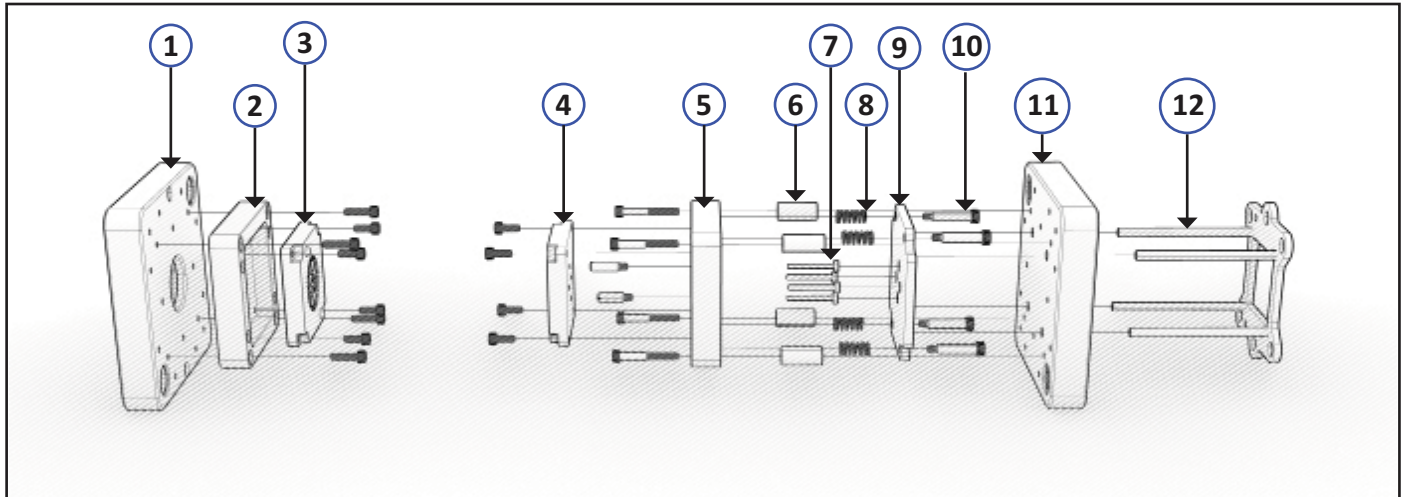
To enable one or both of the zone heaters, navigate to the Temp page. If you are unfamiliar with the layout of this page, please review the User Interface: Temp Control Overview of this document.

Cycle the heaters on by pressing the Slider Switch button over the temp zones.

The indicator light ● will be illuminated next to the appropriate zone label as the heaters are cycled on and off to reach the set temp. The heaters are controlled via firmware PID control loops. It is normal for the red indicator light to cycle on and off randomly when a zone is enabled. This is the PID control loop working to build and maintain the commanded set point temperature

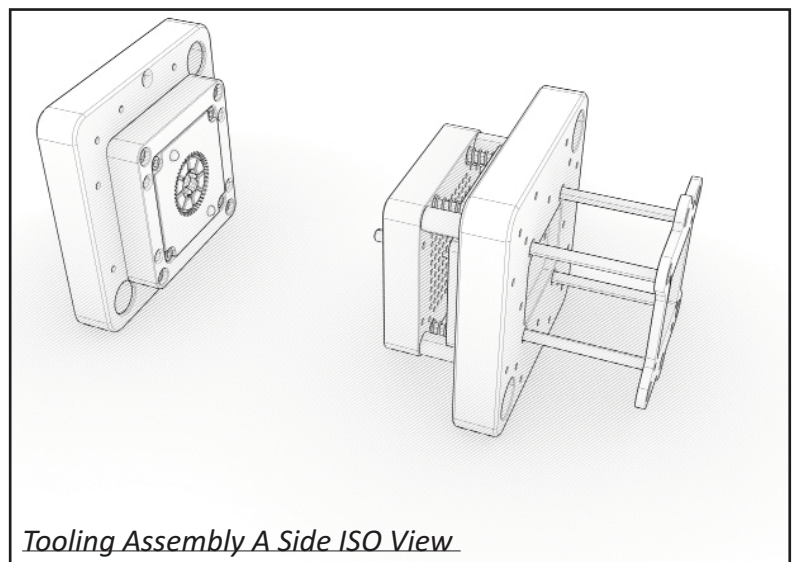
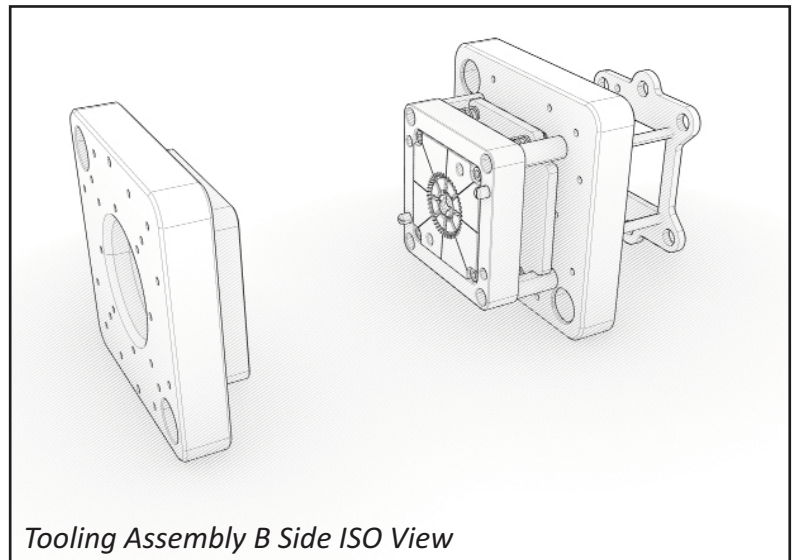


## TOOLING SYSTEM: OVERVIEW



1. B Side Platen
2. B Side MUD Box
3. B Side Tool
4. A Side Tool
5. A Side MUD Box
6. Mud Box Standoffs
7. Ejector Pins
8. Push Plate Return Springs
9. Ejector Push Plate
10. Push Plate Linear Bearing Bolts
11. A Side Platen
12. Ejector Push Rod System

Assembly

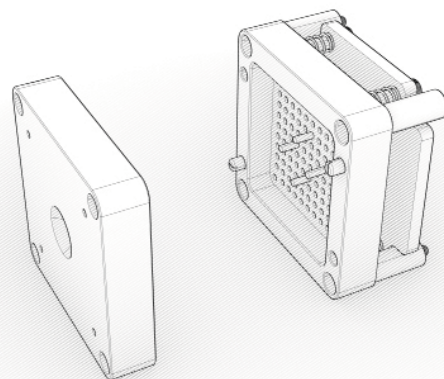
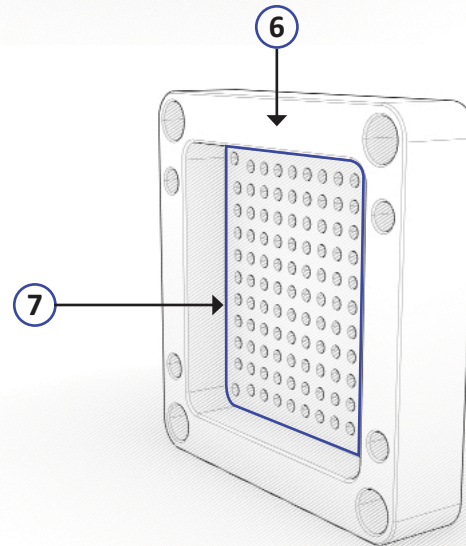
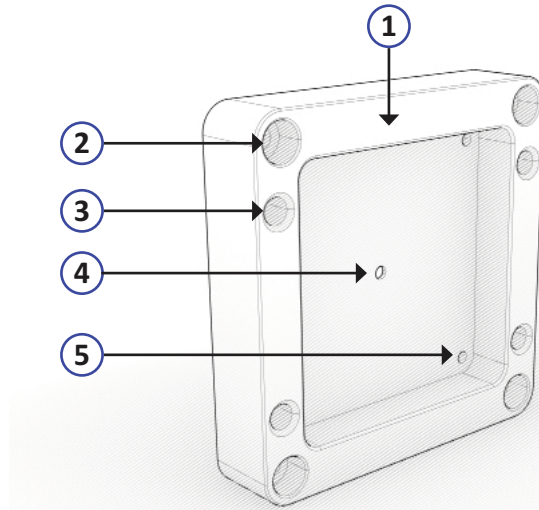


## TOOLING SYSTEM: MULTI USE DIE BOX (MUD)

At the heart of the MicroMolder Evo tooling system is the M.U.D. Box (Multi Use Die Box)

The MUD Box utilizes a standard tooling mounting scheme that allows the user to install tooling with varying part geometry and ejector pin placement into the same universal fixture.

1. A Side M.U.D. Box
2. MUD Box To Platen Mounting Hole
3. Alignment Pin Hole
4. Injection In-feed Hole
5. Tool to MUD Box Mounting Hole
6. B Side MUD Box
7. Ejector Pin Hole Array



*MUD Box Assembly View*

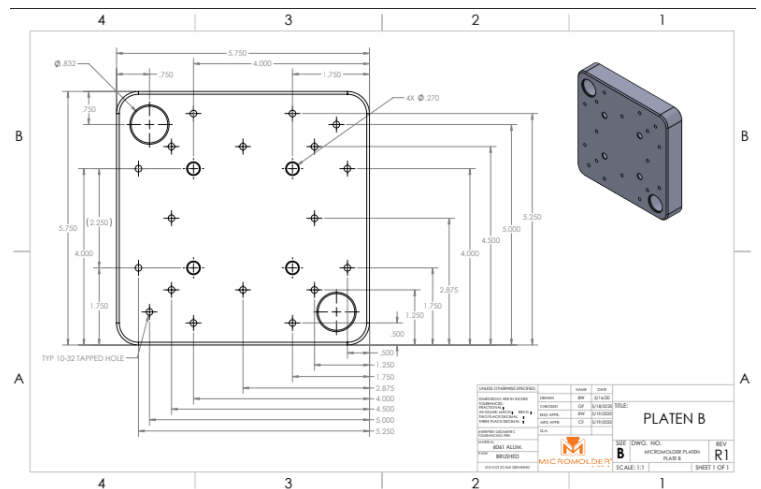
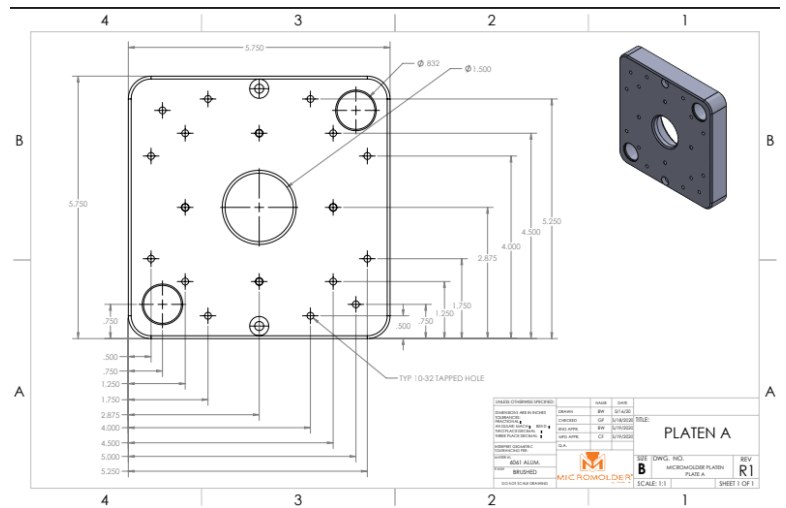
# TOOLING SYSTEM: PLATEN

The MicroMolder Platen is a universal fixturing plate that allows for the installation of a variety of tooling fixtures and tooling die boxes.

