



Materials and Coatings

Non-Toxic Environmentally Safe Flame Suppressant

A non-toxic, non-ozone-depleting fire suppression agent

NASA seeks to license a nontoxic environmentally safe flame suppressant. Developed at the John F. Kennedy Space Center (KSC), FL, this invention is a non-toxic, non-ozone-depleting, non-global-warming agent that is based on recent success with flame suppressant as a fire suppression agent. The water mist is actually microencapsulated water droplets. This material suppresses a flame by lowering the temperature and reducing the oxygen available for combustion. The flame temperature is lower because of the high latent heat of vaporization of water that absorbs energy from the flame as the water evaporates. The water-suppressant technology operates similarly to halons because it contains a functional group that decomposes to add free radicals to the combustion process.

BENEFITS

- Environmentally friendly
- Effective in delivering extinguishing material
- Non-toxic
- Can be stored for long periods of time

technology solution



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THE TECHNOLOGY

The use of the present invention provides three primary flame suppression actions. First the vaporization of the water extracts large amounts of heat from the fire. Second, the water vapor tends to displace oxygen from the flame, and finally, the microencapsulant material can produce free radicals that inhibit the flame propagation reaction, similar to the effects of halon. The system was developed as a back up to the current halon supply at Kennedy Space Center. Halon is no longer being produced because of its toxicity, and it is very possible that one incident at Kennedy could deplete the current supply of halon.



Flame suppression agent consisting of water droplets encapsulated in a flame retardant polymer

APPLICATIONS

This system could replace the agents used currently in fire extinguishing, including:

- Halon
- Water mist
- Dry powders

PUBLICATIONS

U.S. Patent 8,511,396 B2

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