Product Safety Assessment

BETACLEAN™ Automotive Cleaners

Product Safety Assessment documents are available at: www.dow.com/productsafety/finder/.

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Names
- BETACLEAN™ 3000 cleaner
- BETACLEAN 3300 cleaner
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- BETACLEAN GC-800 cleaner
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- BETACLEAN 3900 cleaner

Product Overview
- BETACLEAN™ automotive cleaners are liquids or aerosol sprays manufactured by Dow Automotive Systems, a business unit of The Dow Chemical Company. These formulations are water- or solvent-based products (including isopropanol, methyl ethyl ketone, ethylene glycol butyl ether, or heptane) that are colorless or blue depending on use.\(^1,2,3\) For further details, see Product Description.
- BETACLEAN cleaners are used to prepare the vehicle surface prior to adhesive application and also to remove uncured excess adhesive following application. These cleaners may be used on a variety of surfaces, such as glass, metal, plastic, painted surfaces, ceramic frits, encapsulations, and polyurethane pre-applied adhesive systems (PAAS).\(^4\) For further details, see Product Uses.
- BETACLEAN products are for industrial and professional use only. They are used under well-controlled, contained conditions. Workers applying these materials can minimize the potential for exposure by carefully following application directions and wearing the proper safety equipment.\(^1,2,3\) For further details, see Exposure Potential.
- These products may cause slight to moderate eye irritation. Certain formulations may cause moderate corneal injury and/or pain disproportionate to the level of irritation to eye tissues. Vapor or mist may irritate the eyes. Brief skin contact may cause slight skin irritation with local redness. Prolonged contact may cause a burning sensation, itching, drying, flaking, or staining of the skin. Repeated exposure to the skin may result in the absorption of harmful amounts. Excessive inhalation may cause severe irritation to upper respiratory tract (nose and throat) and lungs. In confined or poorly ventilated areas, vapor can readily accumulate and can cause unconsciousness and death.\(^1,2,3\) For further details, see Health Information.

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The main components in BETACLEAN™ cleaners vary in their environmental properties and range from readily to inherently biodegradable, have low to moderate bioconcentration potential (tendency to accumulate in the food chain), and range from practically non-toxic to toxic to fish and other aquatic organisms. For further details, see Environmental Information.

These products are stable under recommended storage and use conditions. Elevated temperatures can cause these products to decompose. Some of the products are considered combustible, while those containing high levels of heptane are flammable. Avoid contact with strong oxidizers. For further details, see Physical Hazard Information.

Manufacture of Product

Locations – Dow Automotive Systems manufactures BETACLEAN™ cleaners at sites in the U.S. and Europe.

Process – BETACLEAN cleaners are formulated in co-operation with automobile manufacturers according to their needs and specifications.

Product Description

BETACLEAN™ cleaners are formulated and manufactured by Dow Automotive Systems. They are marketed as liquid formulations, aerosol sprays, and wet-dry wipes. The BETACLEAN family contains both water-based and solvent-based cleaners. BETACLEAN cleaners are used together with BETAPRIME™ primers and BETASEAL™ adhesives in the automotive industry.

Product Uses

BETACLEAN™ cleaners are used in the automotive industry to provide a residue-free bonding surface for adhesive application. These cleaners may be used on a variety of surfaces, such as glass, metal, plastic, painted surfaces, ceramic frits, encapsulations, and polyurethane pre-applied adhesive systems (PAAS).

- **BETACLEAN 3000 cleaner** – removes contaminant residues and uncured polyurethane from metal surfaces
- **BETACLEAN 3300 cleaner** – cleans glass, ceramic frits, encapsulation, and polyurethane pre-applied adhesive system (PAAS)
- **BETACLEAN 3350 cleaner** – removes dirt and grease from plastic, paint, metals and glass
- **BETACLEAN 3900 cleaner** – removes uncured polyurethane residues from paints and plastics
- **BETACLEAN GC-800 glass and surface cleaner** – cleans all automotive glass surfaces as part of the adhesive repair process

Exposure Potential

BETACLEAN™ cleaners are industrial products used in the manufacture of vehicles and in the vehicle aftermarket (repair) industry. Based on the uses for these cleaners, the public could be exposed through:
• **Workplace exposure** – Exposure can occur in a facility that manufactures BETACLEAN cleaners or at the industrial, commercial, or manufacturing facilities that use them. Workplace exposure is minimized through engineering controls and the use of personal protective equipment. Each manufacturing facility should have a thorough training program for employees and appropriate work processes and safety equipment in place to limit unnecessary exposure. See Health Information.

• **Consumer exposure to products containing BETACLEAN™ cleaners** – Dow does not sell BETACLEAN cleaners for direct consumer use. Consumer exposure from the cleaner residue is considered negligible. See Health Information.

