

# Rapid Texture Prototyping Post-Process Method



## Overview

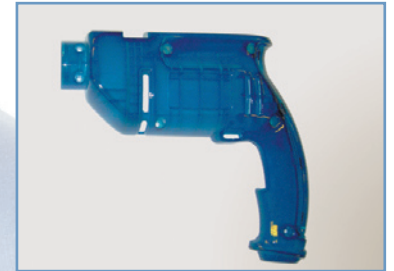
In many rapid prototyping applications, surface texture is a major concern of importance. Not all RP technologies produce finished parts, which makes secondary processes, such as grinding or polishing, possible. These additional steps add time and cost to prototyping. As the goal of RP technology is to produce finished models quickly and at a low cost, producing the right surface texture on RP parts is important. PolyJet™ Technology can print textures (grains or patterns) and logos on prototype parts, molds and models exactly as they would be on final production molds or parts. If needed, the texture can be limited to specified areas.

However, texture can also be added in a **post-process** using rapid texture prototyping applications. As a **post-process**, Objet 3-D printing technology can add high-quality textures with remarkably fine detail to models so that both the models and their related elements and materials have the same texture.

Also, rapid texture prototyping can strengthen thin materials in lightweight structures to improve aero-and fluid dynamics or can be used to fill in layer lines on printed parts to provide a smooth surface, as well as increase the thickness of a wall or a surface without having to make a new part.

Akron Metal Etching specializes in adding textures to different materials and substrates. Akron developed a patented post-process method specifically for texturing the surfaces of parts made by PolyJet™ Technology, called Prototex™. In fact, Akron can put just about any texture on parts made from Objet 3-D printed models. With an extensive design library of thousands of patterns and textures including leather grains, geometric patterns and current popular designs, Prototex lets end-users achieve just the right look for their finished 3-D printed model.

“The advent of rapid texture prototyping technology greatly reduces the effort required for applying texture to printed models,” says Mr. Lee Eisinger, President of Akron Metal Etching. “The goal of Akron Metal Etching has been to provide the highest quality mold texturing based on our extensive experience in the plastics and related industries. We help to work through the details of texture selection and all the items pertinent to end-user tooling to get parts with just the right textures out of the molds with ease”.



**Picture 1.** PolyJet Model coated with base layer.



**Picture 2.** Masking areas before applying texture pattern.



**Picture 3.** Example of textured PolyJet model.



**Picture 4.** Example of textured PolyJet model.

# The Process for Adding Texture to PolyJet Printed Models:

First, printed models are thoroughly cleaned and sanded using fine sandpaper. Second, a coating layer is applied to mask the areas that will not be textured (see picture 1). After the masking, the texture process is built up onto the parts to the depth of the desired texture. A special device measures the thickness as it is being built. In general, a tolerance of +/-0.01 mm (0.0005 in) is acceptable for texture depths. With textures of thicknesses from 0.1mm to 0.375mm (0.004 to 0.015 in) this step takes a relatively short period of time.

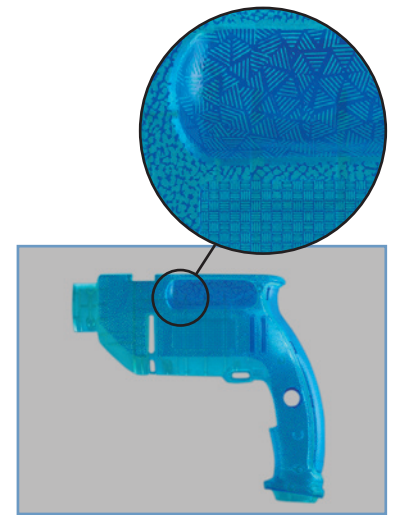
Picture 2 shows the material built to the proper thickness. The red areas are masked off and will remain without texture in the finished parts. The masking also defines texture changes if multiple textures are being applied. The ability to add texture to specific areas adds realism to the parts.

The next stage is to apply the texture patterns. There are several different methods for applying patterns on parts' surfaces. After a curing process the pattern masters are removed from the surface along with the masking materials. A chemical treatment is used to reveal the pattern.

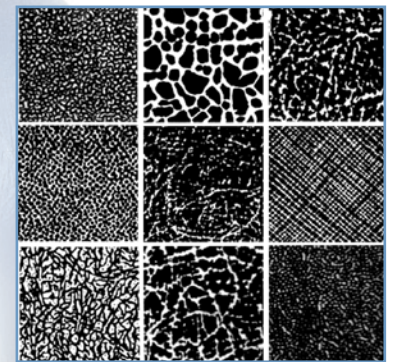
Finally, after the textures are examined and any necessary touch up work is completed, the textured areas are lightly coated with an overcoat to seal the texture to the parts. This can be seen in picture 6 in the light colored areas between the dark blue areas of the pattern. The parts are then exposed to light to cure the materials.

Spray painting the textured printed models produces a finished part look.

The texture (grains or patterns) can be applied to both printed PolyJet models and molds, bridging the gap between rapid tooling and expensive hard tooling.



**Picture 5.** Different texture patterns applied on PolyJet model.



**Picture 6.** Texture patterns.

## Disclaimer

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Information and pictures in this applications note are courtesy of Mr. Eisinger, President of Akron Metal Etching.  
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