

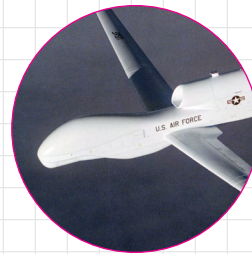
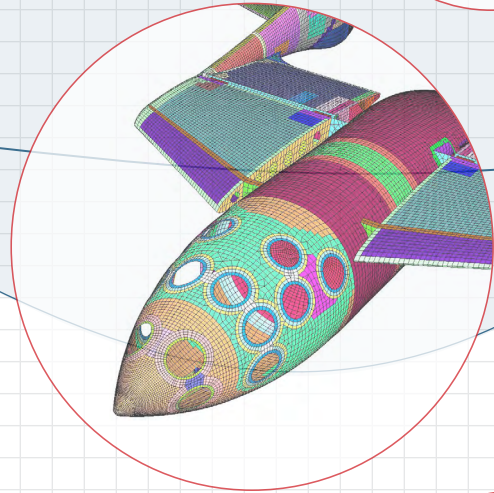
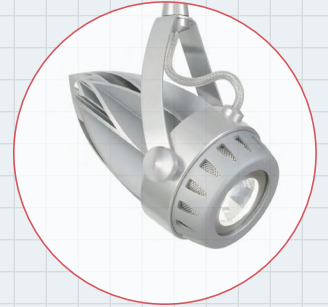
Quartus Engineering specializes in the design and analysis of mechanical systems using computer-aided technologies. Our staff of over 70 employees is committed to serving the needs of our customers in a timely and cost effective manner.

The primary industries we serve are Aerospace, Consumer Products, Medical, Opto-Mechanical and Entertainment.

**INNOVATIVE**

**ACCURATE**

**EFFICIENT**



## DESIGN

Understanding product requirements and providing quick, cost effective solutions are strengths of Quartus. Whether your project is just starting with a napkin sketch and you need a working prototype or your demanding schedule requires a few extra hands, Quartus can make your product a reality.

Quartus design expertise covers multiple industries and categories including the following:

- Product Design
- Consumer Electronics
- Plastic Molded Parts
- Advanced Surface Design
- Medical Devices
- Opto-Mechanics
- Tooling
- Composites
- Flight Hardware
- Classified Programs
- Documentation

## ANALYZE

Quartus prides itself on being able to analyze your product or flight vehicle in a very efficient manner with accurate results. Our engineers have extensive experience in performing a wide range of structural, thermal, and multidisciplinary analyses including:

### STRUCTURAL ANALYSIS

Static, detailed stress, normal modes, and buckling analysis  
 Transient response analysis (shock, drop test)  
 Frequency response and random response analysis (vibration)

### ACOUSTIC ANALYSIS

Random vibration and launch vehicle acoustics  
 Pre-Test analysis for ground vibration testing

### THERMAL ANALYSIS

Steady state and transient, including radiation and convection  
 Electronic system cooling

### AEROELASTIC ANALYSIS

Flutter and divergence  
 Subsonic, supersonic, and hypersonic regimes

### COMPOSITES STRUCTURAL OPTIMIZATION

Minimize weight or maximize stiffness  
 Stress, deflection, frequency, buckling, and gauge limits  
 Laminates and sandwich construction in uni-tape and fabric  
 Optimization of laminate thickness and ply orientation

### COMPUTATIONAL FLUID DYNAMICS

Internal and external flow domains including compressibility effects

## PROTOTYPE

Quartus utilizes advanced manufacturing technologies to provide high value, quality service and committed delivery to our customers in the industries we serve. We partner with companies to provide service along with exceptional design intent execution. Quartus has a 1500 square foot prototyping shop to help you bring your designs to reality. Whether a single prototype is required for concept verification or one hundred are needed for small scale production, we have the experience and the knowledge to bring any concept to life.

### PROTOTYPING CAPABILITIES

Quartus' combination of extensive experience, solid engineering fundamentals, and manufacturing equipment allow us to fabricate parts for your design needs. Some of our capabilities include:

- Composite Wet Lay-up
- 4-Axis Mill
- Lathe
- CNC Table Router
- Foam Cutter

### OUTSOURCED PROTOTYPING

- Rapid prototyping (SLA, SLS)
- High-Precision Machining
- Wire EDM
- Sheet Metal

