

## SOFTWARE/PRODUCT/FINISHING/MATERIAL

### OVERVIEW

For sales samples, photography or finished models, painted and dyed PolyJet™ parts will give your customers a compelling preview of your newest products. Painting is an easy and quick way to enhance the visual characteristics of parts and models. Dyeing clear and translucent parts is also possible to change their appearance without losing transparency. With a little patience and readily available paint and household dye, you can easily decorate your prototypes to look like production parts.

The process takes a minimal amount of time. The smooth surfaces and crisp details of PolyJet technology minimize the tedious and time-consuming steps of sanding and filling. Since surface preparation is the key to the quality of painted models, PolyJet delivers better-looking models in less time. The supplies are inexpensive and available at any hardware retailer.

### 1. RECOMMENDATIONS

#### 1.1. Remove Support Material

The key to a perfectly painted model is its preparation. This starts with the removal of all support material. To optimize paint adherence and cosmetic appeal, it is best to completely remove all support material with the WaterJet station or an equivalent support removal process. Well-prepared models will have a consistent feel on both supported and unsupported surfaces.

There are two possible methods for obtaining a clean model surface. The first option is to use a NaOH (sodium hydroxide) solution (1% diluted in water). To clean and degrease the model, simply dip the model in the NaOH solution for 30 to 40 minutes, rinse with water and let dry. The second option is to bead blast the model.

#### 1.2. Sand Surfaces

With 320-grit wet sandpaper, sand the model for a smooth, paint-ready surface. While sanding, keep the sandpaper and model wet by repeatedly dipping the sandpaper in water or placing the model under running water.

With the thin layers and fine detail of the PolyJet model, surfaces should need only a light sanding. Following sanding, wash the model in water and allow it to dry completely.



Figure 1: Removal of support material with a WaterJet station.



Figure 2: Wet-sand the model with 320-grit sandpaper.

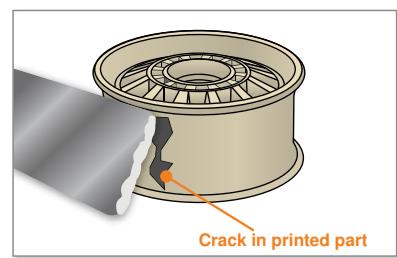


Figure 3: Apply the body filler.

### 1.3. Apply Primer

Primer serves two purposes. First, it provides a good bond coat for paint. Second, it highlights any areas on the model where additional finishing may be needed.

Spray the model with fast-drying primer. Lacquer-based primers and paints are a good choice since they sand well, dry quickly and are readily available. When priming or painting, use two light coats instead of one heavy coat, to prevent drips and puddles. If you do not have a paint sprayer, apply the primer from a spray can. Remember to spray the primer in a well-ventilated area and wear appropriate safety equipment.

After the primer has dried to the touch, inspect the model for any areas that need additional sanding or repair.

### 1.4. Sand and Fill Blemishes

Depending on the results of the primer coat, you can either proceed to the next step or do some additional finishing work. Typically, if the primer is applied correctly, no additional finishing is needed prior to applying the finish paint. However, if there are blemishes in the primer coat you may want to do some additional finish work. Finishing may include wet-sanding and/or filling small pocks.

If sanding is all you need, wet-sand the surfaces with 400-grit sandpaper. Stop sanding if the PolyJet material begins to peek through the primer. Rinse and dry the model. If any of the model surface is exposed, repeat step 1.2. Otherwise, proceed to step 1.5.

Since the PolyJet systems build with such small layers, you will not have to fill in layer stair-stepping. However, if small blemishes show up in the primed model, you can easily fill them with a dab of auto body putty. Body putty comes in many forms but you will want fast-curing, easily-sanded putty such as Freeman TUF-Carv. Alternatively, you can use premixed glazing putty such as 3M™ Acryl-Blue.

After the putty has dried – usually in less than 30 minutes – sand the area smooth. Start with 220-grit sandpaper and finish with 400-grit wet-sanding. Rinse the model with water and dry. Repeat step 1.3.

### 1.5. Apply Finish Paint

Prior to painting the model, ensure it is clean and dry. Use a tack cloth or compressed air to remove dust. Apply several thin coats of finish paint. Allow the paint to dry between each coat. As with the primer, spray paint will do the job if you do not have a paint sprayer available.

### 1.6. Apply Clear Coat (Optional)

A coat of clear lacquer can be applied to provide additional protection against scratches, chips, and other marks.