To download platen drawings please visit:

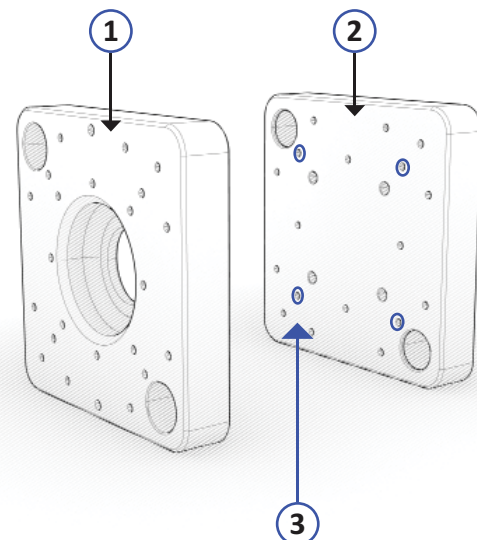
<https://www.micro-molder.com/resources>

Click on the “Downloads” link.



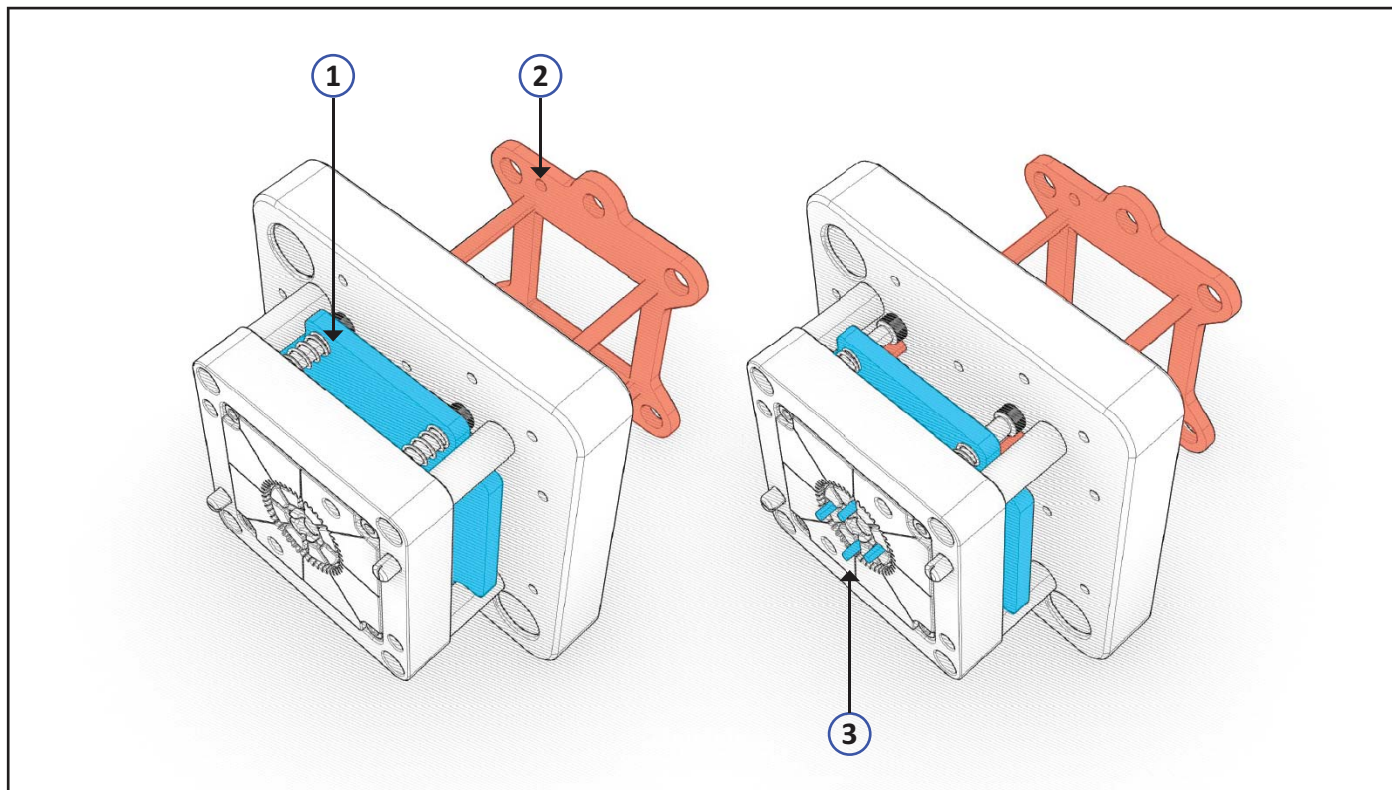
1. A Side Platen
2. B Side Platen
3. Standard MicroMolder MUD Box Mounting Holes

*Note: All threaded tooling mounting holes on the platen plates are a **10-32 thread**.*

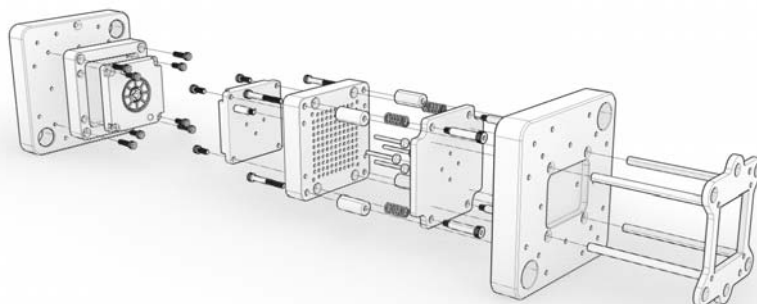


Platen ISO View

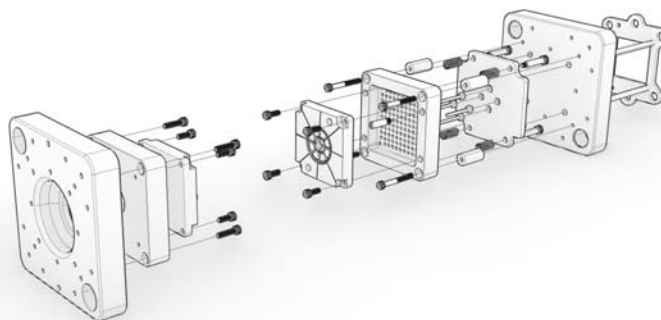
## TOOLING SYSTEM: EJECTOR PUSH PLATE ASSEMBLY:



1. Ejector Push Plate
2. Ejector Push Rod System Assembly (internal to machine).
3. Ejector Pins

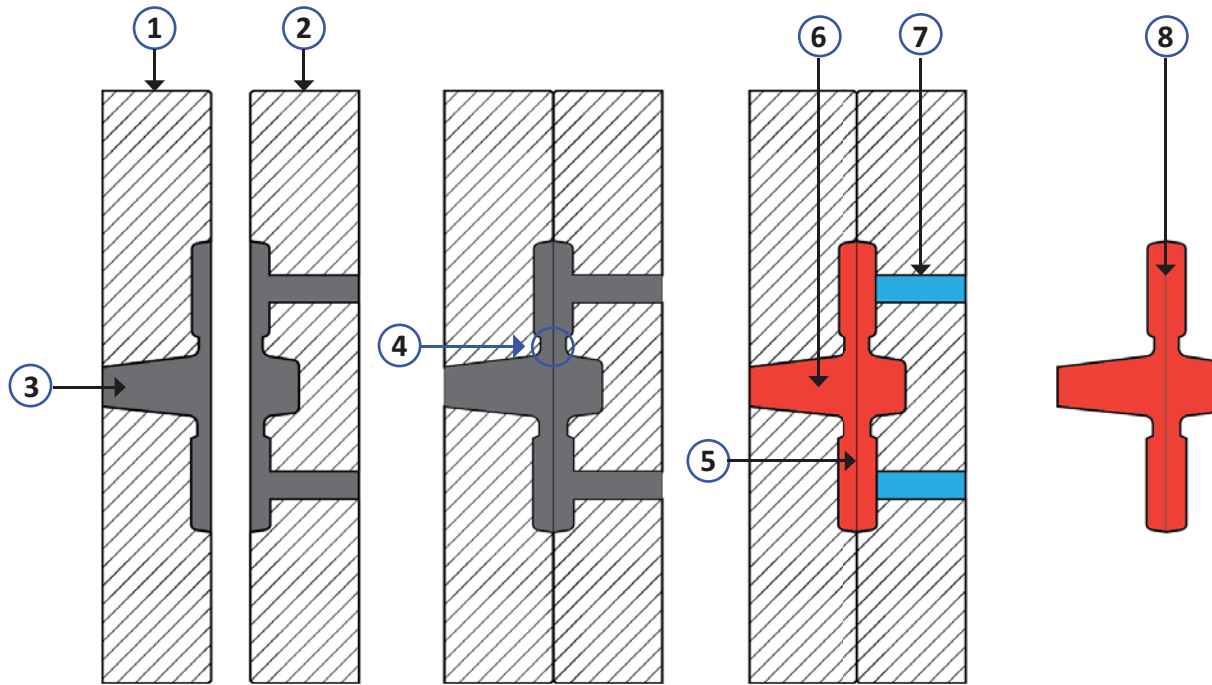


*Alternate Exploded View: A Side*



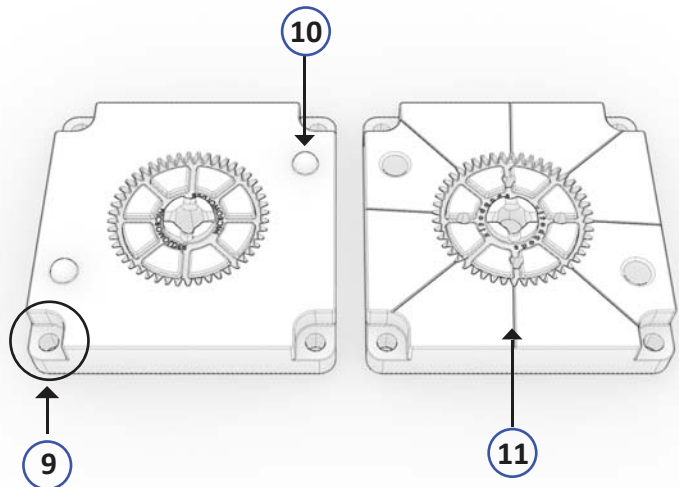
*Alternate Exploded View: B Side*

# TOOLING SYSTEM: TOOL ANATOMY

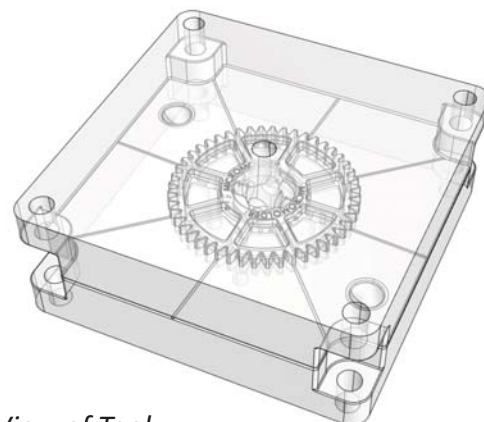


*Basic Tool Cross Section*

1. Tool A
2. Tool B
3. Sprue
4. Runner
5. Parting Line
6. Tool Cavity
7. Ejector Pin
8. Part
9. Tool to M.U.D. Mounting Hole
10. Alignment Feature
11. Vent



*Other Tool Features*



*Transparent View of Tool*

## TOOLING SYSTEM: TOOL ANATOMY DESCRIPTIONS

**COLD SLUG** - The first material to enter an injection mold. So called because in passing through the sprue orifice it is cooled below the effective molding temperature.

**COLD SLUG WELL** - Space provided directly opposite the sprue opening and at the end of main runners to trap cold slug material.

