

Expertise in Turbine Component Evaluation



M+P Labs specializes in evaluating turbine related hardware for the power generation and aerospace industries. Fully equipped to characterize materials, perform specification testing, and determine root causes for failures, our expert analysts are available to help you at every stage of the material life cycle.

APPLICATIONS

Verify quality

- Raw materials
- Outsourced processes/treatments
- First piece qualification
- Production acceptance testing

New product development

- Fundamentally characterize new components/materials
- Failure analysis

Establish root causes of failures

- Identify causes of premature deterioration
- Assess liability for damages
- Define corrective actions

Reverse engineering

- Establish design basis for obsolete products or missing design records
- Acquire Parts Manufacturers Approval (PMA)

MATERIALS

- Superalloys (Co, Ni, Fe-based)
- Titanium alloys
- Stainless steel
- Steel alloys
- Ductile iron
- Cr-Mo-V
- Coatings
- Insulating materials
- Polymers
- Composites
- Lubricants

CAPABILITIES

Failure Analysis

- Fracture site initiation, Type I and Type II hot corrosion analysis, casting defects, coating failures, creep damage, thermal fatigue, fatigue

Metallography/Metallurgical Evaluation

- Expertise in casting, welding, brazing, thermal spray and heat-treatment processes
- Grain size, porosity, microstructure, microhardness, weld/braze evaluations

Mechanical Strength

- Tensile (RT/elevated), hardness, Charpy impact, adhesion testing for TBC systems, creep, stress relaxation, rupture

Chemical Analysis

- Fully-equipped wet lab for identification of material composition; alloys, coatings, diffusion profiles, particulates, residues, defects
- State-of-the-art instruments: SEM-EDS, ICP-OES, IC, FTIR, Electron Microprobe

Coating Characterizations

- Composition, uniformity, thickness
- Thermal barrier (TBC), HVOF, Plasma spray

Thermal Analysis

- Coefficient of Thermal Expansion (CTE)
- Glass transition temperature (T_g)
- Liquidus/solidus temperature

Specimen Preparation

- Sectioning, wire EDM, grinding, machining
- CNC lathe, mill and cylindrical grinder; additional surface grinding capabilities



All testing is performed in compliance with the quality requirements mandated by:

