Product Safety Assessment

*Ethylene Glycol Butyl Ether Acetate*

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**Names**¹

- CAS No. 112-07-2
- 2-Butoxy-ethyl acetate
- Ethylene glycol butyl ether acetate
- Butyl glycol acetate
- Ethylene glycol n-butyl ether acetate
- Butyl ethoxy acetate
- Ethylene glycol monobutyl ether acetate
- Ethanol, 2-butoxy, acetate
- EGBEA
- Glycol ether
- Glycol monobutyl ether acetate
- Butyl CELLOSOLVE™ Acetate

**Product Overview**

- Ethylene glycol butyl ether acetate is a colorless liquid with a mild odor. It enhances certain application properties, such as brush-ability or roll application in high-performance coatings. The slow evaporation rate of this material also makes it ideal for use in specialty printing. It is an ethylene-series (or E-series) glycol ether that is used in many coating applications and is sold by Dow under the trade name Butyl CELLOSOLVE™ Acetate.² See Product Uses.
- Ethylene glycol butyl ether acetate may cause eye irritation. It may be harmful if absorbed through the skin or swallowed.³ Ethylene glycol butyl ether acetate has a high boiling point and a slow evaporation rate, so exposure to vapors is unlikely at room temperature.⁴ See Product Description and Health Information.
- Consumer exposure to ethylene glycol butyl ether acetate may occur through the use of latex coatings and specialty printing inks. Check the product label for ventilation and protective equipment requirements.⁵ See Exposure Potential.
- Ethylene glycol butyl ether acetate is a combustible liquid and vapor. It is thermally stable at typical storage and use temperatures. It can oxidize at elevated temperatures. Gas generation during decomposition can cause pressure build-up in closed systems.⁶ See Physical Hazard Information.
- Ethylene glycol butyl ether acetate is readily biodegradable, and its bioconcentration potential is low. Its potential for mobility in soil is high and it is slightly toxic to aquatic organisms.⁷ See Environmental Information.

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**Manufacture of Product**

- **Capacity** – In 2004, global industry capacity for E-series glycol ethers, including EGBEA, was 952,000 metric tons (2,098 million pounds). U.S. consumption of glycol ethers was 309,000 metric tons (682 million pounds). Dow has production facilities in the following U.S. locations: Midland, Michigan; Taft† and Plaquemine, Louisiana; and Seadrift, Texas†. Dow also has production facilities in San Lorenzo, Argentina, and Stade, Germany.

- **Process** – Ethylene glycol butyl ether acetate is produced by first reacting ethylene oxide with anhydrous n-butyl alcohol. The resulting ethylene glycol butyl ether is reacted with acetic acid or acetic anhydride to form ethylene glycol butyl ether acetate. The reaction sequence is shown below.\(^9,10\)

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\begin{align*}
\text{n-Butyl alcohol} & \quad \text{Ethylene oxide} & \quad \text{Ethylene glycol n-butyl ether} \\
\text{HO} & \quad \text{O} & \quad \text{CH}_3 \\
\text{C}_4\text{H}_9 & \quad \text{O} & \quad \text{C}_2\text{H}_5 \text{OH} \quad \text{HO} & \quad \text{O} & \quad \text{CH}_3 & \quad \text{H}_2\text{O} \\
\text{C}_4\text{H}_9 & \quad \text{O} & \quad \text{O} & \quad \text{C}_2\text{H}_5 \text{OH} & \quad \text{C}_4\text{H}_9 & \quad \text{O} & \quad \text{O} & \quad \text{C}_2\text{H}_5 \text{OH} & \quad \text{H}_2\text{O}
\end{align*}
\]

**Product Description**

Ethylene glycol butyl ether acetate is a clear liquid with a mild odor.\(^11\) It is a high-boiling, slow-evaporating solvent that has limited water solubility, but is miscible with alcohols and ketones.\(^12\) Ethylene glycol butyl ether acetate is an ethylene-series (or E-series) glycol ether and is sold by The Dow Chemical Company under the trade name Butyl CELLOSOLVE™ Acetate.

**Product Uses\(^{13,14,15}\)**

Glycol ethers are primarily used as solvents in formulations for cleaning fluids, paints, coatings, and inks. Ethylene glycol butyl ether acetate is a coalescent for waterborne latex coatings and a solvent used in specialty printing inks.

**Exposure Potential\(^{16}\)**

Ethylene glycol butyl ether acetate is used in the production of industrial and consumer products. Based on these uses, the public could be exposed through:

- **Workplace exposure** – Exposure can occur either in a glycol ethers manufacturing facility or in the various industrial or manufacturing facilities that use glycol ethers in production. Those working with glycol ethers in manufacturing operations could be exposed during maintenance, sampling, testing, or other procedures. Adequate ventilation should be used to maintain vapor levels below recommended guidelines. Each manufacturing facility should have a thorough training program for employees, appropriate work processes and safety equipment in place to limit unnecessary exposure. See Health Information.
• **Consumer exposure to products containing glycol ethers** – Ethylene glycol butyl ether acetate may be found in various paints, stains, and inks used by consumers. Use safety glasses and gloves chemically resistant to this material. Examples of preferred glove barrier materials include butyl rubber, chlorinated polyethylene, polyethylene, ethyl vinyl alcohol laminate and polyvinyl alcohol. Consider the use of protective clothing that is chemically resistant to this material. Avoid prolonged contact with eyes, skin, and clothing and avoid breathing vapor or mist. Keep containers closed and use with adequate ventilation. Wash thoroughly after handling. See Health Information.