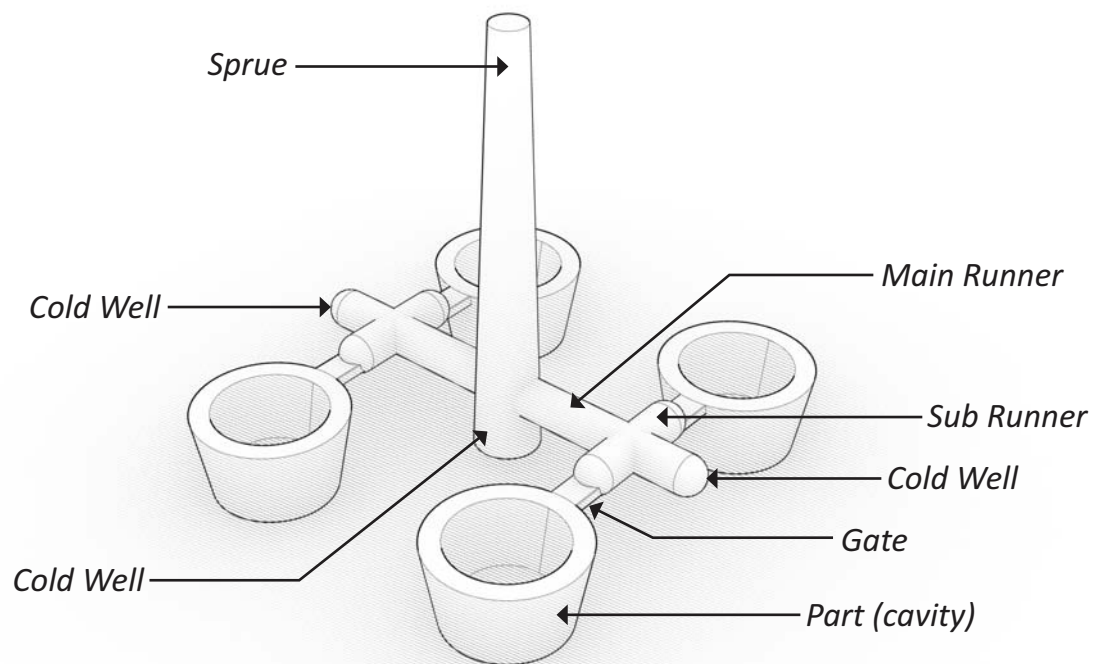
**FAMILY MOLD** - A multi-cavity mold where multiple parts are produced from the same tool.

**GATE** - The orifice through which injected plastic enters the tool cavity.

**PARTING LINE** - The point at which halves of mold meet in closing.

**RUNNER** - The channel that connects the sprue with the gate to the cavity.

**SPRUE** - The channel through which plastic is injected into the mold.

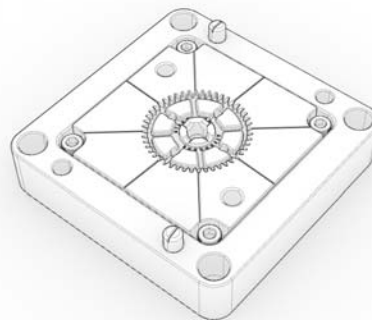
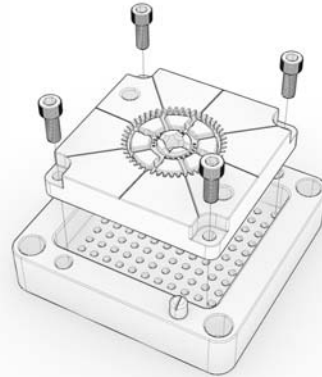


*Example Family Mold:*

## TOOLING SYSTEM: TOOL INSTALLATION

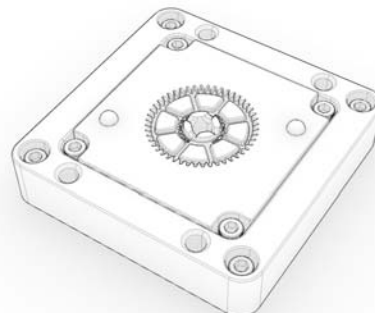
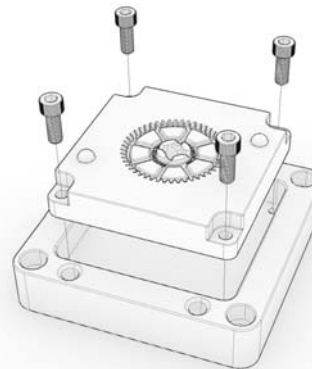
1. Install the A Side tool into the A Side M.U.D. using (x4) 1/2" long, 8-32 Socket Head Cap Screws.

①



2. Install the B Side tool into the B Side M.U.D. using (x4) 1/2" long, 8-32 Socket Head Cap Screws.

②



*Note: the orientation of the both tool haves during install to ensure that all tool alignment features will mate when the haves are closed.*

## TOOLING SYSTEM: TOOL INSTALLATION

3. When applicable, install ejector pins into the push plate. We recommend using CA adhesive for this. If the pins need to be removed for any reason, apply heat to break the CA bond on metal push plates. Alternatively, compression springs or other mechanical systems such as a custom retention plate can be used to create a captive ejector pin situation.

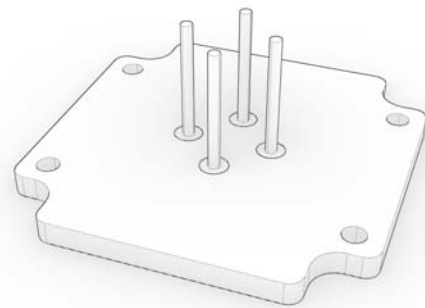
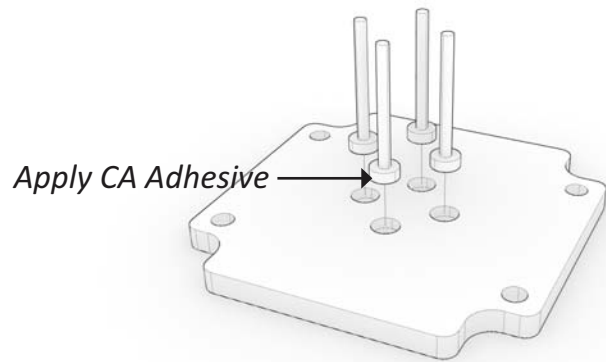
Always dry fit the assembly before gluing or using other methods to ensure placement and alignment of the pins is correct.

Note: Push plates are often tool specific as the location of the ejector pins will vary from tool to tool.

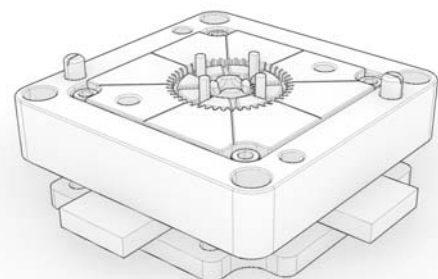
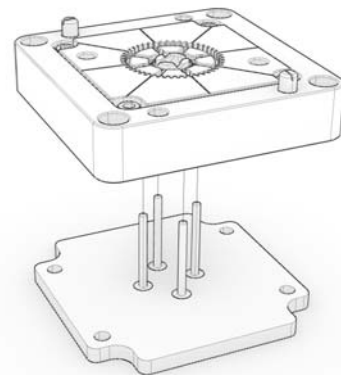
4. It is recommended to install the B Side Tool and M.U.D assembly over the push plate assembly before the adhesive sets up (if using adhesive). This helps ensure proper alignment between the tool and ejector pins.

*Note: Use spacers between assemblies to help prevent excess adhesive from bonding the assemblies together.*

3



4



## TOOLING SYSTEM: TOOL INSTALLATION

5. Once the adhesive has fully cured, rotate the assembly 180 degrees and install (x4) 1/4 x 1" shoulder length #10-32 Socket Head Cap Screws through the return springs as shown.

(Fastener shoulder length corresponds to standoff length, other sizes can be substituted based on your tooling needs.)

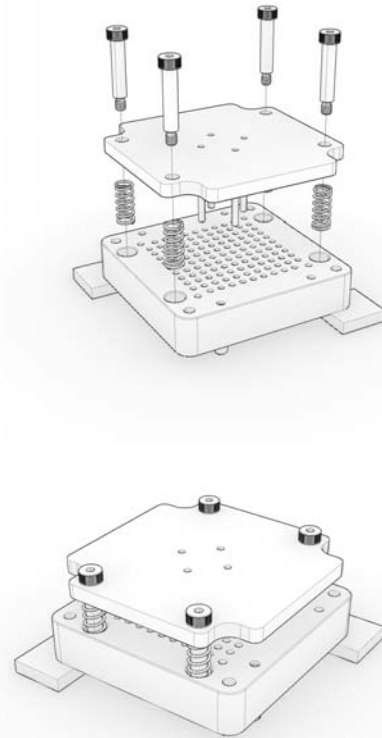
Using spacers as shown will help prevent the assembly from rocking on your workbench during install.

Hold this assembly with both hands and press against the push plate to ensure that there is no binding in the assembly.

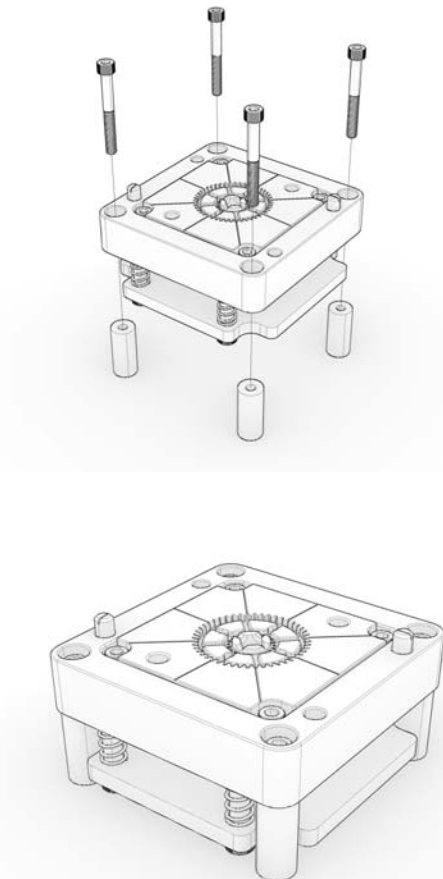
6. Place 1/2 OD, 1.125" long aluminum standoffs upright on your workbench and rotate the assembly as shown, align standoffs with the through holes in the M.U.D. and drop in (x4) 2" #10-32 bolts. The B Side Tooling assembly is now ready to be mounted onto the B Side Platen.

*Note: Hardware sizes listed apply to the example tool shown. If your tooling design requires different length standoffs, be sure to accommodate the required length in the shoulder height of the #10-32 Socket Head Cap Screws used to install the push plate, return springs, and standoffs to the M.U.D.*

5



6



## TOOLING SYSTEM: TOOL INSTALLATION

7. Place a shop towel over the linear bearing to help protect it in the event that the tooling is dropped or miss-handled during install.

Beginning with the B Side tooling assembly (it typically needs the most working room to install) align the standoffs and the 2" 10-32 bolts with the corresponding holes in the B side platen.

It is easiest to have the bolts and standoffs assembled to the M.U.D. during this step.

