



Use of Dry Chemical Fire Extinguishers in Locations where Electronics and High Value Assets are Located

Dry Chemical type fire extinguishers (mono-ammonium phosphate [“multipurpose” or “ABC”], sodium bicarbonate [“Regular Dry Chemical”], and potassium bicarbonate [“Purple K”]) are proven to be effective fire extinguishing agents on a wide variety of fires when employed in UL Listed hardware. These fire extinguishers should be chosen, maintained, and installed in accordance with National Fire Protection Association (NFPA) 10, *Standard for Portable Fire Extinguishers*. ABC dry chemical is widely employed in commercial and industrial environments such as occupied buildings, facilities, and production areas. Dry Chemical agents are comprised of finely divided powders with additives and treatment to resist caking, moisture absorption and to enhance proper flow capabilities that, while effective at extinguishing fires, will remain in the areas where the fire extinguishment occurs and adhere to various surfaces. This is not always a desirable result.

In high value asset areas found in buildings and other areas, it is common to find delicate electronics equipment (defined by NFPA 10 (2018 Ed.) to include, but not be limited to, telecommunications, computers, servers, robotics, and reproduction equipment). In these environments, such powder residue can be compromising to the function of the equipment and the value of the assets. NFPA 10 Section 5.5.6.1. states *“dry chemical fire extinguishers shall not be installed for the protection of delicate electronic equipment”*, and *“dry chemical residue will probably not be able to be completely and immediately removed, and, in addition, multipurpose dry chemical exposed to temperatures in excess of 250°F (121°C) or relative humidity in excess of 50 percent can cause corrosion.”*

The challenges related to these conditions have been addressed over time by development of ‘halogenated’ agents that do not leave a powder residue. These solutions are described in NFPA 10. Halogenated Agents, as defined by NFPA 10, are *“electrically non-conducting, volatile, or gaseous fire extinguishant that does not leave a*



residue upon evaporation.” An acceptable alternative would also include Carbon Dioxide, which is discharged as a gas and leaves no residue.

NFPA 10 addresses use of dry chemical agents and solutions in these high value asset areas. Section 5.5.6 (*Electronic Equipment Fires*) states: “*Fire Extinguishers for the protection of delicate electronic equipment shall be selected from types specifically listed and labeled for Class C hazards (See 5.3.2.3).* And relating to residential use, in Annex Section F.5.2: “*Electronic Equipment Fires: Where provided, extinguishers for the protection of delicate electronic equipment, such as TVs, computers, and stereos, should have a 1-B:C rating or higher and should be of carbon dioxide or halogenated types.*”

Carbon Dioxide fire extinguishers are electrically non-conductive and are effective on, and Listed for, class B fires (fires in flammable liquids, combustible liquids, petroleum greases, tars, oils, oil-based paints, solvents, lacquers, alcohols, and flammable gases). Carbon Dioxide is also Listed for Class C fires (fires that involve energized electronic equipment). However, it is not effective on or Listed for Class A fires (fires involving ordinary combustibles, such as wood, cloth, paper, rubber, and many plastics).

Halogenated agents are comprised of halocarbon agents and halons. Halons are fully halogenated and brominated agents employed since the 1940’s in the commercial/industrial, aviation, marine, and military sectors. The relevant agent for portable fire extinguishers is halon 1211. Halons are severe ozone depleting substances and since the mid 1990’s, have limitations, including a ban on training and they are no longer widely employed. Halocarbons are hydrochlorofluorocarbon (HCFC), hydrofluorocarbon (HFC), perfluorocarbon (PFC), fluoriodocarbon (FIC) and other halocarbons that are found acceptable by the US Environmental Protection Agency as substitutes for halons. Typically, halogenated agents are effective on, and Listed for, (depending on extinguisher size) Class A, B, and C fires. Smaller units (less than 9.5 lbs) are not Listed for Class A fires but are nonetheless effective on those types of fires.

NFPA 10 is a peer reviewed document comprised of authors from a broad spectrum of backgrounds, including government, private industry, consulting, and professional fire protection engineers who collaborate to create sound guidance. NFPA 10 is recognized worldwide as the premiere standard for selection, installation, inspection, maintenance, recharging, and testing of portable fire extinguishers. It is intended for, and may be adopted as, guidance by persons charged with these responsibilities.

It is good practice for those charged with selecting the proper portable fire extinguisher in multiple environments, including where delicate electronic equipment and/or high value assets are present, to adhere to the insight and guidance that NFPA 10 provides.

Founded in 1930, the Fire Equipment Manufacturers' Association is an international, non-profit trade association dedicated to manufacturing commercial fire protection equipment to serve as the first line of defense against fire in its early stages.

For more information and a list of current FEMA members, visit the FEMA website at www.femalifesafety.org.

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