



Product Safety Assessment

DOWCLENETM Cleaning Fluids

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Names

- DOWCLENETM products
- DOWCLENETM 1601 cleaning fluid
- DOWCLENETM 1611 cleaning fluid
- DOWCLENETM 1621 cleaning fluid
- DOWCLENETM 3650 cleaning fluid
- DOWCLENETM 3660 cleaning fluid
- DOWCLENETM 3670 cleaning fluid
- DOWCLENETM 3670 cold cleaner AIII
- DOWCLENETM PX-16S cleaning fluid
- DOWCLENETM PX-33 cleaning fluid
- DOWCLENETM PX-36 cleaning fluid
- DOWCLENETM PX-43S cleaning fluid

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Product Overview

- DOWCLENETM cleaning fluids are specialty formulations based on modified alcohols. These products are colorless liquids with a mild odor. They dry (or evaporate) residue-free. DOWCLENETM fluids are marketed by SAFECHEM, a subsidiary of The Dow Chemical Company. These cleaners are often used with the SAFE-TAINER™ system; a closed-loop, self-contained solvent delivery system.¹ For further details, see [Product Description](#).
- DOWCLENETM fluids are used for high-precision industrial metal cleaning and degreasing. Their applications range from cleaning ball bearings, machine housings, and parts to engine blocks, ballpoint pen tips, and jewelry. DOWCLENETM fluids are also used in the electronics and optics industries.² For further details, see [Product Uses](#).
- DOWCLENETM cleaning fluids are for industrial use only. Worker exposure is possible at DOWCLENETM manufacturing facilities or at facilities using these cleaners. Exposure is minimized through engineering controls and the use of personal protective equipment.³ For further details, see [Exposure Potential](#).
- Users of these materials must be familiar with the product [Safety Data Sheet](#) and adequately trained prior to handling. Eye contact with DOWCLENETM fluids may cause slight to severe irritation, depending on the formulation. Prolonged or repeated skin contact may irritate the skin. Excessive inhalation of these products may adversely affect the upper respiratory tract and lungs.^{4,5} For further details, see [Health Information](#).
- Most DOWCLENETM products, based on modified alcohols, are readily biodegradable, unlikely to accumulate in the food chain, and are practically non-toxic to aquatic organisms. Some hydrocarbon-based DOWCLENETM products are inherently biodegradable, and can pose long-term effects to the environment. If released to the environment, these hydrocarbon based

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products will evaporate and partition into the air where they expected to degrade rapidly. For further details, see [Environmental Information](#).

- Most DOWCLENETM cleaning fluids and their vapors would be considered combustible. They are thermally stable at typical storage and use temperatures, but can decompose (oxidize) at elevated temperatures. Avoid contact with strong acids, strong bases, strong oxidizers, and direct sunlight.^{6,7} For further details, see [Physical Hazard Information](#).

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Manufacture of Product

- **Capacity** – DOWCLENETM cleaning fluids are manufactured by SAFECHEM, a subsidiary of The Dow Chemical Company.
- **Process** – DOWCLENETM products are proprietary formulations based on alkoxypropanol, which are manufactured to meet the stringent cleaning requirements specified by customers.

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Product Description^{8,9}

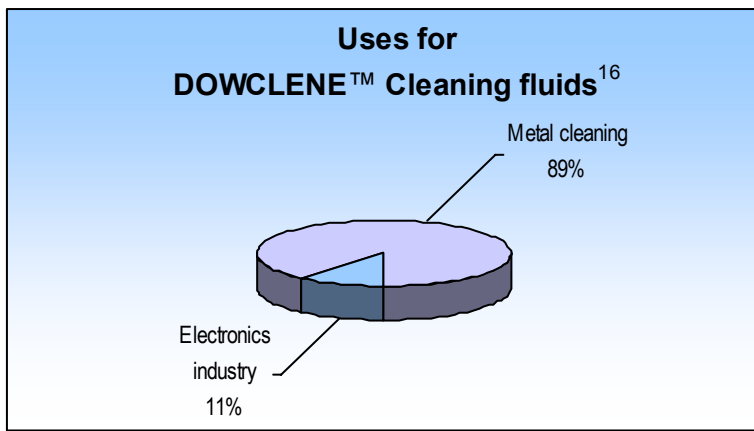
DOWCLENETM cleaning fluids are specialty formulations based on modified alcohols. These products are clear-colored liquids with a mild odor. They are surfactant-free and therefore dry (evaporate) completely clean and residue-free. DOWCLENETM cleaning fluids are noncorrosive and chemically and thermally stable. This family of cleaning products consists of the DOWCLENETM 16 Series (supplied in the SAFE-TAINER™ system; a closed-loop solvent delivery system), DOWCLENETM 36 Series, and the DOWCLENETM PX Series. These products are effective alternatives to conventional chlorinated hydrocarbons, hydrocarbons, and water-based cleaning systems.

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Product Uses^{10,11,12,13,14,15,16}

DOWCLENETM cleaning fluids are used for the following applications:

- **DOWCLENETM 16 Series** – Immersion and vapor cleaning in modern closed-loop vacuum systems.
- **DOWCLENETM 1601 cleaning fluid** – Removal of grease and oil, emulsion residues, polishing and lapping pastes, and fingerprints. Also used on small parts, sintered metals, ballpoint pen tips, lapped parts, aluminum cases, heat exchangers, optical lenses, and jewelry.
- **DOWCLENETM 1611 cleaning fluid** – Removal of water-based cooling lubricants, protective coatings, polishing pastes, and glues. The product is well-suited for medium industrial parts cleaning, such as lapped and sintered metal parts and metal fines and cuttings.
- **DOWCLENETM 1621 cleaning fluid** – This hydrocarbon containing formulation is well-suited for applications where large amounts of oil-based contamination – such as grease, fat, and oil – are removed and where low water solubility and corrosion protection is necessary. It also is used in combination with water-based cleaners, allowing removal of both polar and nonpolar contamination in a single cleaning cycle in closed cleaning equipment.



