

Case Study: Gearing Solutions, Inc.

Reducing 3 Weeks of Design to 10 Minutes

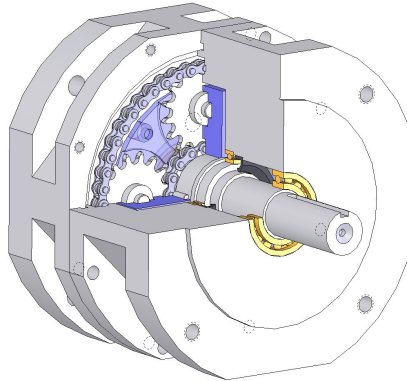
Gearing Solutions, Inc.

"We faced a choice of whether to manufacture a standard product line or enter the custom engineering market. Automating our design process using the Assembly Generator and Design Explorer from Genus Software freed enough engineering resources to pursue both."

*– Theodore Radisek
Engineering Manager
Gearing Solutions, Inc.*

Situation

Gearing Solutions, Inc., a manufacturer of planetary gearboxes using a proprietary "roller gear" design, is a small company with a big idea.



Most large suppliers of gearboxes manufactured standard products in volume. Many outsourced manufacturing to China. Gearing Solutions wanted to take on the big guys and win.

To compete, they had to do things differently. They chose to engineer their products to order and to deliver them in a timeframe similar to that of off-the-shelf drive trains.

Their plan:

- Use their "roller gear" technology to produce a better product.
- Automate their engineering design.

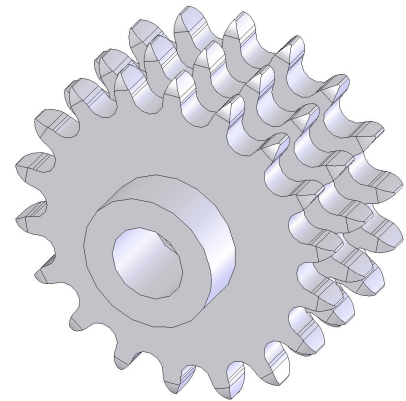


Significant Challenges

Gearing Solutions' proprietary technology gave their products a cost, weight and size advantage, but to automate, they had some serious issues to face:

- There are many ways to achieve a target reduction ratio.
- Customers have specific constraints on space, interface, power and torque.
- Product use dictates differing safety and lifecycle requirements.
- Products need to satisfy design constraints over a large range of variables including tooth strength, drive pin sizing, bearing selection, and manufacturability.
- Important trade-offs need to be made between valid alternatives including: drive train pitch, overall dimensions, number of planets and manufacturing complexity.

In spite of a three week design cycle, Gearing needed to turn around quotes **in a single day!**



Solution

Gearing Solutions initiated the Drive Train Automation Program (DTAP) to fully automate the design of a gearbox. This program turns a customer specification into a complete solution, including a 3D SolidWorks model, drawings and reports.

Problem

- compete with big manufacturers
- produce semi-custom designs
- quote same day
- deliver product in a short timeframe



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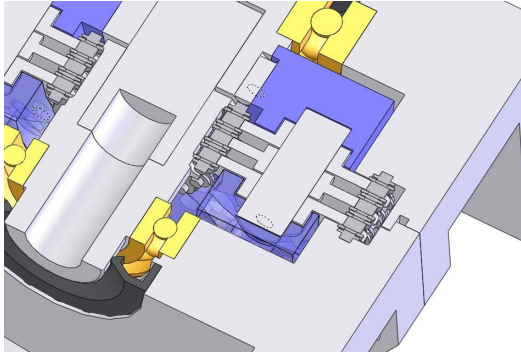
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*Designs when you need them... **Fast!***



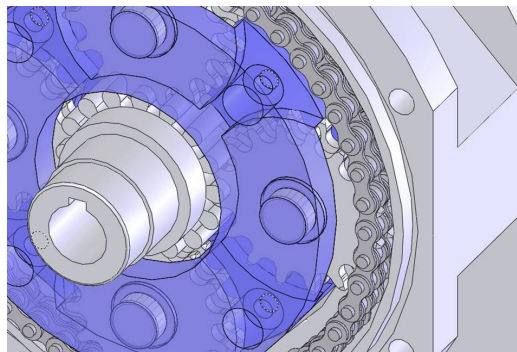
Gearing Solutions chose Genus' design automation products to create their DTAP program. The Genus Assembly Generator and Design Explorer are uniquely suited to address the kinds of issues Gearing Solutions faced.



The **Genus Assembly Generator for SolidWorks** allows DTAP to generate the entire spectrum of design variations required by Gearing Solutions' product line.

Since Gearing Solutions wanted to examine design alternatives and make engineering trade-offs, they needed the additional power of the **Genus Design Explorer for SolidWorks**.

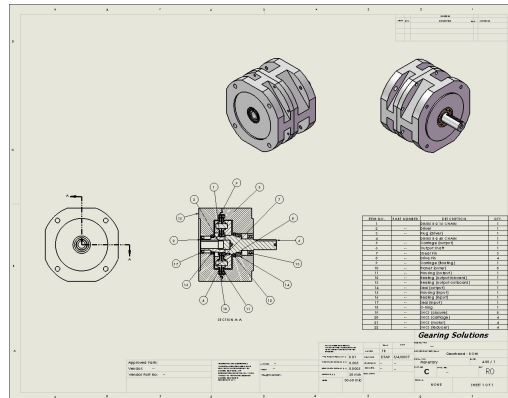
The DTAP application uses the Design Explorer (a product unique in the industry) to systematically explore a design space of approximately 1.5 million gearbox possibilities. The exploration typically yields a dozen or two valid gearbox designs called scenarios.



The DTAP program's specific scoring rules are applied to the resulting scenarios. This ranks them and tells the design engineer which design is best according to the pre-established rules. Since any of the alternatives represents a valid design, the engineer can apply his judgment to the specific situation and select any design he deems best.

The selected scenario is seamlessly passed to the Genus Assembly Generator for rendering in SolidWorks®. Drawings and reports are also generated automatically.

With design time reduced to about 10 minutes, a quote can be turned around the same day. Gearing Solutions is now in a position to respond to every request for quote it receives.



Genus Software provides engineers with design productivity tools that help them create and produce better designs faster.

Created for companies that design and manufacture engineered-to-order (ETO) products, our tools are packaged as reasonably priced add-ins to SolidWorks®.

These easy-to-use productivity tools should be on every design engineer's workstation.

About Gearing Solutions, Inc.

Gearing Solutions manufactures standard and custom NEMA gearheads using roller gear technology in a planetary system along with special products for other industries who want to capitalize on the cost-effective use of this technology.

Gearing Solutions has an advanced development team along with total manufacturing resources to help serve its customers.

For more information, visit Gearing Solution, Inc's web site at <http://www.gearingsolutions.com>

Customer Expectations:

- Eliminate the engineering bottleneck
- Insure manufacturability
- Support manufacturing
- Turn around quotes fast

*When fast designs are not enough... **Best!***

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