

FDM Rapid Prototyping

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Fused Deposition Modeling (FDM) is the rapid prototyping technology that forms three-dimensional objects from CAD generated solid or surface models. A temperature-controlled head extrudes ABS plastic wire layer by layer and as a result, the designed object emerges as a fully functional three-dimensional part.

Why use rapid prototyping? Rapid prototyping (RP) is used to save time and cut costs at every stage of the product development process. Prototypes can now be produced in a matter of hours that have typically taken weeks or even months to make.

“With rapid prototyping, companies are now able to verify and change designs with much less investment in time and money”, says Steve Hatten, a manufacturing specialist at TechHelp. “And if Idaho manufacturers utilize this technology, it should improve their capability to bring products into the marketplace in a more timely manner and at a more competitive price.”

TechHelp, a Boise based company, uses a machine called the FDM3000 made by Stratasys Inc. to provide their RP services to their clients (see picture below).



The FDM3000 features WaterWorks, which provides a hands-free rapid prototyping process and increases overall productivity. According to the Stratasys website,

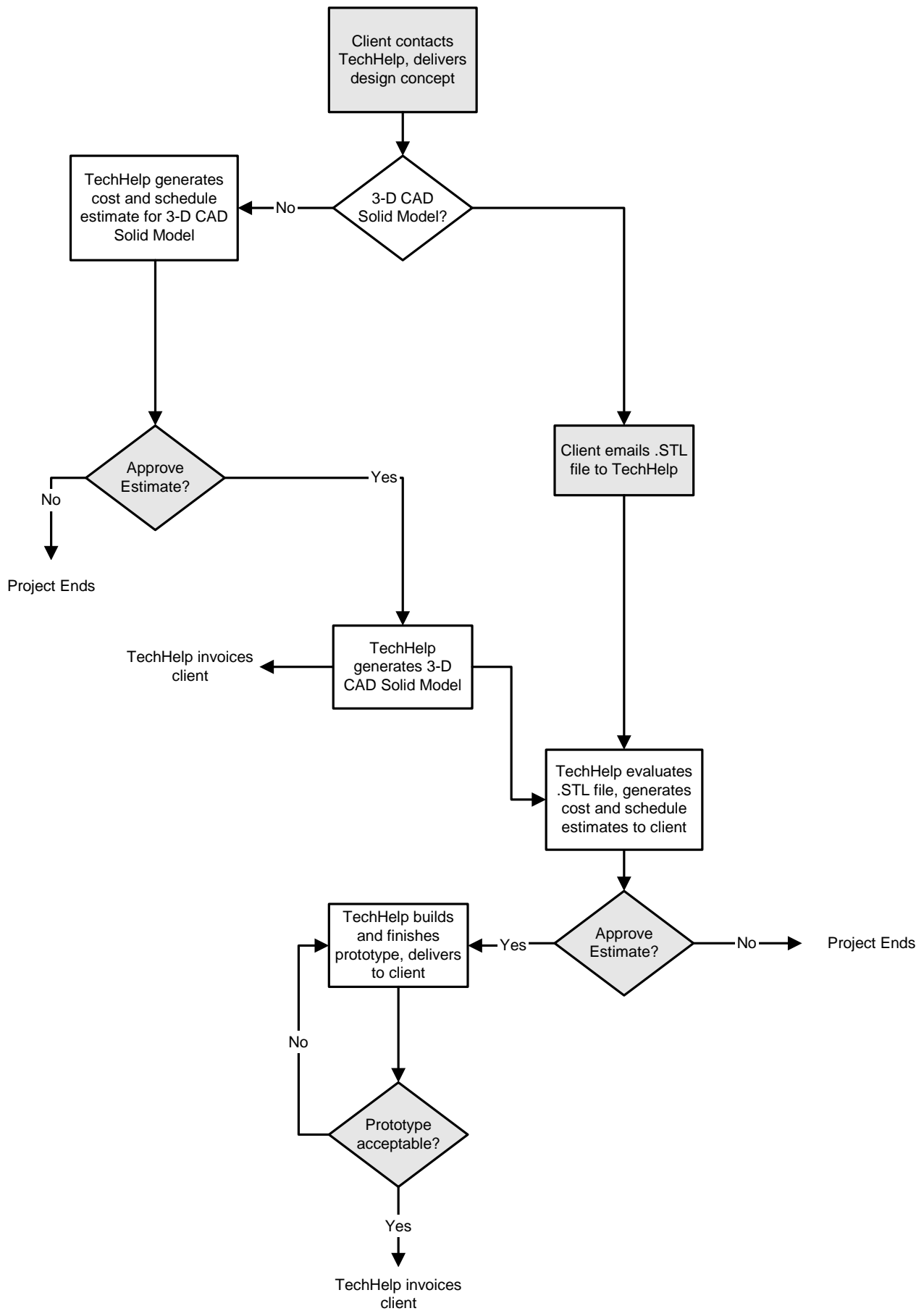
“WaterWorks uses a water-based solution to simply wash away the supports right down the drain. Your model is left smooth and clean – no nicks or scratches – and the fine details remain intact. You’ll find that the convenience of this special feature lets your designers, engineers and manufacturers get down to business, instead of spending their time removing supports from newly created prototypes.”

FDM Features:

- Competitive with other RP technologies
- Strong and durable model
- APS plastic (with color choices) and Elastomer material choices
- Water proof, paintable
- Maximum size- 10” x 10” x 16”

Rapid prototype models can be used as design evolution, manufacturing tools (assemblies, test fixtures, visual aids), sales tools (internal and external), estimating tools (prototype parts included in drawings) and master patterns for composite molds.

The next page consists of a basic process flow chart to help demonstrate the way in which TechHelp operates its RP service to its clients.



The time it takes to develop a concept from its initial phase to its introduction to the marketplace can be critical. Manufacturers are always looking for ways to shorten this process. With the assistance of computer-assisted design tools, such as CAD, manufacturers have taken significant steps toward utilizing these tools to design and develop new products.

“Traditionally, Engineers have created three-dimensional models and prototypes by using conventional methods of fabrication, such as machine tooling. Long turnaround times result in delays in getting products to market. Rapid prototyping (RP) was developed to automate new product development and to shorten the development cycle significantly.”- Stratasys Inc.

For more information on Rapid Prototyping, contact Steve Hatten at 426-2182 or shatten@boisestate.edu.