



Case Study: Product Design & Finite Element Analysis

Client: Champion Specialty Products, Springfield, OHIO

Champion Specialty Products specializes in the design, development, testing and manufacture of hermetically sealed, climate controlled, shock absorbing shipping and storage containers for both military and commercial applications.

The Challenge:

Champion could not meet the new Unigraphics and FEA requirements because they lacked the required modeling and FEA software.

BACKGROUND:

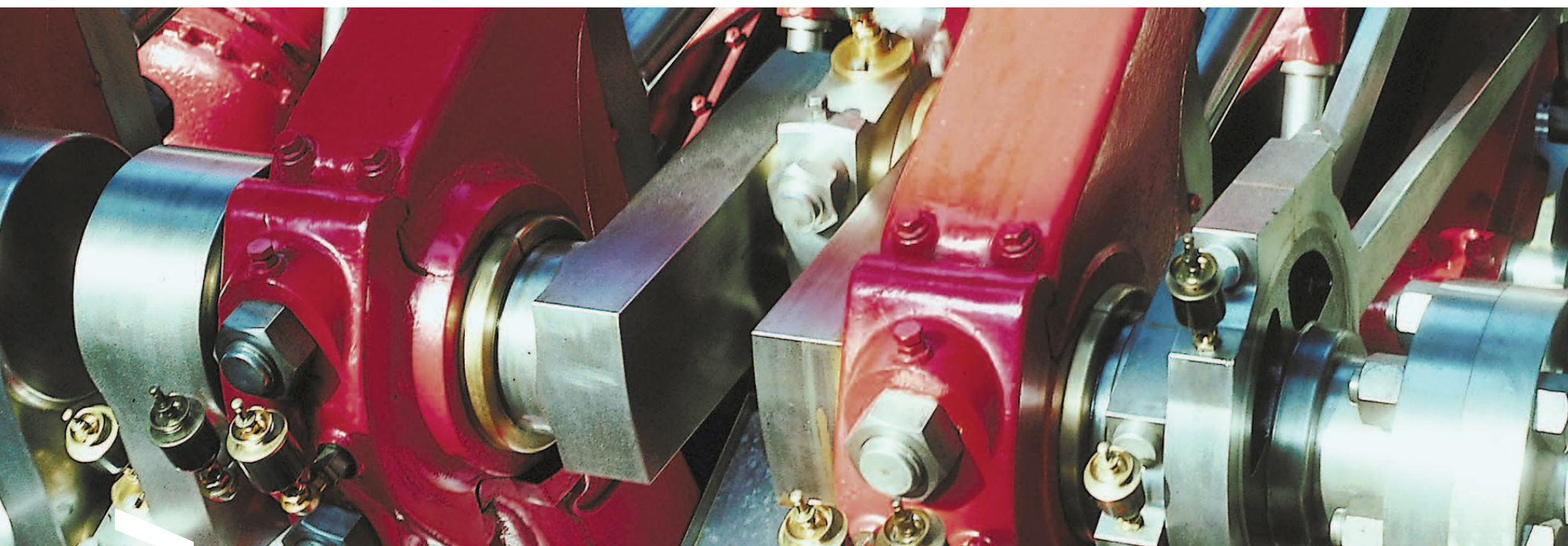
Champion required a new container that would carry a LPT (Low Pressure Turbine) module for a Pratt & Whitney turbine engine. As part of the manufacturing specifications the container had to be modeled in Unigraphics NX2 and have FEA (Finite Element Analysis) performed to ensure that the container could meet the specifications and withstand the rigorous testing required to ensure that the engine component would arrive undamaged. The specifications included side impact, dropping, pressurization, hoisting and stacking.

THE THINKPATH SOLUTION:

Thinkpath designers worked with Champion's engineering group to convert their existing AutoCAD drawings into 3D Unigraphics models, while concurrently our engineers created an FEA model to ensure the design would meet the new standards. When Thinkpath engineers found areas that were in need of improvement they worked jointly with Champion's engineering group to ensure the changes were properly executed.

THE RESULTS:

By utilizing Thinkpath expertise and engineering resources, Champion was able to meet the standards required for the new product without purchasing additional software, and without the loss of productivity associated with training personnel in the new applications.



ENGINEERING & DESIGN SERVICES
Including: Design, Detailing, Reverse Engineering and Finite Element Analysis

> Engineering & Design Services

Thinkpath - When You Insist on a Professional

Our design services can cover every facet of your design, detailing and drafting needs, from concept to rapid prototyping to a complete turnkey package.

Thinkpath's senior level engineers and designers have extensive industry expertise and state-of-the-art technical capabilities to embrace every aspect of your project.

We have provided Engineering Design Services to thousands of customers in virtually every type of engineering project from aerospace and automobile tooling to printing equipment, and have designed almost anything you can imagine, from complex automated assembly lines to children's toys, from aircraft controls to hip replacements. As a result, we have developed the technical skill base and management structure to provide expert design engineering for programs of any size.