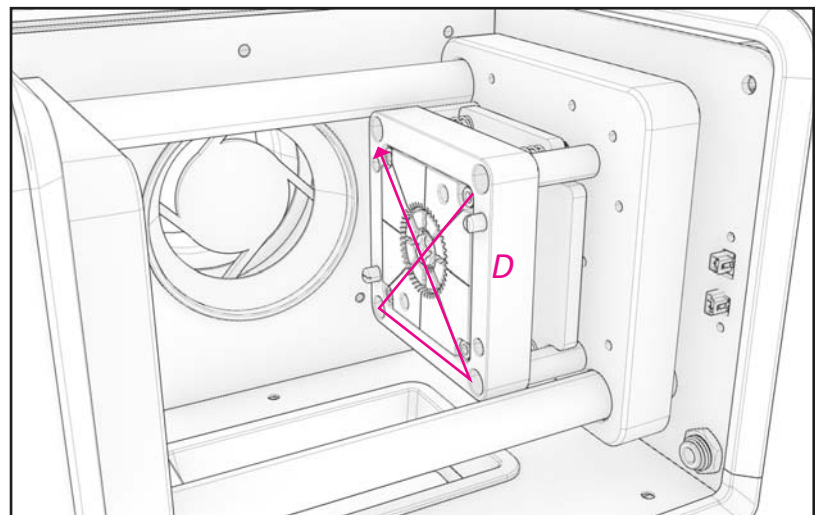
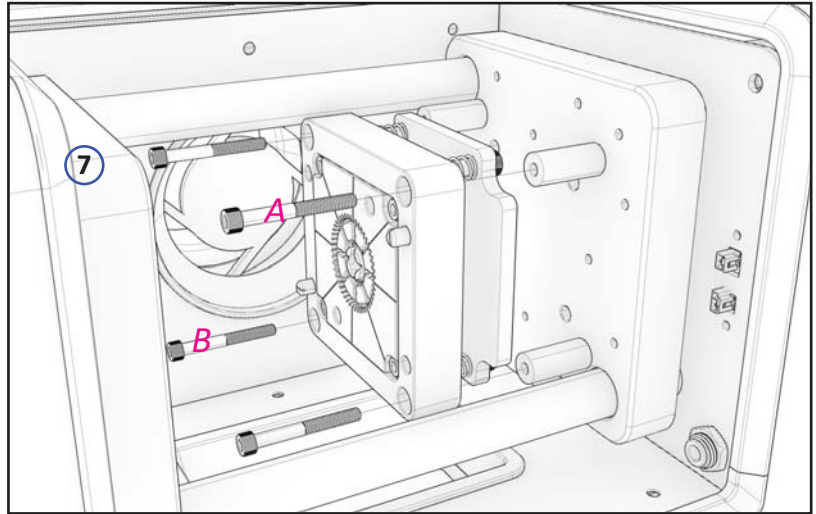
A. Start the most easily accessible bolt by hand until you have secured 3-4 threads.

B. Move on the diagonal to the next bolt. While rotating the tooling assembly to align the holes, start this bolt.

C. Start the remaining two bolts by hand, ensuring that they are not cross threaded and turn freely.

Tighten all bolts by hand as far as you can before using an Allen Key to snug them in place.

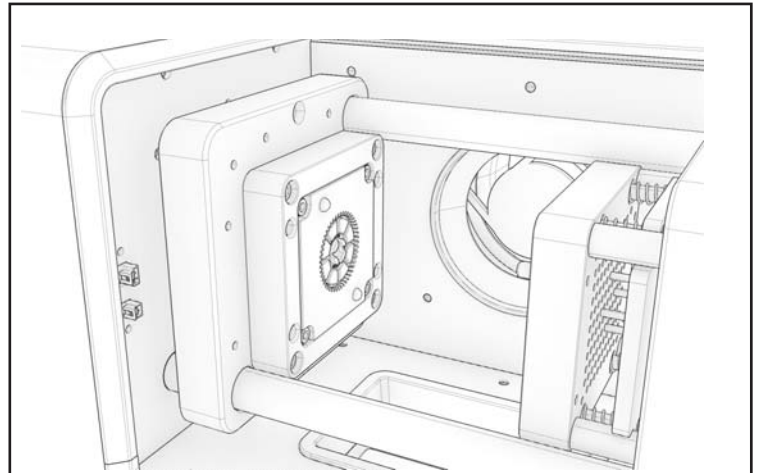
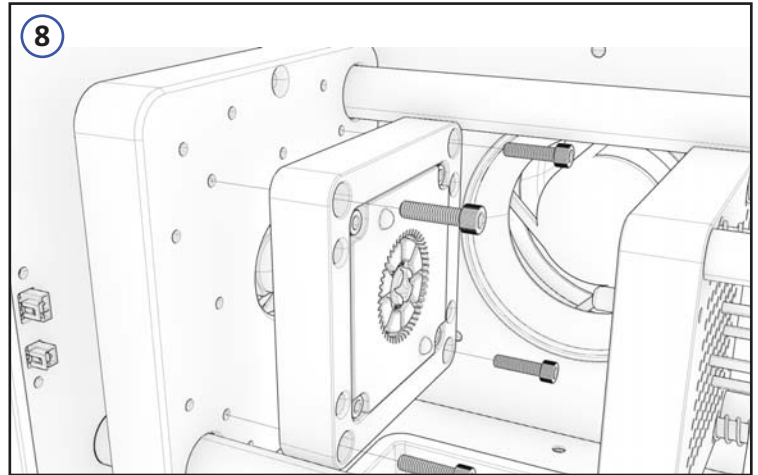
D. It is recommended to tighten these bolts by alternating between them in a criss-cross pattern tightening them a little at a time until they are snug. Do not over tighten, there is no advantage in doing so.



## TOOLING SYSTEM: TOOL INSTALLATION

8. Following the same order of operations used to install the B Side tooling, install the A Side tool and M.U.D assembly to the A Side Platen.

*Note: The injection barrel and nozzle may not be positioned perfectly concentric to the A platen plate (i.e. slightly hanging down or to the side). The barrel is designed to freely move/flex within the A platen cutout hole for the nozzle. This is to allow for any misalignment of the tool and the platen when bolted together. When a tool is not installed on the A platen plate it is not uncommon to observe rotational movement/wobble of the barrel/nozzle. Once your tool is attached to the platen plate the nozzle will self center with the nozzle interface cup of the tool or mud box.*



## TOOLING SYSTEM: SETTING EJECTOR PIN DEPTH

Note:  
Ejector Pin depth is tool specific and must be set and verified upon every tool change. The outlined process is only applicable to tooling that utilizes an ejector pin system.

Follow the procedure outlined in the Machine Movements: Ejector Plate Homing Sequence section of this manual to enable, home, and clear the Ejector Plate.

Home the Clamp Platen

With Tooling installed, manually jog the ejector plate toward the ejector pin push plate. Switching the motion mode from continuous to incremental with a small travel distance selected can be beneficial during setup.

(Fig 1)

Continue to jog the ejector plate a small distance at a time until it makes light contact with the ejector pin push plate.

(Fig 2)

Now as you continue to jog the plate forward in small increments you should see the distance traveled by the ejector pin push plate relative to the stick out depth of the ejector pins themselves. (Fig 3,4)

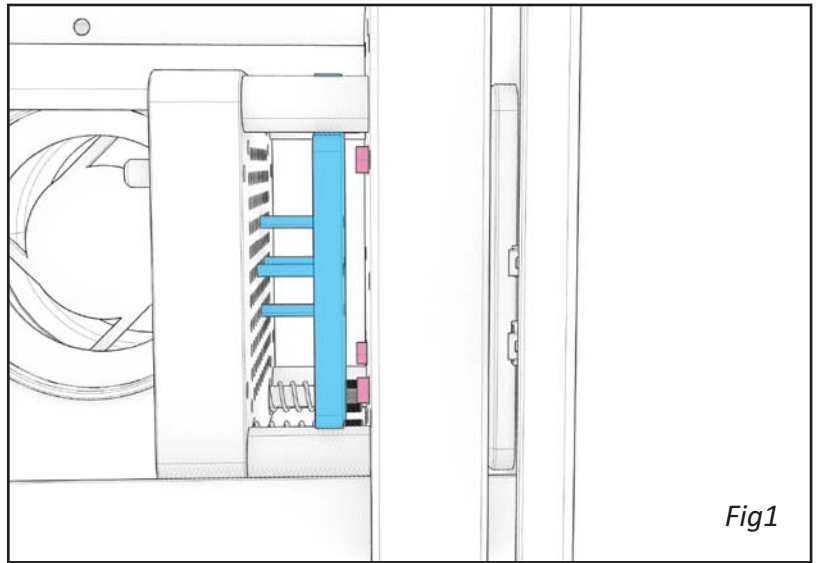


Fig1

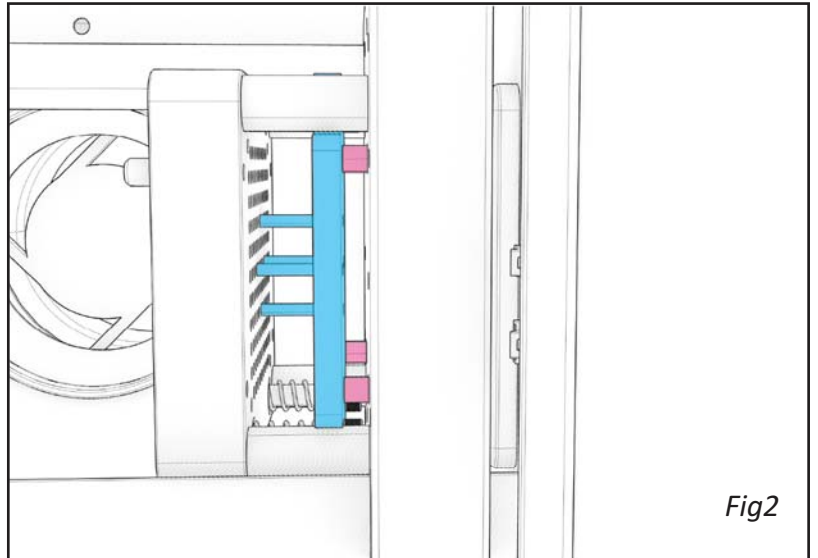


Fig2

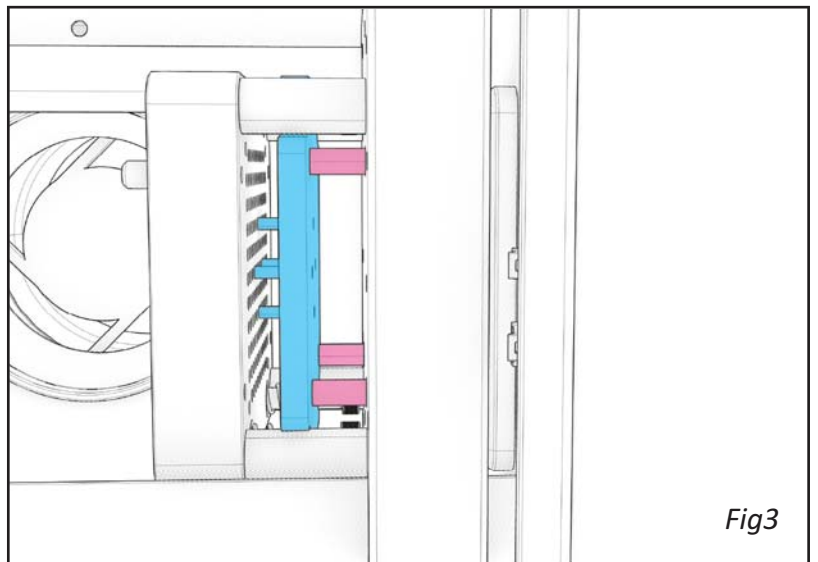


Fig3

## TOOLING SYSTEM: SETTING EJECTOR PIN DEPTH

### CAUTION!

Be careful not to overdrive the ejector plate to the point that it bottoms out the ejector pin push plate against the B Side M.U.D. machine or push rod pin damage will occur. See Fig 5

Set the stick out depth of the ejector pins so that the pins extend beyond the face of the B Side tool at least the depth of the tool cavity. (Fig 6)

This is a good place to start but know that additional adjustments may be needed after initial test shots have been made.

Do not Clear this position, simply disable the ejector plate motors to prevent further movement.

Test the ejector pin push plate travel by manually jogging the clamp away from its home position and then back towards its home position in small increments.

Observe the travel and watch for any binding between the ejector pins and the B side tooling.

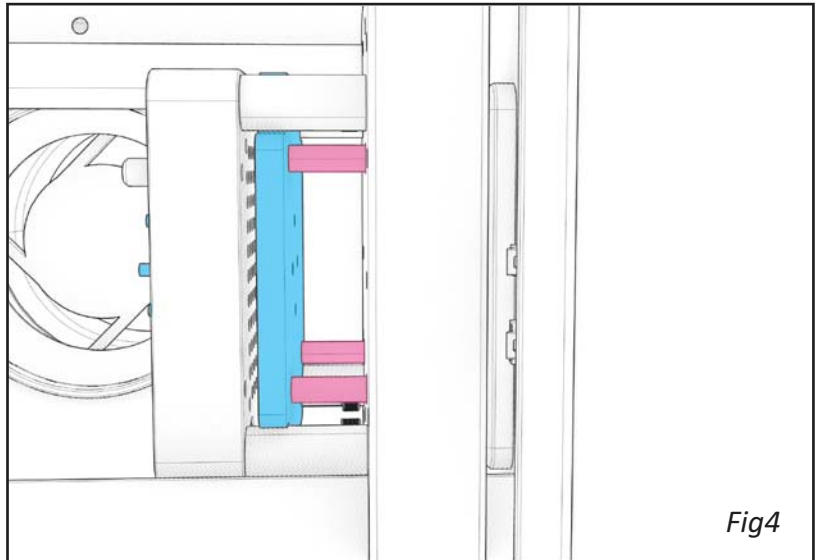


Fig4

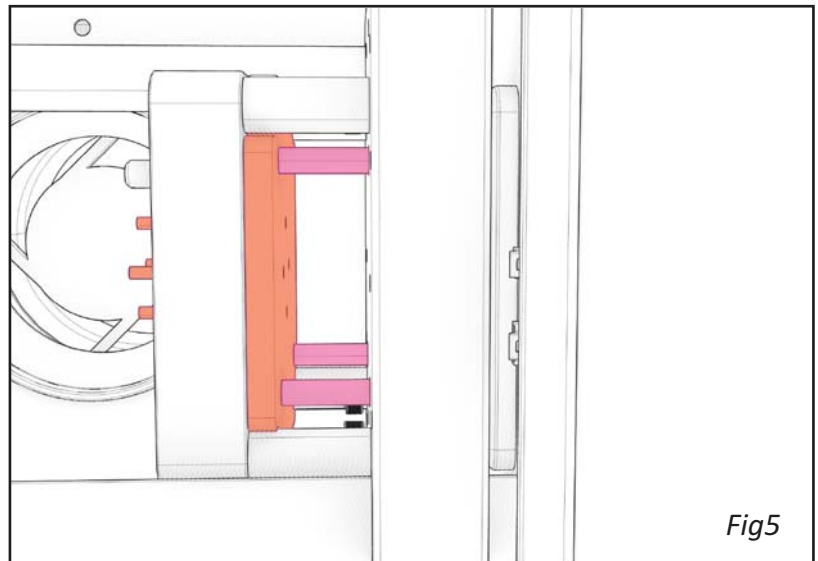


Fig5

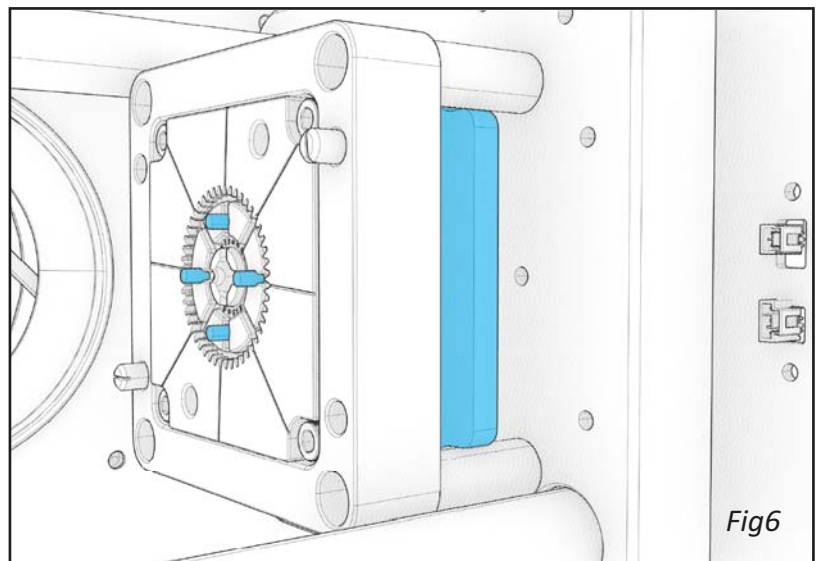


Fig6

## TOOLING SYSTEM: LOADING MATERIAL

1) Loading Material into MicroMolder Evo is very simple. Add The desired amount of plastic pellets to the hopper located on top of the machine.

It is highly recommended to add small amounts of material at a time. It is much easier to add material bit by bit than it is to remove material from the system.

It is recommended to dedicate a small shop vac or hand vacuum to the task of material removal as it will allow you to re-claim pellet without contaminating it.



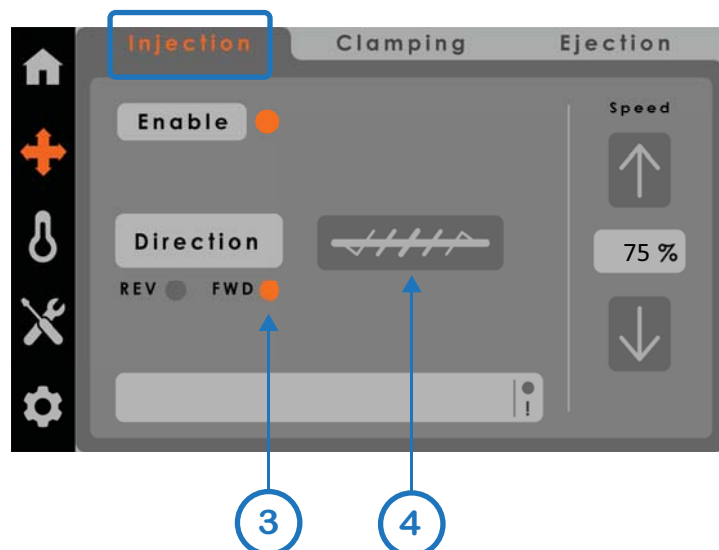
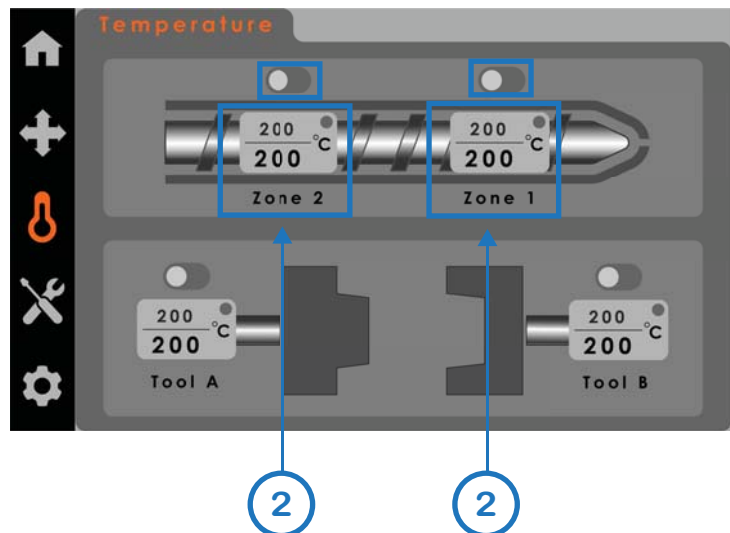
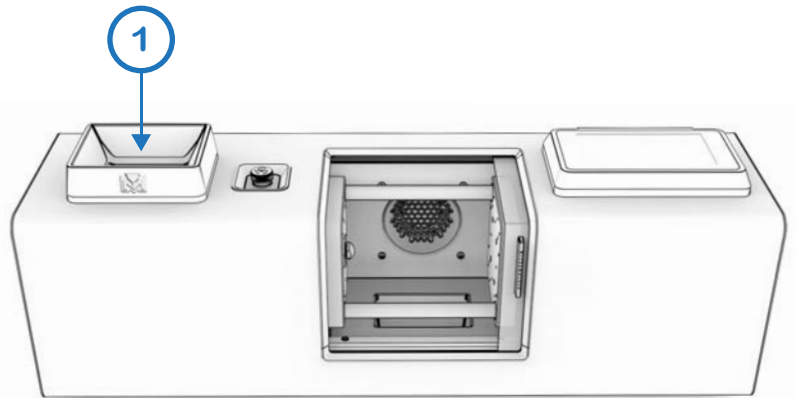
## TOOLING SYSTEM: PURGING MATERIAL

If material purging is needed, follow the procedure below. This applies only to the standard nozzle. The anti-drool nozzle's shut-off design does not allow purging and typically eliminates the need for it.

1. Load a small amount of material into the hopper.
2. Set Temperature the required temperature for both heater zones and allow the system to reach operating temperature.
3. Set Injection direction to FWD.
4. Close the machine safety window.
5. Manually run the injection screw for a short duration bursts (2-3 seconds) to ensure that the auger is turning freely.
6. Continue to run the injection screw in short bursts until material comes out of the injection nozzle.

### CAUTION:

Do not touch purged material, tooling, or injector nozzle as all will be extremely hot. Do not use any flammable containers inside the machine to catch purged material. A simple sheet of aluminum foil below the injector nozzle can aid in cleanup of COOLED purge material.



## DISLODGING FREEZE PLUGS:

A freeze Plug in injection molding is a small slug of plastic that cools and hardens in the injection nozzle during periods of inactivity. This material must be removed before beginning an injection cycle to prevent an under shot or no fill condition.

1. Area where freeze plug forms
2. Freeze plug present at nozzle

**ALWAYS CLOSE THE MACHINE SAFETY WINDOW WHEN PERFORMING THESE STEPS!**

In order to dislodge a freeze plug, we will utilize the compression force of the injection screw itself to drive the freeze plug out of the nozzle.

