POLYJET BEST PRACTICE:

Printing With Rigur (RGD450)

SOFTWARE/PRODUCT/FINISHING

OVERVIEW

Rigur™ (RGD450) is an advanced, simulated polypropylene material. It offers high toughness, excellent dimensional stability and surface quality. This Best Practice describes recommendations and tips for achieving optimum quality and advanced mechanical properties when printing parts with Rigur.

A. Cleaning Printer Components

B. Preparing Trays for Printing

C. Removing Support Material

D. Drying Parts

E. Photobleaching Parts (applicable to Objet1000 Plus™ only)

NOTE: A Quick Reference Guide is provided on page 7 as a supplement to the procedure provided in this Best Practice.

Figure 1: Model made of Rigur.

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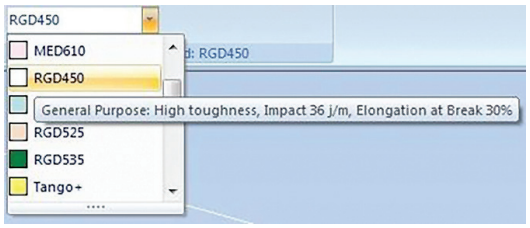

Figure 2: Material selection in Objet Studio 9.

PRINTING RECOMMENDATIONS AND TIPS

A. Cleaning Printer Components

Rigur leaves more residue on the print heads than Vero™ materials. For best results and to maintain print heads in optimum condition:

Desktop printers

- Run the Head Cleaning Wizard after a print job is finished.

Eden/Connex printers

- Run the Head Cleaning Wizard and the Wiper Cleaning Wizard after a print job is finished.

NOTE: If the Head Cleaning Wizard is not run for 33 hours of printing, the wizard automatically opens when starting or resuming printing. If this occurs when a print job is interrupted, cancel the wizard to resume printing. Run the Head Cleaning Wizard after the print job is is finished.

You cannot cancel the Head Cleaning Wizard to resume printing if head cleaning has not been performed for 99 hours.

After every 15 minutes of printing, several sequences of purge are automatically performed.

B. Preparing Trays for Printing

Internal stress may cause parts to curve upward and detach from the tray. The arrangement of Rigur parts on the build tray can reduce this possibility. When printing parts that have a high aspect ratio (X:Y), position the longer edge along the Y axis.

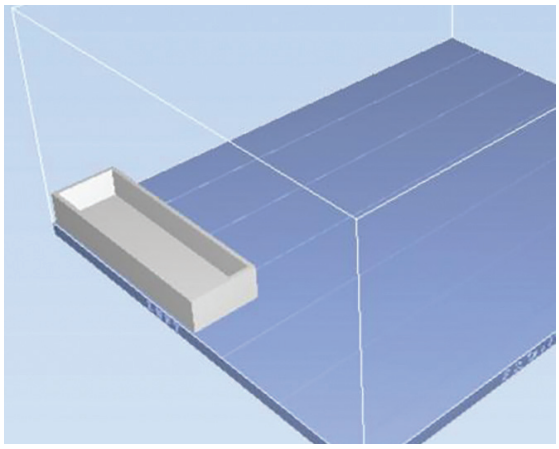

Figure 3: The long edge along the Y axis.

C. Removing Support Material

Proper handling and cleaning of Rigur parts is required for best results.

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- Remove the support material immediately after printing is completed.
- Use special care when cleaning parts with delicate elements.
- Excessive contact of parts with water or caustic soda (sodium hydroxide) can adversely affect dimensional stability and cause deformations.
  - When removing support material with the WaterJet or similar water cleaning tool, keep cleaning time to a minimum.
  - When removing support material with a 1 percent caustic soda solution, soak parts with walls thinner than 2 mm for no more than one hour. Soak all other parts for no more than two hours.

D. Drying Parts

Dry Rigur parts thoroughly to achieve optimum quality, using the following methods as necessary:

- Use an air blower to remove excess water from parts.
- Place parts on a dry surface or on a drying rack.
- Orient parts so that they dry effectively, making sure that areas that trap water are exposed.

