

Halon Options Chapter Revisions – 4.3 Handhelds

Doug Ferguson – Boeing Commercial Airplanes
Bradford Colton – Halotron Division, American Pacific
Corporation

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Options to Halons for use in Handheld Fire Extinguishers is addressed in Section 4.3 of DOT/FAA/AR-99/63 and:

- Identifies the requirements for handheld fire extinguishers in aircraft, including the mandate that aircraft with a passenger capacity greater than 31 have one or more (depending on passenger capacity) Halon 1211 or equivalent extinguishers.
- Discusses toxicity, effectiveness, ODP and GWP for various agents.
- The 2002 edition summary states the use of the potential Halon option agents will result in a weight penalty of 1.4 to 2.6 and a volume penalty of 1.9 to 2.9 when compared to Halon 1211.

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Section 4.3.1 addresses Halocarbons and Halocarbon Blends

- In the 2002 edition, FICs and HFCs were identified as the most likely agents to have the lowest restrictions imposed owing to environmental considerations.
- Some general characteristics and concerns of PFCs and HCFCs were identified.
- Table 18 was a rating matrix for candidate Halocarbons for handhelds, identifying agent, Cup Burner Extinguishment Concentration %, Known or Potential Environmental Regulatory Restrictions, and Toxicity Based on Cardiac Sensitization NOAEL.

Section 4.3.2 addresses Carbon Dioxide

Section 4.3.3 addresses Combination Agents and Foam

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Section 4.3 Areas to be changed:

Three agents have passed the MPS and have been UL listed since the 2002 release of the document.

HFC-227ea (FM-200®)

HFC-236fa (FE-36®)

HCFC Blend B (Halotron I®)

The characteristics of these agents and other options are discussed. In addition, 2-BTP has been added to Table 18 and other paragraphs in Section 4.3 as applicable.

2-BTP (2-Bromo-3,3,3-TrifluoroPropene)

Preliminary studies show high potential for 2-BTP as a handheld replacement agent. Cup burner studies indicate 4.6 % concentration required
Cardiac Sensitization NOAEL similar to Halon 1211 on a per pound basis – however the amount of BTP required for a same-size fire is slightly greater than Halon 1211.

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Section 4.3 Areas to be changed:

Updated to reflect the growing concern regarding the Global Warming Potential of the alternative agents.

Identifies some very small, non-zero ODP agents as Very Short Lived Substances (VSLs).

HCFC Blend B (Halotron I®)

CF3I (Trifluoroiodomethane)

2-BTP

HCFC Blend B is currently scheduled to be phased out under the Montreal Protocol, while CF3I and 2-BTP are not addressed in the Protocol. It is not expected that the Montreal Protocol will be expanded to address any new VSLs agents.

Some agents previously in Table 18 are no longer commercially available. These agents have been removed from the table. Table 18 has been revised to characterize (by agent weight, total weight and dimensions) the commercially available or proposed handheld extinguishers that have passed the FAA MPS or are in the process of testing. The extinguishers are sized for a UL 5B pan test and the MPS hidden fire test.

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Revised Table 18:

Agent	Agent Weight, Lb	Total Weight, Lb	Dimensions, in (H x W x D)
Halon 1211	2.5	3.93	17 x 4.8 x 3.25
2-BTP (2-bromo-3,3,3- trifluoropropene)	3.75	5.6	15.75 x 5 x 3.5
FE-36® (HFC-236fa)	4.75	9.5	15.9 x 8 x 4.5
Halotron® I (HCFC Blend B)	5.5	9.32	15 x 5 x 4.25
FM-200® (HFC-227ea)	5.75	9.75	16.6 x 6.75 x 4.4
Novec 1230 ™ (FK-5-1-12)	TBD	TBD	TBD

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QUESTIONS?