1-Bromopropane Air Guidance

5/2023

1-Bromopropane (1-BP) is an industrial chemical primarily released into the air through industrial or manufacturing operations. 1-BP is mainly used in adhesive sprays, degreasing operations for metals, plastics, asphalt production, and electronic components. 1-BP has also been used as alternative to perchloroethylene in some dry-cleaning operations, and synthetic fiber manufacturing. Production of 1-BP has increased over the last decade or so because of its use as a replacement chemical for select chemical solvents in some manufacturing operations/processes. In late 2021, the EPA signed into final rule the addition of 1-BP to the Clean Air Act's list of hazardous air pollutants (HAPs). The EPA has not added a new HAP since 1990.

How can you be exposed to 1-BP in air?

People can breathe in 1-BP when working in an area that uses or produces 1-BP as part of an industrial, manufacturing, or commercial process. Living near a manufacturing or commercial operation that uses 1-BP is also a way people can be exposed to 1-BP in air.

1-BP released into ambient air begins to break down within a few days to weeks depending on levels. 1-BP is not likely to build up in the food chain because it breaks down quickly in the environment.

MDH Health-based Values

Duration of Exposure	2023 HBV ($\mu g/m^3$)	Health Endpoint
Acute (24 hours or less)	100	Developmental
Short-term (>24 hrs-30 days)	30	Liver Effects
Subchronic (>30 days-~8 years)	20	Nervous System
Chronic (>~8 years-lifetime)	2	Nervous System
Cancer (lifetime)	6	Skin Tumors

The Minnesota Department of Health (MDH) uses Health-based Values (HBVs) to protect people's health from contaminants in air. The HBVs are levels in air that are likely to pose little or no risk to human health over a period of time. They are developed to protect the most vulnerable (e.g., most sensitive or most highly exposed) to the potentially harmful effects of a contaminant.

Breathing an amount of 1-BP that is above the HBV does not mean health effects will occur; however, the risk for health effects can increase as the level of exposure and/or time of exposure increases. When HBVs are exceeded, MDH recommends taking steps to reduce or avoid exposures.

Potential health concerns from breathing 1-BP

Information about the health effects from breathing 1-BP comes from studies of laboratory animals and studies of people. MDH has concluded that the main health concerns from 1-BP exposures are the following:

- In animal studies, developmental and liver effects are the most sensitive endpoints following brief inhalation exposures (less than 24-hours to 30 days) to 1-BP at levels much higher than MDH's HBVs.
- Both human and animal studies show breathing 1-BP over a longer can affect the neurological system. Neurological symptoms can range from mild to more severe depending on levels and exposure time to 1-BP.
- 1-BP may be considered "likely to be carcinogenic in humans" per USEPA's 2005 Cancer Guidelines and a possibly carcinogenic to humans per the International Agency for Research for Cancer's 2018 evaluation. A long term 1-BP inhalation study established evidence of certain cancers in rodents.

More information

1-BP HBV technical information can be found on the MDH Air Guidance Values (https://www.health.state.mn.us/communities/environment/risk/guidance/air/table.html) webpage.

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