

NASA TECH BRIEF

John F. Kennedy Space Center



NASA Tech Briefs announce new technology derived from the U.S. space program. They are issued to encourage commercial application. Tech Briefs are available on a subscription basis from the National Technical Information Service, Springfield, Virginia 22151. Requests for individual copies or questions relating to the Tech Brief program may be directed to the Technology Utilization Office, NASA, Code KT, Washington, D.C. 20546.

A Versatile Flammability Test Chamber

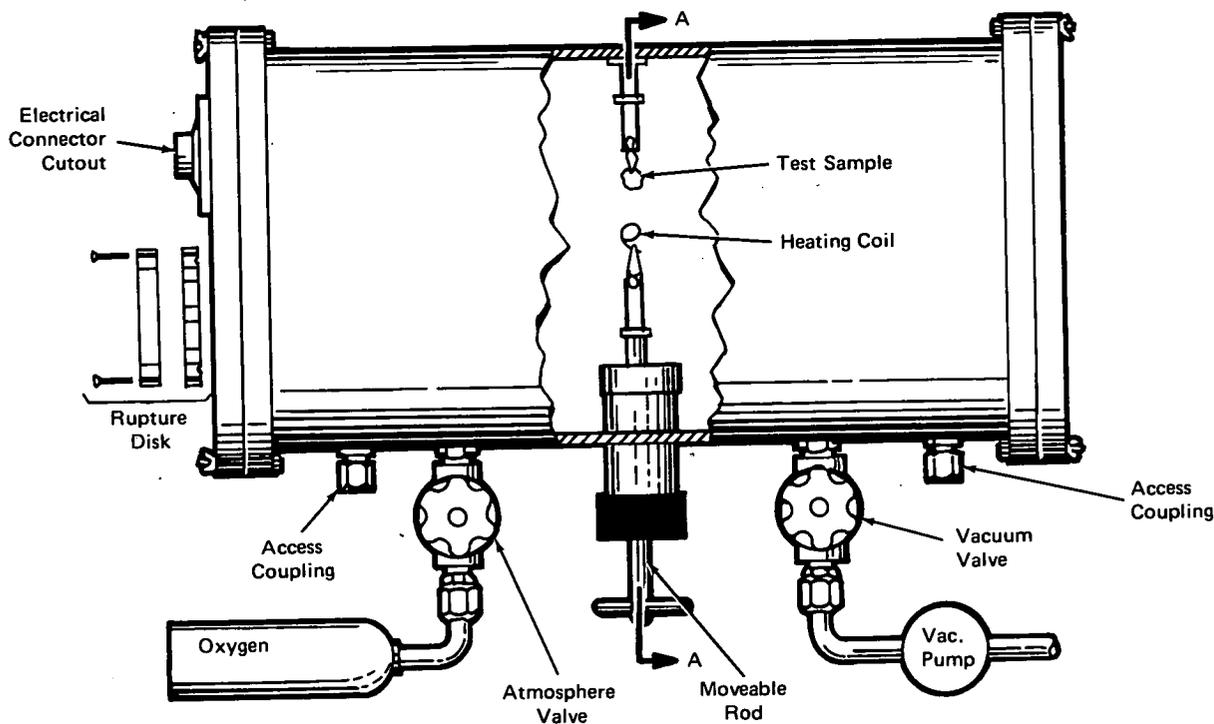


Figure 1 Flammability Test Chamber

The problem:

Most of us are aware of the potential danger of highly flammable clothes and other household and industrial materials. But few realize the difficulty in accurately determining the degree of flammability and the conditions under which a fabric or other material becomes a serious fire hazard. For a baby's pajamas or for an astronaut's shirt, the flammability test procedures are essentially the same. In order to economically determine the flammability of a material, the test apparatus should be indefinitely reusable, accommodate different types of test objects, allow all influencing

factors to be monitored, and to some degree, simulate the conditions under which the test object is used.

The solution:

A relatively inexpensive flammability test chamber is used to safely test the flammability of most materials while allowing constant observation of the test. The chamber can be used at various pressures, under a controlled atmosphere, and is equipped with probes to vary the distance from the heat source to the test object or to move it for observation from several different angles.

(continued overleaf).

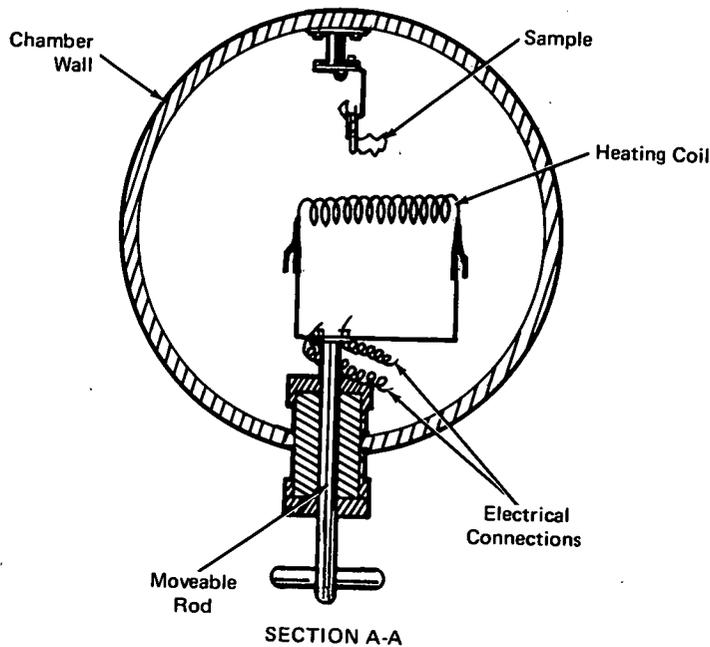


Figure 2. Side View of Test Fixtures

How it's done:

Figure 1 is a side view of the chamber. One end of the chamber has a transparent cover for viewing the test; the other end is covered with a plate assembly equipped with a pressure-relief rupture disk, a view port, and an electrical conductor for introducing energy or sparks into the chamber. A vacuum pump is used to evacuate the chamber before the test, and a second valve can be used to supply the test atmosphere, e.g., oxygen.

Figure 2 is a sectional view of a particular test configuration within the chamber. Here the sample is attached to a fixture on one wall of the chamber, and the heating coil is attached to an adjustable rod. The coil may be rotated or moved in or out to control the relative positions of the sample and heat source. Alternatively, the heat source may be placed on the permanent fixture and the sample placed on the moveable rod. In addition, cutouts in the plate assembly can be removed to include other probes for controlling the position of other components such as thermocouples.

Notes:

1. The basic design of this chamber is adaptable to larger and more complex test apparatus to meet the requirements of specific experiments.
2. Requests for further information may be directed to:
Technology Utilization Officer
Kennedy Space Center
Code AD-PAT
Kennedy Space Center, Florida 32899
Reference: TSP73-10111

Patent status:

This invention has been patented by NASA (U.S. Patent No. 3,545,252). Inquiries concerning nonexclusive or exclusive license for its commercial development shall be addressed to:

Patent Counsel
Kennedy Space Center
Code AD-PAT
Kennedy Space Center, Florida 32899

Source: C. L. Springfield, W. J. Paton,
and J. D. Jeter
Kennedy Space Center
(KSC-10126)