Expert Staff & Advanced Tools Means Excellent Results

To effectively deliver our engineering and design services, we combine the expertise of our staff with the best in hardware and software. Many of our professionals have more than 10,000 hours experience with the most up-to-date programs, including the latest releases of the most advanced parametric solid modeling software.

We Specialize in Design for Many Industries Including:

- Automotive
- Aerospace
- Material Handling
- Automation Equipment
- Military Defense Systems and Equipment
- Medical
- Health Care
- Construction Equipment
- Power Generation and Distribution

Our Services

Thinkpath offers a full menu of design services. We can quickly respond to your needs by using our experienced staff in multiple shift operations. Here are just a few of the many services we offer:

- Conceptual Design
- Layouts
- Form Fit and Function Analysis
- Detailing including Geometric Dimensioning and Tolerancing (GD&T)
- Rapid Prototyping
- Reverse Engineering
- Finite Element Analysis (FEA)

Providing The Full Spectrum of Engineering & Design Services

Conceptual Design Through Rapid Prototyping

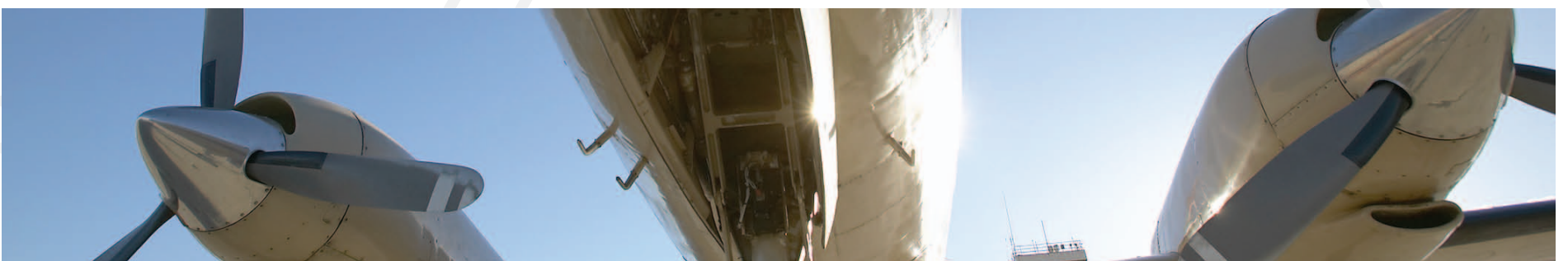
With countless hours of experience in conceptual design, form fit and function analysis, layouts as well as the creation of manufacturing prints, Thinkpath's designers can take your project through every phase of the design cycle. You may have already developed the concept and are interested in Thinkpath's ability to take the design the rest of the way through the engineering process. Our unique structure provides the flexibility to offer a turnkey service as well as the option of picking and choosing only the services you need. Thinkpath's design team is well versed in many of the leading "high-end" parametric CAD programs and is capable of creating models that can be "directly" utilized in the manufacturing process.

Thinkpath's strength lies in decreasing your design cycle time allowing you to complete your project on time and under budget.

Reverse Engineering

Companies sometimes create prototypes to assist their R&D department to review the look and feel of new designs prior to manufacturing. Other times, they manufacture parts but do not have the associated manufacturing prints. In both cases, Thinkpath's design team can provide a cost effective solution.

By employing state-of-the-art Coordinate Measuring Machines (CMM) and/or Optical Scanners, Thinkpath's design team is able to generate parametric solid models of existing piece parts, assemblies and prototypes. Once this task is completed, a variety of engineering functions can be performed to assist in the finalization of the design to include finite element analysis, form fit and function analysis, and the creation of complete manufacturing prints. Thinkpath's team has successfully provided reverse-engineering solutions on a variety of products from ground effects packages for the automotive industry to television sets.



Finite Element Analysis

With over 20 years of experience in the Finite Element Analysis (FEA) field, Thinkpath engineers pride themselves on producing the highest quality analyses with unparalleled accuracy and speed. We use the latest tools in Computer-Aided Engineering & Design, and there is no FEA project that our engineers cannot handle.

We assign our most senior staff to FEA work. They have advanced degrees in engineering, vast experience in engineering design and analysis, and have proven time and time again that they are the best in the industry. Thinkpath's team of FEA experts can provide a wide array of analysis services to include:

- Linear & Non-Linear Structural
- Linear & Non-Linear Thermal
- NVH (Noise, Vibration and Harshness)
- Durability
- Process Refinement
- Forensic Engineering

You Can Count On Thinkpath

Our engineers, designers and FEA experts are the best in the industry – and have received quality process awards from many Fortune 500 companies. We have the necessary skills, experience and software capabilities to meet all your performance requirements, budget, and deadline – no matter how demanding the project.