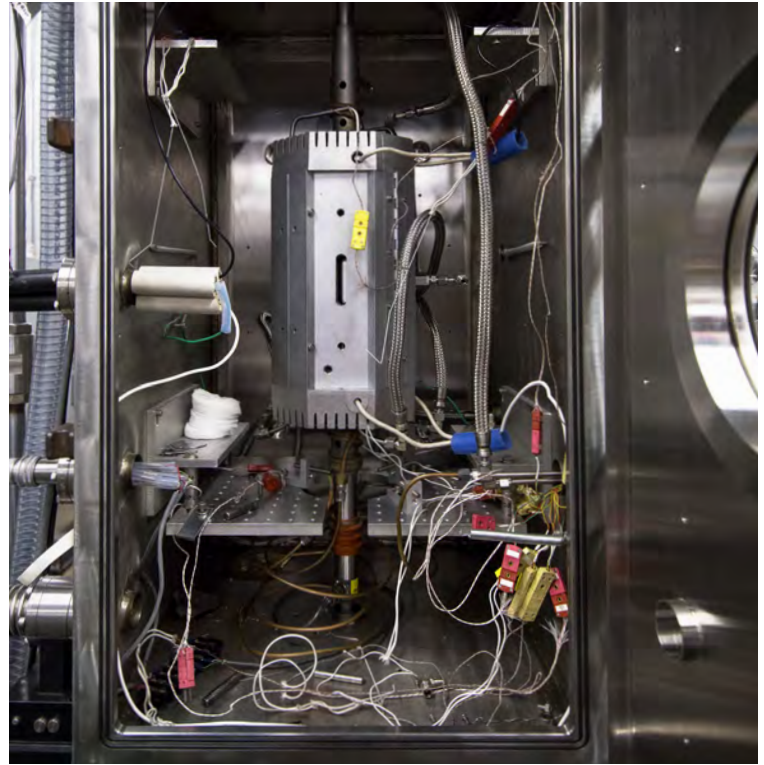
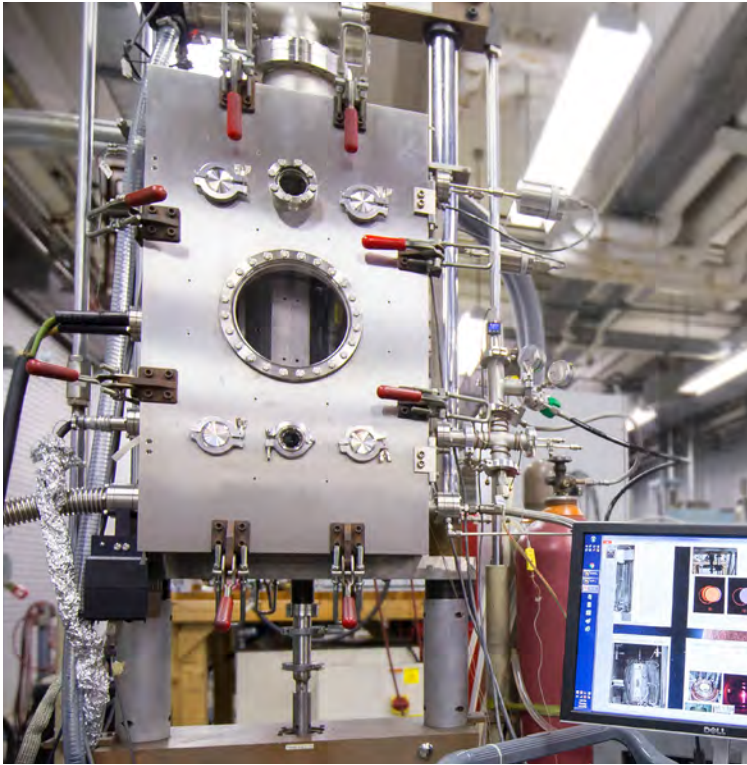




Variable Atmosphere Temperature Pressure Facility

ENGINEERING



Southern Research's Variable Atmosphere Temperature and Pressure (VATP) Facility was built for evaluation of hypersonic vehicle leading-edge materials via mission performance tests in realistic service environments, such as variable temperature, atmosphere, pressure, and load.

