



United States
Environmental Protection Agency

Air and Radiation
Stratospheric Protection Division
6205J

Halon Substitutes Under SNAP as of April 26, 2000

SNAP Information: <http://www.epa.gov/ozone/title6/snap/snap.html>
Stratospheric Ozone Protection Hotline: (800) 296-1996

EPA has created the Significant New Alternatives Policy (SNAP) Program under section 612 of the Clean Air Act Amendments. SNAP evaluates alternatives to ozone-depleting substances. Substitutes are reviewed on the basis of ozone depletion potential, global warming potential, toxicity, flammability, and exposure potential as described in the March 18, 1996 final SNAP rule (59 FR 13044). Lists of acceptable and unacceptable substitutes will be updated periodically in the Federal Register. The following SNAP notices and subsequent final rules are included in this list: August 26, 1994 (59 FR 44240), January 13, 1995 (60 FR 3318), June 13, 1995 (60 FR 31092), July 28, 1995 (60 FR 38729), February 8, 1996 (61 FR 4736), May 22, 1996 (61 FR 25585), September 5, 1996 (61 FR 47012), October 16, 1996 (61 FR 54030), March 10, 1997 (62 FR 10700), June 3, 1997 (62 FR 30275), February 24, 1998 (63 FR 9151), May 22, 1998 (63 FR 28251), January 26, 1999 (64 FR 3861), April 28, 1999 (64 FR 22981), April 26, 2000 (64 FR 30410), and April 26, 2000 (65 FR 24387).

Acceptable Substitutes for Halon 1211 Streaming Agents Under the Significant New Alternatives Policy (SNAP) Program as of April 26, 2000

| Substitute | Trade Name | Comments |
|---|---------------------|--|
| HCFC-123 | FE-232 | Non-residential uses only. |
| HCFC-124 | FE-241 | Non-residential uses only. |
| [HCFC Blend] B | Halotron 1 | Non-residential uses only. |
| [HCFC Blend] C | NAF P-III | Non-residential uses only. |
| [HCFC Blend] D | Blitz III | Non-residential uses only. |
| Gelled Halocarbon/Dry Chemical Suspension | Envirogel | Allowable in the residential use market. |
| [Surfactant Blend] A | Cold Fire, FlameOut | |
| Water Mist Systems using Potable or Natural Sea Water | | |
| Carbon Dioxide | | |
| Dry Chemical | | |
| Water | | |
| Foam | | |

**Acceptable Substitutes for Halon 1211 Streaming Agents Subject to Narrowed Use Limits
under the Significant New Alternatives Policy (SNAP) Program as of April 26, 2000**

| Substitute | Trade Name | Limitations | Comments |
|--------------------------------|------------------|--|--|
| [HCFC Blend] E | NAF P-IV | Acceptable in nonresidential uses only. | As with other streaming agents, EPA recommends that potential risks of combustion byproducts be labeled on the extinguisher (see UL 2129). See comments 1, 2. |
| HFC-227ea | FM-200 | Acceptable in nonresidential uses only. | See comments 1, 2 |
| HFC-236fa | | Acceptable in nonresidential uses when manufactured using any process that does not convert perfluoroisobutylene (PFIB) directly to HFC-236fa in a single step. | See comments 1, 2, 3 |
| CF ₃ I | | Acceptable in nonresidential uses only. | |
| C ₆ F ₁₄ | PFC-614, CEA-614 | Acceptable for nonresidential uses where other alternatives are not technically feasible due to performance or safety requirements because of their physical or chemical properties. | Users should observe the limitations on PFC acceptability by making reasonable effort to undertake the following measures: (i) conduct an evaluation of foreseeable conditions of end use; (ii) determine that the physical or chemical properties or other technical constraints of the available agents preclude their use; and (iii) determine that human exposure to the other alternative extinguishing agents may result in failure to meet applicable use conditions; Documentation of such measures should be available for review upon request. See additional comments 1, 2 |

Additional Comments

1. Discharge testing and training should be strictly limited only to that which is essential to meet safety or performance requirements.
2. The agent should be recovered from the fire protection system in conjunction with testing or servicing, and recycled for later use or destroyed.
3. Acceptable for local application systems inside textile process machinery.

