

## A Real Fire Suppression System Problem and Your Electronics and Computer Systems

HFC-227ea is replacing Halon 1301 as the gaseous fire suppression agent for data processing and electronic equipment. However when activated in a fire situation HFC-227ea will decompose to produce Hydrogen Fluoride. This is a real and ongoing concern. **Why? Because Hydrogen Fluoride causes major corrosion problems for electronics and connectors. You may save your equipment but for how long?**

In 2004 the Institute of Research and Construction in Canada published a study on HFC-227ea (C3F7H) paper, *Thermal decomposition products from fire suppression with HFC-227ea in an electronic facility*<sup>1</sup>. That study was followed by *Corrosion of Electronic Components by Hydrogen Fluoride (HF)*<sup>2</sup> in 2008 by the Fire Research Program of the National Research Council of Canada. Both studies were published in the Journal of Fire Protection Engineering. These two in depth studies address and prove the very definite concern of Hydrogen Fluoride (HF) corrosion after a gaseous HFC-227ea fire suppression system is used in computer and other electronic environments.

The first published study by the National Research Council of Canada (NRC) in 2004 showed that HFC-227ea, a gaseous fire suppressant, a replacement for Halon 1301, produced at least 5 to 10 times more HF than Halon 1301 under similar fire conditions, however, there was no information available on the amount of thermal decomposition products generated during fire suppression with halocarbon agents in an electronic facility.

The *Corrosion of Electronic Components by Hydrogen Fluoride (HF)* paper published in 2008 describes in detail the HF corrosion and provides the test results showing the corrosion damage due to HF. While HFC-227ea is a very good fire suppression system, the HFC-227ea thermal decomposition byproduct, Hydrogen Fluoride, would cause serious and expensive short and long term extensive corrosion damage by the condensed Hydrofluoric acid. Hydrogen Fluoride corrosion severely affects computers, servers, switching circuits, and other electronics, connectors and electromechanical devices.

To prevent corrosion caused by Hydrogen Fluoride, as well as other chemicals, acids, salts, and water which can be deposited during the activation of fire suppression systems or rapid humidity changes, all the electrical and electronic hardware, boards and connectors should be sprayed or coated with **SuperCorr-A**, an ultra-thin film lubricant and corrosion preventive compound that is non-hardening and will not crack. **SuperCorr-A** is a water displacing non-flammable compound that will not interfere with any type of electronics or avionics and prevents corrosion.

While a fire suppression system utilizing HFE-227ea will put out the fire, **SuperCorr-A** will protect and prevent damage to the electronics or avionics caused by exposure to the Hydrogen Fluoride produced as a byproduct during the fire. **SuperCorr-A**, Mil-L-87177, is also effective in preventing damaging corrosion by atmospheric gases such as Sulfur dioxide (SO<sub>2</sub>), Nitrogen dioxide (NO<sub>2</sub>), Hydrogen Sulfide (H<sub>2</sub>S), Ammonia (NH<sub>3</sub>), and Chlorine based gases (CL<sub>2</sub>) in Class III mixed gas tests and fresh or salt water systems.

1. Thermal Decomposition Products from Fire Suppression with HFC-227ea in an Electronic Facility, Andrew K. Kim and Joseph Su
2. Corrosion of Electronic Components by Hydrogen Fluoride, NRCC-49219, Kim, A.; Crampton, G.