



NASA SBIR 2008 Phase I Solicitation

X2.05 Spacecraft Fire Protection

Lead Center: GRC

Participating Center(s): ARC, JPL, JSC, KSC, MSFC

NASA's fire protection strategy includes: strict control of ignition sources and flammable material, early detection and annunciation of fire signatures, and effective fire suppression and response procedures. While proposals in all of these areas are applicable, they are particularly sought in the areas of nonflammable crew clothing and fire suppression technology.

The requirements for crew clothing are balanced between comfort, durability, and flammability. Non-flammable alternatives are requested for shirts, shorts, sweaters, jackets, etc. and, ideally, would be available in a variety of colors and weights. For exploration missions, clothing should be nonflammable up to 34% O₂ by volume without being stiff and uncomfortable. The flammability characteristics of the clothing must be maintained through the recommended cleaning process.

Fire suppression technologies for exploration spacecraft and habitats must:

- Be applicable for use in a confined habitable volume having an atmosphere of up to 34% O₂ by volume and pressures as low as 7.6 psia;
- Be suitable for use in a portable fire extinguisher against fires behind panels and close-outs or the cabin open volume;
- Have minimal mass and volume requirements including consumables required for post-fire clean-up; and
- Be compatible with the spacecraft environmental control and life support system.

Results of a Phase 1 contract should show feasibility of the technology and approach. A plan for the demonstration of a prototype to be developed in Phase 2 should also be produced at the end of Phase 1. The Phase 2 contract should produce at least a prototype demonstration and test of the fire suppression system.

