



Technology Focus: Test & Measurement

⚙️ Simulator for Testing Spacecraft Separation Devices

Marshall Space Flight Center, Alabama

A report describes the main features of a system for testing pyrotechnic and mechanical devices used to separate spacecraft and modules of spacecraft during flight. The system includes a spacecraft simulator [also denoted a large mobility base (LMB)] equipped with air thrusters, sensors, and data-acquisition equipment. The spacecraft simulator floats on air bearings over an epoxy-covered concrete floor. This free-flotation arrangement enables simulation of motion in outer

space in three degrees of freedom: translation along two orthogonal horizontal axes and rotation about a vertical axis. The system also includes a static stand. In one application, the system was used to test a bolt-retraction system (BRS) intended for separation of the lifting-body and deorbit-propulsion stages of the X-38 spacecraft. The LMB was connected via the BRS to the static stand, then pyrotechnic devices that actuate the BRS were fired. The separation distance and

acceleration were measured. The report cites a document, not yet published at the time of reporting the information for this article, that is said to present additional detailed information.

This work was done by Nick Johnston, Joe Gaines, and Tom Bryan of Marshall Space Flight Center. For further information, contact Sammy Nabors, MSFC Commercialization Assistance Lead, at sammy.a.nabors@nasa.gov. Refer to MFS-31907.

⚙️ Apparatus for Hot Impact Testing of Material Specimens

It is not necessary to cool and reheat the furnace between tests.

John H. Glenn Research Center, Cleveland, Ohio

An apparatus for positioning and holding material specimens is a major subsystem of a system for impact testing of the specimens at temperatures up to 1,500 °C. This apparatus and the rest of the system are designed especially for

hot impact testing of advanced ceramics, composites, and coating materials.

The apparatus includes a retaining fixture on a rotating stage on a vertically movable cross support driven by a linear actuator. These components are located below

a furnace wherein the hot impact tests are performed (see Figure 1). In preparation for a test, a specimen is mounted on the retaining fixture, then the cross support is moved upward to raise the specimen, through an opening in the bottom of the

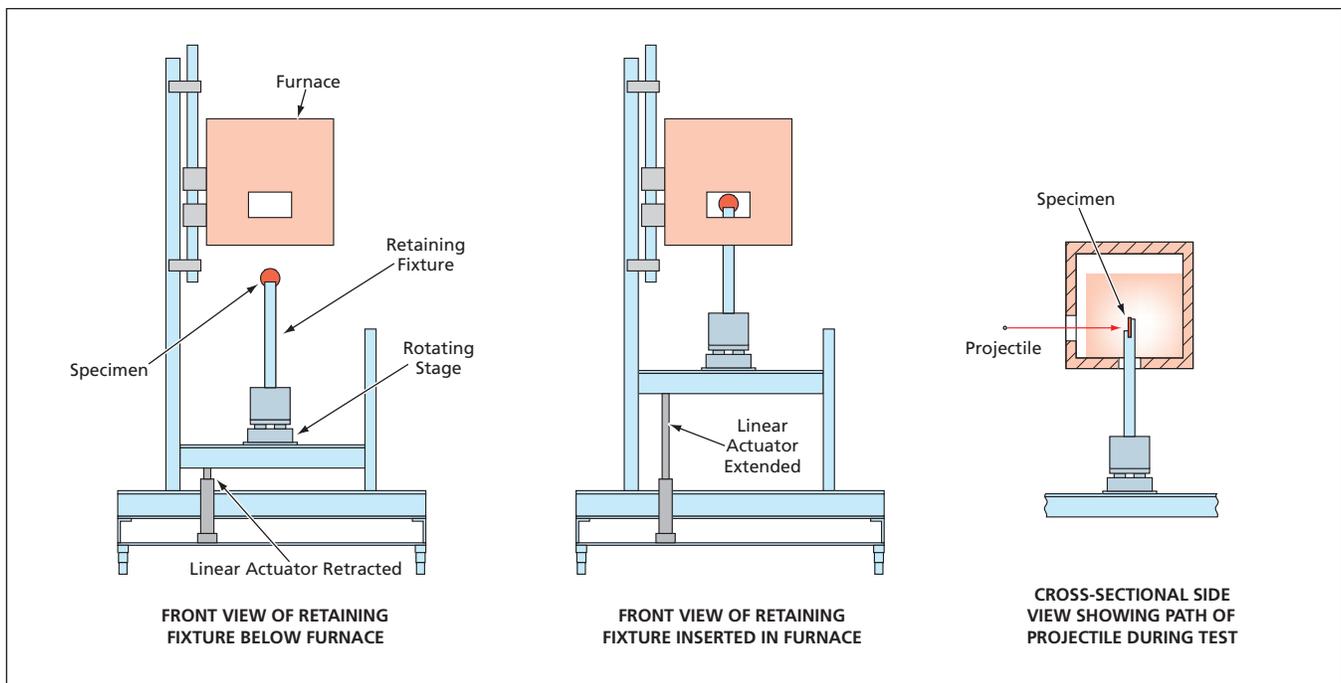


Figure 1. The Retaining Fixture and Specimen are raised into the furnace, wherein the specimen is heated and subjected to impact by a projectile.