Clear coat paint can be purchased in a variety of finishes including matte, semi gloss, and gloss. Choose a lacquer-based clear coat with the desired finish.

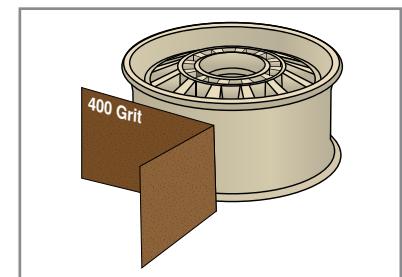


Figure 4: Dry-sand the model with 400-grit sandpaper.

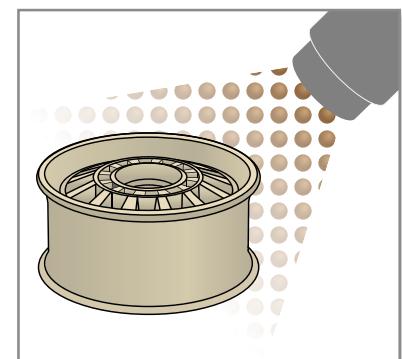


Figure 5: Beadblast the part as needed.

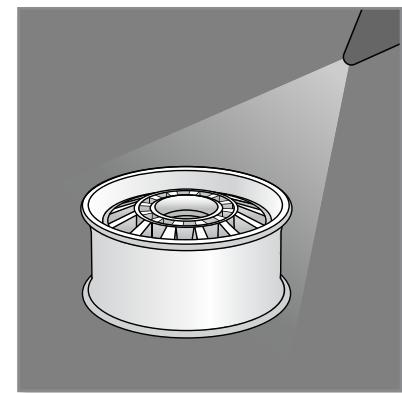


Figure 6: Application of the primer.

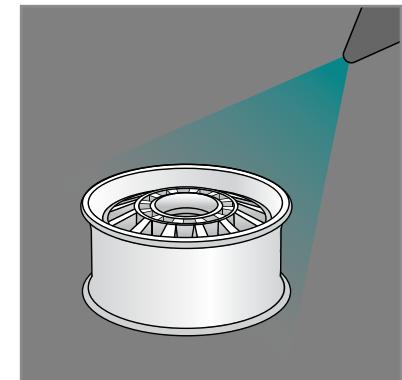


Figure 7: Final paint application.

## 2. RECOMMENDATIONS – DYEING

### 2.1. Cleaning

Obtaining good results when dyeing clear and translucent parts requires thorough post-processing. First, remove all support material using a WaterJet station or equivalent support removal system. Next, soak the model in a 1% water-diluted NaOH (sodium hydroxide) solution for approximately 30 minutes and then rinse with water. Allow the parts to dry completely and clean all surfaces with a lint-free cloth and isopropyl alcohol (>90%).

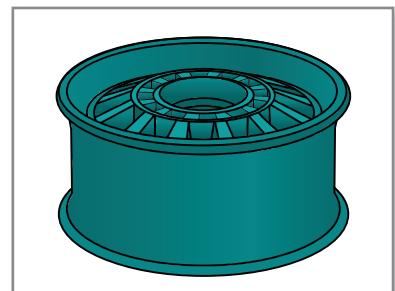


Figure 8: Painted model in the desired finish.

### 2.2. Dye Application

To apply the dye, simply mix common clothing dye in water and soak the part in the solution. Follow the mixing instructions provided by the dye manufacturer but using more dye typically produces darker and more intense colors. After the part reaches the level of color that's desired, remove it from the solution and allow it to dry completely.

### 2.3. Apply Clear Coat

Seal the part with a spray-on clear coat for added protection.

## PAINTING AND DYEING POLYJET PARTS

### 3. SAFETY

Observe manufacturer's recommendations for safety, material handling and storage. This information can be found in the Safety Data Sheet (SDS).

## 4. TOOLS & SUPPLIES

- Primer
- Paint
- Spray-on clear coat
- Rit brand dye or an equivalent fabric dye
- Sandpaper
  - 320 and 400-grit wet/dry
- Body filler or sandable putty (optional)
  - 3M Acryl-Blue, Freeman TUF-Carv or equivalent
- NaOH solution
- Tack Cloth
- Disposable Gloves
- Spray Mask
- WaterJet cleaning station or equivalent
- Bead blast cabinet (optional)

## CONTACT:

To obtain more information on this application, contact:

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