**Acceptable Substitutes for Halon 1301 Total Flooding Agents Under the
Significant New Alternatives Policy (SNAP) Program as of April 26, 2000**

| Substitute | Trade Name | Comments |
|--|-------------------|---|
| Powdered Aerosol C | PyroGen, Dynameco | For use in unoccupied areas only. |
| Powdered Aerosol A | SFE | For use in unoccupied areas only. |
| Carbon Dioxide | | System design must adhere to OSHA 1910.162(b)(5) and NFPA Standard 12 |
| Water | | |
| Water Mist Systems using Potable or Natural Sea Water | | |
| Foam A (formerly [Water Mist / Surfactant Blend] A) | Phirex+ | This agent is not a clean agent, but is a low-density, short duration foam. |

**Acceptable Substitutes for Halon 1301 Total Flooding Agents Subject to Narrowed Use Limits
under the Significant New Alternatives Policy (SNAP) Program as of April 26, 2000**

| Substitute | Trade Name | Limitations | Comments |
|------------|------------|--|--|
| HFC-236fa | | <p>Acceptable when manufactured using any process that does not convert perfluoroisobutylene (PFIB) directly to HFC-236fa in a single step:</p> <ul style="list-style-type: none"> - for use in explosion suppression and explosion inertion applications, and - for use in fire suppression applications where other non-PFC agents or alternatives are not technically feasible due to performance or safety requirements: <p>(a) because of their physical or chemical properties, or</p> <p>(b) where human exposure to the extinguishing agents may result in failure to meet applicable use conditions</p> <p>For a discussion of the applicable use conditions see the Use Conditions section below.</p> | <p>The comparative design concentration based on cup burner values is approximately 6.4%.</p> <p>Users should observe the limitations on HFC-236fa acceptability by taking the following measures:</p> <ul style="list-style-type: none"> (i) conduct an evaluation of foreseeable conditions of end use; (ii) determine that the physical or chemical properties or other technical constraints of the available agents preclude their use; and (iii) determine that human exposure to the other alternative extinguishing agents may result in failure to meet applicable use conditions; Documentation of such measures should be available for review upon request. <p>Feasible for use in a normally occupied area.</p> <p>See additional comments 1, 2, 3, 4</p> |

**Acceptable Substitutes for Halon 1301 Total Flooding Agents Subject to Narrowed Use Limits
under the Significant New Alternatives Policy (SNAP) Program as of April 26, 2000 (continued)**

| Substitute | Trade Name | Limitations | Comments |
|--------------------------------|------------------|---|--|
| C ₃ F ₈ | PFC-218, CEA-308 | <p>Acceptable for nonresidential uses where other alternatives are not technically feasible due to performance or safety requirements</p> <p>(a) because of their physical or chemical properties, or</p> <p>(b) where human exposure to the extinguishing agents may result in a failure to meet applicable use conditions</p> <p>For a discussion of the applicable use conditions see the Use Conditions section below.</p> | <p>The comparative design concentration based on cup burner values is approximately 8.8%.</p> <p>Users should observe the limitations on PFC acceptability by taking the following measures:</p> <p>(i) conduct an evaluation of foreseeable conditions of end use;</p> <p>(ii) determine that the physical or chemical properties or other technical constraints of the available agents preclude their use;</p> <p>(iii) determine that human exposure to the other alternative extinguishing agents may result in a failure to meet applicable use conditions; Documentation of such measures should be available for review upon request.</p> <p>The principal environmental characteristic of concern for PFCs is that they have high GWP and long atmospheric lifetimes. Actual contributions to global warming depend upon the quantities of PFCs emitted. For additional guidance regarding applications in which PFCs may be appropriate, users should consult the description of potential uses which is included in the March 18, 1994 final rule (59 FR 13044).</p> <p>See additional comments 1, 2, 3, 4</p> |
| C ₄ F ₁₀ | PFC-410, CEA-410 | <p>Acceptable for nonresidential uses where other alternatives are not technically feasible due to performance or safety requirements</p> <p>(a) because of their physical or chemical properties, or</p> <p>(b) where human exposure to the extinguishing agents may result in a failure to meet applicable use conditions</p> <p>For a discussion of the applicable use conditions see the Use Conditions section below.</p> | <p>The comparative design concentration based on cup burner values is approximately 6.6%.</p> <p>Users should observe the limitations on PFC acceptability by taking the following measures:</p> <p>(i) conduct an evaluation of foreseeable conditions of end use;</p> <p>(ii) determine that the physical or chemical properties or other technical constraints of the available agents preclude their use;</p> <p>(iii) determine that human exposure to the other alternative extinguishing agents may result in a failure to meet applicable use conditions; Documentation of such measures should be available for review upon request.</p> <p>The principal environmental characteristic of concern for PFCs is that they have high GWP and long atmospheric lifetimes. Actual contributions to global warming depend upon the quantities of PFCs emitted. For additional guidance regarding applications in which PFCs may be appropriate, users should consult the description of potential uses which is included in the March 18, 1994 final rule (59 FR 13044).</p> <p>See additional comments 1, 2, 3, 4</p> |
| SF ₆ | | <p>Only for use as a discharge agent in military applications and in certain civilian aircraft.</p> | <p>Users should limit testing only to that which is essential to meet safety or performance requirements.</p> <p>This agent is used only to test new Halon 1301 systems.</p> |