• **Environmental releases** – The main components in BETACLEAN cleaners may evaporate from products containing them. The compounds range from low to highly soluble in water. The water soluble components, when introduced, will have a tendency to remain in water. Because the main components range from readily to inherently biodegradable, they will be removed from water and soil environments, including sewage treatment plants. In the event of a spill, the focus is on containing the spill to prevent contamination of soil and surface or ground water. Eliminate all sources of ignition. Use non-sparking tools in cleanup operations. For products containing heptane, a flammable liquid and vapor explosion hazard, ground and bond all containers and handling equipment, keep out of sewers, and check the area with a combustible gas detector before reentering area. Absorb small spills with inert absorbents such as sand, sawdust, or cat litter. Collect recovered material in properly labeled containers and dispose of it according to applicable government requirements. See Environmental, Health and Physical Hazard Information.

• **Large release** – Industrial spills or releases are infrequent and generally contained. Spilled material should be captured, collected, and reprocessed or disposed of according to applicable governmental requirements. Only properly trained and equipped personnel should attempt to isolate or contain the spill. Eliminate all sources of ignition immediately. Use only explosion-proof equipment and ground and bond all containers and handling equipment. See Environmental, Health and Physical Hazard Information.

• **In case of fire** – Keep people away and deny any unnecessary entry into the area. Stay upwind and out of low areas where gases (fumes) can accumulate. Use water fog or fine spray, dry-chemical fire extinguishers, or foam. Alcohol-resistant foams (ATC type) are preferred. Water is not recommended but may be applied in large quantities as a fine spray when other extinguishing agents are not available. Do not use a direct water stream; it may spread the fire. Firefighters should wear full chemical-resistant firefighting clothing with positive-pressure, self-contained breathing apparatus (SCBA) with an approved full-face mask for emergency work. Contain fire water run-off if possible as it may cause environmental damage. Follow emergency procedures carefully. The public should be warned of downwind vapor explosion hazards. Keep vapors out of sewers. Immediately withdraw all personnel from the area in case of rising sounds from venting safety devices or discolorations of the container. See Environmental, Health and Physical Hazard Information.

• **Unusual Fire and Explosion Hazards** – For some products, flammable mixtures may exist within the vapor space of containers even at room temperature and can be readily ignited by static discharge or other ignition sources. These vapors are heavier than air and may travel a long distance and accumulate in low-lying areas. Combustion products may include, but are not limited to carbon monoxide and carbon dioxide.

For more information, request the relevant Safety Data Sheet from the Dow Customer Information Group or Dow Automotive Systems.

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Health Information\textsuperscript{1,2,3}

Health information for BETACLEAN™ cleaners is summarized on the relevant Safety Data Sheet. It is important to note that health risks associated with individual products may vary based on their formulation or intended use. The Safety Data Sheet is the preferred source for specific health information. These products may also contain minor components or additives that have additional health risks. An overview of health information for BETACLEAN™ cleaners appears below.

**Eye contact** – Eye contact with these cleaners may cause slight to moderate eye irritation. Certain formulations may cause moderate corneal injury and/or pain disproportionate to the level of irritation to eye tissues. Vapor or mist may cause eye irritation.

**Skin Contact** – Brief contact may cause slight skin irritation with local redness. Prolonged contact may cause a burning sensation, itching, drying, flaking, or staining of the skin. Repeated exposure to the skin may result in the absorption of harmful amounts. Excessive exposure may cause hemolysis, impairing the body’s ability to transport oxygen.

**Inhalation** – Excessive inhalation may cause severe irritation to the upper respiratory tract (nose and throat) and lungs. In confined or poorly ventilated areas, vapor can readily accumulate and can cause unconsciousness and death.

**Ingestion** – Low toxicity if ingested in small amounts. Swallowing larger amounts may cause injury. Swallowing may cause central nervous system effects or nausea. Aspiration into the lungs may occur during ingestion of vomiting, causing lung damage for even death due to chemical pneumonia.

**Repeated exposure** – In animals, some components of these products have adversely affected the blood, kidneys, and liver following repeated, excessive exposures.

**Cancer information** – In long-term animal studies with ethylene glycol butyl ether (a material present in some formulations), a small but statistically-significant increase in tumors was observed. This effect occurred in mice but not rats. The effects are not believed to be relevant to humans. If these products are handled in accordance with proper industrial handling procedures, exposures should not pose a carcinogenic risk to man. For more information about ethylene glycol butyl ether, consult Dow’s product safety assessment for that product.

For more information, request the relevant Safety Data Sheet, from the Dow Customer Information Group or Dow Automotive Contact Us.

