Product Safety Assessment
DOW™ 2-Ethylhexanol

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Names
• CAS No. 104-76-7
• DOW™ 2-ethylhexanol
• 2-Ethyl-1-hexanol
• EC No. 203-234-3
• 2-Ethylhexyl alcohol

Product Overview
• DOW™ 2-ethylhexanol is a clear, colorless liquid with a mild odor. Because of its low volatility, 2-ethylhexanol is not considered a Hazardous Air Pollutant (HAP) solvent by the United States Environmental Protection Agency (U.S. EPA). For further details, see Product Description.
• DOW 2-ethylhexanol is used primarily for the manufacture of plasticizers and to produce 2-ethylhexylacrylate, a monomer used to modify the properties of acrylic and methacrylic polyesters. For further details, see Product Uses.
• Eye contact with 2-ethylhexanol may cause severe irritation and severe corneal injury. Prolonged skin contact may cause moderate irritation with local redness and may cause more severe response on covered skin. Prolonged, excessive inhalation exposure may cause respiratory irritation and central nervous system depression. In animal testing, effects of repeated exposure have been reported on the blood, kidney, liver, and spleen. For further details, see Health Information.
• 2-ethylhexanol is not sold by DOW for direct consumer use, nor is it intended to be present in consumer products. Exposure can occur either in a 2-ethylhexanol manufacturing facility or in the various industrial or manufacturing facilities that use this material. For further details, see Exposure Potential.
• 2-ethylhexanol is combustible. It is stable at recommended storage and use conditions, but incompatible with strong acids or strong oxidizers. For further details, see Physical Hazard Information.
• 2-ethylhexanol has moderate potential to accumulate in the food chain and is slightly toxic to fish and other aquatic organisms on an acute basis. It is unlikely to persist in the environment as it is readily biodegradable. For further details, see Environmental Information.

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Manufacture of Product

- **Process** – DOW™ 2-ethylhexanol is produced by reacting synthesis gas with propylene to form n-butyraldehyde. Two n-butyraldehyde molecules then combine under basic conditions and are dehydrated and then hydrogenated to form 2-ethylhexanol. The reaction sequence is shown below.

\[
\begin{align*}
\text{Propylene} & \quad + \quad \text{Synthesis gas} \quad \xrightarrow{\text{H}_2} \quad \text{n-Butyraldehyde} \\
2 \text{n-Butyraldehyde} & \quad \xrightarrow{[\text{OH}^\text{-}]} \quad \text{H}_2\text{CCH}_2\text{CH}_2\text{C} = \text{O} \\
\text{H}_3\text{CCH} = \text{CH}_2 & \quad + \quad \text{CO/H}_2 \quad \xrightarrow{\text{H}} \quad \text{H}_3\text{CCH}_2\text{CH}_2\text{C} = \text{O} \\
\end{align*}
\]

Product Description

DOW™ 2-ethylhexanol is a clear, colorless liquid with a mild odor. It is soluble in most organic solvents, but has limited solubility in water. Because of its low volatility, it is not considered a Hazardous Air Pollutant (HAP) solvent by the United States Environmental Protection Agency (U.S. EPA). DOW 2-ethylhexanol is highly pure.

Product Uses

DOW™ 2-ethylhexanol is used for the manufacture of plasticizers such as dioctylphthalate. (A plasticizer is a non-volatile organic material added to plastics to make them easier to process and to contribute flexibility and toughness.) DOW 2-ethylhexanol is also used to produce 2-ethylhexylacrylate, an acrylate monomer used to modify the properties of acrylic and methacrylic polyesters, as a lube oil and diesel fuel additive, as an extraction solvent in the mining of metals, in coatings, and in the production of certain surfactants and herbicides.

Exposure Potential

DOW™ 2-ethylhexanol is used in the production of industrial products. Based on the uses for this material, the public could be exposed through:

- **Workplace exposure** – Exposure can occur either in a 2-ethylhexanol manufacturing facility or in the various industrial or manufacturing facilities that use this material. It is produced,
distributed, stored, and consumed in closed systems. Those working with this material in manufacturing operations could be exposed during maintenance, sampling, testing, or other procedures. Each manufacturing facility should have a thorough training program for employees and appropriate work processes, ventilation, and safety equipment in place to limit unnecessary exposure. See Health Information.

- **Consumer exposure to products containing 2-ethylhexanol** – This material is not sold by Dow for direct consumer use, nor is it intended to be present in consumer products. See Health Information.