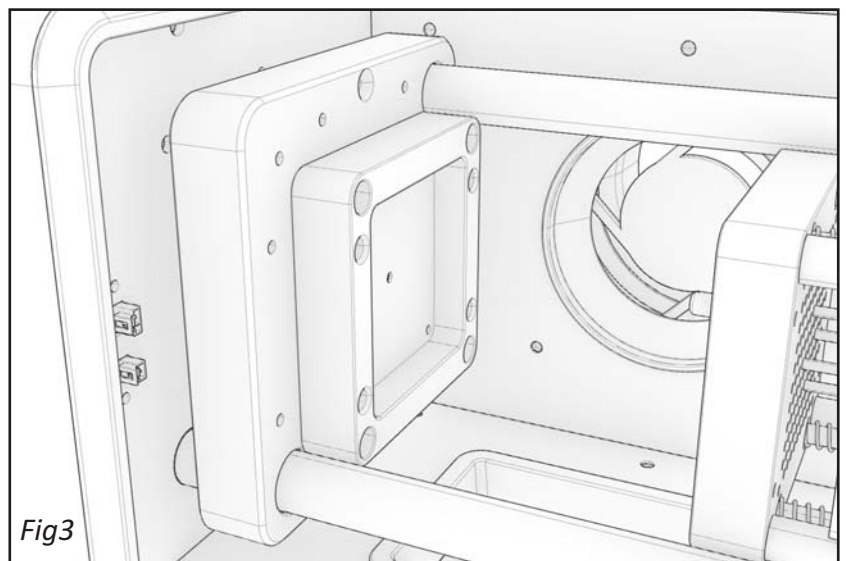
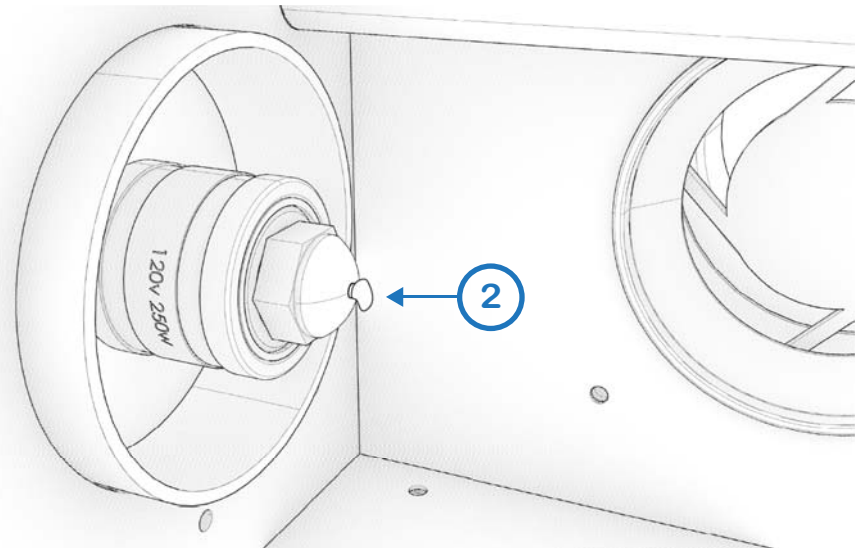
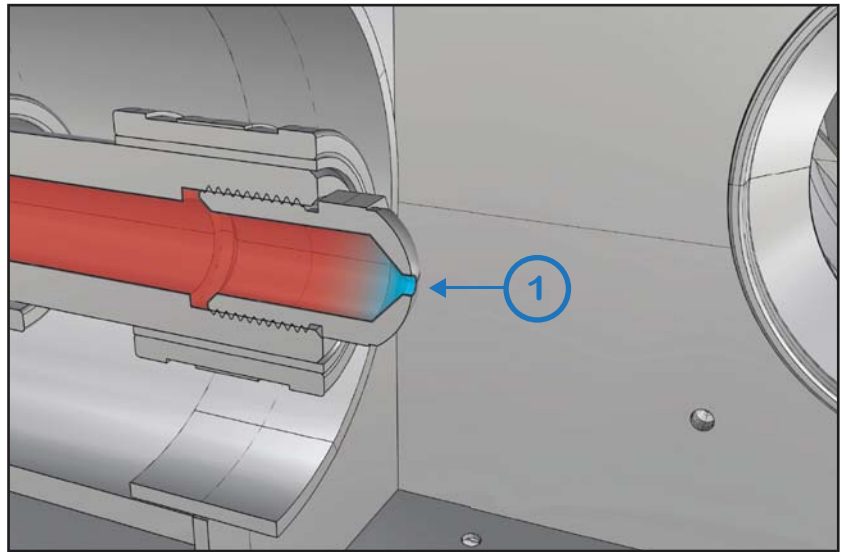
1. Bring the machine up to a set temperature appropriate to the material loaded into the machine. Allow adequate time for temperatures to build and settle at the set point.

As the temperature distributes itself from the injection barrel to the nozzle, the freeze plug will soften slightly.

2. Manually jog the injection screw in the forward direction until you hear the pop sound of the plug being released from the nozzle.

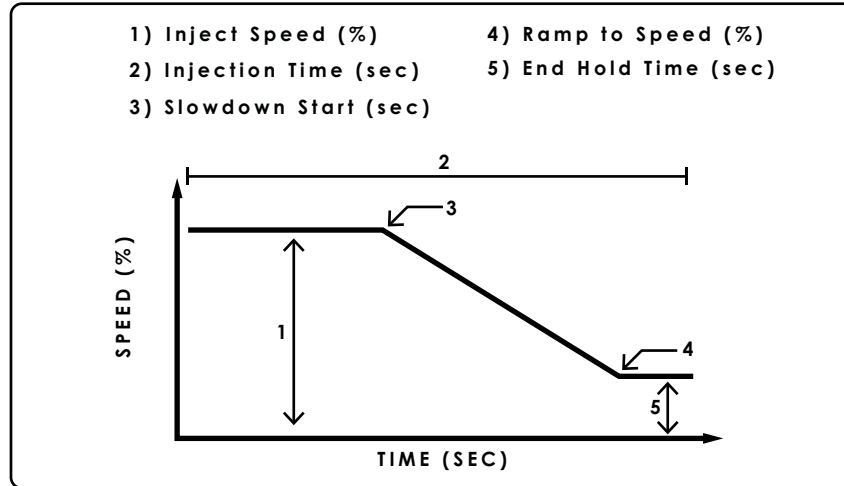
3. Although it is possible to dislodge a freeze plug with A Side tooling installed, it is recommended to remove the A side tool leaving the M.U.D. in place as shown in fig 3.

For persistent freeze plugs a small pointed screw driver or pin may be needed to push the plug back into the nozzle to be melted. The method for dislodging a freeze plug will vary from case to case.



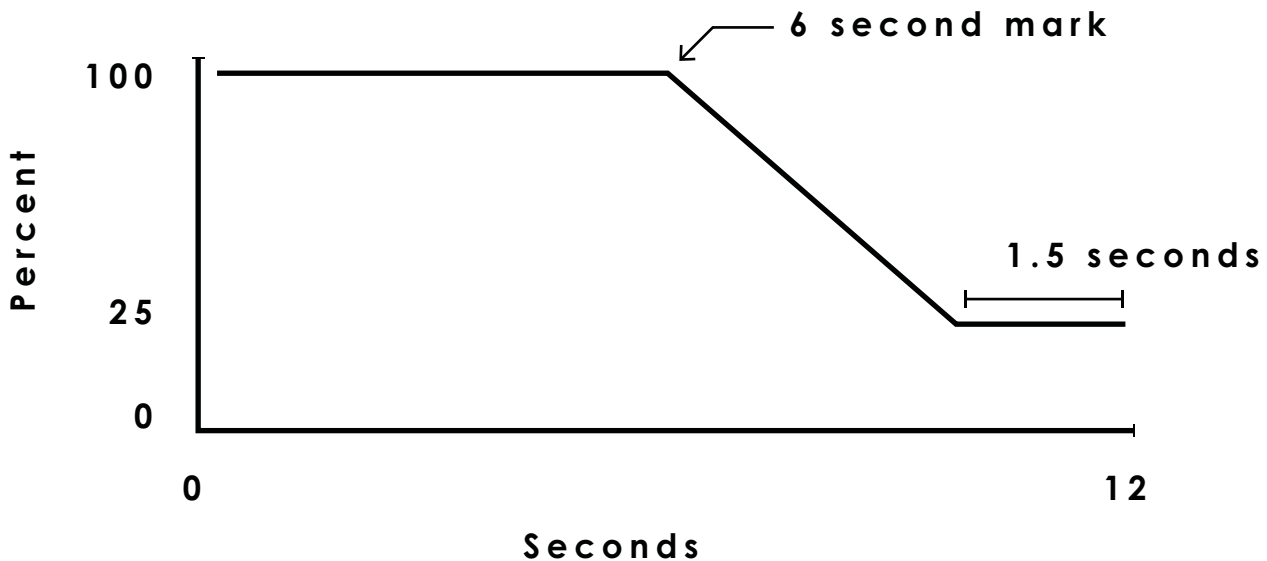
## RAMPED PROFILE INJECTION:

Injection profile ramping is a user-controlled feature that dynamically reduces injection speed during the shot, providing greater control over material flow, minimizing defects, and improving overall part quality.



### Injection Cycle Example:

- In this example, the total Injection Time is 12 seconds.
- The machine injects at 100% Injection Speed for the first 6 seconds.
- At 6 seconds, the Slowdown Start point is reached and the machine starts to ramp down speed.
- The speed decreases to a 25% Ramp to Speed.
- The machine then continues at 25% speed for 1.5 seconds before the injection cycle ends.



## INJECTING THE FIRST PART:

### 1) Secure the Tooling:

Attach the tooling onto the platen plates.

Set the ejector pin depth if applicable to your tooling design. (See: *Tool Installation steps starting on page 44*)

### 2) Enable Barrel Heaters:

Turn on the barrel heaters and allow each zone to reach the desired temperature set point.

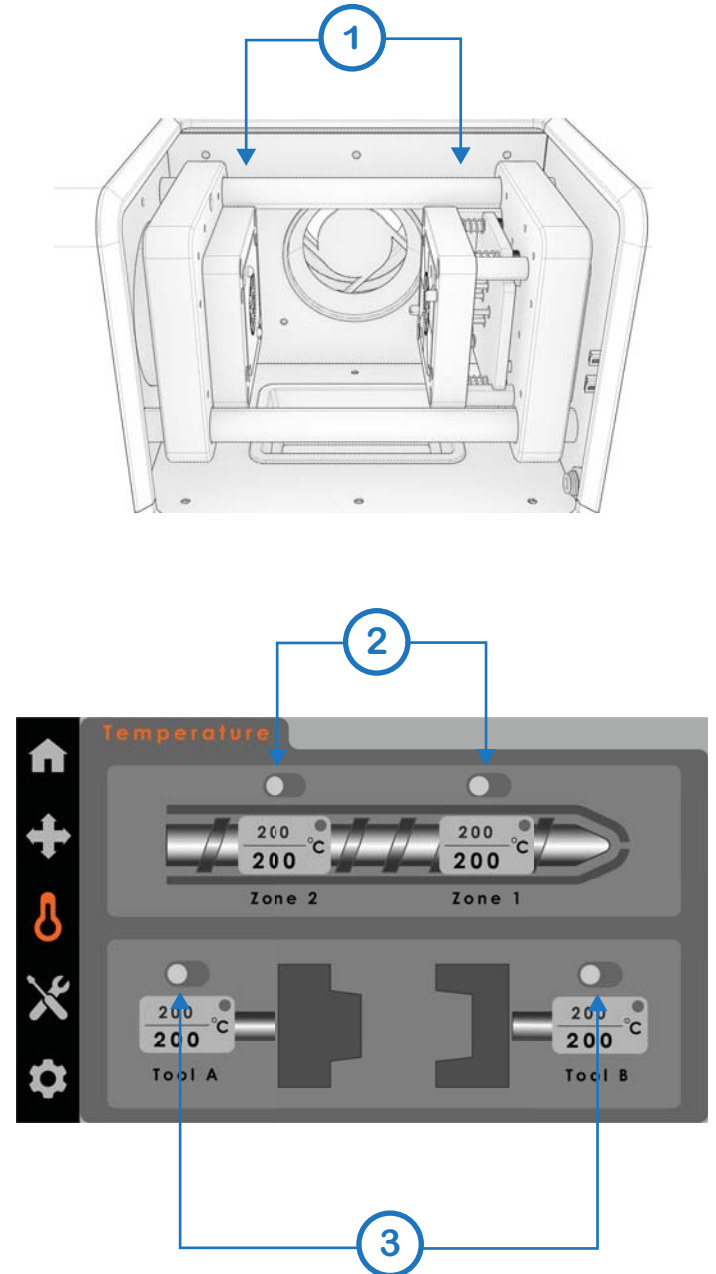
*Note: During initial startup, the heating system may overshoot and undershoot the target temperature for 15-20 minutes. Over time (about 15 minutes), the PID control will stabilize within +/- 3 degrees of the target set point.*

### 3) Enable Tool Heaters (if applicable):

Turn on the tool heaters and allow the tool to reach the target set point.

