PU-20230320 March 20, 2023

Aerosol Defense Sprays and Determination of Flammability

Defense Technology® manufactures a complete line of aerosol defense sprays, used as a less lethal tool by law enforcement, corrections, and military personnel. Due to the potential use of aerosol sprays along with Electrical Discharge Weapons (EDW) such as Tasers, extensive testing is done to ensure the sprays are non-flammable and "EDW safe". Due to the different testing methods used and the changing test protocols for flammability, there is some confusion around how aerosol flammability is determined, and how this relates to real-world product usage. The below information is provided for clarification.

Flammability Test Protocols

- Historically, aerosol flammability was determined using a "flame extension test" as specified in 16 CFR 1500.45. The test involved spraying the aerosol into a candle flame from a distance of 6 inches, and measured the flame extension. The aerosol was deemed flammable if it produced a flame elongation of 18 inches or greater when sprayed through the top third of the candle flame [1].
- The current industry-standard test for flammability utilizes the Globally Harmonized System (GHS) of Classification and Labeling, which was developed by the United Nations as a way to bring into agreement the chemical regulations and standards of different countries. The GHS flammability classification was adopted as part of OSHA Hazcom 2012, and is the current scheme by which to determine the flammability classification for labels and SDS.
- The GHS test protocol uses an Ignition Distance Test that is very different from the old flame extension test, because it utilizes a burner ignition source that is much more energetic than the candle used in the flame extension test. In addition, instead of setting a limit to the observed flame extension, any flame extension beyond 15 cm counts as a flammable result, and other criteria such as an enclosed space ignition test can be utilized to ultimately determine flammability. This updated ignition distance test has proven to be a more strenuous test to pass compared to the old flame extension test.

Flammability Testing Results

Defense Technology aerosols have been tested and determined to be non-flammable and EDW safe according to the following protocols:

- GHS Ignition Distance Test [2]
- GHS Enclosed Space Aerosol Flammability Test [2]
- CRT Testing for flammability with Electrical Discharge Weapons [3]

Although Defense Technology aerosol sprays pass the stringent requirements of the above flammability tests, it is still possible to produce a combustible result under extreme conditions. For example, if an excessive amount of spray is applied to a cloth material, the wicking action can concentrate the solvent vapors which can ignite when a sufficient heat source is applied. The accepted testing protocols are intended to simulate realistic worst-case conditions that could be experienced during normal discharge of an aerosol spray in the presence of a heat source or Electrical Discharge Weapon. Some extreme scenarios are beyond the scope of the accepted test standards and do not indicate product flammability under normal conditions.

[1] *The Aerosol Handbook, p. 200*
[2] *GHS Recommendations on the Transport of Dangerous Goods Manual of Tests and Criteria, 2015 version, Chapter 31.*
[3] Protocol developed by CRT Less Lethal, Inc.