Additional Comments

1. Should conform with OSHA 29 CFR 1910 Subpart L Section 1910.160.

2. Per OSHA requirements, protective gear (SCBA) must be available in the event personnel must reenter the area.
3. Discharge testing should be strictly limited only to that which is essential to meet safety or performance requirements.
4. The agent should be recovered from the fire protection system in conjunction with testing or servicing, and recycled for later use or destroyed.

**Acceptable Substitutes for Halon 1301 Total Flooding Agents Subject to Use Conditions
under the Significant New Alternatives Policy (SNAP) Program as of April 26, 2000**

| Substitute | Trade Name | Conditions | Comments |
|----------------|------------|--|---|
| HCFC-22 | | <p>Where egress from an area cannot be accomplished within one minute, the employer shall not use this agent in concentrations exceeding its cardiotoxic NOAEL of approximately 13.9% while its cardiotoxic LOAEL is 5.0%.</p> <p>Where egress takes longer than 30 seconds but less than one minute, the employer shall not use the agent in a concentration greater than its cardiotoxic LOAEL of 5.0%.</p> <p>HCFC-22 concentrations greater than 5.0% are only permitted in areas not normally occupied by employees provided that any employee in the area can escape within 30 seconds. The employer shall assure that no unprotected employees enter the area during agent discharge.</p> | <p>The comparative design concentration based on cup burner values is approximately 13.9% while its cardiotoxic LOAEL is 5.0%. Thus, it is unlikely that this agent will be used in normally occupied areas.</p> <p>See additional comments 1, 2, 3, 4</p> |
| HCFC-124 | | <p>Where egress from an area cannot be accomplished within one minute, the employer shall not use this agent in concentrations exceeding its cardiotoxic NOAEL of approximately 8.4% while its cardiotoxic LOAEL is 2.5%.</p> <p>Where egress takes longer than 30 seconds but less than one minute, the employer shall not use the agent in a concentration greater than its cardiotoxic LOAEL of 2.5%.</p> <p>HCFC-123 concentrations greater than 2.5% are only permitted in areas not normally occupied by employees provided that any employee in the area can escape within 30 seconds. The employer shall assure that no unprotected employees enter the area during agent discharge.</p> | <p>The comparative design concentration based on cup burner values is approximately 8.4% while its cardiotoxic LOAEL is 2.5%. Thus, it is unlikely that this agent will be used in normally occupied areas.</p> <p>See additional comments 1, 2, 3, 4</p> |
| [HCFC Blend] A | NAF S-III | <p>Where egress from an area cannot be accomplished within one minute, the employer shall not use [HCFC Blend] A in concentrations exceeding its cardiotoxic NOAEL of 10.0%</p> <p>Where egress takes greater than 30 seconds but less than one minute, the employer shall not use [HCFC Blend] A in a concentration greater than its cardiotoxic LOAEL of 10.0%.</p> <p>[HCFC Blend] A concentrations greater than 10 percent are only permitted in areas not normally occupied by employees provided that any employee in the area can escape within 30 seconds. The employer shall assure that no unprotected employees enter the area during agent discharge.</p> | <p>The comparative design concentration based on full scale testing is approximately 8.6%.</p> <p>The agent should be recovered from the fire protection system in conjunction with testing or servicing, and should be recycled for later use or destroyed.</p> <p>Feasible for use in a normally occupied area.</p> <p>See additional comments 1, 2, 3, 4</p> |