■ **Intended Applications**

- Oxidation exposure of CMCs to as high as 4000 °F (2204 °C) in partial pressures of pure, dry air as low as 10⁻⁵ Torr with automated, digital control of pressure and temperature.
- Re-entry leading-edge temperature/pressure mission simulation
- Mechanical tests in vacuum and low-pressure air including tensile creep

■ **Capabilities in Air via Induction Heating**

1. Zirconia: 4200 °F, 50–760 Torr
Heating rate: as high as 3 °F/sec

2. Iridium: 4000 °F, 10⁻⁵–50 Torr
Heating rate: as high as 10 °F/sec

■ **Other Capabilities**

1. Quartz Lamp: 2600-3000 °F, 10⁻⁵ Torr
Heating rate: as high as 10-30 °F/sec
2. Iridium: 4000 °F, 10⁻⁵ Torr
Tensile hardware in development

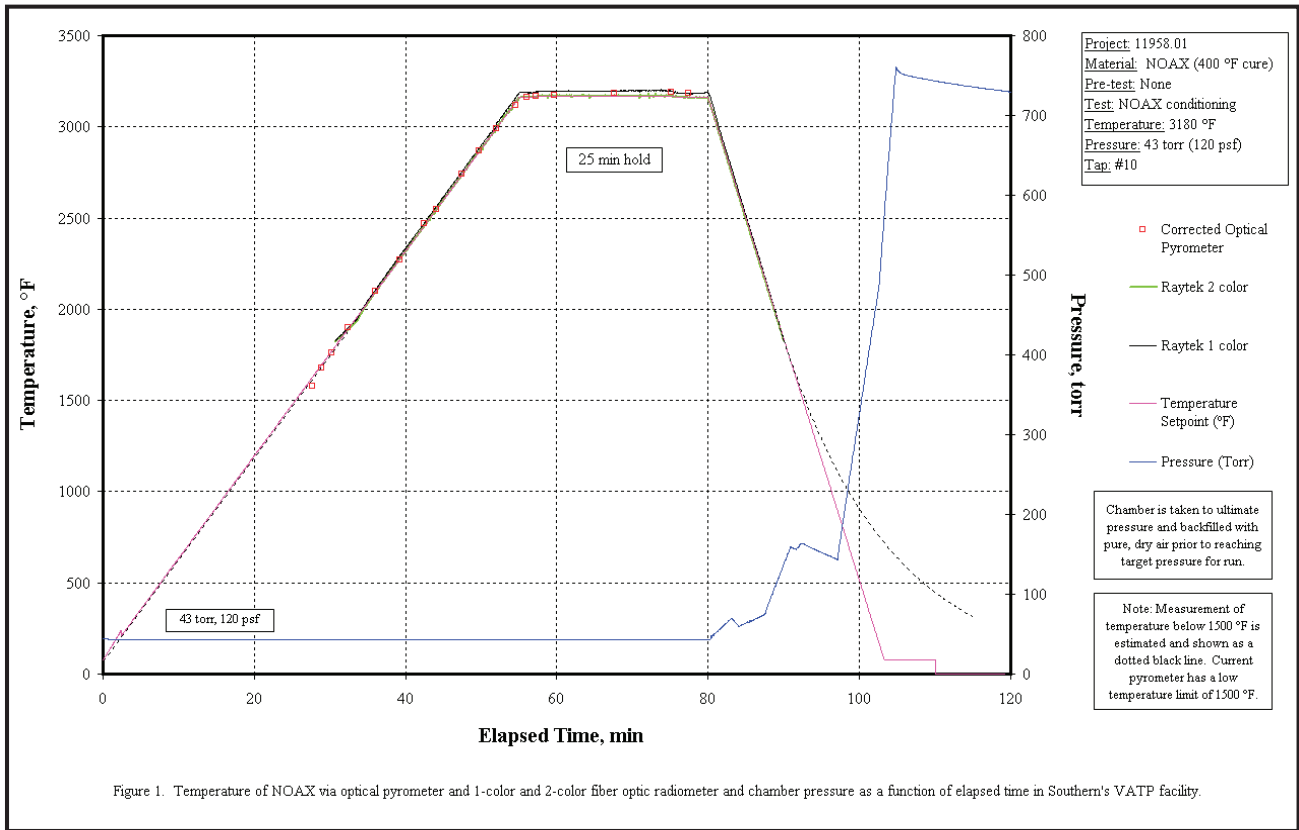
■ **Future Capabilities**

Cryogenic testing to as low as 20 K with a cryo-cooler; utilization of Digital Image Correlation and other non-contact strain methods. Elevated temperature refractory metal hardware to conduct mechanical tests in vacuum above 2600 °F



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ABOUT SOUTHERN RESEARCH

Founded in 1941 in Birmingham, Alabama, Southern Research is a scientific and engineering research organization that conducts preclinical drug discovery and development, advanced engineering research in materials and systems development, and energy and environmental technologies research. SR supports clients and partners in the pharmaceutical, biotechnology, defense, aerospace, environmental, and energy industries.

We pursue entrepreneurial and collaborative initiatives to develop and maintain a pipeline of intellectual property and innovative technologies that contribute to the growth of the organization and positively impact real world problems.