



CUSTOMER:
Composite Optics, Inc. (COI)

INDUSTRY:
Aerospace

PROJECT NAME:
Composite Reflector Structural Analysis

CUSTOMER LOCATION:
San Diego, California

OVERVIEW

Composite Optics, Incorporated (COI) is a provider of advanced composite products for the space and aerospace markets. With over 23 years of space flight heritage in the design, manufacture and test of successful programs for customers around the globe, COI is recognized as a world leader.

One of COI's core businesses is large, shaped reflector assemblies for the telecommunications industry. Typically, COI is responsible for their design, analysis, and fabrication. The shaped reflectors are geometrically complex, high accuracy surfaces. The composite materials used for the assembly offers light weight, high stiffness and tailorable coefficient of thermal expansion (CTE) characteristics. Since 2000, ATA has augmented COI's internal staff by providing analysis support on a wide variety of composite reflector programs.

ATA SUPPORT INCLUDED:

- ▷ Developed coarse finite element models (FEMs) of design concepts and performed feasibility studies to assess their performance early in the program.
- ▷ Constructed detailed reflector FEMs as the design evolved and performed static, dynamic, thermal distortion, and acoustic analyses per the design specification.
- ▷ Assessed overall structural stresses, detailed stresses at fittings, edge bond loads, lap bond interfaces, and bolted joints.
- ▷ Developed custom software code to automate repetitive tasks and increase the overall project efficiency.
- ▷ Iteratively performed analyses, calculated margins of safety, and made design recommendations to achieve positive margins.
- ▷ Reduced reflector weight by optimizing rib configurations and fitting designs.