**Acceptable Substitutes for Halon 1301 Total Flooding Agents Subject to Use Conditions
under the Significant New Alternatives Policy (SNAP) Program as of April 26, 2000 (continued)**

| Substitute | Trade Name | Conditions | Comments |
|------------|------------|--|--|
| HFC-23 | FE 13 | <p>Where egress from an area cannot be accomplished within one minute, the employer shall not use HFC-23 in concentrations exceeding 30%.</p> <p>Where egress takes greater than 30 seconds but less than one minute, the employer shall not use HFC-23 in a concentration greater than 50.0%.</p> <p>HFC-23 concentrations greater than 50 percent are only permitted in areas not normally occupied by employees provided that any employee in the area can escape within 30 seconds. The employer shall assure that no unprotected employees enter the area during agent discharge.</p> <p>The design concentration must result in an oxygen level of at least 16%.</p> | <p>The comparative design concentration based on cup burner values is approximately 14.4% while data indicates that its cardiotoxicity NOAEL is 3% without added oxygen and 50% with added oxygen. Its LOAEL is likely to exceed 50%.</p> <p>Feasible for use in a normally occupied area.</p> <p>See additional comments 1, 2, 3, 4</p> |
| HFC-125 | FE 25 | <p>Where egress from an area cannot be accomplished within one minute, the employer shall not use this agent in concentrations exceeding its cardiotoxic NOAEL of 7.5%.</p> <p>Where egress takes longer than 30 seconds but less than one minute, the employer shall not use the agent in a concentration greater than its cardiotoxic LOAEL of 10.0%.</p> <p>HFC-125 concentrations greater than 10.0% are only permitted in areas not normally occupied by employees provided that any employee in the area can escape within 30 seconds. The employer shall assure that no unprotected employees enter the area during agent discharge.</p> | <p>The comparative design concentration based on cup burner values is approximately 11.3% while its cardiotoxic LOAEL is 10.0%. Thus, it is unlikely that this agent will be used in normally occupied areas.</p> <p>See additional comments 1, 2, 3, 4</p> |
| HFC-134a | | <p>Where egress from an area cannot be accomplished within one minute, the employer shall not use this agent in concentrations exceeding its cardiotoxic NOAEL of 4.0%.</p> <p>Where egress takes longer than 30 seconds but less than one minute, the employer shall not use the agent in a concentration greater than its cardiotoxic LOAEL of 8.0%.</p> <p>HFC-134a concentrations greater than 8.0% are only permitted in areas not normally occupied by employees provided that any employee in the area can escape within 30 seconds. The employer shall assure that no unprotected employees enter the area during agent discharge.</p> | <p>The comparative design concentration based on cup burner values is approximately 12.6% while its cardiotoxic LOAEL is 8.0%. Thus, it is unlikely that this agent will be used in normally occupied areas.</p> <p>See additional comments 1, 2, 3, 4</p> |

**Acceptable Substitutes for Halon 1301 Total Flooding Agents Subject to Use Conditions
under the Significant New Alternatives Policy (SNAP) Program as of April 26, 2000 (continued)**

| Substitute | Trade Name | Conditions | Comments |
|------------|------------|--|--|
| HFC-227ea | FM-200 | <p>Where egress from an area cannot be accomplished within one minute, the employer shall not use HFC-227ea in concentrations exceeding its cardiotoxic NOAEL of 9.0%.</p> <p>Where egress takes longer than 30 seconds but less than one minute, the employer shall not use the agent in a concentration greater than its cardiotoxic LOAEL of 10.5%.</p> <p>HFC-227ea concentrations greater than 10.5% are only permitted in areas not normally occupied by employees provided that any employee in the area can escape within 30 seconds. The employer shall assure that no unprotected employees enter the area during agent discharge.</p> | <p>The comparative design concentration based on cup burner values is approximately 7.0% while data indicate that its cardiotoxicity LOAEL is probably greater than 10.5%. EPA is accepting 10.5% as its LOAEL.</p> <p>This agent was submitted to the Agency as a Premanufacture Notice (PMN) agent and is presently subject to requirements contained in a Toxic Substances Control Act (TSCA) Significant New Use Rule (SNUR).</p> <p>Feasible for use in a normally occupied area.</p> <p>See additional comments 1, 2, 3, 4</p> |
| HFC-236fa | | <p>For occupied areas from which personnel cannot be evacuated in one minute, permitted only up to concentrations not exceeding the cardiotoxicity NOAEL of 10%;</p> <p>Where egress takes longer than 30 seconds but less than one minute, the employer shall not use the agent in a concentration greater than its cardiotoxic LOAEL of 15%.</p> <p>All personnel must be evacuated before concentration of HFC-236fa exceeds 16%.</p> <p>Design concentration must result in oxygen levels of at least 16%.</p> <p>See additional comment 5</p> <p>For a discussion of the limitations on HFC-236fa applicability see the Narrowed Use Limits section above.</p> | <p>The comparative design concentration based on cup burner values is approximately 6.4%.</p> <p>Users should observe the limitations on HFC-236fa acceptability by taking the following measures:</p> <p>(i) conduct an evaluation of foreseeable conditions of end use;</p> <p>(ii) determine that the physical or chemical properties or other technical constraints of the other available agents preclude their use; and</p> <p>(iii) determine that human exposure to the other alternative extinguishing agent may result in failure to meet applicable use conditions; Documentation of such measures should be available for review upon request.</p> <p>Feasible for use in a normally occupied area.</p> <p>See additional comments 1, 2, 3, 4</p> |

**Acceptable Substitutes for Halon 1301 Total Flooding Agents Subject to Use Conditions
under the Significant New Alternatives Policy (SNAP) Program as of April 26, 2000 (continued)**

| Substitute | Trade Name | Conditions | Comments |
|--------------------------------|------------------|--|---|
| C ₃ F ₈ | PFC-218, CEA-308 | <p>For occupied areas from which personnel cannot be evacuated in one minute, use is permitted only up to concentrations not exceeding the cardiotoxicity NOAEL of approximately 30%.</p> <p>Although no LOAEL has been established for this product, standard OSHA requirements apply, i.e. for occupied areas from which personnel can be evacuated or egress can occur between 30 and 60 seconds, use is permitted up to a concentration not exceeding the LOAEL.</p> <p>All personnel must be evacuated before concentration of C₃F₈ exceeds 30%.</p> <p>Design concentration must result in oxygen levels of at least 16%.</p> <p>See additional comment 5</p> <p>For a discussion of the limitations on C₃F₈ applicability see the Narrowed Use Limits section above.</p> | <p>The comparative design concentration based on cup burner values is approximately 8.8%.</p> <p>Users should observe the limitations on PFC acceptability by taking the following measures:</p> <ul style="list-style-type: none"> (i) conduct an evaluation of foreseeable conditions of end use; (ii) determine that the physical or chemical properties or other technical constraints of the other available agents preclude their use; (iii) determine that human exposure to the other alternative extinguishing agent may result in failure to meet applicable use conditions; Documentation of such measures should be available for review upon request. <p>The principal environmental characteristic of concern for PFCs is that they have high GWPs and long atmospheric lifetimes. Actual contributions to global warming depend upon the quantities of PFCs emitted. For additional guidance regarding applications in which PFCs may be appropriate, users should consult the description of potential uses which is included in the March 18, 1994 final rule (59 FR 13044).</p> <p>See additional comments 1, 2, 3, 4</p> |
| C ₄ F ₁₀ | PFC-410, CEA-410 | <p>For occupied areas from which personnel cannot be evacuated in one minute, use is permitted only up to concentrations not exceeding the cardiotoxicity NOAEL of approximately 40%.</p> <p>Although no LOAEL has been established for this product, standard OSHA requirements apply, i.e. for occupied areas from which personnel can be evacuated or egress can occur between 30 and 60 seconds, use is permitted up to a concentration not exceeding the LOAEL.</p> <p>All personnel must be evacuated before concentration of C₄F₁₀ exceeds 40%.</p> <p>Design concentration must result in oxygen levels of at least 16%.</p> <p>See additional comment 5</p> <p>For a discussion of the limitations on C₄F₁₀ applicability see the Narrowed Use Limits section above.</p> | <p>The comparative design concentration based on cup burner values is approximately 6.6%.</p> <p>Users should observe the limitations on PFC acceptability by taking the following measures:</p> <ul style="list-style-type: none"> (i) conduct an evaluation of foreseeable conditions of end use; (ii) determine that the physical or chemical properties or other technical constraints of the other available agents preclude their use; (iii) determine that human exposure to the other alternative extinguishing agent may result in failure to meet applicable use conditions; Documentation of such measures should be available for review upon request. <p>The principal environmental characteristic of concern for PFCs is that they have high GWPs and long atmospheric lifetimes. Actual contributions to global warming depend upon the quantities of PFCs emitted. For additional guidance regarding applications in which PFCs may be appropriate, users should consult the description of potential uses which is included in the March 18, 1994 final rule (59 FR 13044).</p> <p>See additional comments 1, 2, 3, 4</p> |

