



# Material Processing Guide

## P3 DEFLECT™ 120

P3 Deflect 120 is a rigid, high temperature material with good printability and an excellent surface finish.

### FEATURE CAPABILITIES

Feature	Value
Maximum unsupported overhang length	1 mm
Maximum span length	13 mm
Minimum unsupported overhang angle	15°
<b>Minimum vertical wire diameter:</b>	
• 1 mm height	1 mm
• 3 mm height	0.5 mm
• 5 mm height	0.5 mm
<b>Minimum unsupported wall thickness:</b>	
• 5 mm height	0.25 mm
• 10 mm height	0.25 mm
Minimum hole diameter (Z orientation)	0.5 mm
Minimum hole diameter (XY orientation)	1.0 mm

## SUPPORT TIPS

P3 Deflect 120 demonstrates very high green stiffness and green strength, so supports can be minimal. Adequate support structure rigidity is still required to achieve the best print quality.

Contact point diameter for supports can range from 0.2mm-0.6mm. 0.4mm is typical.

Contact point spacing of 2-3mm is typical for flat downward facing surfaces. Tighter spacing is useful for flat surfaces, angled surfaces can tolerate wider spacing

## PRINTING

The Stratasys validated print profile settings work well for most geometries. In general, increasing the model region delay will result in better surface finish for parts with large cross-sectional areas. In general, increasing the model region exposure duration will result in better overhang structures.

- Stratasys will provide the printing profile to ensure printability on the Origin® One.
- Perform cleaning on the build head to ensure that there are no residual parts or resin on it.
- Perform the build head calibration using the touchscreen on the front of the machine and follow the instructions displayed on the screen.
- Ensure the glass bottom/membrane of the tray is clean. If smudged, wipe clean with a Kimwipe or another lint-free wipe and a small amount of acetone or isopropyl alcohol.
- Check the sealing of the tray by using the touchscreen and function "Check tray Seal" after placing the tray inside the chamber.
- Shake the bottle of resin for at least 30 seconds before pouring resin into the tray
- Fill the tray with enough resin to accommodate the part volume plus at least 200mL extra.
- If resin in the tray and has been sitting for a while, then use a flexible silicone spatula and thoroughly stir the resin.
- If adding fresh resin to an existing tray with resin, then use a flexible silicone spatula and thoroughly stir the resin.

## PART REMOVAL

In general, parts with large cross-sectional areas may be difficult to remove from the platform. The suggested procedure is to use a metal razor scraper and slowly work the tool between the print and the build head with gradual, careful movements. Always push the scraper away from your hands. Be patient, don't try to get it all at once. Be careful not to pry with a razor blade. Avoid using the corners of the scraper as it may damage the build platform.

- Place the build platform with the printed parts on a non-reactive portable surface and avoid dripping resin when performing the transfer from the printer onto the non-reactive portable surface.
- Remove all parts from the build platform. A razor scraper or a putty knife is helpful for detaching part/supports from platform. **Always push scrapers away from your hands.**
- After removing all parts, clean the build platform with a paper wipe and acetone or isopropyl alcohol.
- Remove the supports before cleaning to ensure extended solvent life and accelerate cleaning, as there will be less resin that needs to be removed. Dense supports can be difficult to clean or prevent areas of the part from being fully cleaned.

## CLEANING

The overall cleaning procedure consists of a 4-step process, which involves two solvent baths each placed in an ultrasonic bath (sonicator) and an air compressor. If the parts are not fully clean after the full cleaning cycle, repeat the 2nd bath followed by compressed air drying until the parts are free from resin.

Cleaning Step	Duration
1st bath in sonicator in isopropyl alcohol	2 minutes
Dry parts with compressed air	10 -60 seconds
2nd bath in sonicator in isopropyl alcohol	2 minutes
Dry parts with compressed air	10 -60 seconds

- Always aim to minimize the part's exposure to solvent during cleaning. All materials will absorb solvent in their green state to some degree and minimizing time in solvent will lessen the impact on mechanical properties.
- Wash parts in two separate solvent baths: first in a "used" IPA bath followed by a "clean" bath using clean 99% IPA.
- Keep dedicated solvent containers for each material. Containers should close with an air-tight seal to prevent IPA evaporation.
- Dry parts between baths with compressed air. Take care to avoid damaging delicate features. Always spray away from body, machinery or other parts.
- Dry parts after second bath with compressed air.
- Inspect the part after the second bath. If not fully clean (still appears wet and evaporation is not evident), repeat the clean bath and subsequent air drying.

- Negative features, interior corners, and blind holes may be difficult to clean. A Q-tip soaked in IPA can be helpful.
- Use a clean room wipe wet with IPA to spot-clean resin.

## POSTCURE

The presented material requires a two-step post curing process to ensure the best possible mechanical and thermal properties. The two-step post curing process is divided into an ultraviolet and a thermal curing process.

- Place the part under a fume hood and wait for 60 minutes before proceeding to the next step.
- Stratasys is recommending the Dymax ECE 5000 as an ultraviolet curing system (Mercury Bulb).
- Place the part on shelf level I and cure for 360 seconds per side.
- Thin-walled parts may warp during the postcure process. To avoid this, postcure for shorter intervals, flipping part between exposures.
- An initial short burst of 10 seconds on each side can help build strength and stiffness to reduce warping in subsequent longer intervals.
- After finishing the ultraviolet curing, place the parts in an oven (Mettler UF75plus) with the following heating profile:
  1. Heating ramp 3C/min to 110°C
  2. Isothermal for 120 mins at 110°C
  3. Cooling ramp 3C/min to 25°C