

Application Note



Skill level

Time

Cost

Overview

This application note is a guide for Objet 3D Printing Systems' users on how to enhance the detail, color and creativity of their FullCure™ models by applying special color dye techniques.

Highlighting one part of a model can bring the whole assembly to life. You can create a compelling presentation by adding a visual accent to any FullCure™ model using these simple dyeing and painting techniques.

The examples detailed in this application note were applied to models created by Legacy Effects for Microsoft's Halo 3 marketing campaign. The photos capture models that were printed in FullCure™ model materials and custom dyed to create a lifelike appearance.

Example #1 - Halo 3 ODST Soldier

Standing an impressive 15 inches tall, this Halo 3 ODST Soldier figure was printed on a Connex™500 as an assembly. It was made from four Digital Materials™ which had been created by combining Objet's VeroWhite™ and VeroBlack™ base materials. The clear visor lens was printed separately in Objet's FullCure®720 transparent material. The post-processing techniques detailed below were then applied.

Post-processing Techniques to Achieve Lifelike Characteristics

1. Cleaning

The foundation for an effective and durable painted model requires thorough post-processing finishing techniques. [Note: Due to the nature of this model and the quality of the printing, no sanding was required.]

- First, remove all support material from the model using the WaterJet station
- Soak the model in 2% NaOH water-diluted solution for approximately 30 minutes
- Rinse the model again in the WaterJet station to remove all residues
- Allow the model to dry completely
- Clean all surfaces with a lint free cloth and isopropyl alcohol (>90%)

2. Applying Dye

After the cleaning and drying process is complete, applying dye is as simple as mixing common clothing dye in water and soaking the part in the solution. In this example, the lens was placed in warm water mixed with royal blue dye for 10 to 20 minutes.



Clear lens visor printed in FullCure®720 (left) and dyed version (right).



2. Soak part in warm water and powdered dye solution.

- 4 ounces warm water
- 2 tablespoons powdered dye
 - *Tip:* Add more powdered dye for a darker or more intense color
- Soak model part in dye and water solution
- Remove the part from the solution and allow to dry completely

Materials used:

- *Common clothing dye*

3. Clear Coat

It is recommended that you seal the model by spraying it with a clear coat varnish or lacquer.

- Cover all surfaces with a clear coat varnish
- Allow the part to dry completely

Materials used:

- *Clear coat spray*

4. Assembly

The face of the ODST Soldier model was painted a bright, metallic silver to create a reflective surface behind the visor lens. After the paint had dried completely, the dyed lens was carefully glued into place.

- Brush paint the model's facial area with a bright, silver paint
- Allow the model to dry completely
- Apply a small bead of cyanoacrylate (CA) adhesive to the lens' edges
- Press lens in place

Materials used:

- *Silver, metallic model paint*
- *Acrylic or watercolor brush*
- *CA adhesive (super glue)*

5. Materials List

Dye

- Rit All-Purpose Concentrated Clothing Dye

Paints

- Model Master Enamel Paint

Finishes

- Krylon Acrylic Crystal Clear Spray Finish

Tools

- Acrylic or watercolor brushes



2a. Remove from dye solution after approximately 15 minutes.



3a. Spray part with a clear coat finish.



4. Paint face bright metallic silver.



4a. Apply glue to dyed lens and press in place.

Example #2 - Halo 3 Needler Weapon

This rather intimidating weapon was printed on a Connex™500 in four Digital Materials™ as an assembly. The Digital Materials™ had been created by combining Objet's VeroWhite™ and VeroBlack™ base materials. The needles were printed separately in FullCure™720. The post-processing techniques detailed below were then applied.

Skill level	■ ■ ■ ■ ■
Time	■ ■ ■ ■ ■
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Post-processing Techniques to Achieve Lifelike Characteristics

1. Cleaning

The foundation for an effective and durable painted model requires thorough post-processing finishing techniques. [Note: Due to the nature of this model and the quality of the printing, no sanding was required.]

- First remove all support material from the model using the WaterJet station
- Soak the model in 2% NaOH water-diluted solution for approximately 30 minutes
- Rinse in the WaterJet station to remove all residues
- Allow the model to dry completely
- Clean all surfaces with a lint free cloth and isopropyl alcohol (>90%)

2. Applying Dye

After the cleaning and drying process is complete, applying dye is as simple as mixing common clothing dye in water and soaking the model part in the solution. In this example, the needles were placed in warm water with rose pink dye for 10 to 20 minutes.