CF₃I

For use in normally unoccupied areas only.

Any employee that could possibly be in the area must be able to escape within 30 seconds. The employer shall ensure that no unprotected employees enter the area during agent discharge.

The weight equivalence of this agent is 1.36 compared to halon 1301, and its volume equivalence is 1.0. However, its cardiotoxic LOAEL is 0.4%. Thus, manufacturer has not submitted this agent for use in normally occupied areas. See additional comments 1, 2, 3, 4

**Acceptable Substitutes for Halon 1301 Total Flooding Agents Subject to Use Conditions
under the Significant New Alternatives Policy (SNAP) Program as of April 26, 2000 (continued)**

| Substitute | Trade Name | Conditions | Comments |
|---------------------------------------|------------|--|--|
| IG-100 | NN100 | <p>IG-100 systems should be designed to maintain an oxygen level of 10%. A design concentration of less than 10% may only be used in normally unoccupied areas and in areas where egress is possible within 30 seconds.</p> <p>If it is not possible to egress an area within one minute, IG-100 systems must be designed to maintain an oxygen level of 12%.</p> <p>If the possibility exists for the oxygen levels to drop 10%, employees must be evacuated prior to such oxygen depletion.</p> | <p>IG-100 systems must include alarms and warning mechanisms.</p> <p>Workplace personnel and employees should not remain in or re-enter the space after system discharge (even if such discharge is accidental) without appropriate personal protective equipment.</p> <p>See additional comments 1, 2 and 5.</p> |
| IG-01 (formerly Inert Gas Blend C) | Argotec | <p>IG-01 systems may be designed to an oxygen level of 10% if employees can egress the area within one minute, but may be designed only to the 12% oxygen level if it takes longer than one minute to egress the area.</p> <p>If the possibility exists for the oxygen to drop below 10%, employees must be evacuated prior to such oxygen depletion.</p> <p>A design concentration of less than 10% may only be used in normally unoccupied areas, as long as an employee who could possibly be exposed can egress within 30 seconds.</p> | <p>This Agency does not contemplate personnel remaining in the space after discharge during a fire without Self Contained Breathing Apparatus (SCBA) required by OSHA.</p> <p>EPA does not encourage any employee to intentionally remain in the area after system discharge, even in the event of accidental discharge. In addition, the system must include alarms and warning mechanisms as specified by OSHA.</p> <p>See additional comments 1, 2.</p> |
| IG-55 (formerly Inert Gas Blend B) | Argonite | <p>IG-55 systems may be designed to an oxygen level of 10% if employees can egress the area within one minute, but may be designed only to the 12% oxygen level if it takes longer than one minute to egress the area.</p> <p>If the possibility exists for the oxygen to drop below 10%, employees must be evacuated prior to such oxygen depletion. A design concentration of less than 10% may only be used in normally unoccupied areas, as long as any employee who could possibly be exposed can egress within 30 seconds.</p> | <p>This Agency does not contemplate personnel remaining in the space after discharge during a fire without Self-Contained Breathing Apparatus (SCBA) required by OSHA.</p> <p>EPA does not encourage any employee to intentionally remain in the area after discharge, even in the event of accidental discharge. In addition, the system must include alarms and warning mechanisms as specified by OSHA.</p> <p>See additional comments 1, 2</p> |
| IG-541 | Inergen | <p>The design concentration must result in at least 10% oxygen and no more than 5% CO₂.</p> <p>If the oxygen concentration of the atmosphere falls below 10%, personnel must be evacuated and egress must occur within 30 seconds.</p> | <p>Studies have shown that healthy, young individuals can remain in a 10% to 15% oxygen atmosphere for 30 to 40 minutes without impairment. However, in an emergency, the oxygen level may be reduced below safe levels, and the combustion products formed by the fire are likely to cause harm. Thus, the Agency does not contemplate personnel remaining in the space after system discharge during a fire without Self Contained Breathing Apparatus (SCBA) required by OSHA.</p> <p>Feasible for use in a normally occupied area.</p> <p>See additional comments 1, 2</p> |

