

SOLIDWORKS & DESIGN TECHNIQUES FOR SUCCESSFUL 3D PRINTING

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Session Outline

- Documentation for the prototype stage
- Prototyping Options
- 3D Printing; Alternatives & Comparisons
- Large FDM Models & SOLIDWORKS Configurations
- Machinery Prototypes & Modeling Techniques
- Creative 3D Printing, How to get there with SOLIDWORKS
- 3D Printing, Know Prior to Printing

Documentation for Prototyping

Manufacturing Documentation

- 3D Model
- 2D Drawings
- Bill of Matl
- Manufacturing Instructions

Annotation

- Quality Plans
- Product Performance Specs

Prototype Documentation

- 3D Model, (.stl file?)
 - tolerances; SOLIDWORKS 3D Annotation
 - matl specs; SOLIDWORKS 3D Annotation
 - feature function; SOLIDWORKS 3D
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- Specific Prototype Plan Outline
 - Physical Test Plan Outline



Prototyping Options

Metals: Sand Casting, Investment Casting, Plaster Casting,
Machining
Laser Cutting, Plasma Cutting

Plastics: 3D Printing, Urethane Casting, Aluminum Injection
Molding
Machining, Laser Cutting

Elastomers: Aluminum Compression Molding, Casting, Machining

3D Printing; Alternatives & Comparisons

PROCESS
DURABILITY

ACCURACY

SLA	Stereolithography	10	5
SLS	Selective Laser Sintering	8	7
FDM	Fused Deposition Modeling	5	9
LOM	Layer Object Manufacturing	4	6

3D Printing; Alternatives & Comparisons

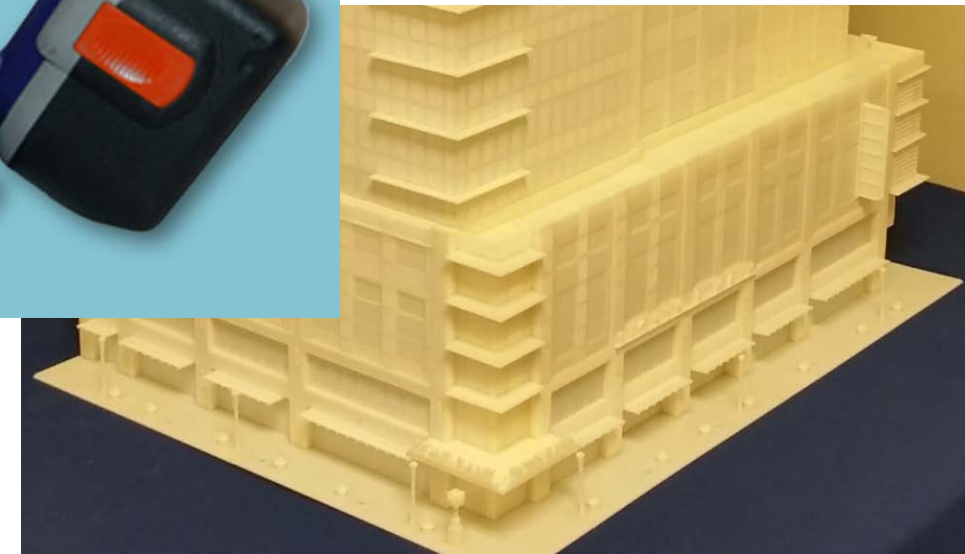


SLA; x,y - .002"
z - .002"



SLS; x,y - .030"
z - .004"

FDM; x,y - .040"
z - .004 - .012"



Large FDM Models & Modeling Techniques

Scale & Printer Resolution & Geometry Outcomes per axis, (X,Y,Z)

Part Printing Preparation:

- Assembly .stl files,
- Breaking large pieces down & the SOLIDWORKS Configurations

FDM layering & Print Path Reviews

Circular Inaccuracies in FDM

Corner Inaccuracies in FDM

Machinery Prototypes & Modeling Techniques

Pre Printing; Surface Size Reduction

- Circular Features
- Linear Features

Pre Printing; X,Y,Z orientation & feature reduction

Post Printing; 2nd Operations

- Machining
- Heated Assembly

Creative 3D Printing & How to Get There

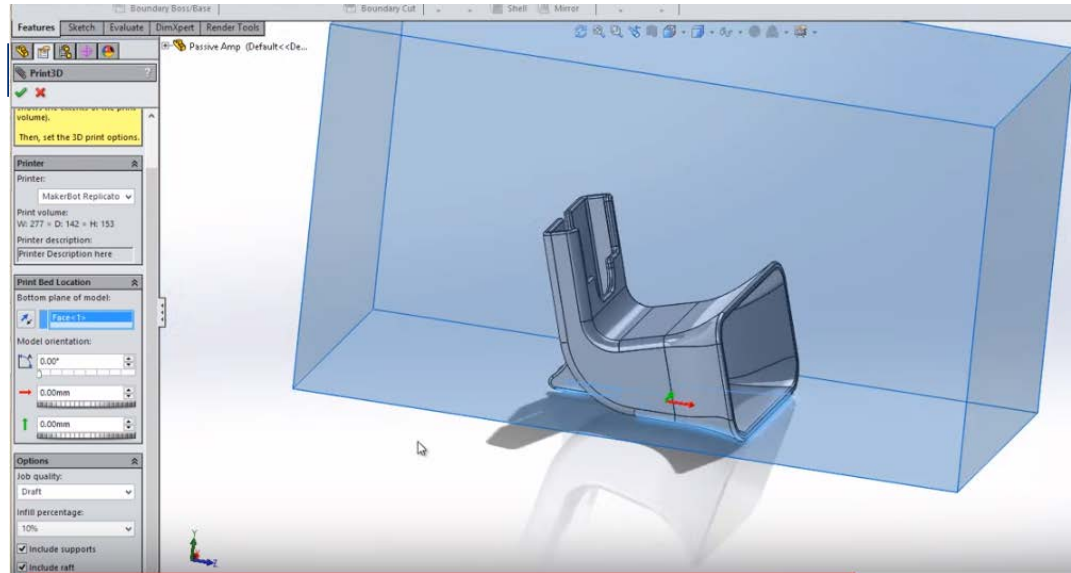
Inlay Labeling

Internal Levers

Mixing Materials & Processes

3D Printing; Know Prior to Printing

SOLIDWORKS



Slic3R