- 4 ounces warm water
- 2 tablespoons powdered dye
 - *Tip:* Add more powdered dye for a darker or more intense color
- Soak model in dye and water solution
- Remove from solution and allow the part to dry completely

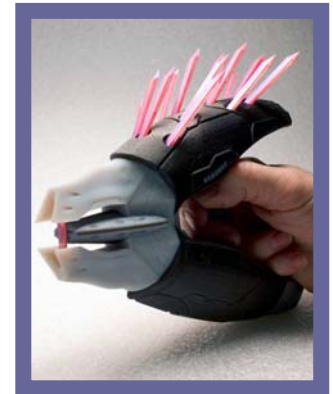
3. Painting

Paint can be applied to help enhance the lifelike characteristics of your model. In this example, each needle was painted with an acrylic iridescent medium to create a translucent, metallic effect.

- Brush paint the clean, dry surfaces of the model with iridescent medium
- Proceed to next steps while parts are tacky

Materials used:

- *Iridescent medium*
- *Acrylic or watercolor brush*



Clear needles printed in FullCure®720 (left) and dyed version (right).



Printed Connex™ needler



2. Soak parts in water and dye solution for approximately 15 minutes.

4. Applying Pigment

Applying pigments can also enhance your model by adding vibrancy and intensity. The needles, while still tacky, were dusted with a bright, pink-blue pearlescent powdered pigment.

- Place tacky needles in pigment powder and dust all surfaces
- Carefully remove from the powder and lightly blow or shake off excess powder

Materials used:

- *Pearlized pigment powder*

5. Finishing

It is recommended that you seal the model by spraying it with a clear coat varnish or lacquer.

- Cover all surfaces of the clean, dry model with a clear coat varnish
- Allow the model to dry completely

Materials Used:

- *Clear coat spray*

6. Assembly

Once the clear coat had dried completely, the needles were placed in the mounting slots on the main body of the weapon.

7. Materials List

Dye

- Rit All-Purpose Concentrated Clothing Dye

Paints

- Liquitex Iridescent Medium

Pigments

- Jacquard Pearl Ex Pigments

Finishes

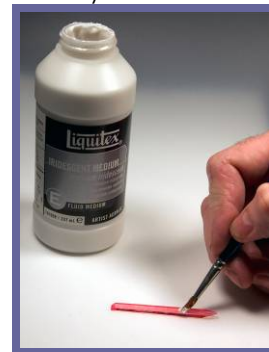
- Krylon Acrylic Crystal Clear Spray Finish

Tools

- Acrylic or watercolor brushes



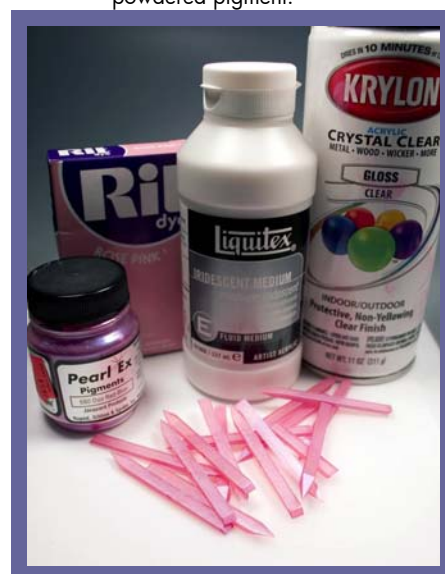
Detail of dyed and dried needles



3. Paint iridescent medium on surfaces.



4. Dust parts in a container with powdered pigment.



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Objet Geometries Ltd. Headquarters 2 Holtzman st., Science Park, P.O Box 2496, Rehovot 76124, Israel T: +972-8-931-4314 F: +972-8-931-4315	Objet Geometries Inc. North America 5 Fortune Drive Billerica, MA, 01821 USA T: +1-877-489-9449 F: +1-866-676-1533	Objet Geometries GmbH Europe Airport Boulevard B 210 77836 Rheinmünster Germany T: +49-7229-7772-0 F: +49-7229-7772-990	Objet Geometries AP Asia Pacific Unit28, 10/f, HITEC 1 Trademart Drive Kowloon Bay, Hong Kong T: +852-217-40111 F: +852-217-40555	Objet Geometries AP Limited China Rep Office Rm1220, CIMIC Tower, 1090 Century Blvd, Pudong Shanghai 2000120 P. R. China T: +86-21-5836-2468 F: +86-21-5836-2469
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Info@objet.com – www.objet.com

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