Rapid Freeze Prototyping and Investment Casting Application

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Project Description:
This research is aimed at developing the Rapid Freeze Prototyping (RFP) process as an environmentally benign, low-cost rapid prototyping process and also developing the techniques of using ice patterns for investment casting. Invented by Dr. Ming Leu and his colleagues, RFP is a freeform fabrication process that builds ice parts by depositing water in the form of droplets in a freezing environment. The research objectives are: (1) generating a scientific understanding of the physics of the RFP process, (2) developing a part building strategy to reduce build time and increase dimensional accuracy, (3) identifying the support material for fabrication of complex 3D ice parts, (4) developing thermal and concentration models to predict the temperature and diffusion during the build process, and (5) developing techniques for investment casting with ice patterns. More details of the project description is available on the weblink:

Publications: