Coffee Break Training - Fire Protection Series

Portable Extinguishers: Water Mist Extinguishers

No. FP-2012-46REV November 13, 2012

Learning Objective: *The student shall be able to describe how water mist extinguishers obtain a Class C rating.*

Water mist extinguishers provide a multiclass rating option to dry chemical or clean agent devices and can be rated for use on energized electrical equipment (Class C fires). While it seems incongruous that electrically conductive water could obtain a Class C rating, protecting the operator from electrical shock while applying water to an electrically energized appliance or piece of equipment is similar to a hand-held fog nozzle being used on energized electrical equipment. When the water is sprayed and the droplets of water are not connected in a solid stream, the electric current path is broken between the droplets, preventing current flow-back to the operator of the extinguisher.

Water mist extinguishers provide a multi-class rating option to dry chemical or clean agent devices. *Photo courtesy of the Fire Equipment Manufacturers' Association.*

Water mist extinguishers were introduced in the United States in 1997. Initially, these extinguishers were simply modified stored-pressure water extinguishers that included a spray nozzle allowing the extinguisher to meet all of the requirements of American National Standards Institute/ Underwriters Laboratories (ANSI/UL) 8, *Water Based Agent Fire Extinguishers*, and ANSI/UL 711, *Rating and Fire Testing of Fire Extinguishers*, in a way that enabled the extinguisher to earn a 2-A, 1-B:C rating.

Later, requirements were added so that a water-based extinguishing agent in an extinguisher had to have an electrical resistance of less than 1 million ohms (1 microsiemen). Plain water used in the first water mist extinguishers was changed to deionized water, but the same principles applied to the extinguisher. Deionized water easily complies with the conductivity requirements for the agent, and the extinguisher is still tested to the ANSI/UL 711 requirements for Class C. The test for a Class C rating involves aiming the discharge nozzle at an electrically energized metal target from a distance of approximately 10 inches (254 millimeters) and measuring any current that flows between the target and the extinguisher. The target is energized to 100,000 volts (100 kilovolts), and the agent is discharged so that it hits the energized target. A milliammeter is attached between the extinguisher and the metal target, and during discharge of the extinguishing agent, the current traveling through the discharge stream, if any, is measured. To qualify for the Class C rating, there must be no more than 0.001 ampere (1 milliampere) of conductance measured.

A water mist extinguisher tested to ANSI/UL 8 and ANSI/UL 711 is considered safe for the operator to use on electrically energized equipment or appliances—that is, they will not deliver an electrical shock back through the discharge stream. Also, they offer enhanced Class A firefighting capability due to the exceptional cooling capability of the water spray. The deionized water extinguishing agent is nontoxic, environmentally friendly (zero ozone depletion potential and zero global warming potential), has no disposal problems, and is inexpensive. The extinguishers are easy to use and have a long discharge duration. They are rechargeable and have a low-maintenance cost.

This Coffee Break Training tip is courtesy of the Fire Equipment Manufacturers' Association.