

Durability testing in high temperature industrial ovens

[Science](#)



High temperature durability testing is used to assess the potential service life of a component engineered for harsh operating conditions. A durability test is typically used to measure the physical integrity of a material in response to one or more forms of thermodynamic stress, from continuous agitation to elevated temperatures. Gaskets for the mating surface areas in heavy machinery must be characterized as a function of their resistance to wearing via abrasion, for example. Products that are subject to multiple forms of stress simultaneously throughout their lifetime must be measured for durability through more dynamic testing. Such dynamic durability testing is routinely carried out using specialized high temperature industrial ovens, which can accommodate additional measuring components like electrodynamic shakers. This arrangement allows a material under test to be agitated under elevated thermal conditions to measure its resistance to thermodynamic strain. Durability tests of this caliber are often applied in research and development of mechanical parts in the automotive sector. It is uniquely suited to forecasting the design lifetimes of mechanical components and for predictive maintenance in industrial sectors. It can also be used to assess the reparability of a product by measuring the maximum stress levels before the product undergoes irreversible deformation.

High Temperature Industrial Ovens for Durability Testing

Synchronous measurement of a material's resistance to high temperatures and strain can be carried out using a LAB-TEMPTM high temperature industrial oven that has been retrofitted to enable agitation and measurement of the material under test. Internal probes can evaluate the deformation of a test object, or load cells can be attached to the object via

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one or both ends of a split tube high temperature industrial oven. These data acquisition systems are used to record temperature-dependent data sets and provide an accurate picture of the material's stability as a function of temperature and time. Vibration may be sustained as a constant or automatically set to increase in increments as the experiment progresses.

Applications of Durability Testing

Durability testing in high temperature industrial ovens is a specialized process that is typically reserved for mechanical components. The most common commercial application of heated durability testing is for automotive components, particularly for exhaust components that are attached to the undercarriage of a vehicle. These are subject to some of the most severe thermodynamic conditions in auto-engineering and are integral to the long-term performance of the product.

High Temperature Laboratory Ovens from Thermcraft

Thermcraft specializes in the development of novel heat treatment components for industrial, commercial, and academic applications. Our high temperature laboratory ovens are applicable for a range of fields including quality control (QC) and research and development. The LAB-TEMPTM range is uniquely suited for materials testing, with demonstrable success in the performance of creep, fatigue, compression, and durability testing.