

HFC-245fa is also known as 1,1,1,3,3-pentafluoropropane (CAS Registry No. 460-73-1). We previously found HFC-245fa acceptable for use as a substitute for CFC-11 and HCFC-141b in foam blowing (64 FR 68041, December 6, 1999), refrigeration and air conditioning (65 FR 37901, June 19, 2000) and aerosols (67 FR 13272, March 22, 2002).

In its original rulemaking on March 18, 1994 (59 FR 13084), the SNAP program addressed the use of blends in foam blowing applications. EPA determined that notification was not required for "use of blends or mixtures of substitutes listed as acceptable under the SNAP program in open-celled or closed-cell or semi-rigid end uses" *except* in the following end-uses: polyurethane rigid laminated boardstock; polystyrene extruded boardstock and billet foams; phenolic foams; and polyolefin foams. Therefore, use of HFC-245fa in blends with other substitutes that EPA has found acceptable¹ as HCFC replacements is currently acceptable in the following end uses:

- Rigid polyurethane appliance;
- Rigid polyurethane slabstock and other foams;
- Rigid polyurethane commercial refrigeration and sandwich panels;
- Polyurethane integral skin foam.

Approval of an HFC-245fa blend in any other end-use would require formal determination by EPA. Blends of HFC-245fa and other substitutes EPA has found acceptable as replacements for HCFCs are subject to the same conditions that apply to the individual substitutes (*e.g.*, flammable blowing agents in spray foam require EPA approval and safety training). For more information on HFC-245fa and its blends refer to the original listing (64 FR 68041, December 6, 1999) and the information below for blends of HFC-245fa and HCFC-22.

3. Blends of HFC-245fa and HCFC-22

EPA's decision. Blends of HFC-245fa and HCFC-22 are acceptable substitutes for blends of HCFC-141b and HCFC-22, where the HFC-245fa replaces the HCFC-141b in:

- Rigid polyurethane and polysocyanurate laminated boardstock;
- Rigid polyurethane appliance;
- Rigid polyurethane slabstock and other foams;
- Rigid polyurethane commercial refrigeration and sandwich panels;
- Phenolic insulation board and bunstock;

- Polyolefin;
- Polyurethane integral skin foam.

Further information on HFC-245fa is described above in section C.2. of this document.

Environmental information. HFC-245fa has an ODP of zero. It has a GWP of 1022. This value is similar to or lower than the GWP of the substances that HFC-245fa would be replacing. Both HFC-245fa and HCFC-22 have been excluded from the definition of VOC under Clean Air regulations addressing the development of State implementation plans (SIPs) to attain and maintain the national ambient air quality standards. 40 CFR 51.100(s).

Flammability. Blends of HFC-245fa and HCFC-22 are non-flammable.

Toxicity and exposure data. EPA anticipates that HFC-245fa will be used in such a manner so that any recommendations specified in the manufacturers' Material Safety Data Sheets (MSDSs) are followed. We also expect that the workplace exposure level will not exceed the American Industrial Hygiene Association's (AIHA) workplace environmental exposure limit (WEEL) of 300 ppm for HFC-245fa or the American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Value (TLV) of 1000 ppm for HCFC-22.

The blend of HFC-245fa and HCFC-22 has moderate to low toxicity. EPA expects that these blends will be used in a manner such that occupational exposure to any component of the blend does not exceed the WEEL for that chemical.

Comparison to other foam blowing agents. HFC-245fa has a lower ODP than HCFC-141b, the ODS it replaces; thus, blends of HFC-245fa and HCFC-22 reduces risk overall compared to the ODS blends they replace. Blends of HFC-245fa and HCFC-22 have comparable or lower GWP than HCFC-141b and other approved substitutes for HCFC-141b. Blends of HFC-245fa and HCFC-22 are non-flammable. Blends of HFC-245fa and HCFC-22 exhibit moderate to low toxicity and guidance is available from the AIHA and the ACGIH on their use in the workplace. Thus, we find that blends of HFC-245fa and HCFC-22 are acceptable because they reduce overall risk to public health and the environment in the end uses listed.

D. Fire Suppression and Explosion Protection

1. HFC-125 with 0.15% *d*-limonene (NAF S-125)

EPA's decision. NAF S-125 is acceptable for use as a substitute for

halon 1301 in the total flooding end use in both normally occupied and unoccupied spaces. NAF S-125 is a mixture of HFC-125 containing 0.15% *d*-limonene by weight. HFC-125 is also known as 1,1,1,2,2-pentafluoroethane, CAS No. 354-33-6. Another name for *d*-limonene is 4-isopropenyl-1-methyl-1-cyclohexene, CAS No. 5989-27-5. EPA finds the blend acceptable as submitted; however, blends containing more than 0.15% *d*-limonene are not addressed by today's decision. EPA previously found HFC-125 acceptable in total flooding (January 29, 2002; 67 FR 4185). EPA previously found the entire class of terpenes, including *d*-limonene, acceptable in solvent cleaning (March 18, 1994; 59 FR 13044).

Environmental information. Both of the components of NAF S-125 have an ozone depletion potential of zero. HFC-125 has a global warming potential (GWP) of 2800 and *d*-limonene has a GWP of 10. These values are lower than the GWP of Halon 1301 (6900).

HFC-125 is excluded from the definition of volatile organic compound (VOC) under Clean Air Act regulations addressing the development of State implementation plans (SIPs) to attain and maintain the national ambient air quality standards. 40 CFR 51.100(s). *d*-limonene is used as a solvent in cleaning solutions and has a variety of uses. *d*-limonene is a VOC. Given that *d*-limonene exists at higher percentages in commonly used cleaners and polishes than it does in NAF S-125, the effects of fire extinguishers containing *d*-limonene upon the environment and the general population are expected to be minimal.

Flammability. Although *d*-limonene is flammable, the blend is non-flammable.

Toxicity and exposure data. As with other fire suppressants, EPA recommends that you minimize exposure to this agent. If personnel are exposed to the agent, they should exit the area within five minutes or less. EPA recommends that unnecessary exposure to fire suppression agents and their decomposition products be avoided and that personnel exposure be limited to no more than 5 minutes.

In order to keep exposure levels as low as possible, EPA recommends the following for establishments installing and maintaining total flooding systems:—Put adequate ventilation in place. If ventilation is suspected to be inadequate, self-contained breathing apparatus (SCBA) should be available;—Wear proper personal protection equipment (impervious butyl gloves, eye protection, chemical resistant aprons, long sleeves, and safety shoes);

¹ By acceptable, in this case we mean acceptable, acceptable subject to use conditions, or acceptable subject to use limits.