

TIPS for Material Handling

ProJet™ 3500Max & 3510 Series

Purpose: We want you to have the very best possible experience with the material delivery system on your new ProJet® 3500 system. These tips are important to ensure you understand the key points about the system.

1. **Which material is which?** Looking into the drawer of the Material Delivery Module (MDM), the layout below describes what material goes where - and how we refer to each cubby via the User Interface (i.e. – touchscreen).

Support Cubby 1

Support Cubby 2

Part Cubby 1

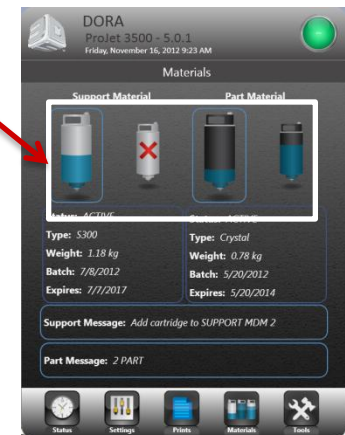
Part Cubby 2

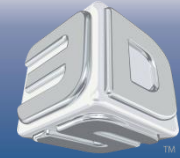
2. **When the machine is cold:** Do not attempt to remove or add a material cartridge until the printer has been booted and warming for at least 15 minutes.
3. **Use the cartridge release trigger:** Do not remove cartridges without activating the cartridge **release** trigger. Simply pulling out a cartridge could damage the mechanism on the cubby.
4. **Cartridge installation:** Please make sure that all cartridges are properly installed, seated and locked in place.
5. **Use a cartridge until depleted:** 3D Systems encourages installing cartridges and running the Printer until each cartridge is depleted before swapping cartridges. We do understand that under normal daily use, this may not be always manageable, and the Printer does accommodate removing cartridges and replacing partially used cartridges. We simply encourage leaving cartridges installed until depletion to help reduce the possibility of contamination or spill.
6. **How much material do I have in the bottles?** Do not remove hot bottles to check the amount remaining! If you would like to check how much material is in a bottle, on the touchscreen:
 - Press the Materials icon at the bottom of touchscreen.
 - Materials window opens and will show you the level of the part and support material remaining for every cartridge that is installed in the system.

Cartridge
release trigger



Level of
Material in
Cartridge





TIPS for Material Handling

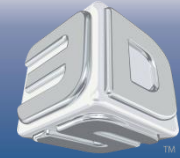
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If you make a change based on the information displayed (perhaps you install a new bottle), note that the screen will not **auto**-update. For cartridge changes to be displayed, you must first exit the Materials screen, install the new cartridge, close the drawer so that the new cartridge is recognized by the printer and then re-enter the Materials screen.

Removing a melted cartridge: When removing a melted cartridge, it is critical that the cartridge remain vertical at all times until it is completely cooled. If the cartridge is laid on its side, the vent located in the cartridge lid will be plugged with material. If this vent is not functioning correctly, the cartridge may fail to deplete, and the system could be damaged. If a cartridge has been removed and later replaced, it is good practice to visually inspect the inside of the vent cap for any obstruction before using.

7. Cartridge action alerts (Touchscreen):

- a. The Printer will alert the user to “Add cartridge to Support MDM X; Add cartridge to Part MDM Y” for three reasons:
 - i. No cartridge is installed in the specified MDM
 - ii. The cartridge installed in the specified MDM is empty
 - iii. The cartridge installed in the specified MDM is not reading properly...alert 3DSystems
- b. The Printer will alert the user to “Add cartridge to Support MDM X (Not Melted)” if the printer thinks the cartridge is melted and yet it was still unable to retrieve material from that cartridge. This can be due to a variety of issues; please contact your local maintenance provider if you experience this problem.
- c. If the Printer reports that a cartridge is “Not Melted”, that cartridge will NOT get reused unless it is removed from the printer so that the printer recognizes that the cartridge is no longer present (could take up to 1-2 minutes), inspected, and then reinstalled in the cubby.
- d. If the Printer reports “Add cartridge to...”, please go ahead and satisfy this condition by installing a new cartridge before starting your next print.



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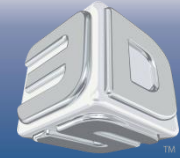
ProJet™ 3500Max & 3510 Series

- 9. Melt timers:** Melt timers are set up to ensure the material in the cartridge is ready for use at the start of a print. Melt timers for the active cartridges (i.e. – cartridge that is currently in use) will need to complete before a print can start. This will be displayed on the touchscreen once the printer has been put online and the countdown (in seconds) displays; the build will start once the countdown is completes.
- 10. Melt timing:** Please be aware of the state of the material installed into your Printer.
- All materials used in the ProJet 3500 SD, HD, DP, MP Production Printers take two hours to fully melt.
 - The support material for the ProJet 3500 CP & CPX Production Printers also takes two hours to fully melt.
 - The part material for the ProJet 3500 CP & CPX Production Printers takes 4.5 hours to be melted enough to satisfy the highest material flow build possible to run on these printers.

It is important for you to have this awareness, because the system does not yet take into account the state of the “next” cartridge when starting a high flow print. If your “next “ cartridge was just installed and was frozen at the time of installation, and the currently active cartridge is getting really low on material, you could induce a print failure because the “next” cartridge may not be melted when it is time to use it.

11. Cartridge change alerts (Touchscreen):

- The Printer currently provides on the touchscreen a “Cartridge Change Window” if the material installed in the system is less than what is required to complete the build. This will be stated as “Replace cartridge in Support MDM X between MM:SS and MM:SS”. The first time listed is the expected time for depletion of the active cartridge. The second time listed is the expected time for depleting the second cartridge, minus the required full melt timer for a new cartridge getting installed.
- Once the first cartridge goes empty, the message will switch over to “Add cartridge to Support MDM X”. The second time value of the “Cartridge Change Window” is no longer displayed. This will be remedied in the future, but for the time being, if the machine says “Add cartridge...”, please go ahead and add the next cartridge to avoid build disruption.
- With the “Cartridge Change Window”, if the current print will consume more material than what is currently installed, at the start of the print, the Printer will report “Replace cartridge in Support MDM X – estimate pending...”. That will be updated once the system requests material from the cartridge. This could be as early as a few minutes or could be as long as an hour or so.



TIPS for Material Handling

ProJet™ 3500Max & 3510 Series

- 12. Waste material:** For those familiar with the ProJet® 3000, the waste bag is no longer a waste bag with the ProJet 3500. It is now a Waste Pan. Please check the status of your waste pan before the start of every build. The Printer will provide a message at the start of every build reminding you to check your Waste.
- 13. Email:** We highly encourage those users that have the ability to set up email to do so for this system. All ProJet 3500 Production Printers include the email feature. If set up, emails will be sent as follows:
 - a. When the print starts
 - b. When a print is aborted or completed
 - c. When the material in the system is getting low. Low material warnings begin when there is less than one cartridge of material left in the system. The system will continue to send “reminders” that your material is getting low for 90%, 80%, 70%....0% of that last cartridge until your print aborts due to no material left, or a new cartridge of material is installed, or the build completes.
- 14. The “Conserve” state:** If a Printer is unused for more than 72 hours, it will partially cool down to a state called “Conserve.” If the Printer is in the Conserve state, do not attempt to change cartridges until you have warmed the system back up. To warm the system back up, you may either restart the service or press “online” on the touch screen.
- 15. Printer was shut down:** If the Printer has been shut down, do not attempt to remove the installed cartridges. The Printer needs to be heated for cartridge add/removal.