The text in brackets refers to the corresponding user guide chapter. [Chapter Number]

TIP COMPATIBILITY [2]

Table 1-1: **Available Tips**

Material	Model Tip	Support Tip
ABSi*	T12, T16, T20	T12SR20*
ABS-M30 ABS-M30i	T12, T16, T20	T12SR20* / T12SR30
ABS-ESD7	T12, T16	T12SR30
ASA	T10, T12, T16, T20	T12SR30
	T40A	T20B
Nylon 12	T12, T16, T20	T12SR100
Nylon 12CF	T20C	T12SR100
Nylon 6	T16, T20	T12SR100
PC-ABS	T12, T16, T20	T12SR20* / T12SR100
PC	T12, T16, T20	T12SR100
PC PC-ISO	T12	T12
	T16, T20	T16
ST130	T20B	T20
ULTEM 9085	T16, T16A, T20	T16
ULTEM 1010	T14, T20	T16
	T40A	T20
PPSF	T16	T16
ANT 800NA	T20D	T16
ANT 840CN03	T20D	T16

* Available on Fortus 900mc only, not F900

Table 1-2: **Slice Height**

| Model Tip	Slice Height
T10	0.005 in. (0.127 mm)
T12	0.007 in. (0.178 mm)
T14	0.010 in. (0.254 mm)
T16, T16A, T20C, T20D	0.010 in. (0.254 mm)
T20	0.013 in. (0.330 mm)
T20B	0.013 in. (0.330 mm)
T40A	0.020 in. (0.508 mm)

IDENTIFYING TIPS [3]

All unused model and support tips are interchangeable - EXCEPT for Soluble Release (SR) support tips. Once a tip is used, it is committed to that material type and is no longer interchangeable.

Tip size is imprinted on the top side of the plate (T12, T14, T16, T20)
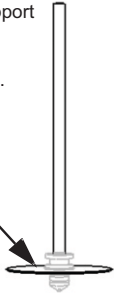
The Soluble Release support tip is shorter than standard tips.
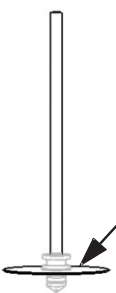
Tip size is imprinted on the top side of the plate (T12SR20, T12SR30, T12SR100).

PLATEN VACUUM [4]

Make sure the vacuum indicator on the Operator Touchscreen is green and showing that a small or large build sheet is in place on the platen.

USING BUILD SHEETS [4]

Use clear build sheet for ABS-based, ASA, PC, PC-ABS, ST130. Use smoky gray build sheet for ULTEM, PPSF, Antero materials. Use green tinted build sheet for Nylon-based materials.

INSTALLING CANISTERS [4]

Remove the anti-rotation plug from side of canister before use. Seal hole with sealing tape. Make sure the rubber shipping insert is removed from the thumbwheel door before building. Do not remove rubber shipping insert until the canister is loaded into the canister bay.

Pull sealing tape back

New thumbwheel

Remove the plug

Remove insert
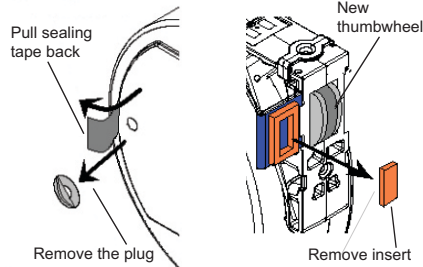
Storing Canisters

Always replace the rubber shipping insert when storing a partially used canister. Store canister vertically (as if it is installed in a system) or cross-winding of the filament on the inner spool may result.

CHANGING TIPS OR MATERIAL TYPE [4]

1. Remove the used build sheet from platen.
2. Clean the oven and tip wipe assembly.
3. Inspect the tip wipe assembly.
4. From the Build Screen, select Material/Tools and then select Tips/Materials Change. Follow the screen prompts to change tips.
   The Tip Wizard will guide you through the process.
   The system automatically does the following:
   - Unloads model and support
   - Waits for oven to stabilize
   - Performs Auto Z Zero Calibration
   - Performs Auto Tip Calibration
   - Loads model and support material*
   - Builds a Calibration Job*
     * Requires button to be pressed by user and then user placement to build the calibration box.

5. When changing liquefier tips.

   Note: If material type is changed, the tips MUST be changed. Do not use the same tip for different material types.

   - Remove the canisters. If removing a partially used canister, you must remove it immediately (within ten seconds) after separating drive block from canister; otherwise the filament is forced into the canister, making it unusable.
   - Seal the canisters and store vertically.
   - Insert new canisters and turn the thumbwheel to put the canister in the "Ready" state (flashing LED).
   - If the removed tips are to be re-used later, record material type and volume.
   - Make sure that you insert the tip fully into the heater block.

   Make sure tip is fully inserted into block
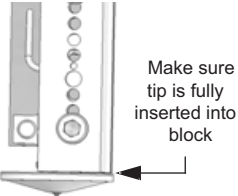
   Note: Worn tips cause part quality issues and can lead to loss of extrusion. Always replace tips when prompted (reset tip odometers).

6. When changing material type:
   - Select Review Materials to Load and choose materials to load.
   - Select Menu to continue.

7. Select the circle next to the desired tip. A black dot in the center indicates which tip is selected.

AUTO COOLDOWN FEATURE [4]

This option acts as an energy saver when PC, PC-ABS, ULTEM, or PPSF materials are being used. It also helps to prevent parts from cracking when building large, thick parts using PPSF. After building completes, the oven gradually cools to the standby temperature. Wait until the PPSF parts are cool before removing them from the oven. To use this feature go to the Administrator screen, select System Default and then set Auto Cool Oven to On or after the job.

