Tips and Information for Building with Accura Xtreme SL Material on the Viper, SLA™ 3500, 5000 and 7000, & ViperPro® Systems

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

Recommended Starting Parameters

	ViperHR System	Viper System	SLA™ 350/3500 System	SLA 5000 System	SLA 7000 System	ViperPro® System
Dp (mils)	4.1	4.1	4.1	4.1	4.1	4.1
Ec (mJ/cm2)	11.7	11.7	11.7	11.7	11.7	11.7
Baseline Scale Factors (x, y, z)	1.001, 1.001, 1.000	1.0012, 1.0012, 1.000	1.0012, 1.0012, 1.000	1.003, 1.003, 1.000	1.0025, 1.0025, 1.000	1.0025, 1.0025, 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")	0.125 mm (0.005")

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 either at a minimum Lightyear™ 1.4 or 1.5 is necessary, as style files are compatible with these two versions..
3. Run at the **RECOMMENDED VAT TEMPERATURE**. Accura® Xtreme plastic is designed to run at a vat temperature of 28˚C.
4. **AccuMax™ category**: Accura Xtreme material should be categorized as a Category 1 material resin for the AccuMax software.
5. **Bubbles:** 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.
6. **Styles Availability**: The table below outlines the styles available for Accura Xtreme 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	0.150 mm (0.006 in.)
ViperHR SLA system	High Resolution	EXACT (EXCT)	0.050 mm (0.002 in.)

7. **MAXIMIZING THE DURABILITY**: While Accura Xtreme plastic is a high durability material, it is possible to enhance this property.

   7.1. To ensure that the most durable parts are produced, do not postcure parts more than is necessary. With fresh PCA bulbs, postcure time can be as quick as 15minute/side for most geometries. Please make sure that parts are tack free.

   7.2. On ViperPro systems, reducing the Large Spot hatch overcure by 0.025mm (0.001") can also enhance the durability of parts produced.

   7.3. Parts produced with the FAST build styles are not as durable as the those made with the EXACT build style. For maximum durability please use the EXACT style.

8. **SOLVENT cleaning recommendations**: Accura Xtreme plastic cleans well with most common solvents used in Stereolithography. TPM with a water rinse is the recommended cleaning method. 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.

9. **Hatch overcure:** In general, modifying the EXACT™ and FAST™ styles is not necessary, as they have been optimized for both speed and accuracy. It is highly recommended that the hatch overcure values for EXACT and FAST not be reduced from default, to ensure good part yield and low post-cure distortion.

10. **Downfacing surfaces:** In the EXACT style, the down fill cure depth has been optimized to reduce curl on the downfacing layer. Modifying down fill cure depth may reduce part quality.

11. **FAST style**: In general, the FAST style is about 40% faster than the EXACT style. The actual difference in throughput is dependent on part geometry, laser power and system type. Note that this increased throughput comes at the cost of accuracy and mechanical properties of both green and post cured parts. Since the FAST style is a WEAVE™ style, less resin cure occurs in the vat. So take care when handling parts, and be aware of this when building very thin geometries as they will be less robust in the green state than the same geometry built in EXACT.

12. **Use of post-hatch delay (PHD):** The styles for this resin are set up to allow the use of PHD. However, PHD time greater than zero is used only on the SLA 7000 default styles. Decreasing PHD time on the SLA 7000 may cause the part to overheat and warp, due to

the exothermic reaction of photo-polymerization. It may also result in bad sidewall and overall part quality. For all systems, the PHD value may be increased to decrease differential shrinkage, but the PHD time required to increase part quality is very large, and generally not a good tradeoff. On the SLA 5000, you may want to add some PHD if you are building a very large bulky part, to avoid heat buildup and ensure best part quality.

13. **Large flats**: Certain parts with large flat areas (larger than 2.00 inches (50mm) across) may not build successfully using the general frg support style. If you have geometries with large flats, you may want to use the supplied support style designated "LFLT" such as AccuraXtreme_LFLT.frg. This file with tightens the Strand Spacing to reduce lifting of the large surface. Also, when building parts that have a large surface area (larger than 6 inches (150mm) square), the sweep speed should be reduced to 1 in/s (25mm/s).

14. **Near-flat downfacing features:** For the Viper, SLA 3500 and SLA 5000 system, special build styles have been developed to minimize downfacing border and surface delamination for Near Flat Inclined Downfacing surfaces for EXACT and FAST builds. These style should be used when surfaces are sloped at an angle of less than 20 degrees from horizontal. These files are Part_AccuraXtreme_EXCT_0040in_NFLT.sty and Part_AccuraXtreme_FAST_0040in_NFLT.sty.

15. **Trapped volumes:** Accura Xtreme does not require a special trapped volume style.

16. **Viper HR mode part building:** When building parts in the HR mode on a Viper 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", part failure risk does increase. To help ensure proper part building, you may want to increase border overcure by 2 from the default.