- **Environmental releases** – DOW™ 2-ethylhexanol is utilized entirely in closed systems during manufacture and use. Thus, releases to the environment are expected to be minimal. It has low volatility and limited solubility in water. When introduced to water, it will have a tendency to remain. Because DOW 2-ethylhexanol is readily biodegradable, the compound will be removed by sewage treatment plants. See Environmental, Health, and Physical Hazard Information.

- **Large release** – Industrial spills or releases are infrequent and generally contained. If a large spill does occur, the material should be captured, collected, and reprocessed or disposed of according to applicable governmental requirements. Positive-pressure, self-contained breathing apparatus (SCBA) with a full-face mask approved by NIOSH is recommended for emergency work. Eliminate all sources of ignition immediately. See Environmental, Health, and Physical Hazard Information.

- **In case of fire** – Isolate the fire and deny any unnecessary entry into the area. Use of a direct water stream may spread the fire. Use water fog or spray, dry-chemical or carbon-dioxide extinguishers, or foam. General-purpose synthetic or protein foams are preferred. Contain fire-water run-off if possible to minimize the potential for environmental damage. Firefighters should wear positive-pressure, self-contained breathing apparatus (SCBA) with a full-face mask approved by NIOSH and protective firefighting clothing. Follow emergency procedures carefully. See Environmental, Health, and Physical Hazard Information.

For more information, see the relevant Safety Data Sheet.

**Health Information**

**Eye contact** – May cause severe eye irritation and severe corneal injury.

**Skin contact** – Prolonged contact may cause moderate skin irritation with local redness. A more severe response may occur when confined on covered skin. Prolonged skin contact is unlikely to result in absorption of harmful amounts.

**Inhalation** – Prolonged, excessive exposure may cause adverse effects, including respiratory irritation and central nervous system depression. If the material is heated or an aerosol or mist is produced, concentrations sufficient to cause respiratory irritation or other effects may be attained.

**Ingestion** – This material has low toxicity if swallowed. Small amounts swallowed incidental to normal handling operations are not likely to cause injury. However, swallowing larger amounts may cause injury.

**Repeated exposure** – In high-dose animal testing, toxic effects have been reported on the blood, kidney, liver, and spleen.

**Other** – This material has caused birth defects or been toxic to the fetus in laboratory animals only at doses toxic to the mother. Genetic toxicity studies were negative in in vitro and in animal studies.

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For more information, see the relevant Safety Data Sheet.

Environmental Information

DOW™ 2-ethylhexanol has low volatility and limited solubility in water. When introduced to water, it will have a tendency to remain in the water. It has minimal tendency to bind to soil or sediment.

DOW 2-ethylhexanol has a moderate probability to accumulate in the food chain (bioconcentration potential is moderate) and is slightly toxic to fish and other aquatic organisms on an acute basis. This is mitigated by the minimal potential for environmental release of DOW 2-ethylhexanol and that, if released, it is unlikely to persist in the environment. It is considered readily biodegradable, which suggests the chemical will be rapidly and completely removed from water and soil environments, including biological wastewater treatment plants.

For more information, see the relevant Safety Data Sheet.

Physical Hazard Information

DOW™ 2-ethylhexanol is stable at recommended storage and use conditions. Exposure to elevated temperatures can cause the material to decompose. This material is incompatible with strong acids or strong oxidizers.

This material is combustible.

For more information, see the relevant Safety Data Sheet.

Regulatory Information

Regulations may exist that govern the manufacture, sale, transportation, use, and/or disposal of 2-ethylhexanol. These regulations may vary by city, state, country, or geographic region. Information may be found by consulting the relevant Safety Data Sheet, Technical Data Sheet, or Contact Us.

Additional Information

- Safety Data Sheet (http://www.dow.com/webapps/msds/msdssearch.aspx)
- Contact Us (http://www.dow.com/oxysolvents/contact/index.htm)
Product Safety Assessment: DOW™ 2-Ethylhexanol


References

1 2-Ethylhexanol, Technical Data Sheet, The Dow Chemical Company, Form No. 327-00037-0405
3 2-Ethylhexanol, 99.5% Safety Data Sheet for the US, The Dow Chemical Company
NOTICES:

As part of its 2015 Sustainability Goals, Dow has committed to make publicly available safety assessments for its products globally. This product safety assessment is intended to give general information about the chemical (or categories of chemicals) addressed. It is not intended to provide an in-depth discussion of health and safety information. Additional information is available through the relevant Safety Data Sheet, which should be consulted before use of the chemical. This product safety assessment does not replace required communication documents such as the Safety Data Sheet.

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