

# SLA Best Practices

## SLA Best Practices Accura ClearVue

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Original Instructions



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## 1 SLA BEST PRACTICES ACCURA CLEARVUE SOFTWARE VERSION

It is best to use the most current appropriate software version for your system type, to ensure compatibility with newly-created build styles. For Buildstation™ users wishing to use the reduced bubble recoat style, you must use version 5.1 or above.

## 2 SLA BEST PRACTICES ACCURA CLEARVUE PRINTER CONTROL AND PART PREPARATION SOFTWARE ENTRIES

Each material on a SLA system uses a specific material entry. This is entered in the printer Control Code or 3DPrint software. See Users' Guide for details. Recommended starting parameters are shown below.

**Table 1: Recommended Starting Parameters**

|                                       | VIPER™ SYSTEM        | SLA 5000 SYSTEM      | SLA 7000 SYSTEM      | IPro™ / VIPERPRO™ SYSTEMS | IPro™ 8000/9000 PROX® 800/950 SYSTEMS |
|---------------------------------------|----------------------|----------------------|----------------------|---------------------------|---------------------------------------|
| Dp (mils)                             | 6.1                  | 6.1                  | 6.1                  | 6.1                       | 6.1                                   |
| Ec (mj/cm2)                           | 9.5                  | 9.5                  | 9.5                  | 9.5                       | 9.5                                   |
| Baseline Scale Factors (x, y, z)      | 1.0020/1.0020/1.0000 | 1.0029/1.0029/1.0000 | 1.0025/1.0025/1.0000 | 1.0024/1.0024/1.0000      | 1.0024/1.0024/1.0000                  |
| Baseline Linewidth Compensation Value | 0.075 mm (0.003")    | 0.0500 mm (0.002")   | 0.1000 mm (0.004")   | 0.0250 mm (0.001")        | 0.0250 mm (0.001")                    |
| Recommended vat temperature           | 28°C                 | 28°C                 | 28°C                 | 28°C                      | 28°C                                  |

### 3 SLA BEST PRACTICES ACCURA CLEARVUE PART SUPPORTS

Accura ClearVue supports have been described as “hard and crisp.” The default parameters are optimum for successful part building. Modifying supports may cause the build to crash, so proceed with caution if you change support parameters. In some cases, the supports may be crowded on some parts and may require editing. This is because ClearVue is has high initial cured (“green”) strength, so supports may get difficult to remove without damaging the part surface, especially if they are crowded.

## 4 SLA BEST PRACTICES ACCURA CLEARVUE SUPPORT REMOVAL

It is preferable that supports be removed prior to UV post cure, to avoid damaging the part surface.

## 5 SLA BEST PRACTICES ACCURA CLEARVUE HATCH OVERCURE

Hatch overcure has been optimized to maximize part clarity and build speed. It is highly recommended that the hatch overcure values not be reduced from default. However, you can increase hatch overcure to increase part hardness, or decrease the hatch overcure to increase build speed. In general, increased hatch overcure may reduce the clarity of the parts.

## 6 SLA BEST PRACTICES ACCURA CLEARVUE BUBBLES

- Due to the nature of this resin, micro bubbles may be seen in some thin wall parts. In the event bubbles present an issue for the part, a recoat style is provided which minimizes the potential for bubbles. This style minimizes bubble creation by extending number of sweeps to 3, and does come at the expense of build speed. For each supported system, a special recoat styles is provided, named Part\_Accura~ClearVue\_EXCT\_0040in\_BUBL.rcs. For Buildstation users wishing to use the reduced bubble recoat style, you must use version 5.1 or above.
- To minimize bubbles, avoid placing thin walls parallel to the recoater, whenever possible.

## 7 SLA BEST PRACTICES ACCURA CLEARVUE TRAPPED VOLUMES

- If your geometry has trapped volumes (a right-side up coffee cup is an example of a trapped volume), you should use GNRL recoat styles, however, parts might have micro bubbles embedded.
- Part\_Accura~ClearVue\_EXCT\_0040in\_BUBL.rcs recoat style is intended to reduce the occurrence of bubbles. It includes one sweep, and parts are deep-dipped\* into the resin during the recoating process, therefore, this type of recoating should not be applied to trapped volume part building. If “bubble free” is required, parts should be oriented or designed to avoid trapped volumes. \* deep dipping means that during the recoating process, the build platform is lowered significantly below the resin surface, then brought up near the surface before sweeping.