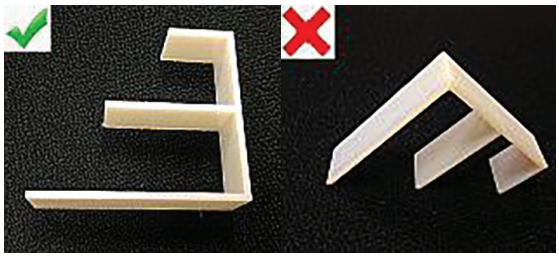

Figure 4: Suggested orientation for drying.

- Position parts so that there is minimal strain on thin walls (see Figure 4).

E. Photobleaching Parts (applicable to Objet1000 Plus only)

Parts printed with Rigur on the Objet1000 Plus have a slightly yellow tint when removed from the printer. This is especially true for parts printed with a glossy finish. The yellow tint fades naturally over time, but you can greatly accelerate this process by using a suitable photobleaching treatment. This involves exposing parts to intense fluorescent light.

Within six hours of exposure, there is a tint reduction of approximately 70%. After 24 hours, there is tint reduction of 90%.

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Two photobleaching methods are recommended by Stratasys:

Method A: Using an Illumination Chamber (Figure 5)

- Off-the-shelf chamber
- Ability to control temperature and light intensity
- Assures predictable results

Method B: Using Desk Lamps (Figure 6)

- Easily assembled from readily available components
- Variable results, due to the lack of precise control over temperature and light intensity
- Low cost

NOTE: The fluorescent lamps should be rated 45W, 6500K.

Photobleaching Instructions:

1. When using desk lamps, place the models in a container. The inside of the container must be covered with aluminum foil. Use at least two lamps, more when treating larger models.
2. Arrange the models in the chamber/container with enough distance between them to allow light to reach all sides of each model.

Figure 5: Illumination chamber for photobleaching.

Figure 6: Using desk lamps for photobleaching.

Figure 7: Rigur part before photobleaching (left) and after (right).

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3. Turn on the lights. Verify that the ambient temperature around the models is approximately 40 °C (104 °F). Higher temperatures may cause model distortion whereas lower temperatures may not produce satisfactory results. When using desk lamps, you can achieve the required temperature by positioning the lamps approximately 10 cm (4 in) above the models.
4. Inspect the models after six hours of treatment.
    a. For parts with a matte finish, this should be enough.
    b. For parts with a glossy finish, if photobleaching is not completed after six hours, continue for up to an additional 18 hours as needed to achieve the desired results.

NOTE: Glossy parts will usually require more time for photobleaching than matte parts.

CONTACT: To obtain more information on this application, contact:

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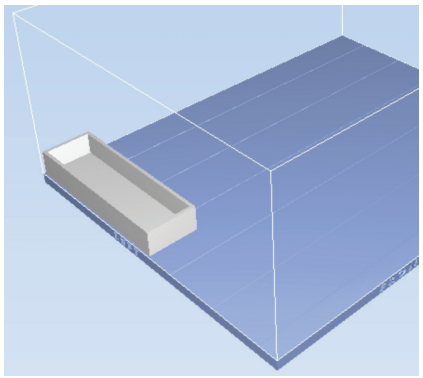
RIGUR (RGD450) QUICK REFERENCE GUIDE

1. PREPARE THE TRAY.

For models with a high aspect ratio (X:Y), when possible position the long edge on the Y axis.



2. REMOVE THE SUPPORT MATERIAL.

After printing, remove support material from parts. Keep WaterJet treatment to a minimum and treat delicate parts with special care.

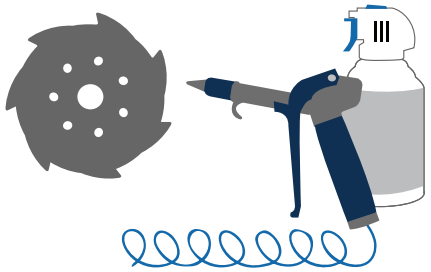
Optional:

Soak parts in a 1% caustic soda solution—

- delicate parts < 1 hour
- regular parts < 2 hours

3. DRY THE PARTS THOROUGHLY.

a. Use an air blower to remove excess water.



b. Place the parts on a dry surface or drying rack.

c. Position the parts so that they dry effectively.

d. Make sure that there is minimal strain on delicate elements.

4. CLEAN THE PRINT HEADS.

Run the Head Cleaning Wizard soon after printing.