STABILIZING OVEN [4]

When changing material type or using Auto Cool-Down, allow oven temperatures to stabilize before calibration and system use. Oven stabilization times are as follows:

Table 1-3: **Oven Stabilization Times (Software V.3.27 and later*)**

Oven Stabilization Times (Hours)		TO:		
		All ABS, ASA, ST130 & Nylons	PC & ULTEM 9085 & Antero	ULTEM 1010/PPSF
FROM:	Room Temp	2	3	4
	Auto Cooldown	--	2	3
	All ABS, ASA, ST130 & Nylons	--	2	3
	PC & ULTEM 9085 & Antero	4	--	2
	ULTEM 1010/PPSF	6	4	--

* For oven stabilizing times prior to software V.3.27, please consult the appropriate user guide.

HEALTH MONITOR [4]

The light pole reflects the overall state given by the Health Monitoring system.

- Green = Good warnings acknowledged
- Yellow = Unacknowledged warnings - could require further user intervention
- Red = Error - requires immediate attention by operator.

CALIBRATING LIQUEFIER TIPS [5]

Calibration is an automatic step when changing material type or tips. The user is still required to fine-tune some steps manually.

Calibration Job

After the system builds the Calibration Job, follow these steps:

1. View the relationship between the support calibration toolpath and the alignment indicators to determine the X and Y axis calibration.
   - Use a magnifying glass.
   - Hold the build sheet up to the light, a light-colored wall, or a light-colored piece of paper.
2. Determine where on each axis the support toolpath is most centered between the X-Y alignment path. For example, if most centered between indicators below the "4" on the "-Y" side of calibration box, tip offset value for -Y is 0.004.
3. Slide the arrow on the screen to match where the support is most centered. Only move arrows on two of the four sides of the calibration part.
4. Press OK. A pop-up will be displayed asking if you want to apply these values, press OK.
5. Repeat steps 1-4 until the support toolpath is centered between all X and Y zero indicators. After adjustments are made, a new calibration box can be run from this menu by pressing Build Calibration Box.
6. Peel the Z box support layer from the last Calibration Job and measure its thickness using a caliper or micrometer. Z thickness should measure within +/-0.0005 in. (0.01 mm) of the installed model tip's slice height.

   Note: Do not measure for Z adjustment until the Calibration Model shows the XY Offset to be less than 0.002 inch (0.05 mm) for the X and Y axis.

7. If Z thickness is not within specification, enter the value read from the caliper/micrometer into the Support Thickness field using the up/down arrows.
8. Continue to check for Z Calibration until the support layer matches the model tip slice height +/-0.0005 in. (0.01 mm).

MAINTAINING TIP WIPE ASSEMBLY [6]

1. Open the oven door.
2. Using safety gloves and sleeves, remove the purge bucket.
3. Remove the purge ledge assembly.
4. Remove the brush/flicker assemblies.
5. Clean the purge bucket.
6. Clean purge ledge and brush/flicker assemblies and surrounding area.
7. Inspect the Kapton tape around the top of the purge bucket.
8. Inspect the purge ledge assembly.
9. Inspect the brush/flicker assemblies.
10. Replace parts as necessary.
11. Re-install parts in reverse order of disassembly.

EMPTYING THE PURGE BUCKET [6]

1. Open the oven door.
2. Lift the purge bucket straight up from the purge bucket bracket and remove from the oven bay.
3. Empty the purge bucket by dumping the contents or using the waste door at the bottom of the bucket.
4. Re-install the purge bucket.

TROUBLESHOOTING [8]

Canister Will Not Load

- Anti-rotation plug not removed from canister. Remove the plug.
- Rubber thumbwheel insert not removed from thumbwheel door. Remove the insert.
- Empty canister (zero volume). Replace the canister.
- Filament stuck in canister. Remove the canister from the bay. Pull about 8 feet (2 meters) of material out, making sure the filament pulls out freely.
- Canister drive block not fully lowered onto canister. Re-seat the drive block onto canister.
- Wrong tip size selected on operator display. Verify correct tip size is displayed. See Tip Compatibility
- Canister smartspool circuit failed. View filament status from the operator display. If the status reads None or is blank, replace the canister.
- Broken or bent pogo pin. Remove the canister from the bay and check the pogo pins on the underside of the canister drive block. Replace any bent or broken pogo pins.
- Filament does not reach head (load time-out). Change the canister. If this fails, contact Customer Support.

Auto-Changeover Failure

Filament not unloaded into empty canister.
Perform a manual unload.

Note: All scenarios from Canister Will Not Load section may apply in an Auto-Changeover Failure.

Loss of Extrusion

- Filament stuck in canister. Remove the canister from the bay and pull about 8 feet (2 meters) of material out, making sure the filament pulls out freely.
- Canister drive too slow. Verify that load time from the canister to the head switch is less than 2.5 minutes. Material not extruding on first two layers or model base. Verify that material purges by performing a load.

  Verify that the size of tip matches tip size indicated on the operator display. See Tip Compatibility. Verify that tip life has not exceeded the maximum tip odometer. Verify that the tips were installed correctly. Verify that material purges by performing a load. Replace the tip (if necessary).

System not calibrated. Verify that material purges by performing a load. Perform the Auto Z Stage Zero and Auto Tip Calibration. Low vacuum caused build sheet to shift and may have plugged tip. See Low Vacuum

Low Vacuum

Note: System will not build until the vacuum level is adequate.

- Misalignment. Check the alignment of the build sheet making sure it is properly paced on the platen.
- Bubble in build sheet. Ensure that the build sheet is laying flat on the platen.
- Filament debris on the platen. Clean the platen surface.
- Plugged platen inlet screens. Clean the inlet screens.

Low Air Pressure

Contact Customer Support for assistance.