

# A Technical Note on Worker Exposures to Bromothane™ Solvents

## General Information

This technical note has been prepared to answer several complex and subtle questions about the toxicity of Bromothane™ solvents. These comments also are equally applicable to any brand or source of n-Propyl Bromide, also known as nPB, 1-Bromopropane or CAS # 106-94-6.

It is prudent to understand the underlying basis for exposure limits recommended or mandated by an organization or vendor. Some exposure limits are set simply to prevent acute effects such as eye or respiratory tract irritation that could make working uncomfortable or difficult to perform. Other exposure limits are set to prevent more serious immediate effects such as death by asphyxia (lack of oxygen). Most exposure limits are set to prevent long-term damage to organs of the body that could occur if high exposures continued over a period of time (days, weeks or even years). These consensus values are considered protective of most (but not necessarily all) workers that would be exposed at the specified concentration for up to 8 hours per day, 40 hours per week for a working life time (which is taken as 40 years).

No OSHA *Permissible Exposure Limit (PEL)*, *Threshold Limit Value (TLV)* by the American Conference of Governmental Industrial Hygienists (ACGIH), or *Workplace Environmental Exposure Limit (WEEL)* by the American Indus-

trial Hygiene Association has yet been assigned to n-propyl bromide (nPB). The U.S. EPA, through its SNAP process, recommends an exposure level of 25 parts per million (ppm). Micro Care's supplier of Bromothane solvents, Great Lakes Chemical, has established a recommended worker exposure level of 10 ppm.

Micro Care Marketing Services works with customers to control employee exposure levels to the more conservative level of 10 ppm (as an 8-hour Time Weighted Average, or "TWA"). In practical terms, a TWA means over the course of the workday there could be periods of time spent working in concentrations above the exposure limit that will be offset by periods of time below the exposure limit, so that by the end of the workday, the average exposure would be 10 ppm or less.

## The Hazards Associated with nPB

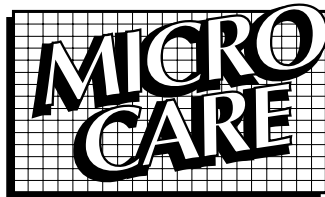
In simple terms, the hazards associated with n-propyl bromide can be viewed with regards to short and long term exposure. Like other solvents, short-term overexposure can lead to skin irritation and dizziness. Proper storage and handling procedures, along with personal protective equipment should be used to avoid short-term overexposure.

From a long-term exposure viewpoint, tests in animals have shown n-propyl bromide affects male and female

## Product Summary...

- Powerful Cleaning on Tough Soils
- Nonflammable for Easy Handling
- Fast Drying, No Rinsing
- Very Economical Performance
- A Great Replacement for Ozone-Depleting and/or Chlorinated Cleaners

## Available World-Wide from...



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fertility. The U.S. National Toxicology Program has recommended a No Observable Adverse Effect Level (NOAEL) for nPB of 100 ppm, which, with a sensible ten-fold safety factor, has led us to recommend a 10 ppm exposure limit as well.

To this end, Micro Care Marketing Services provides Bromothane products only into engineered systems and has developed an extensive product stewardship program. Product training, emission reduction training, and an active monitoring program are all part of the product stewardship program. Micro Care also is proud to offer this unmatched technical expertise with the support of the only major U.S. producer of nPB, Great Lakes Chemical.

Micro Care and Great Lakes take their responsibility for product stewardship very seriously. If engineers, specifiers or users desire assistance to understand the information on the Bromothane material safety data sheets, product specifications or products labels, or should any person have any other concerns about these products, simply contact Micro Care Marketing Services.

#### Common Questions and Answers:

##### 1. Is Bromothane SNAP-approved by the U.S. EPA?

After an extensive review, the U.S. EPA has proposed that nPB be SNAP-approved for precision cleaning, defluxing and metal cleaning applications. The EPA review included a thorough investigation of n-propyl bromide's environmental, safety, health and flammability characteristics.

##### 2. What is the recommended exposure limit for Bromothane solvents?

We recommend our products be controlled to meet a 10 ppm exposure limit (8-hour TWA).

##### 3. Is nPB listed as a carcinogen?

No, nPB is not listed as a carcinogen by NTP, OSHA, or ACGIH.

##### 4. What are the risks in handling Bromothane solvents?

**Acute:** Short-term hazards with nPB are similar to many other solvents where a person with significant overexposure may experience skin and eye irritation, dizziness or headaches.

**Chronic:** Based on animal studies long-term overexposure to nPB may lead to multiple adverse affects in the body likely including fertility problems.

Consult the most recent Bromothane MSDS for a complete and up to date review of health hazards.

##### 5. What are the minimum recommended protective measures to use with nPB?

Bromothane solvents should only be used in an engineered process such as a well-designed vapor degreaser where solvent emissions are minimized. Where there is a potential for splashing or skin contact, protective equipment should be worn made of butyl rubber or other materials that are resistant to penetration by nPB. Suitable eye protection also should be worn. Lastly, Micro Care will work with every customer to implement a monitoring program to track worker exposure levels.

##### 6. Where can I find additional information?

Additional safety information is located on the Bromothane Product Specifications, the Material Safety Data Sheets, application notes and on the web at [www.Bromothane.com](http://www.Bromothane.com). If additional information or clarification is required, please contact Micro Care Marketing Services at 860-595-4525.

#### Availability

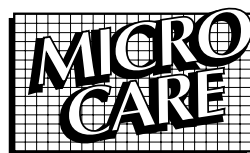
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#### Notes

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