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# Putting Out the Flames

## Fire extinguishers for your airplane

DANA HEIMOS, EAA 834980

**A**n inflight fire may be one of the most dangerous situations any pilot may face.

The difference between safely extinguishing a cockpit fire or perhaps losing your airplane and your life hinges on three factors: having a fire extinguisher on board, knowing how to use it, and having it easily accessible. Although the Federal Aviation Regulations do not require general aviation aircraft to carry one, common sense would suggest a fire extinguisher should be standard equipment in every aircraft.

The National Fire Protection Association (NFPA) organizes the different types of fires likely to occur in aircraft into four classes. Class A fires start from ordinary combustible materials, such as wood, cloth, paper, rubber, and plastics. To be extinguished, these fires require solutions containing a large percentage of water. Class B fires are those that involve flammable liquids, such as oils, greases, tars, oil base paints, lacquers, and flammable gases. These types of fires require extinguishing agents that use a blanketing effect to “smother” the fire. Fires that occur in energized electrical equipment are considered Class C, and they require extinguishers with zero conductivity to electrical circuits. Finally, Class D fires involve combustible metals, such as magnesium, titanium, zirconium, lithium, and potassium. This class of fire requires extinguishing agents of the dry powder type.

Three of the most common types of extinguishers are dry chemical, water, and carbon dioxide (CO<sub>2</sub>). Dry chemical extinguishers are typically marked with a letter rating

(AB, BC, ABC) that denotes which classes of fire they are capable of extinguishing. These types use a compressed, non-flammable gas as a propellant. The second type, a water extinguisher, uses water and compressed gas and should only be used on Class A (ordinary combustibles) fires. The third type is a carbon dioxide extinguisher. These are most effective on Class B and C (liquid and electrical) fires. While these common types of extinguishers are easy to find and relatively inexpensive, none of them are recommended for aircraft use.

One reason dry chemical extinguishers should not be



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used in an aircraft is because they're highly corrosive on metals such as aluminum and tend to produce a blinding cloud of dust when used in a confined space.

William Griswold of the Oshkosh Fire Department, the department that handles fire incidents at Wittman Regional Airport, also warns pilots of this extinguisher type. “ABC [dry chemical] fire extinguishers can be detrimental to the electronics in your aircraft,” Griswold said. “We use foam and dry chemical agents for fires on the runway, but a fire in the sky is a different story.”

Though CO<sub>2</sub> fire extinguishers leave no residual mess, they can cold-shock electrical components and are considered as dangerous as dry chemical extinguishers because

**While the Federal Aviation Regulations don't specifically require a fire extinguisher be onboard your aircraft, it is a good idea to have one and make sure it is easily accessible in the event of a fire.**



Bonnie Kratz

they restrict oxygen levels in confined areas. Water extinguishers should not be used because there is a risk of being electrocuted if used on electrical equipment.


The FAA and NFPA strongly recommend the use of portable Halon fire extinguishers in all aircraft. Halon is a liquefied, compressed gas that stops the spread of fire through chemical combustion. It is recommended for aircraft use because it doesn't emit a blinding cloud of dust upon use, and it won't damage electrical equipment. Its low toxicity and chemically stable compounds make it safe for human exposure, and because it stops the spread of fire through chemical reaction, it doesn't displace oxygen from the air surrounding the fire. Although the production of Halon ended in 1994, after it was classified a CFC (chlorofluorocarbon, which contains ozone-depleting chemicals), it continues to be sold and is perfectly legal for aviation use. "It's a common misconception that Halon is no longer available since its production ended," said Chris Dieter, vice president of marketing and distribution for H3R Aviation Inc., a leading supplier of Halon and Halon-alternative fire extinguishers. "In reality, the recycling and reuse of the existing supply means there is plenty of it out there. You just need to know where to find it."

Halon fire extinguishers are sold in two types: a Halon 1211-1301 blend (liquid streaming agent combined with a gaseous flooding agent) and those containing only Halon 1211. "When choosing a fire extinguisher you have to take into account factors such as weight and durability, as well as performance," Dieter said. "Our gauged fire extinguishers are generally heavier and require somewhat more maintenance than our non-gauged, disposable units. However, the gauged units are more durable, inspection is easier, and the extinguishers are rechargeable."

Halon alternatives, such as Halotron 1, are also available. Halotron 1 is sold as a safe, eco-friendly replacement

for Halon 1211 fire extinguishers. "Halotron 1 represents a clean agent alternative that is less damaging to the ozone layer," Dieter said. "The disadvantage of a Halotron 1 extinguisher is that it is approximately twice as large and heavy as a like-rated Halon extinguisher because Halotron 1 is less effective, pound per pound, compared to Halon."

A big difference between gauged and non-gauged Halon fire extinguishers is the maintenance and inspection requirements. Gauged, rechargeable units require a six-year maintenance and 12-year hydrostatic test. According to H3R Aviation, the six-year maintenance requires a professional inspection that may involve the replacement of certain parts. The 12-year hydrostatic test is performed by certified technicians and confirms the integrity of the cylinder. Non-gauged, disposable units don't require the six-year or 12-year maintenance tests. However, these extinguishers do require monthly maintenance, and the NFPA always advises users to follow the nameplate instructions found on the outside of the unit. "The most important thing to remember is that if there is any damage to the extinguisher, or if it is undercharged, it should be taken out of service immediately," Dieter said.

While Halon fire extinguishers may be more expensive than other types of extinguishers, the safety benefits and non-corrosive nature make it worth the extra cost. For information on where to purchase or recharge Halon fire extinguishers, inspection and maintenance guidelines, or other questions pertaining to use, ownership, or disposal of Halon products, visit [www.NFPA.org](http://www.NFPA.org). 

*Dana Heimos is the editorial assistant for EAA publications.*

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