- The final parts show geometry dependent shrinkage (differential shrinkage). If the differential shrink must be reduced to the absolute minimum, increase post hatch delay (PHD) from default of zero seconds to 30 seconds or more. Please note that PHD values less than 30 seconds have been tested, and provide little improvement in situations where differential shrinkage was observed. The provided styles allow PHD to be set from zero to 60 seconds.
- Using the bubble minimizing style by adding two additional sweeps (to 3 sweeps) can also achieve the same effect as the addition of PHD.

## 9 SLA BEST PRACTICES ACCURA CLEARVUE PARTS WITH NEAR-FLAT DOWNFACING SURFACES

- For the Viper system, a special EXACT build style has been developed to minimize downfacing border and surface delamination for Near Flat Inclined Downfacing surfaces. This style should be used when surfaces are sloped at an angle of less than 20 degrees from horizontal. This file is named Part\_Accura~ClearVue\_EXACT\_0040in\_NFLT.sty.
- If delamination of near-flat downfacing surfaces is seen on other systems, reduce support spacing from 0.3 to 0.2 or less.

## 10 SLA BEST PRACTICES ACCURA CLEARVUE QUICKCAST PART BUILDING

Accura ClearVue can be used for occasional QuickCast part building, using the provided Recommended Baseline build styles. Note that these are not fully developed styles, and some modifications may be required to obtain the best results on your system. Recommended Baseline styles are provided for Viper™, iPro™/ViperPro™, and ProX® 800/950 systems.

## 11 SLA BEST PRACTICES ACCURA CLEARVUE LIQUID MATERIAL COLOR

This material includes components which, over time, can agglomerate/clump together and become visible as colored “specks” in the resin, typically bluish specks. This is due to liquid material age or storage conditions. If this is observed, simply mix the material as described below:

- For material in bottles: Shake or stir the material in the bottle for 10 minutes, shaking by hand or using a drill motor and blade (e.g., paint stirrer).
- If this is observed in the vat or MDM: Stir using the elevator stir function for a minimum of 1 hour.

If you have questions about this process, contact your regional customer support center. The regional contact information can be found on the 3D Systems website, [www.3DSystems.com](http://www.3DSystems.com).

## 12 SLA BEST PRACTICES ACCURA CLEARVUE PREFERRED PART CLEANING

For best results, parts should be cleaned ONLY with IPA. Use of other solvents is not recommended, as they may cause surface gumminess or tackiness. The following procedure will minimize this:

- Carefully remove parts and supports from the platform.
- Place parts in the IPA bath for five minutes.
- If needed, brush downfacing surfaces/features with a soft toothbrush to remove residual resin.
- Rinse again with fresh clean IPA.
- Air dry to complete cleaning.



**Note: Care should be taken to ensure that the parts are not left in IPA for more than 15 minutes total time.**

## 13 SLA BEST PRACTICES ACCURA CLEARVUE ALTERNATE PART CLEANING

TPM cleaning can also be used, but a final IPA rinse is required, and timing is critical to avoid surface gumminess or tackiness. Follow this procedure:

- Place parts on the platform in the TPM bath for 10-30 minutes (the shortest time needed to remove resin).
- Rinse parts with water (do not soak) to remove all residual TPM.
- Remove parts from the platform.
- Rinse parts with fresh IPA.
- If needed, soak parts for 5 minutes in fresh IPA.
- If needed, brush downfacing surfaces/features with a soft toothbrush to remove residual resin.
- If needed, rinse again with fresh IPA.
- Repeat brush and IPA rinse, if required.
- Air dry to complete cleaning.

## 14 SLA BEST PRACTICES ACCURA CLEARVUE CLEANING FOR USP CLASS VI

A separate document is available that outlines the cleaning method used by 3D Systems to produce articles that meet the requirements of USP Class VI. Users of Accura ClearVue material who require that their articles meet the requirement of USP Class VI should independently validate the procedure in use at their facility.



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