T-Splines enables organic new product design for PC Pillow

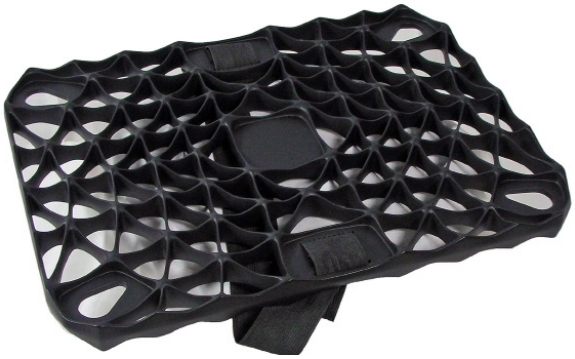
>The design was transferred seamlessly from a polygonal model to production-ready NURBS surfaces.

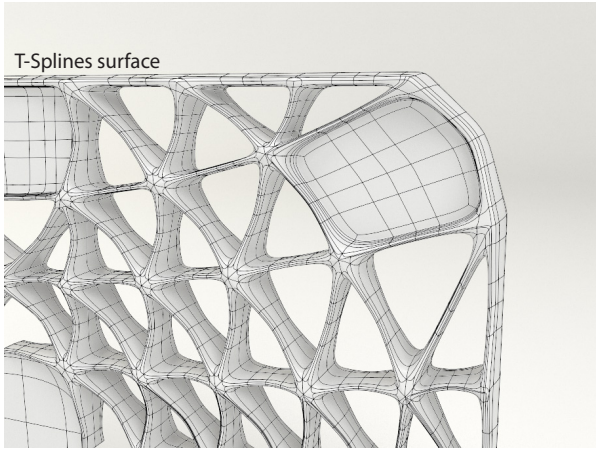
Company:	Collins Machine & Tool Co. , Inc
Industry:	Product Design & Development
Headquarters:	Madison, TN
Webpage:	www.pcpillow.com

Collins Machine & Tool Co. provides advanced manufacturing capabilities to customers worldwide and designs and markets its own branded consumer products.

"T-Splines allows us to go directly from our design concepts created in a polygonal/sub-d modeler to a production-ready NURBS surface model quickly and without any compromises in aesthetics or quality."

Jeff Rutan, Product Design & Development Engineer





The challenge

The Collins product development team regularly comes up with innovative product ideas to bring to market. In their words, "Our goal is to create new products that make you smile." One of their newest inventions is the PC Pillow, pictured at left. Its shape is designed to provide superior natural passive thermal circulation to the bottom of a laptop computer—even when it is resting on a sofa, pillow or carpet.

The PC Pillow is a rigid structure but has a slightly soft surface to grip the bottom of a laptop computer. "We believe the attractive organic appearance of the PC Pillow—along with its functional properties—will make it a hit product that we hope to get into production and sales channels very soon," stated Jeff Rutan, Product Design & Development Engineer.

The original idea for the pillow was a simple rectangular matrix mesh. Over several iterations this design evolved and was curved and sculpted into a unique, organic, spider web-like shape. All the conceptual modeling was done in a polygonal/subdivision surfacing application, which allowed quick and easy development of different organic shapes. The problem was that these polygonal models could not be converted to a manufacturable surface model that could be used in a CAM application to generate the production tooling.

© 2008 by T-Splines, Inc. and Collins Machine & Tool Co. , Inc.

In the past, the design team delivered an assortment of images and polygonal mesh files from sub-d models as reference to potential manufacturers, who would rebuild the final CAD models from scratch and add details as needed to optimize the production process.

As the designs became more complex, the designers at Collins assumed more of the responsibility for the details, and the design process became more time consuming. In the case of the PC Pillow, when they arrived at the final design concept, the manufacturer was not able to rebuild the complex concept into a manufacturable, NURBS-based CAD model.

The solution

After multiple CAD experts had failed to produce an acceptable NURBS model for the final PC Pillow design, Jeff Rutan turned to T-Splines for help. The unique T-Splines capability to bridge the gap between polygonal modeling and NURBS surfaces provided the solution. Without making any compromises to the unique organic shape of the PC Pillow design, T-Splines was able to convert the model to a gap-free, smooth and manufacturable NURBS surface model. With this NURBS model the manufacturer was quickly able to make the production tooling.

Using T-Splines and Rhino as the design tools, Collins Machine was able to realize their design as intended and completely eliminate the tedious and error prone CAD model rebuilds required with their previous design process.

Future direction

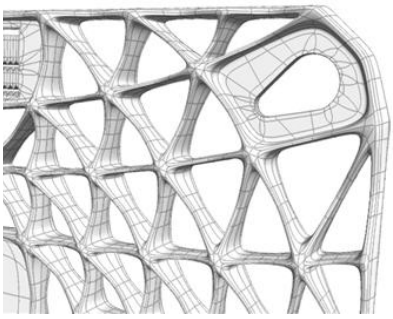
Based on this successful PC Pillow project, Jeff will be using Rhino and the T-splines plugin on future projects, and the applications are now critical components in the toolset for product development at Collins Machine & Tool Co.

Learn more

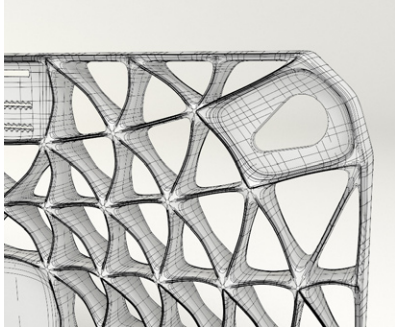
To learn more about T-Splines and how it will help accelerate and improve your design process, please visit www.tsplines.com.

To learn more about Rhino, please visit www.rhino3d.com.

Finished product



Original subdivision surface model



Production NURBS surface (via T-Splines)

Mold tooling

T•Splines