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Badger Fire Protection
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TECHNICAL BULLETIN
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Subject: MRI Portable Fire Extinguishers (Application Questions & Answers)

This bulletin addresses some of the common questions associated with selection and placement of portable fire extinguishers in and around MRI applications. The specific requirements or recommendations of the authority having jurisdiction should always be followed.

1. What special fire extinguisher hardware concerns do MRI applications present?

The extremely high magnetic forces generated by MRI (Magnetic Resonance Imaging) equipment can present unique hardware concerns. These concerns are primarily associated with conditions where the exposed hardware could become a projectile, might physically heat up or generate various torque forces during product operation, as well as potentially present detrimental artifacts on critically important patient MRI readings.

2. What special extinguishing agent concerns are associated around expensive MRI equipment?

The extremely high electrical voltages associated with MRI equipment typically exceed 100,000 volts. For operator safety and to prevent any unnecessary equipment damage, only non-conductive extinguishing agents that will not puddle or pool within various exposed energized equipment areas should be used. The discharge of extinguishing agents can leave deposits or residues in expensive MRI equipment, resulting in damage and costly down time.

3. What special considerations typically exist within controlled MRI suite applications?

MRI suites are often considered special applications, not just because of the high electrical voltages and magnetic equipment properties present but because they are specially constructed and controlled environments having limited amounts of any unnecessary commonly combustible materials present. MRI rooms are also controlled applications with restricted access and staffed by educated, responsible and well trained personnel.

4. Are there any special equipment marking or service requirements for portable fire extinguishers utilized within MRI suites?

In September of 2005 a new MR equipment testing and marking standard was adopted by the FDA. This new standard for marking medical devices and other items for safety testing within magnetic resonance environments is ASTM-2503-05. It is important to realize that MR equipment manufactured, tested, labeled or installed prior to the introduction of this standard could be improperly marked and present potential safety concerns. Properly tested and labeled MR fire extinguishers will typically address any special installation and service recommendations on the nameplate or within their owner's manual.

5. What does a fire extinguisher tested and labeled MR CONDITIONAL mean?

MR CONDITIONAL in the ASTM standard identifies items demonstrated to pose no known hazards in magnetic resonance environments within specified conditions of use. The designated symbol features a yellow triangular symbol containing the letters "MR". This symbol alerts users that there are certain limitations to the usability of an item or the testing performed such as having a 7-Tesla MR environment application limitation. Tesla is the industries term used for measuring magnetic strength.

6. What fire extinguisher model does Badger recommend for use in MRI suites?

Based on the controlled environment and fire hazard materials typically found in and associated with MRI rooms, Badger recommends the use of the small, lightweight and effective model **B5V-MR Carbon Dioxide Portable Fire Extinguisher**. Use of this type of fire extinguisher is also recommended by the healthcare's leading safety organization, ECRI Institute. (Reference: "Choosing fire extinguishers for use in MR environments" in Health Devices October 2005; 34(10):3423).

7. Why recommend 5B:C rated CO2 fire extinguishers for use within MRI suites?

Recommendations for CO2 as the extinguishing agent are based upon the limited amounts of class "A" and "B" material hazards typically present within controlled MRI suite environments and because it's clean gaseous discharge leaves no residue or contamination. All available fire history information indicates the incipient fires occurring within MRI applications are associated with various class "C" forms of electrically energized equipment. Carbon dioxide's extremely effective and safe non-conductive extinguishing properties on energized electrical fires do not present collateral equipment damage concerns or raise costly down time and clean up issues.

8. Are any special operator or patient exposure concerns associated with the discharge from a CO2 portable fire extinguisher?

Patients undergoing MR readings could also be highly susceptible to cardiac sensation exposure, so extinguishing agents utilized within these environments should address various agent decomposition and patient inhalation exposure issues. Carbon dioxide doesn't present the same patient sensitivity exposure concerns associated with halogenated forms of extinguishing agents. Small hand portable carbon dioxide fire extinguishers discharged during fire situations present minimal human inhalation or bare skin exposure concerns. The limited CO2 agent capacity only represents total exposure durations of less than 9 seconds, so any serious health related concerns are unlikely. Hospital operating rooms have successfully used CO2 fire extinguishers to address incipient fires for over 50 years without problems.

9. What fire extinguisher model does Badger recommend for meeting the general building occupancy fire protection needs outside MRI suites?

To address the various NFPA-10 general occupancy Class "A", "B" and "C" fire protection coverage requirements for areas outside MRI equipment rooms, the selection and use of the Kidde model **XL5-MR Multipurpose Dry Chemical Extinguisher** rated MRI CONDITIONAL can be utilized. While a multipurpose dry chemical extinguisher can present various clean up exposure concerns to some equipment, it has the necessary 3A:40B:C fire rating to address various minimum occupancy fire protection code coverage requirements. Because in the past, some outside fire extinguishers have been brought into MRI rooms during emergency fire situations, many insurance and hospital safety interests sometimes desire any portable fire extinguishers being installed on MRI equipment floors within a building, to also be properly tested and rated MR-CONDITIONAL.

10. What special testing qualifications do the Badger MRI recommended extinguisher models have?

Both recommended fire extinguisher models have been independently tested, approved and listed to meet all of the various required ANSI/UL fire extinguisher design and test standards specified within NFPA-10 by the Underwriters Laboratories. These extinguisher models have additionally also been tested MR CONDITIONAL for safe use within magnetic environments up to 7-Tesla by one of the medical industries most recognized MRI safety authorities, Dr. Emanuel Kanal at the Pittsburgh Medical Facility.

Should you have any additional questions or desire more information on our special MR CONDITIONAL portable fire extinguisher models, please feel free to visit www.badgerfire.com or contact Badger Fire Protection at 1-800-446-3857.