

commenters to submit more specific information concerning the flashpoint of pure nPB. We are aware that nPB blends may have flashpoint characteristics different from that of pure nPB, depending on the nature of the additives or stabilizers. In this rulemaking, EPA is evaluating only pure nPB as a substitute for CFC-113 and methyl chloroform. We therefore are not interested in receiving information concerning the flashpoints of blends that contain nPB. Commenters providing information on nPB's flashpoint should refer to the specific test methodology and apparatus used to determine the flashpoint, such as ISO 1523, American Society of Testing Materials (ASTM) E-681, D92, D93-85—Pensky-Martens closed cup, or D56-96—Tag closed cup. EPA also invites readers to submit information concerning any potential fire or explosion hazards that may result from the use in solvent cleaning of compounds that have flashpoints within the range of normal atmospheric pressures and temperatures.

E. Other Environmental Concerns

Because nPB breaks down in the atmosphere within 21 days, and is not particularly soluble in water, it is unlikely that "rain out" from nPB released into the atmosphere could cause contamination of water supplies. However, as with all chemicals, significant contamination of soil and water can result when directly introduced into water or onto the ground. Thus, EPA expects that users will dispose of nPB in accordance with relevant regulations under the Resource Conservation and Recovery Act, and with applicable state and local regulations. Compliance with these regulations will mitigate the possibility that nPB might enter water supplies or top soil.

nPB is a volatile organic compound (VOC). VOCs are associated with the formation of ground-level ozone, a respiratory irritant. Therefore, nPB use currently is controlled under state and local regulations implementing Federal clean air requirements at 40 CFR part 51. These regulations are intended to bring areas into compliance with the National Ambient Air Quality Standards for ground-level ozone. Users located in ozone non-attainment areas may need to consider using other alternatives for cleaning that are not VOCs or control emissions.

F. Comparison of nPB to Other Solvents

Section 612 of the Clean Air Act directs EPA to determine the acceptability of a replacement substance ("substitutes") for class I and class II

ozone depleting substances based on whether such substitute creates an overall greater risk to human health and the environment than other substitutes that are available. Section 612(c) specifically states that the Administrator shall issue regulations:

providing that it shall be unlawful to replace any class I or class II substance with any substitute substance which the Administrator determines may present adverse effects to human health or the environment, where the Administrator has identified an alternative to such replacement that—

- (1) reduces the overall risk to human health and the environment; and
- (2) is currently or potentially available.

Thus, EPA must compare the risks to human health and the environment of a substitute to the risks associated with other substitutes that are currently or potentially available. In addition, EPA also considers whether the substitute for class I and class II ODSs "reduces the overall risk to human health and the environment" compared to the ODSs being replaced, consistent with the safe alternatives policy of § 612.

In our evaluation, we considered the substitutes available within a given end use. In other words, we compared nPB as a metal cleaning solvent against other metal cleaning alternatives, and we compared nPB as a carrier solvent in adhesives to other adhesive alternatives. Because of the large amount of overlap in the alternatives available in the different end uses, the discussion below will mention alternatives from multiple end uses where nPB is used.

Although EPA does not judge the effectiveness of alternatives, this factor is an additional one that we consider when determining what alternatives are available in a particular application within an end use. For example, aqueous cleaners are the substitute of choice for many in the metal cleaning end use and many electronics applications now use the "no clean" technology. However, some types of soils are especially difficult to remove and some applications require a high degree of cleanliness; thus, in some applications, particularly in precision cleaning, there may still be a need for organic solvents for cleaning. Depending on the particular application, it may be necessary to use an aggressive cleaning solvent such as nPB.

nPB has an ODP of 0.013 to 0.018 at the latitudes of the continental U.S. Thus, nPB reduces risk compared to CFC-113, methyl chloroform, and HCFC-141b, the ODSs it replaces, which have ODPs of 0.8, 0.1, and 0.11, respectively. HCFC-225ca/cb has an

ODP of approximately 0.03. HCFC-225ca/cb is acceptable in metals cleaning and aerosol solvents, and acceptable subject to use conditions in precision cleaning and electronics cleaning. Although HCFC-141b has been phased out of production in the U.S., its use is currently acceptable in aerosol solvents; HCFC-141b has a higher ODP than nPB. HCFC-123 has an ODP of 0.0124, which is comparable to that of nPB. HCFC-123 is acceptable in precision cleaning. There are other acceptable cleaners that essentially have no ODP (aqueous cleaners, hydrofluoroethers (HFEs), hydrofluorocarbon (HFC)-4310mee, HFC-365mfc, HFC-245fa, hydrocarbons, volatile methyl siloxanes (VMSs), methylene chloride, trichloroethylene (TCE), perchloroethylene (PERC), and parachlorobenzotrifluoride (PCBTf)).

nPB has a GWP of only 0.31, which is lower than or comparable to that of the lowest GWP solvents. Acceptable HCFC, HFC and HFE solvents all have GWPs that are two to four orders of magnitude higher than that of nPB (55 to 1700 on a 100 year time horizon compared to CO₂).

nPB is a volatile organic compound for purposes of EPA regulations, although there are petitions with EPA requesting its exemption. Thus, nPB currently is subject to regulations for ground-level ozone and local air quality. nPB is not currently regulated as a hazardous air pollutant and is not listed as a hazardous waste under RCRA.

nPB is less flammable than many acceptable substitutes, such as ketones, alcohols, terpenes, and hydrocarbons. nPB is comparable in its low flammability to chlorinated solvents, HCFCs, HFEs, HFC-245fa, HFC-4310mee, and aqueous cleaners.

EPA used an acceptable exposure limit of 25 ppm as the basis for comparison with measured exposure levels in the workplace to determine whether nPB could be used safely, and thus, to determine the acceptability of nPB. EPA found that nPB could be used as safely at 25 ppm as other acceptable solvents when they are used at their AELs or other relevant occupational exposure limits, such as OSHA PELs or ACGIH TLVs.¹⁵ Based on the

¹⁵ The recommended AEL for nPB is lower than that for many acceptable solvents (HFEs, ketones, HFCs, HCFC-225ca/cb, hydrocarbons), but is higher or comparable to the AEL for some acceptable solvents (d-limonene, VMSs, dichlorobenzotrifluoride, HCFC-123, methylene chloride, PCBTf). However, a direct comparison between two compounds with different AELs does not necessarily mean that using a compound with a higher AEL is more risky. Actual exposure levels will vary based upon factors other than the AEL,