

Assessing the Thermal Threat of Chemical Disinfectants on Cargo Aircraft

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The purpose of this research is to assess the likelihood of a thermal hazard event occurring during transport of chemical disinfectants via cargo aircraft. Due to the COVID-19 pandemic, disinfectant products are being shipped in large quantities at high frequency. Taking into consideration extreme weather and temperature as a result of global warming, the FAA will first determine how hot a cargo pallet can become sitting on the tarmac and how long that temperature is sustained once out of those conditions (i.e. post-loading into aircraft). The FAA will evaluate both surface and air temperatures in and around a full-sized ULD container. Testing will consider various ULD configurations (outer material, color, and thickness) and geographic irradiance and insolation values. In addition, tests will capture the effects of humidity and moisture on irradiance and heating rate of the container. Once the ULD temperature data is established, the FAA will then test a variety of chemical disinfectants at the maximum temperature, humidity, and moisture content levels achieved to assess the threat of disinfectants spontaneously combusting. Autoignition study is immensely complex as many variables can change the time to and temperature of self-ignition of a substance. The FAA will attempt to control variables such as sunlight exposure, air temperature, humidity, pressure, proximity of chemicals to one another, packaging, and state of matter of substances, however, the results of this research will not yield firm autoignition temperatures of specific substances. The aim of this research is to ensure large quantities of chemicals can be shipped safely via aircraft.