



Material Processing Guide

P3 STRETCH™ IND475

Stretch 475 is a soft, 47 Shore A elastomer with good resilience and excellent surface finish.

FEATURE CAPABILITIES	
Feature	Value
Maximum unsupported overhang length	0.5 mm
Maximum span length	4.0 mm
Minimum unsupported overhang angle	15°
Minimum vertical wire diameter:	
• 1 mm height	0.5 mm
• 3 mm height	0.5 mm
• 5 mm height	0.5 mm
Minimum unsupported wall thickness:	
• 5 mm height	0.25 mm
• 10 mm height	0.5 mm
Minimum hole diameter (Z orientation)	0.5 mm
Minimum hole diameter (XY orientation)	1.0 mm

SUPPORT TIPS

Stretch 475 is a soft elastomer with low green strength and green stiffness. While Stretch 475 is lower viscosity than IND402, parts require similar support considerations - parts printed in 475 need more robust support structures in order to print successfully.

The low green stiffness of Stretch 475 makes tall parts with large aspect ratios challenging. You may notice “wobble” defects for tall parts or features with large aspect ratios. You can mitigate this by strengthening the support structure, increasing the advancement delay, increasing exposure delay, and/or making approach settings more conservative.

Stretch 475 has moderate adhesion to the build platform, so you may consider adding a base/raft to parts with small cross sections to improve adhesion.

The contact point diameter for supports should range from 0.5-1.2 mm; 1.0 mm is typical.

Contact point spacing of 1.5-2.5 mm is typical for flat downward facing surfaces. Tighter spacing is useful for flat surfaces, angled surfaces can tolerate wider spacing.

More and bigger supports are needed for Stretch 475 than for rigid materials. For best first print success, we suggest over-supporting your first print, then optimizing supports iteratively.

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. Additionally, increasing the model region exposure duration will result in better overhang structures. Furthermore, increasing the advancement delay may also improve the part quality and print success rate.

- Stratasys will provide the printing profile to ensure optimal 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 the “Check tray Seal” function 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 200 mL extra
- If resin is in the tray and has been sitting for a while (> 8 hours), 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 scraper or 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.

- 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 block 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 full cleaning cycle, repeat the 2nd bath followed by compressed air drying until the parts are free from any resin.

Cleaning Step	Duration
1st bath in sonicator in Glycol Ether TPM	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 Glycol Ether TPM bath followed by a "clean bath," using clear 99% IPA.
- Keep dedicated solvent containers for each material. Containers should close with an air-tight seal to prevent solvent 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 2nd 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

Stretch 475 requires only ultraviolet postcuring. It differs from other Stratasys P3 materials in that it needs to be post-cured while submerged in water. Place the part first in a water bath and then place in the curing unit. The water bath is necessary to reduce the initial tackiness of the material and achieve the desired mechanical properties.

- After cleaning, place the part under a fume hood and wait for 60 minutes before proceeding to postcure.
- Stratasys recommends the Dymax ECE 5000 as an ultraviolet curing system. Other systems may work, but would need to be validated to ensure physical properties meet specification
- Submerge the part in de-ionized water in a glass container, using as little water as possible to cover the part. If DI water is not available, tap water is acceptable
- Sparse parts may float in water, so you may need to add a small metal weight to keep parts submerged.
- Place the part + water bath container on shelf level I in the Dymax ECE500 and cure the part for 10 minutes per side.