Customer Information Bulletin

CIB

CIB #: 07-01
Date: 8 Jan 08
Status: Non-confidential

Subject: Tips and Information for Building with Accura® 55 Plastic on the Viper si2™, SLA® 3500, 5000, 7000 Systems and Viper Pro™

1. **Buildstation™ and 3D Print software entries:** Each material on a SLA system uses a specific material entry in the Buildstation and 3D Print software. The entries contain the values for Dp and Ec used for each material. See the Buildstation and 3D Print Users' Guide for details. The values for Dp and Ec are shown below. In addition, different machine specific shrink/scale factors and line width compensation values must be used. The baseline or starting values to be used with Accura 55 SL material are given below:

Recommended Starting Parameters

	Viper HR System	**Viper** System	**SLA 350/3500** System	**SLA 5000** System	**SLA 7000** System	**ViperPro** System
Dp (mils)	5.2	5.2	5.2	5.2	5.2	5.2
Ec (mJ/cm2)	7.4	7.4	7.4	7.4	7.4	7.4
Baseline Scale Factors (x, y, z)	1.001, 1.001, 1.000	1.0011, 1.0011, 1.000	1.0011, 1.0011, 1.000	1.003, 1.003, 1.000	1.003, 1.003, 1.000	1.002, 1.002, 1.000
Baseline Linewidth Compensation Value	0.025 mm (0.001")	0.1125 mm (0.0045")	0.1125 mm (0.0045")	0.125 mm (0.005")	0.125 mm (0.005")	0.075 mm (0.003")
Vat Temperature	28° C	28° C	28° C	28° C	28° C	28° C

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2. **Software version**: Please make sure that the most current software version is loaded. At a minimum, it is recommended that users have Buildstation 5.4 software Update 1 installed. Use of Lightyear™ 1.4 or 1.5 is necessary, as style files are compatible with these or newer versions. For ViperPro, LightYear1.5 should be used in conjunction with 3D Print software.

3. **AccuMax™ category**: Accura 55 plastic should be categorized as a Category 1 material resin for the AccuMax software.

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4. **BUBBLES are not common:** Though this material does not easily create bubbles, users should still take care to avoid creating bubbles during the support building process. If bubbles are observed, slowing down the elevator movement can reduce bubble formation during support building.
5. **SOLVENT cleaning recommendations**: Accura 55 plastic cleans well with most common solvents used in Stereolithography. TPM, Isopropanol, and polyflush have all been used with a high degree of success. If using Isopropanol or other volatile solvents, the amount of time parts spend in the solvent should be kept to a minimum. Parts left in solvent too long may soften, or swell.
6. **Accura 55 plastic parts can be BONDED easily.** Use of common adhesives in the industry work well. Many users have had good success with traditional two-part epoxies, cyanoacrylate (superglue) adhesives, and UVI-Bond products sold by SLA Sales (www.slasales.com). With the photocurable bonding agents (UVI-bond), curing thick sections may be more difficult as the UV light may not penetrate though thick areas. In addition on thin sections liquid Accura 55 plastic may be used as a photocurable adhesive for bonding itself.
7. **Accura 55 Plastic doesn't show inhibition with silicones used for RTV work.** Beta tests results have not shown any issues with this product and inhibition of platinum cured silicones. While not every silicone has been tested, we expect the material to perform as well as our other SL resin with respects to inhibition.
8. **Details on the FAST™ style:** In general, the FAST style is about 40% faster than the EXACT™ style. The actual difference in throughput depend on part geometry, laser power and system type. Note that this increased throughput comes at the cost of accuracy and surface finish of final parts.

   The FAST style for this material is 0.100 mm (0.004 in) layer thickness, so it achieves excellent speed along with the same Z resolution as the EXACT style. Note that the EXACT style for Accura 55 resin is already comparable in speed to FAST styles for other similar resins. Use of 0.125 mm (0.005 in) or 0.150 mm (0.006 in) layer thickness is not recommended. Building in thicker layer thickness may cause significant upfacing and/or sidewall surface defects. This would be especially pronounced on thicker solid sections.
9. **Use care in reducing post-hatch delay (PHD)**: Most of the styles for this resin are set up using PHD. Reducing PHD should be done with caution, as this may affect surface finish and quality.
   - Reducing PHD may result in "fuzzy" sidewalls. If you observe fuzzy sidewalls on any geometry, increasing PHD may be an appropriate course of action.

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- Sidewall anomalies may appear with bulky parts (individual part cross section greater than 4 square inches) specifically on SLA 5000, SLA 7000 and ViperPro systems. Furthermore, "fuzzy" sidewall might occur at the hollow sections, which is relatively small comparing to the solidified areas. These sections are defined as small pseudo trapped volumes.
- On these systems, to avoid "fuzzy" sidewalls, you may need to increase PHD from 15 seconds to 30 or more seconds to achieve the best surface finish. The styles allow PHD to be set from zero to 60 seconds. The alternative is to apply multiple sweeps with or without deep dip.

10. **For building NEAR-FLAT DOWNFACING features:** For the Viper, SLA 3500 and SLA 5000 system, special styles have been developed to minimize downfacing border and surface delamination for Near Flat Inclined Downfacing surfaces. These styles should be used when surfaces are sloped at an angle of less than 20 degrees from horizontal. These files are named as Part_Accura55_EXACT_0040in_NFLT.sty and Part_Accura55_FAST_0040in_NFLT.sty.
11. **Accura 55 Plastic builds TRAPPED VOLUMES well:** This resin does not require a special trapped volume style.
12. **Minor color SETTLING may occur:** To ensure that the material is always homogeneous, if the system has been idled for more than 48 hours, before starting a new build, the resin should be stirred for ~20 minutes using [stir] option of BuildStation software or 3DPrint 0.99.36 to stir the material. In addition users may wish to stir any time they notice color variation across the surface of the vat. The material can also be stirred manually using a stirring stick, squirrel cage mixer or similar device.
13. **Viper HR mode part building:** When building parts in the HR mode on a Viper si^2 SLA system, it is recommended to build in the "sweet area", which is 5"x5" center of the vat. If parts are built outside this "sweet area", the risk of part failure increases. To ensure proper part building, you can increase border overcure by 0.002" (0.05mm) from the default.

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14. **Styles Availability**: The table below outlines the styles available for Accura 55 plastic.

SLA System	Build Mode	Style	Layer Thickness
Viper and SLA 3500/5000/7000/ViperPro systems	Normal Resolution	EXACT (EXCT)	0.100 mm (0.004 in.)
Viper and SLA 3500/5000/7000 systems	Normal Resolution	FAST	0.100 mm (0.004 in.)
ViperHR SLA system	High Resolution	EXACT (EXCT)	0.050 mm (0.002 in.)

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