### INTEGRATE GLOBAL RESOURCES

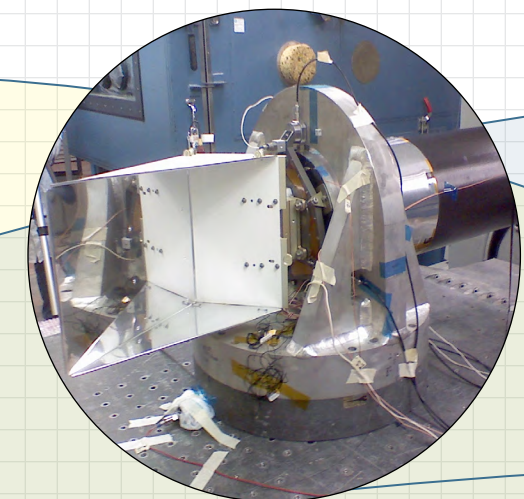
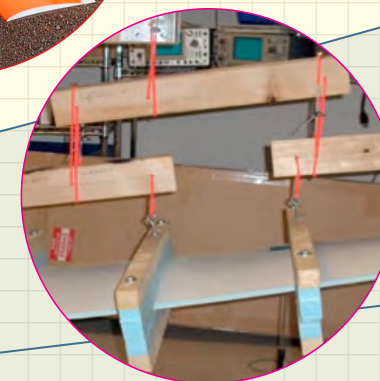
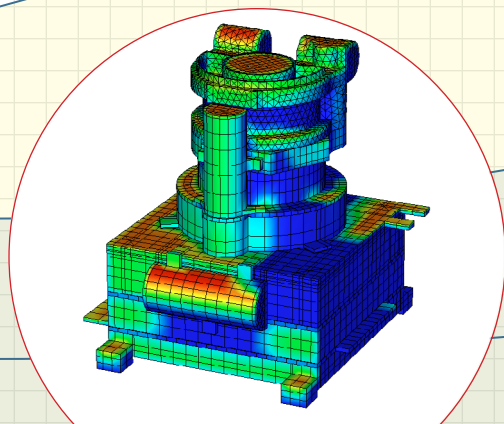
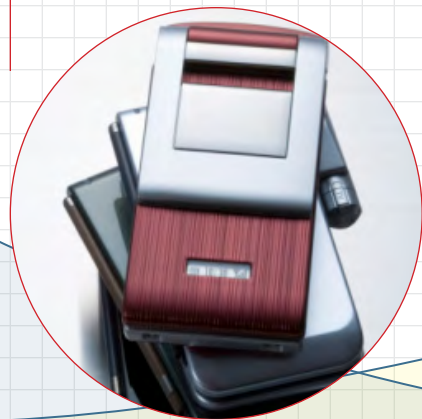
Complicated assemblies often require parts from many different vendors. Quartus can coordinate and supervise the integration of multiple vendors by interfacing with manufacturers on a local, national and global level.

## TEST

Finite Element Analysis methods are fundamental in today's engineering world, playing an ever increasing role in the design of mechanical structures. The testing of physical structures plays an equally important role in design by measuring and quantifying a structure's behavior.

Quartus leverages its cross-disciplinary experience in design, analysis, and testing methods to deliver solutions to a wide variety of problems. Quartus can develop and perform all aspects of your test, or we can augment your staff to help with test setup, data acquisition, data processing, or model correlation. We offer expertise in the following areas:

- Static Load Testing
- Operational Testing
- Modal and Ground Vibration Testing
- Shock, Impact, and Drop Testing
- Pre-Test Analysis
- Post-Test FEM Correlation



## ENGINEERING TOOLS

Quartus supports a wide variety of the leading CAD and CAE programs:

### DESIGN

I-DEAS  
Unigraphics NX  
Pro/ENGINEER  
CATIA V4 and V5  
SolidWorks  
Inventor  
AutoCAD  
Teamcenter PDM  
Workgroup PDM

### ANALYSIS

Solvers  
MSC.NASTRAN  
NX NASTRAN  
ABAQUS  
LS-Dyna  
Zona ZAERO  
Optistruct  
Solidworks Simulation  
  
Pre and Post  
I-DEAS  
FEMAP  
HyperMesh  
Patran

### SPECIALTY

Matlab  
MathCAD  
NASGRO  
CompositePRO  
Zemax (Optical Design  
and Analysis)  
I-deas ESC & TMG  
Quartus CLAS  
Star-CCM+  
Thermal Desktop

### TEST

LabView  
Matlab  
LMS Test.Lab

## FACILITIES

Quartus has engineering facilities in San Diego CA, Los Angeles CA, and Washington DC. The San Diego office includes multiple secure rooms for sensitive projects plus a laboratory for systems integration. Quartus also has a prototype development and testing laboratory located near the San Diego office. This facility includes equipment for prototype construction and provides space for structural testing of large hardware.

Please contact us or visit our website for additional information.

## CONTACT

San Diego Headquarters

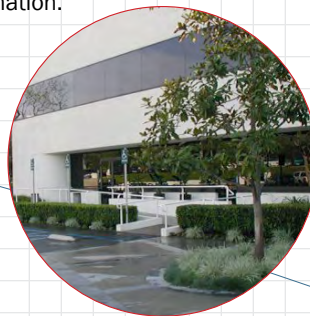
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