Gelled
Halocarbon/Dry
Chemical
Suspension

Envirogel

For use in normally unoccupied areas only.

Any employee who could possibly be in the area must be able to escape within 30 seconds. The employer shall ensure that no unprotected employees enter the area during agent discharge.

The manufacturer's SNAP application requested listing for use in unoccupied areas only.
See additional comment 2.

**Acceptable Substitutes for Halon 1301 Total Flooding Agents Subject to Use Conditions
under the Significant New Alternatives Policy (SNAP) Program as of April 26, 2000 (continued)**

| Substitute | Trade Name | Conditions | Comments |
|--|------------|---|--|
| Inert Gas/Powdered Aerosol Blend | FS 0140 | For use in normally unoccupied areas only. Any employee who could possibly be in the area must be able to escape within 30 seconds. The employer shall ensure that no unprotected employees enter the area during discharge. | The manufacturer's SNAP application requested listing for use in unoccupied areas only. See additional comment 2. |

Additional Comments

1. Must conform with OSHA 29 CFR 1910 Subpart L Section 1910.160.
2. Per OSHA requirements, protective gear (SCBA) must be available in the event personnel must reenter the area.
3. Discharge testing should be strictly limited only to that which is essential to meet safety or performance requirements.
4. The agent should be recovered from the fire protection system in conjunction with testing or servicing, and recycled for later use or destroyed.
5. EPA has no intention of duplicating or displacing OSHA coverage related to the use of personal protective equipment (e.g., respiratory protection), fire protection, hazard communication, worker training or any other occupational safety and health standard with respect to EPAs regulation of halon substitutes.

**Unacceptable Substitutes for Halon Fire Suppression and Explosion Protection Systems
under the Significant New Alternatives Policy (SNAP) Program as of April 26, 2000**

| Substitute | Trade Name | ODS Being Replaced | Reason |
|--------------------|------------|----------------------------------|--|
| CFC-11 | | Halon 1211 streaming agents | This agent has been suggested for use on large outdoor fires for which non-ozone depleting alternatives are currently available. In addition, CAAA section 610 bans the use of CFCs in portable extinguishers. |
| HFC-32 | | Halon 1301 total flooding agents | This agent is flammable. |
| Chlorobromomethane | | Halon 1301 total flooding agents | Other alternatives exist with zero or lower ODP; OSHA regulations prohibit its use as an extinguishing agent in fixed extinguished systems where employees may be exposed. See 29 CFR 1910.160(b)(11). |