Environmental Information\textsuperscript{1,2,3}

Environmental risks associated with individual BETACLEAN™ products vary by formulation and application. The Safety Data Sheet is the preferred source for specific information. An overview of general environmental information for BETACLEAN products appears below.

The main components in BETACLEAN™ cleaners range from low to high volatility, and may evaporate from products containing them. The components range from low to very soluble in water. The water soluble components, when introduced, will have a tendency to remain in water, and will have minimal tendency to bind to soil or sediment.

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The components in BETACLEAN cleaners are unlikely to persist in the environment. The compounds range from readily to inherently biodegradable, which suggests they will be removed from water and soil environments, including biological wastewater treatment plants.

Most components have a low bioconcentration potential (not likely to accumulate in the food chain) and range from practically non-toxic to toxic to fish and other aquatic organisms on an acute basis. Heptane, a component of some BETACLEAN™ cleaners, is toxic to aquatic organisms and has moderate potential to bioconcentrate.

Several of the individual components used in the formulation of BETACLEAN cleaners have been assessed individually in government risk assessments. The OECD SIDS Initial Assessment profiles for isopropanol and methyl ethyl ketone concluded that both compounds were considered of low priority for further work.

Environmental risk assessments for ethylene glycol butyl ether have been conducted by the European Union and Environment Canada. The former concluded that there are at present no environmental concerns and no need for risk reduction measures beyond those being currently applied. Environment Canada concluded that ethylene glycol butyl ether is not entering the environment in a quantity or concentration that may have immediate or long-term harmful effects on the environment.

For more information, request the relevant Safety Data Sheet, from the Dow Customer Information Group or Dow Automotive Contact Us.

Physical Hazard Information

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It is important to note that the physical hazard risks associated with individual products may vary by formulation and application. The Safety Data Sheet is the preferred source for specific physical hazard information.

BETACLEAN™ cleaners are stable under recommended storage conditions. However, they can decompose at elevated temperatures. Store indoors, in a dry place out of direct sunlight in tightly closed, properly vented containers. Do not cut or weld containers. No smoking, open flames or sources of ignition in handling or storage areas. Electrically bond and ground all containers and equipment before transfer or use of material.

Some of these products are considered combustible, and products containing high levels of heptane are flammable liquids and vapor explosion hazards. Containers should be stored away from ignition sources such as heat, flame, or static discharge.

Avoid contact with strong oxidizers such as perchlorates, peroxides, permanganates, chlorates, nitrates, chlorine, bromine, and fluorine. 2-Butoxyethanol, found in BETACLEAN GC 800 cleaner, is not compatible with strong bases such as sodium hydroxide and potassium hydroxide and forms peroxides on exposure to air and light. 5

For more information, request the relevant Safety Data Sheet, from the Dow Customer Information Group or Dow Automotive Contact Us.
Regulatory Information

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

Additional Information

- Safety Data Sheets may be obtained through the Dow Customer Information Group or (http://www.dowautomotive.com/contact/)
- Dow Automotive Systems (www.dowautomotive.com)
- Contact Us (http://www.dowautomotive.com/contact/)
- Dow Automotive Systems website for information about BETACLEAN™ cleaners (http://www.dowautomotive.com/capabilities/product_family/betaclean.htm)
- BETACLEAN Cleaners Advance the Adhesive Process, The Dow Chemical Company, (Contact Us for more information.)
- BETACLEAN 3000 Cleaner Technical Data Sheet, Dow Automotive, The Dow Chemical Company, (Contact Us for more information.)
- BETACLEAN 3350 Cleaner Technical Data Sheet, Dow Automotive, The Dow Chemical Company, (Contact Us for more information.)
- BETACLEAN™ 3900 Cleaner Technical Data Sheet, Dow Automotive, The Dow Chemical Company, (Contact Us for more information.)
- Environmental Protection Agency (EPA) Integrated Risk Information System (IRIS) website http://www.epa.gov/ncea/iris/subst/0500.htm (CAS No. 111-76-2)
- IPCS INCHEM website for CAS No. 142-82-5, Reviewed November 1997 (http://www.inchem.org/documents/icsc/icsc/eics0657.htm)

For more business information about the BETACLEAN product lines, visit the Dow Automotive Aftermarket Division business web site at http://www.dowautomotive.com/contact/.

References

1 BETACLEAN™ 3300 Cleaner Material Safety Data Sheet. The Dow Chemical Company.
2 BETACLEAN 3350 Cleaner Material Safety Data Sheet. The Dow Chemical Company.
3 BETACLEAN GC-800 Cleaner Material Safety Data Sheet. The Dow Chemical Company.
4 BETACLEAN Cleaners Advance the Adhesive Process, The Dow Chemical Company.
5 New Jersey Department of Health Right to Know website (http://www.nj.gov/health/eho/rtkweb).
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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