

# SERVICES FOR AEROSPACE

## TITANIUM & ALUMINUM STRUCTURES

- Static & Dynamic Mechanical Testing
- New Alloy & Process Development
- Additive Manufacturing Support
- Ambient & High Temp Mechanical Testing
  - Carbide & Chrome Wear Coatings

## CERAMICS

- TBC Coating Development & Qualification
- Application Specific Testing
  - High Temperature Erosion & Oxidation Testing

## POLYMER COMPONENTS

- Failure Analysis
- Processing Optimization
  - Compositional & Thermal Testing



## COMPOSITES

- Custom Component Testing
- Component Qualification
  - Surface Analysis & Problem Solving

## NICKEL SUPERALLOYS

- Ambient & High Temperature Mechanical Testing
- New Alloy & Process Development
  - Gleeble Testing & Digital Image Correlation (DIC)

## ADDITIVE MANUFACTURING SUPPORT

Additive manufacturing offers a wide range of benefits and opportunities for the aerospace sector, but is not without its challenges. At Lucideon we help you navigate the obstacles of component testing and validation, materials and process development, failure analysis and third party benchmarking, to develop an AM product that is fit for purpose.

## STATIC & DYNAMIC MECHANICAL TESTING

To ensure your aerospace components are fit for purpose over the lifetime of the implant, our experts can carry out a range of extensive physical and mechanical testing to ensure materials and designs produce safe and robust components and products. We conform to a range of ASTM and ISO standards, but also offer design and development of novel fixtures and frame modifications to accommodate complex designs.

## FAILURE ANALYSIS

Lucideon performs extensive testing to predict and reduce failure risks in application. We can also perform root cause identification of failures should the failure have occurred in application, as well as recommending corrective actions. Laser marking failures are commonly seen; we help you to understand the impact of the process on the material, and to optimize the conditions to prevent recurrence.

## AMBIENT & HIGH TEMPERATURE MECHANICAL TESTING

At Lucideon, we offer a wide range of ambient and elevated temperature mechanical testing including tensile, fracture toughness, and 3-point bending. Our experience and trained personnel enable us to provide not only test results but answers for when the unexpected occurs.

## GLEEBLE TESTING

The development of new high temperature and high strength alloys is at the core of enabling efficiencies in the aviation industry. These material advances are enabled through the use of thermal-mechanical simulations, such as Gleeble, which allow the characterization of properties such as hot ductility, flow stress and weldability. Lucideon is the only ISO 17025 compliant laboratory in North America to offer Gleeble testing on a toll basis. Working with our experienced staff can reduce the development and qualification cycles required to move products from R&D into production.

## DIGITAL IMAGE CORRELATION (DIC)

Failures of materials, especially complex components, are rarely as straightforward as a single number or a trend on a chart. When a more in-depth understanding is required of how a failure has occurred in a system, Digital Image Correlation (DIC) can be used to augment conventional mechanical and complex component testing by providing full surface strain mapping throughout loading and failure.

## SURFACE ANALYSIS & PROBLEM SOLVING

Even the largest problems may come down to something as small as a trace element or nano-scale feature. Lucideon's surface science team provides quantitative and qualitative surface analysis, producing scientific conclusions and support that's both visual and backed by detailed data and analysis.

## CORROSION ANALYSIS

Stability and safety are of the utmost importance for aerospace components, especially where multiple materials are used and the environment changes. At Lucideon, we offer expert materials selection and long and short-term performance testing to ensure that your products function without fear of excessive corrosion leading to failure. If corrosion does occur, we also help you to understand why, and make the necessary changes to your product design.