Fortus 360mc/400mc and FDM 360mc/400mc
QUICK REFERENCE CARD

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

TIP COMPATIBILITY [3]

Table 1-1: Available Tips

Material	Model Tip	Support Tip
ABSi	T10, T12, T16, T20	T12SR20
ABS-M30 ABS-M30i †	T10, T12, T16, T20	T12SR20 / T12SR30
ABS-ESD7 †	T12, T16	T12SR30
ASA	T10, T12, T16, T20	T12SR30
Nylon 12	T12, T16, T20	T12SR-100
PC-ABS	T10, T12, T16, T20	T12SR20
PC	T10, T12, T16	T12SR-100
PC PC-ISO †	T12	T12
PC PC-ISO †	T16, T20	T16
ULTEM 9085 †	T16, T20	T16
ULTEM 1010 †	T14, T20	T16
PPSF †	T16	T16
† 400mc only		

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	0.010 in. (0.254 mm)
T20	0.013 in. (0.330 mm)

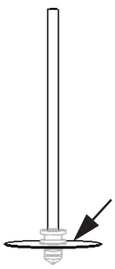
IDENTIFYING TIPS [3]

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 (T10 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 [3]

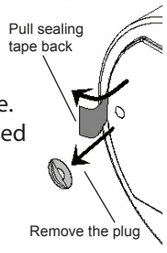
Make sure the vacuum gauge reads -15Hg or higher (more negative) before building or calibrating. See Troubleshooting: *Low Vacuum* if gauge is out of range.

USING BUILD SHEETS [4]

Use clear build sheet for ABS-M30, PC, and PC-ABS.
Use amber build sheet for PPSF and ULTEM.
Use green tinted build sheet for Nylon 12.

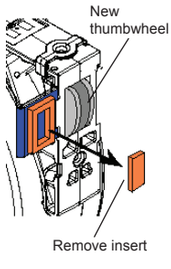
INSTALLING CANISTERS [4]

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.



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]

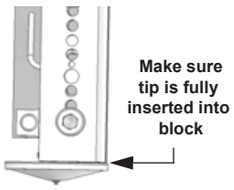
1. Remove the used build sheet from platen.
2. Clean the oven and tip wipe assembly.
3. Inspect the tip wipe assembly.
4. From the Main Menu select; *Operator Control > Change Tips/Mtl.. > Unload Model and Support.* Wait until the material unloads before continuing to the next step.
5. If changing material type:

   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).
6. Change the liquefier tips.

   Note: Worn tips cause part quality issues and can lead to loss of extrusion. Always replace tips when prompted (reset tip odometers).

   - 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.



7. From the menu, choose *Select Materials/Tips..*
8. If changing material type:
   - Select *Review Materials to Load..* and choose materials to load.
   - Select *Menu* to continue.
9. Choose *Select Tips* to toggle through tip choices.
10. Select *Reset Tip Odometers..* and enter the odometer values for the new tips.
11. If user placement is on, choose *Select Calibration Part Position* and make user placement selections.
12. Select *Load and Calibrate..*
13. Select *Unlock Door* and insert a new build sheet. If switching to or from PPSF, wait for the oven to stabilize before inserting a new build sheet.

    The system automatically does the following:
    - Waits for oven to stabilize
    - Performs Auto Z Zero calibration
    - Loads model and support material
    - Performs Auto Tip-to-Tip calibration
    - Builds Calibration Job
14. Determine Calibration Job tip offset values. See *Calibration Job* for more information.

MATERIAL DRYING SYSTEM [4]

Call Customer Support if the air pressure does not read between 36-40 psi for internal air or 48-52 psi for external air.

AUTO COOL-DOWN 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.

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

	Oven Stabilization Times (in hours)									
	ABSi	ABS-M30	ABS-ESD7	ASA	Nylon 12	PC-ABS	PC/ PC-ISO	ULTEM 9085	ULTEM 1010	PPSF
Room temp.	4	4	4	4	4	4	4	8	8	8
ABS-M30 ABSi Auto Cooldown	---	---	---	---	---	4	4	6	6	6
ABS-ESD7	---	---	---	---	---	4	4	6	6	6
ASA	---	---	---	---	---	4	4	6	6	6
Nylon 12	---	---	---	---	---	4	4	6	6	6
PC-ABS	4	4	4	4	4	---	4	6	6	6
PC/ PC-ISO	4	4	4	4	4	4	---	4	4	4
ULTEM 9085	6	6	6	6	6	4	4	---	4	4
ULTEM 1010	6	6	6	6	6	4	4	4	---	---
PPSF	6	6	6	6	6	6	4	4	---	---

CALIBRATING LIQUEFIER TIPS [6]

Calibration is an automatic step when changing material type or tips.

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. Select *Operator Control* > *Calibrate* > *Tip Offset Value*. Enter any X and Y tip offset corrections.
4. Select *Operator Control* > *Calibrate* > *Calibration Job* to build a new Calibration Job.
5. Repeat steps 1-4 until the support toolpath is centered between all X and Y zero indicators.
6. Peel the Z box support layer from the last Calibration Job. 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 the Z thickness is not within specification, subtract your measurement from the model's tip slice height.
8. Select *Operator Control* > *Calibrate* > *Tip Offset Value.* Enter any Z tip offset corrections.
   - Select -Z if thickness is greater than slice height.
   - Select +Z if thickness is less than slice height.

MAINTAINING TIP WIPE ASSEMBLY [7]

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

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 (4-bay systems only)

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. Perform the Platen Flatness Diagnostic. Verify that all numbers are within +/-0.015 inches (0.38 mm).
- **Plugged tips:**
  - 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.
- **System not calibrated.**
  Verify that material purges by performing a load. Perform the Auto Z Stage Zero and Auto Tip-to-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.

- **Filament debris on the platen.**
  Clean the platen surface.
- **Plugged vacuum screen.**
  Clean or replace the vacuum screen.
- **Rubber O-ring is twisted or needs to be replaced.**
  - Remove the O-ring and inspect for cracks.
  - Replace if cracks are found or problems persist. If no cracks are found, re-install the O-ring, making sure that it is not twisted.

Low Air Pressure

Contact Customer Support for assistance.

stratasys

E info@stratasys.com / STRATASYS.COM

HEADQUARTERS
7665 Commerce Way, Eden Prairie, MN 55344
+1 800 801 6491 (US Toll Free)
+1 952 937 3000 (Intl)
+1 952 937 0070 (Fax)

2 Holtzman St., Science Park, PO Box 2496
Rehovot 76124, Israel
+972 74 745 4000
+972 74 745 5000 (Fax)