Safer Aviation Materials Tested

A series of thermally stable polymer samples were tested. These materials are called low heat release materials and are designed for aircraft interior decorative materials. The materials are designed to give off a minimum amount of noxious gases when heated, which increases the possibility that people can escape from a burning aircraft.

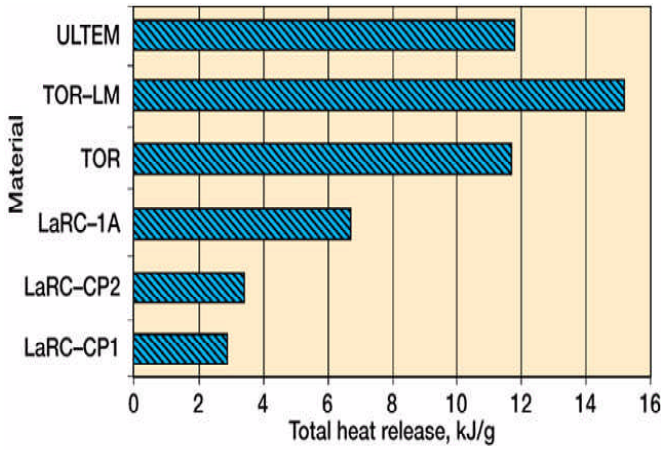
New cabin materials have suitably low heat release so that fire does not spread, toxic chemicals are not given off, and the fire-emergency escape time for crew and passengers is lengthened. These low heat-release materials have a variety of advantages and applications: interiors for ground-based facilities, interiors of space vehicles, and many commercial fire-protection environments.

A microscale combustion calorimeter at the Federal Aviation Administration's (FAA) Technical Center tested NASA Langley Research Center materials samples. The photo shows the calorimeter.

Calorimeter testing rig at FAA Technical Center.

A sharp, quantitative, and reproducible heat-release-rate peak is obtained in the microscale heat-release-rate test. The newly tested NASA materials significantly reduced the heat-release capacity and total heat release.

The thermal stability and flammability behavior of the samples was very good. The new materials demonstrated a factor of 4 reduction in total heat release over ULTEM (a currently used material). This information is provided in the following barchart. In other tests, the materials showed greater than a factor 9 reduction in heat-release capacity over ULTEM. The newly tested materials were developed for low dielectric constant, low color, and good solubility.



Material (total heat release) properties for NASA samples newly tested as part of the FAA ultralow heat-release materials project.

A scale up of the material samples is needed to determine the repeatability of the performance in larger samples. Larger panels composed of the best candidate materials will be tested in a larger scale FAA Technical Center fire facility.

The NASA Glenn Research Center, Langley (Jeff Hinkley), and the FAA Technical Center (Richard Lyon) cooperatively tested these materials for the Accident Mitigation aspects of Fire Prevention under NASA's Aviation Safety Program.

Find out more about NASA's aviation safety program (http://www.aero-space.nasa.gov/programs/program_org/as.htm **and FAA fire research**, (http://www.fire.tc.faa.gov/) see "Materials Group".

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