



Featured FreeForm® Modeling™ Customer: Levolor

Levolor Reduces Time-to-Market for Decorative Finials with the FreeForm Modeling System and Rapid Prototyping Technology

Decorative finials (curtain rod ends) are just one of more than a dozen home products that the North Carolina-based Levolor® Kirsch Window Fashions produces. Levolor is a division of NewellRubbermaid, a global marketer of consumer products such as cabinet hardware, decorative trim, paint brushes, rollers, and propane torches, among many others. Levolor creates products for leading retailers such as Lowe's, Home Depot, JC Penney, Linens 'n' Things, Sears, Bed, Bath and Beyond, Target, and Wal-Mart.

To maintain its competitive position with major retailers and other market players—while maintaining its commitment to quality—Levolor constantly evaluates new technology and approaches to product design. Due to the complex forms of finials, Levolor's industrial design team turned to the FreeForm Modeling system and rapid prototyping technologies to speed the design process for the production of a decorative leaf finial.

The Digital Production Process - A Leaf Finial

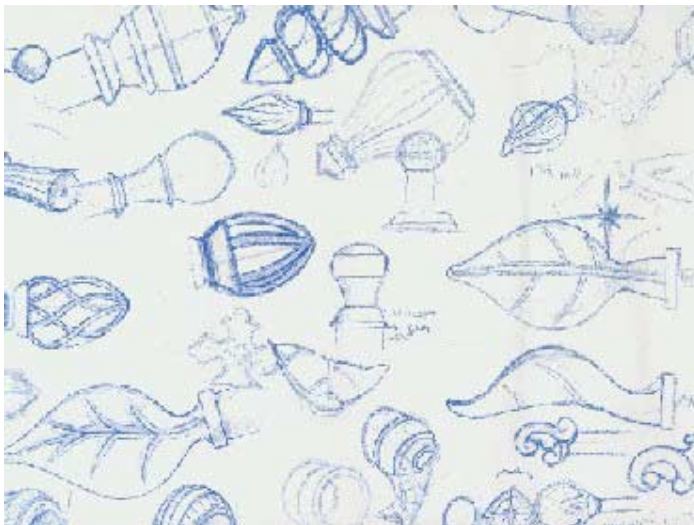
The Spec

Each new finial project begins when one of Levolor's industrial designers is provided a Spec (specification). The spec contains the needs of the design including what look is intended (antique, classical, modern, etc.) and whether the project is a line update or a total redesign. Once a designer receives the spec, he/she conducts initial background research into current trends, design motifs, etc., then starts sketching.

Thumbnail Sketches

Thumbnail sketches are completed quickly and can number in the hundreds.

(Below) The designer completes the thumbnail sketches quickly by hand



Presentation Sketches

From the thumbnail sketches the designer chooses a few designs to be worked-up into more detailed presentation sketches. These presentation sketches, which are still done by hand, will typically be at a 1:1 scale and contain two views—a side view and an isometric view. The designer can complete up to 60 or more presentation sketches.

(Below left) Presentation sketches contain multiple views of the leaf finials



(Below right) The designer creates the final presentation sketch of the leaf finial



The presentation sketches are shown to the client (for example Home Depot, JC Penney, etc.) for approval and any necessary iteration will be completed. Small selections of these designs are chosen to be worked-up into 3D models. In this case the designer created the final presentation sketch of the center design (above right).

Digital Modeling Using the FreeForm Modeling system

If the shape of the finial is highly decorative in nature, the FreeForm Modeling system is used to create a 3D model. Through SensAble's PHANTOM® force-feedback interface, designers and modelers work with virtual media to create highly complex, free-form shapes in a fast, intuitive way. Controlling the FreeForm Modeling system's digital tools such as Carve and Smudge through touch enables Levolor designers to have a direct connection with the models, much like using physical methods such as clay or wax.

Before incorporating the FreeForm Modeling system into part of its design process, Levolor would carve the 3D model out of wood and/or model it using clay. These traditional, physical methods were often time consuming processes that took at least a week. By switching to the FreeForm Modeling system, the industrial design team saved an average of 7-10 days of pure modeling time.

Stan Chudzik, an industrial designer at Levolor, often uses the FreeForm Modeling system for projects like the leaf finial. "Using the FreeForm Modeling system, we can quickly and easily make multiple changes on the finial designs based on feedback from the client," says Stan. "We can scale the product to meet the guidelines both for manufacturing and for anyone involved in the approval process. All these benefits combined enable us to reduce time-to-market.

(Right) Stan Chudzik uses the FreeForm Modeling system to design a leaf finial



Rapid Prototyping - The ThermoJet

After the 3D final model is developed in the FreeForm Modeling system, the designer generates a rapid prototype using the ThermoJet. The ThermoJet provides a quick and inexpensive first look at the proposed model. The designer also uses the ThermoJet rapid prototype to identify any manufacturing problem areas.

Stan Chudzik said, "Using a combination of the FreeForm Modeling system and rapid prototyping enables us to design and physically produce a high-quality model which as a result, greatly speeds the approval process."

(Right) The rapid prototype provides a quick and inexpensive first look at the proposed model



The RP model - SLS (Selective Laser Sintering) or SLA (Stereolithography)

If the client approves the ThermoJet model, the next type of rapid prototype to be produced is an SLS or SLA model. Often these models have different finishes applied for the customer presentation.

(Right) The SLA is produced after the client approves the ThermoJet



Drawing

Obtaining quotes for final manufacturing, which usually takes place in Asia, requires a 2D drawing and a prototype model of the final design. Typically, the drawing contains orthographic views and an isometric view. The physical prototype model provides the bidding vendors with an exact representation of what the final product should look like. Once a bid is finalized, the model moves into production.

The Levolor leaf finial is one of the finial designs for the 2" Decorative Traverse Rod that is currently available at J.C. Penney's or through local interior decorators.

(Right) The final production model of the leaf finial is currently out on the market today