*Note: Depending on the tool size and material, it may take time to reach the desired temperature.*

*Use thermal blocking materials between your tool and the platen plates to mitigate thermal creep if required. MicroMolder Evo includes a .25" thick piece of G10 FR4 between the platen and the chassis to prevent thermal migration. Adding an additional .125" piece of G10 between the tool A side and the platen can help reduce heat transfer.*



## INJECTING THE FIRST PART: CONT

### 4) Fill the Hopper:

Fill the hopper with plastic pellets.

*Note: Beginners are recommended to use polyethylene or polypropylene due to the lower processing temperatures, non-hygroscopic nature, and good flow characteristics.*

### 5) Close the Safety Door

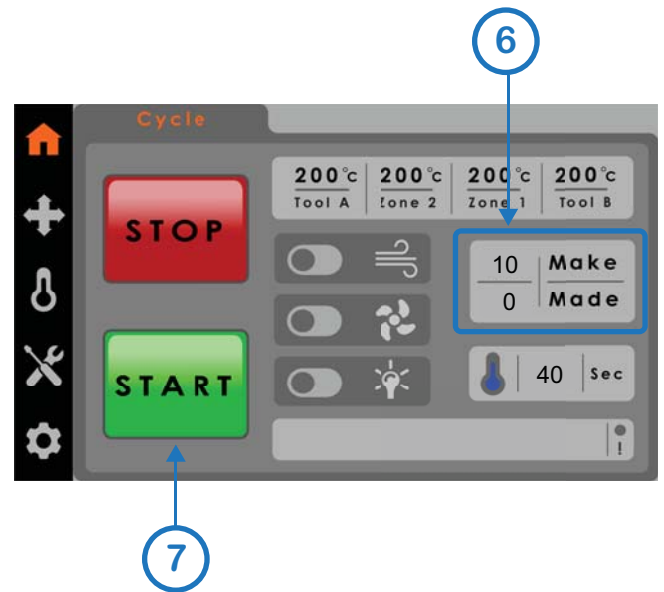
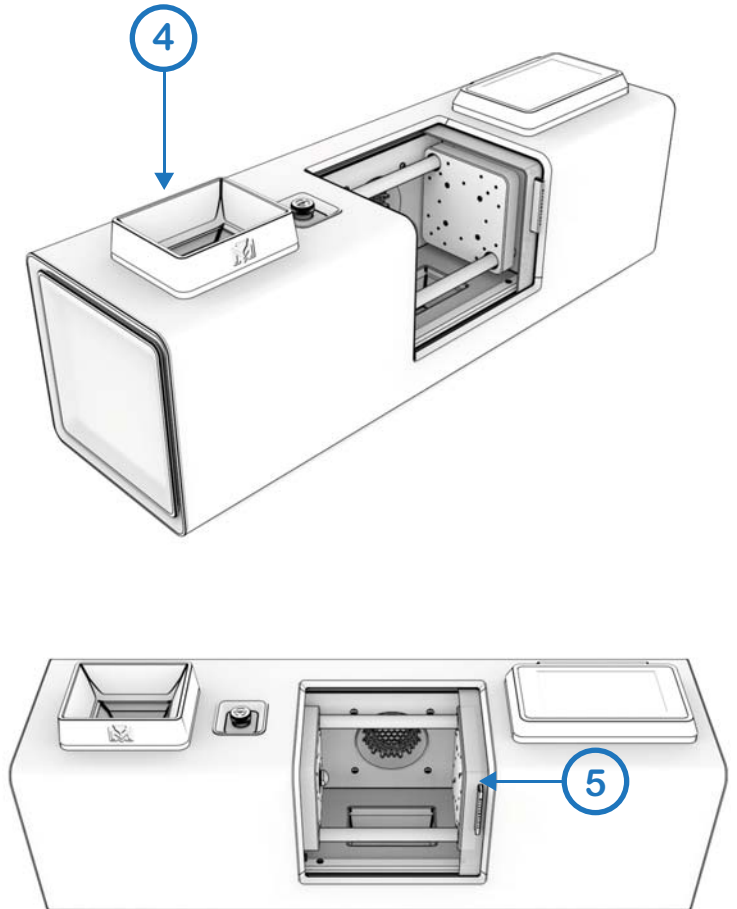
If open, close the safety door.

### 6) Enter Production Details:

Enter the number of parts to make in the “Make” field and configure the Tools Settings page values as desired.

### 7) Initiate Injection Cycle:

Press the Start button to begin the injection cycle.



## INJECTING THE FIRST PART: CONT

### Injection Cycle Steps:

- 1) The platen plate moves forward approximately 0.50 inch (12.7mm) and then pauses.
- 2) If using the ejector rod system, the motors initialize and move the push rods to the value entered on the Tool Settings page.
- 3) The platen plate motor closes the tool halves together. The motor will automatically detects mold closure and stops moving when the two halves meet.
- 4) The platen plate motor then applies clamping pressure to the mold halves.
- 5) The injection motor initializes and begins filling the mold with plastic at the speed and time values entered on the Tool Settings page.
- 6) The mold remains closed for the cooling cycle to complete.
- 7) The injection motor runs in reverse to draw back molten plastic from the nozzle, minimizing drooling or freeze plug formation (only if user configured ).
- 8) After injection and cooling, the platen motor moves to the home position. The String Break sequence will happen if configured during this time.
- 9) If using the ejector rod system, the mold contacts the ejector push rods to eject the part from the mold.
- 10) The platen plate moves forward 0.50" (12.5mm) and then back to the home position. Sometimes a second push is required to dislodge the part.
- 11) The completed part falls through the drop doors and is counted and tabulated in the "Make" field.

### Repeat Process:

- If the "Make" value is greater than the "Made" value, the machine repeats this process until the desired part count is completed.
- Upon completion the "Make" value will be set to 0, the platen and the ejection motors will home and the heating zones will be disabled. "Part count to make is complete" will be displayed.

## INJECTING THE FIRST PART: CONT

### Initial Shot Testing Guidelines:

During initial shot testing, various issues may arise:

- The cavity might be under or over-filled.
- The part may not eject properly.
- Temperature settings might be incorrect.
- Cooling time may not be optimal.

The goal at this stage is to observe the resulting part and adjust parameters to improve the quality of subsequent parts. Remember, adjustments to machine settings cannot fix a poorly designed tool. This process does not account for the tool's design or the part's geometry.

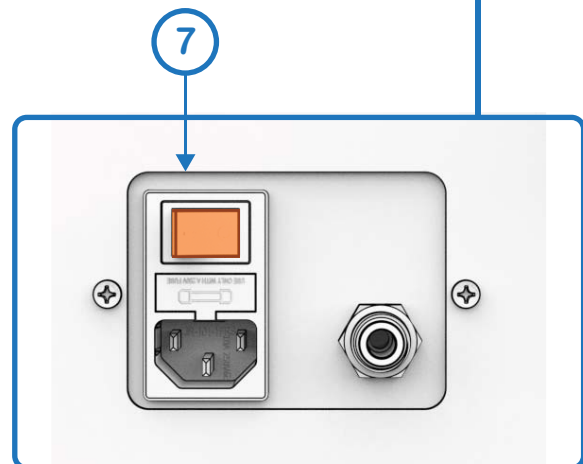
As you gain experience with the machine and improve your tooling design skills, your results will become more predictable. Injection molding does not have a one-size-fits-all solution; what works for one part/tool combination may not be suitable for another, even if the part geometries are similar.

Injection molding and tool design require patience, trial and error, testing, failure, and dedication to problem-solving. The reward is the ability to reliably, efficiently, and repeatedly bring ideas into physical form. With each part you create, you will develop a recipe for success.

## MACHINE SHUTDOWN PROCEDURE:

To shut down the machine, please follow this procedure:

1. Turn off any active heaters and allow the unit to cool.
2. Return all systems to their home positions.
3. Exit MicroMolder software by navigating to the Settings page and pressing the Exit App button.
4. When software is shut down, you will notice that the machine end cap lights turn off.
5. Navigate to Windows Start and select Power > Shut Down
6. Once the on-board computer has shut down you will notice that the chassis fans will still be running. This is normal.
7. Now you can turn off the machine power supply switch on the back of the unit.



## PART-SENSING SYSTEM:

The MicroMolder Evo is equipped with a fiber optic curtain that monitors the platen area and confirms when molded parts fall clear of the mold. This “smart sensing” system provides reliable part detection across a wide range of part sizes and speeds, ensuring cycle logic and part counting remain accurate.

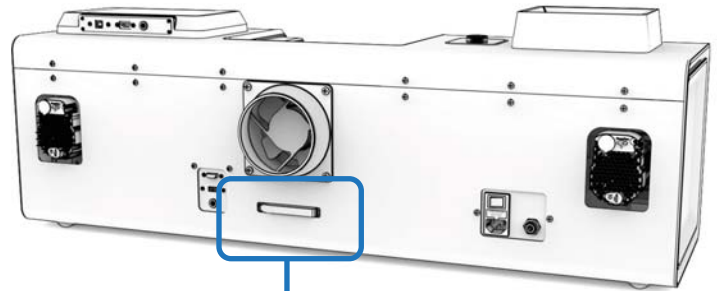
The fiber amplifier (located on the back of the machine) continuously measures the light level passing through the fiber optic curtain at the part drop opening between the two platen plates.

Two values are shown on the amplifier display:

**Red value** — live sensor reading (changes as parts pass, or with ambient light)

**Green value** — detection threshold (user-adjustable)

When the red value drops below the green threshold, the amplifier triggers an output signal.



## SMART PART-SENSING SYSTEM: CONT

- 1) Threshold Value Reading
- 2) Live Sensor Value Reading
- 3) Threshold Value Adjust Button

Users may need to adjust the threshold value (green value) to match part size and the machine's lighting environment.

Check the live red value when the machine is on and in its permanent location.

Sunlight, bright or dim overhead lights, and other ambient conditions can cause the red value to shift slightly. Always check the current red reading under the conditions where the machine will run on each new startup and adjust if needed.

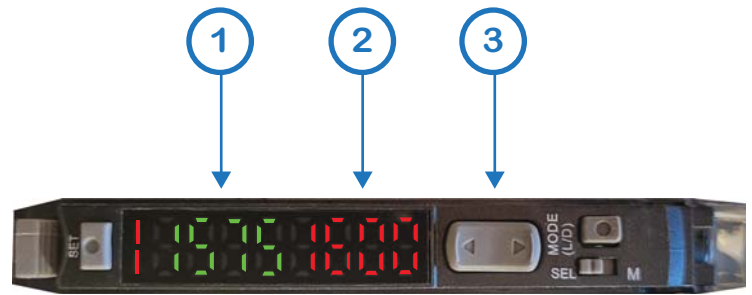
If the red value is below the green value due to lighting:

The sensor will not detect falling parts and will assume an error occurred. Adjust the green threshold so it's lower than the current red value.

### Notes:

*\*User Adjustment = Threshold Only*

*\*\*The amplifier is factory pre-configured. Do not change any settings other than the detection threshold value.*

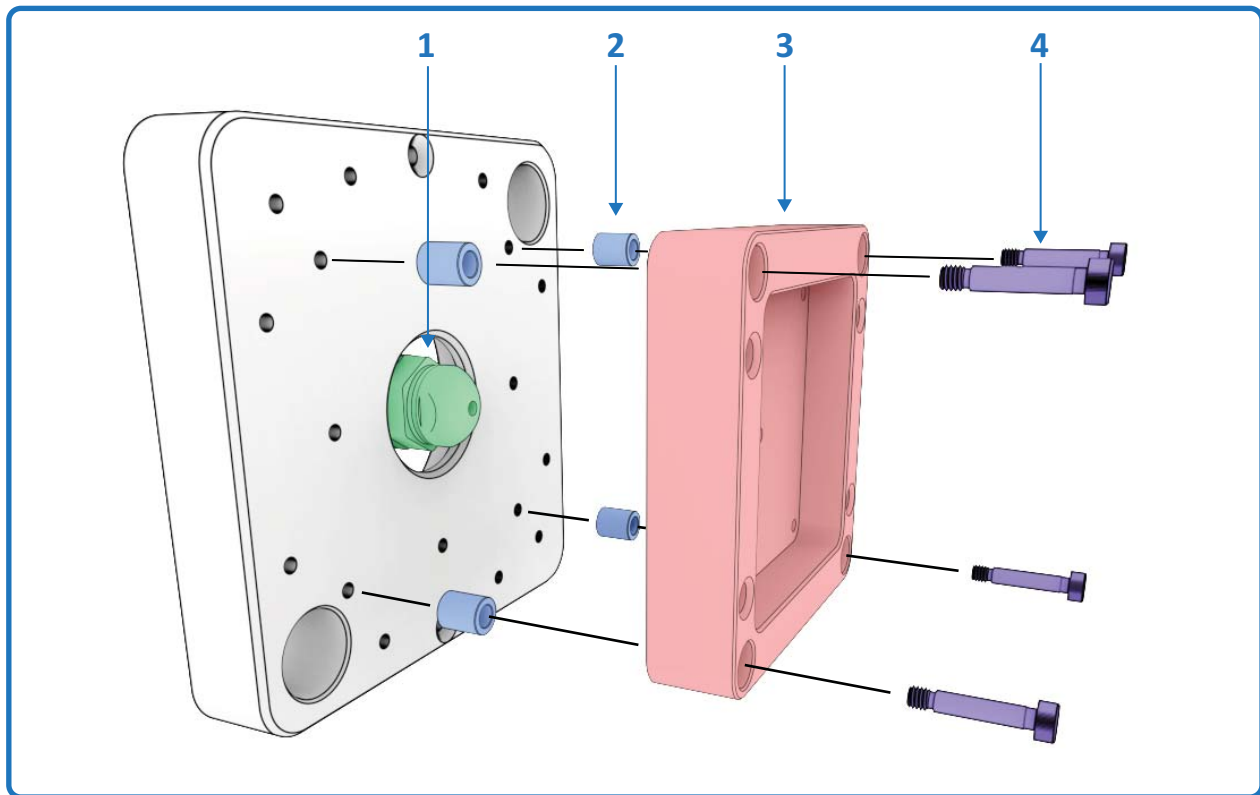


Example: red = 1600 → set green to around 1575–1550. (25-50 points lower)

Adjust the threshold using the < and > keys on the amplifier module.

The larger the delta between the green value and the red value the less sensitive the detector will be. The closer the values the more sensitive it will be.

## ANTI-DROOL NOZZLE:



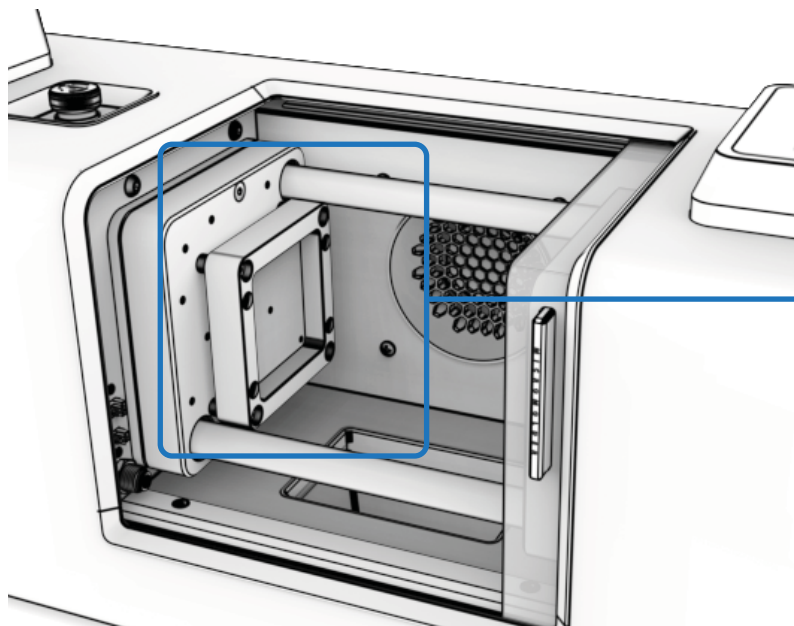
1) Anti-drool nozzle assembly

2) 4x Spacers (.4375" long)

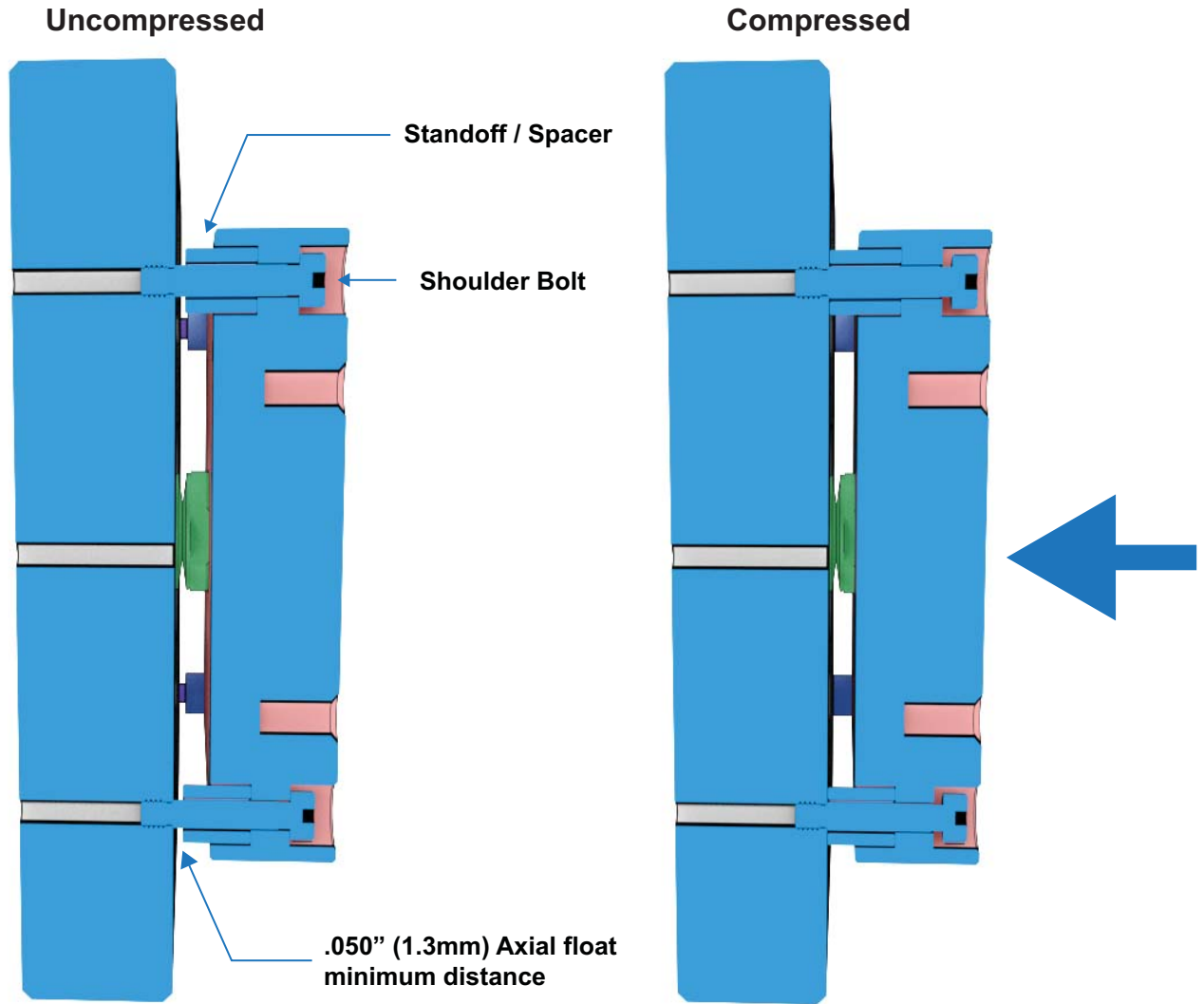
3) MUD box or Mold (nozzle side)

4) 4x Shoulder bolts (10-32 thread, 3/16 Shoulder Dia, 3/4" Shoulder Length)

*\*All hardware (shoulder bolts and spacers come with the MicroMolder Evo anti-drool nozzle accessory kit and are **required** for proper functioning of the anti-drool nozzle.*



## ANTI-DROOL NOZZLE: CONT.



### Anti-Drool Nozzle Compression Function

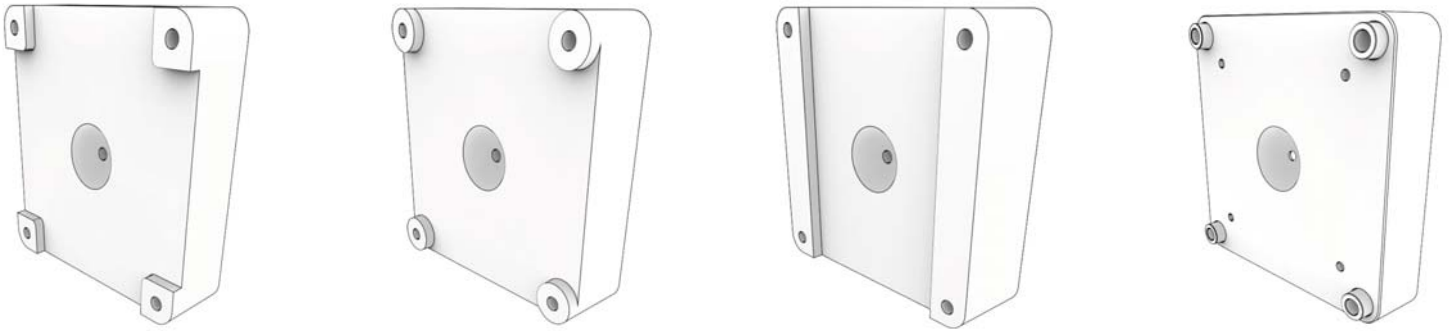
The anti-drool nozzle assembly is internally spring-loaded. During mold clamping, the nozzle-side mold half is driven toward the nozzle, compressing the nozzle assembly.

The integrated standoffs (spacers) precisely limit the nozzle compression amount. This serves two critical functions:

- Protects components – Prevents excessive force from damaging the nozzle or the mold-to-nozzle interface
- Controls nozzle operation – Ensures the nozzle opens to the correct position for proper material flow

**IMPORTANT:** The spacers must be installed. Operating without spacers will over-compress the nozzle and may cause damage to the nozzle assembly, mold interface or machine!

## ANTI-DROOL NOZZLE: CONT.



*Example mold design approaches for use with the anti-drool nozzle*

### Custom Mold / MUD Box Compatibility

To use the anti-drool nozzle, the nozzle-side mold half must include a minimum standoff of 0.175" (4.5 mm) from the platen face.

The mold must contact the platen only at these standoff locations. All surrounding material must be relieved to provide clearance for proper nozzle compression.

The mounting system must also allow for 0.050" (1.3 mm) of axial float on the shoulder bolts. This enables the mold to move toward the nozzle during clamping and compress the internal nozzle spring.

During clamping, the mold is driven backward, compressing the nozzle by approximately 0.050" (1.3 mm), until the standoffs contact the platen and stop further travel.

### **IMPORTANT:**

- If the mold cannot float, the nozzle will not compress or open properly
- If the mold face is flat (no relief), or standoffs are incorrect, damage to the nozzle or mold interface will occur

Examples shown illustrate typical approaches to creating the required standoff, clearance, and floating features for compatibility with the anti-drool nozzle.

*Note:*

*Example CAD files can be downloaded from the [micro-molder.com](http://micro-molder.com) website on our "Resources" page.*