

# OXIDATION TESTING OF HIGH-TEMPERATURE MATERIALS

Lucideon's Burner Rig Test Facility is used to evaluate the performance of gas turbine materials in an oxidizing environment. Small-scale samples of high-temperature coatings and substrates can be subjected to long-term exposures up to 2100°F, providing a cost-effective alternative to full-scale testing for materials screening and development.

## EQUIPMENT

The facility contains six independently-controlled test rigs, each comprised of a small natural gas fueled combustion system operating within the annulus of an electric tube furnace. The tube furnaces are configured in a dual-zone arrangement to provide precise control over the supplemental heat to maintain temperatures in the work zone where test samples are located.

Fuel and compressed air flow are metered independently on each rig. The facility is also equipped with a precision moisture injection system, which atomizes and pre-heats water vapor or other fluids for injection directly into the combustion zone.



## TEST SAMPLES

Test sample geometry is typically cylindrical pins, approximately 0.2 inches in diameter by 1 inch long. Each chamber holds 21 pins, providing a total testing capacity of 126 pins across all six rigs. Alternative sample geometries, such as disks, may also be considered, within the constraints of the test hardware.



## CONTROL & DATA ACQUISITION

A data acquisition system, with remote monitoring capability, provides continuous recording of work zone temperatures and other operating parameters. Remote access is also available for clients. The control and protection system helps prevent thermal excursions on the test samples, as well as provides protection for personnel and equipment. In the event of an alarm condition, system-generated e-mail notifications are sent to test personnel during off-shift periods, which ensures timely response to maximize testing up-time.

## POST-TEST EVALUATION

Lucideon also offers complete metallographic preparation and metallurgical evaluation services for post-test analysis of coating and substrate performance.

## EXPERTISE IN METALLIC MATERIALS

Our expertise in metallic materials encompasses analysis of corrosion, erosion, wear, fatigue, heat treatment, castings, coatings and surface treatments, powder metallurgy, welding, brazing, component design, and the analysis of contamination.

## QUALITY ASSURANCE

Lucideon's comprehensive quality assurance program is in compliance with ISO 17025, Nadcap (aerospace and defense) and 10CFR50 Appendix B (nuclear). These rigorous requirements are applied to every job we perform, regardless of whether it requires conformance to any of these accreditations.

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



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Materials Development • Testing • Assurance