• **Environmental releases** – In the event of a spill, isolate and ventilate the area and contain the spilled material if possible. Keep unnecessary and unprotected personnel from entering the area. Keep upwind of spill and do not smoke. Absorb small spills with noncombustible material, clay, or Zorb-all. Collect material in suitable and properly labeled containers. Prevent material from reaching surrounding soil, ditches, sewers, waterways, and/or ground water. Use appropriate safety equipment for clean up. See Environmental, Health and Physical Hazard Information.

• **Large release** – Industrial spills or releases are infrequent and are generally contained. If a large spill does occur, dike area to contain spill. The material should be captured, collected, and reprocessed or disposed of according to applicable governmental requirements. If ethylene glycol butyl ether acetate is present in a fire situation, it can produce carbon monoxide (highly toxic) and carbon dioxide (an asphyxiant at sufficient concentrations). Containers may rupture from gas generation in a fire situation. Use water (fog or fine spray) to cool fire-exposed containers until danger of reignition has passed. Fire-fighting personnel can also use dry-chemical or carbon-dioxide fire extinguishers or foam. Alcohol-resistant foams are preferred. General-purpose synthetic foams or protein foams may function, but will be less effective. Keep people away. Isolate fire and deny unnecessary entry. Fight fire from protected location or safe distance. Consider the use of unmanned hose holders or monitor nozzles. Do not use direct water stream, as it may spread fire. Move containers from fire area if this is possible without hazard. Burning liquids may be moved by gentle flushing with water. Emergency personnel should wear proper protective equipment, including self-contained breathing apparatus (SCBA), and follow emergency procedures carefully. Avoid contact with this material during fire-fighting operations. If contact is likely, change to full chemical-resistant fire-fighting clothing with self-contained breathing apparatus. If this is not available, wear full chemical-resistant clothing with self-contained breathing apparatus and fight fire from a remote location. When relevant in scale or risk, the community should be notified of the hazards associated with the specific release event. See Environmental, Health and Physical Hazard Information.

For more information, see the relevant Safety Data Sheet (SDS).

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**Health Information**

Eye contact with ethylene glycol butyl ether acetate may cause slight eye irritation with discomfort and redness.

Prolonged skin contact is essentially nonirritating to skin. However, prolonged or widespread skin contact may result in absorption of potentially harmful amounts.

Vapor or mist may cause eye and upper respiratory tract irritation. Excessive exposure to vapor may cause irritation to upper respiratory tract (nose and throat). Prolonged excessive exposure to vapor or mist may cause serious adverse effects, even death.

Ethylene glycol butyl ether acetate has a low toxicity if swallowed. Small amounts swallowed incidental to normal handling operations are unlikely to cause injury. However, swallowing larger amounts may cause injury.
In animal studies, excessive exposure caused hemolysis (breakage of red blood cells) and secondary effects to the kidneys and liver. Hemolysis impairs the blood's ability to transport oxygen and excessive exposure to ethylene glycol butyl ether acetate can aggravate preexisting diseases of the kidneys, liver or blood (like anemia). However, human red blood cells have been shown to be significantly less susceptible to hemolysis than those of the test animals.\textsuperscript{19}

For more information, see the relevant Safety Data Sheet (SDS).

**Environmental Information**\textsuperscript{20,21}
Ethylene glycol butyl ether acetate is readily biodegradable, and its bioconcentration potential is low. Its potential for mobility in soil is very high, and it is slightly toxic to aquatic organisms.

Additional environmental information for diethylene glycol butyl ether acetate is available in the Ecological and Toxicological Data of DOW Glycol Ethers brochure.

For more information, see the relevant SDS

**Physical Hazard Information**\textsuperscript{22}
Ethylene glycol butyl ether acetate is a combustible liquid that is thermally stable at normal storage and use temperatures. Ethylene glycol butyl ether acetate should not be stored in aluminum, copper, galvanized-iron, or galvanized-steel containers. Avoid contact with strong acids and strong oxidizers.

Ethylene glycol butyl ether acetate can oxidize at elevated temperatures. Gas generation during decomposition can result in pressure build-up in closed systems. Decomposition products can include aldehydes, ketones, and organic acids.

Containers, even empty ones, can contain vapors. Do not cut, drill, grind, weld, or perform similar operations on or near containers. Spills of these organic materials on hot fibrous insulation may reduce the autoignition temperature, resulting in greater potential for spontaneous combustion.

For more information, see the relevant SDS

**Regulatory Information**
Regulations may exist that govern the manufacture, sale, transportation, use, and/or disposal of this material. These regulations may vary by city, state, country, or geographic region. Information may be found by consulting the relevant SDS or Contact Us.

**Additional Information**
- Safety Data Sheet (http://www.dow.com/webapps/msds/msdssearch.asp)

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For more business information about this product, visit Dow's Oxygenated Solvents web site. (www.dow.com/oxysolvents/)

References

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15 Estimates by The Dow Chemical Company.


19 Dow Test Data, Developmental Toxicity, Reproductive Toxicity Phases and Genetic Toxicity Phases, July 1, 2002.
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