Painting of PolyJet™ Parts

Skill Level   Time   Cost
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Overview

For sales samples, photography or finished models, painted PolyJet™ parts produced using Objet 3-Dimensional Printing Systems will give your customers a compelling preview of your newest products. With a little patience and almost any type of paint, you can easily decorate your prototypes to look like production parts.

Painting PolyJet models takes half the time of other rapid prototypes. The smooth surfaces and crisp details 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 needed for your painting projects are inexpensive and are available at any hardware supply retailer.

Supplies:
1. Primer
2. Paint
3. Sandpaper –
   320 & 400-grid wet/dry
4. Body filler or sandable putty
   (optional)
5. NaOH solution
6. Tack cloth
7. Disposable gloves
8. Spray mask

Figure 1. Removal of support material. Use WaterJet station to remove support material.

Process

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. 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 solution (2% 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.

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.

Figure 2. Wet-sanding. Wet-sand the model with 320-grid sandpaper.

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.

3. Apply primer

Primer serves two purposes. Firstly, it provides a good bond coat for paint. Secondly, it will highlight 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.

Figure 3. Apply Body filler.

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

Painting Show-Quality Models

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 three. Otherwise, proceed to step five.

Since the Eden 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 three.

Figure 5. Sandblasting.

Tip: To preserve the accuracy of your model when sanding, apply a red or white primer as the base coat and follow with gray primer. The color difference gives you a visual reference that you are getting close to the model's surface.

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.

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 6. Apply Primer Paint.

Figure 7. Apply Final Paint.

Disclaimer

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