



## APPLICATION GUIDE:

# Bead Blasting for Surface Smoothing

TIME REQUIRED ■■■ COST ■■■ SKILL LEVEL ■■■

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## OVERVIEW

For any FDM application, bead blasting with plastic media is an ideal solution. Inexpensive and quick, your model, part, pattern or tool can have a great surface finish without sandpaper, fillers or solvents.

While sanding a rapid prototype can take hours, bead blasting an FDM part takes only a few minutes. This simple process also preserves a part's quality since it will not distort it or change its dimensional accuracy.

Plastic blast media (PMB) is a recycled material made of finely reground thermoplastics. This media lasts longer than glass bead, and it is available with abrasiveness that ranges from mild to harsh. PMB costs U.S. \$110.00 per 50 pound (22.7 kg) bag.

## PROCESS

### 1. PREPARE MODEL:

After removing support structures (figure 1), apply masking tape to areas of the model where a bead blasted surface is undesirable. Masked areas may include parting surfaces of tools or sharp, outside corners that could be rounded by bead blasting.

### 2. SETUP BEAD BLASTER:

Plastic blast media (PMB) ranges in size and abrasiveness. An ideal PMB is Polyplus®, which has a Mohs hardness of 3.5 and a 20/30 U.S. standard sieve size (0.84/0.58 mm).

Loaded with PMB, set your bead blaster to a pressure that does not exceed 100 psi (689 kPa). Start with a low pressure and gradually increase it until you get the desired result. Excessive pressure will make divots on the part surface and break down the media.

### Supplies:

- Plastic blast media
- Masking tape

### Tools:

- Bead blaster/Abrasive blasting cabinet



Figure 1: Title If desired, mask features prior to bead blasting.

# BEAD BLASTING FOR SURFACE SMOOTHING

## 3. BEAD BLAST PART:

Holding the spray gun at a 60 degree angle from the part, lightly bead blast all surfaces (figure 2). Do not dwell in one area. Instead, use a continuous sweeping motion similar to that for spray painting. To avoid damaging the part, use several light passes of the bead blaster rather than one aggressive pass. After bead blasting the part, inspect it and repeat as necessary. When complete, rinse the part. The FDM part is now ready for use as a functional prototype, pattern or tool (figure 3).

## SUPPLIERS

(Seek similar if unavailable in region)

### Plastic blast media:

Polyplus (US Technology Corp., Canton, Ohio) is available from International Surface Preparation. [www.surfacepreparation.com](http://www.surfacepreparation.com)

### Bead blaster/abrasive blast cabinets:

Units range from U.S. \$150.00 for small bench top models to \$4,000 for freestanding units. In addition to the bead blaster, an air compressor is required. [www.eastwoodco.com](http://www.eastwoodco.com)



Figure 2: Lightly bead blast all surfaces with a constant, sweeping motion.



Figure 3: Finished FDM part after only a few minutes of bead blasting.

## FDM PROCESS DESCRIPTION

Fortus 3D Production Systems are based on patented Stratasys FDM (Fused Deposition Modeling) technology. FDM is the industry's leading Additive Fabrication technology, and the only one that uses production grade thermoplastic materials to build the most durable parts direct from 3D data. Fortus systems use the widest range of advanced materials and mechanical properties so your parts can endure high heat, caustic chemicals, sterilization, high impact applications.

The FDM process dispenses two materials—one material to build the part and another material for a disposable support structure. The material is supplied from a roll of plastic filament on a spool. To produce a part, the filament is fed into an extrusion head and heated to a semi-liquid state. The head then extrudes the material and deposits it in layers as fine as 0.005 inch (0.127 mm) thick.

Unlike some Additive Fabrication processes, Fortus systems with FDM technology require no special facilities or ventilation and involve no harmful chemicals and by-products.

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