LumaSint PK 5000
Processing Guide

LUMAS
AM POLYMERS

MACHINE PREPARATION

The SLS machine must maintain an inert environment during the printing process (<1% oxygen) to prevent oxidation and material degradation.

Material flow can be aided by texturing the roller with a light media blasting or sanding with 240 grit sandpaper. This process should be repeated every three to six months, or whenever changing materials in a machine.

MATERIAL PREPARATION

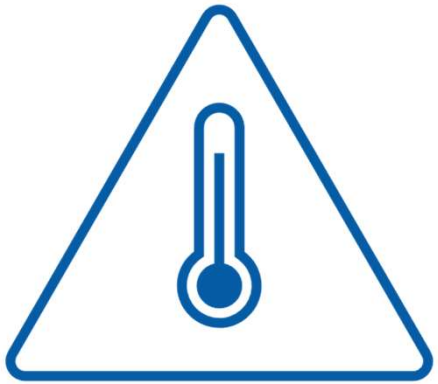
Part cake, overflow, and remaining feed material should be sieved at 140 mesh (106µm) for reuse.

Material should be refreshed at 40% virgin content for repeatable, steady-state processing. Reduced virgin content can be processed at the expense of material lifespan and mechanical performance.

Material that has experienced significant degradation due to oxidation will turn brown/amber color and produce odor. This material should be discarded.

PRINTING

Keep part cake in machine under inert atmosphere until part bed surface temperature cools to 60°C, then transfer to an inert environment to continue cooling until cake center has reached 60°C. This typically takes two to four times as long as the build time, depending on packing density and volume of part cake.



Exposing semi-molten parts within a cooling part cake to oxygen has the chance to trigger an exothermic reaction, resulting in temperatures in excess of 280°C in the part bed center and emission of odorous vapor. Care should be taken to ensure that the part cake is cooled under an inert environment. If such a reaction does begin to occur, it can be mitigated and controlled by placing the cake in an inert environment until cool.

Lumas AM can provide parameter sets for some SLS equipment or work with you to integrate LumaSint PK 5000 on your platform.

PRINTING

For optimal part performance, part cake firmness will be higher than for polyamide materials. Powder clumps should break apart and crumble with force. Use of a nylon bristle brush, particularly on a spinning tool, should remove the part cake easily.

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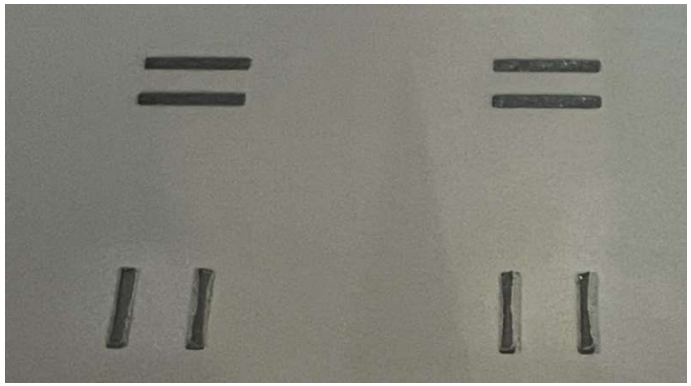
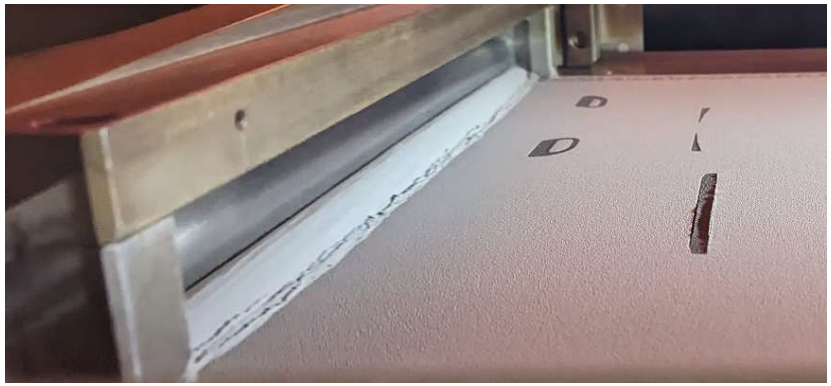
TROUBLESHOOTING

Material is not curl-prone, so curl phenomena of parts within the part bed is typically indicative of very low part bed temperature.





Excess melt energy causing clumping and sticking of powder around melt pool perimeters. This can potentially cause collisions with the roller and eventually part and build failure.

TROUBLESHOOTING

Material is sensitive to machine leaks, both for oxidation as well as associated cold spots resulting in orange peel. Ensure all machine seals are kept in good condition and part bed thermal distribution is uniform.

Machine must recoat material effectively, ensuring powder flowability while limiting clumping. Reducing feed temperature and amount of material fed can improve flowability if issues arise.

Material tends to loosely stick and clump when exposed to elevated temperatures for long times. This may include clumps forming on build plate areas around part bed. These clumps seldom result in print defects.