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- **DOWCLENETM 36 Series** – Developed as cold-cleaner formulations for dip, brush, and wipe cleaning of hard surfaces.
- **DOWCLENETM 3650 cleaning fluid** – Water-based wipe cleaner formulation used for residue-free cleaning and degreasing of surfaces by wiping with a towel prior to welding, painting, or application of adhesive; cleaning of large surfaces, such as machine housings, glass, mirrors, engine blocks, etc.
- **DOWCLENETM 3660/3670 cleaning fluid** – Cleaning and degreasing by dip and/or brush application also used for general cleaning during maintenance and repairs. These products are hydrocarbon-based.
- **DOWCLENETM PX Series** – Specialty cleaning for the optics and electronics industries.
- **DOWCLENETM PX-16S cleaning fluid** – Closed-system cleaning (cleaning under vacuum); removal of resin-containing flux residuals from soldered electronic components.
- **DOWCLENETM PX-33/PX-36 cleaning fluid** – Cleaning screens, templates, misprints, circuit boards, and frames; removing printing inks/pastes, soldering pastes, thick film pastes, and surface-mount technology (SMT) adhesives.
- **DOWCLENETM PX-43S cleaning fluid** – Vacuum cleaning of screens, templates, frames, soldering frames, circuit boards, surface-mount device (SMD) hybrids, misprints, optical glass; removing flux residues, soldering pastes, SMT adhesives, thick-film pastes, printing inks and pastes, and fillers.

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Exposure Potential^{17,18}

DOWCLENETM cleaning fluids are used in the production of industrial and consumer products. Based on the uses for these products, the public could be exposed through:

- **Workplace exposure** – Exposure can occur either in a DOWCLENETM manufacturing facility or in the various industrial or manufacturing facilities that use these products. These cleaners are produced, distributed, and stored in closed systems. Those working with DOWCLENETM products in manufacturing operations could be exposed during maintenance, sampling, testing, or other procedures. Each 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 DOWCLENETM cleaning fluids** – DOWCLENETM fluids are industrial cleaners for commercial use. They are not available to the general public. See [Health Information](#).
- **Environmental releases** – DOWCLENETM cleaning fluids are generally used in enclosed systems, so releases to the environment are expected to be minimal. The modified alcohol-based DOWCLENETM fluids may be released to air by slowly evaporating from cleaners or other products containing them. However, because they are completely soluble, once introduced to water, the compounds will tend to remain dissolved in water. If released to the environment, DOWCLENETM products containing hydrocarbons will evaporate and partition into the air. In the event of a spill, the focus is on containing the spill to prevent contamination of soil and surface or ground water. Absorb small spills with sand or vermiculite. Collect in suitable and properly labeled containers. Most DOWCLENETM fluids do not pose a risk to aquatic organisms; however, those that contain a hydrocarbon component may pose long-term adverse risk to aquatic organisms if released to the aquatic environment. See [Environmental](#), [Health](#), and [Physical Hazard Information](#).
- **Large release** – Industrial spills or releases are infrequent and generally contained. If a large spill does occur, ventilate and dike the area to contain the spill. DOWCLENETM products are vapor explosion hazards. Keep spilled material out of sewers. Evacuate personnel upwind. Eliminate all sources of ignition immediately. Ground and bond all handling equipment. Pump with explosion-proof equipment. Respiratory protection and other personal protective equipment should be worn when there is a potential to exceed the exposure limit. Collect in

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suitable and properly labeled containers. See [Environmental](#), [Health](#), and [Physical Hazard Information](#).

- **In case of fire** – Keep people away. Isolate the area and deny unnecessary entry. Use a water fog or fine spray, dry-chemical or carbon-dioxide extinguishers, or foam to fight the fire. ATC-type alcohol-resistant foams are preferred. Do not use a direct water stream; it may spread the fire. Firefighters should wear positive-pressure, self-contained breathing apparatus (SCBA) and protective firefighting clothing. Follow emergency procedures carefully. See [Environmental](#), [Health](#), and [Physical Hazard Information](#).

For more information, request the relevant Safety Data Sheet from the [Dow Customer Information Group](#).

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Health Information^{19,20,21}

Health information for DOWCLENÉ™ cleaning fluids is summarized on the relevant [Safety Data Sheets](#). 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 materials may also contain minor components or additives that have additional health risks. An overview of health information for DOWCLENÉ cleaning fluids appears below.

Eye contact – Eye contact with these products may cause slight to severe irritation with corneal injury, depending on formulation. Vapor may cause eye irritation experienced as mild discomfort and redness.

Skin contact – Prolonged or repeated skin contact may cause local redness and irritation. Drying and flaking may occur. A chemical burn is possible from repeated skin contact. Symptoms may include pain, severe local redness, swelling, and tissue damage. Prolonged skin contact is unlikely to result in absorption of harmful amounts.

Inhalation – Prolonged, excessive inhalation of these products may irritate the upper respiratory tract (nose and throat) and lungs. Symptoms of excessive exposure may be anesthetic or narcotic effects and dizziness or drowsiness. Excessive exposure may increase sensitivity to epinephrine and increase irregular heartbeats.

Ingestion – These cleaners have low toxicity if swallowed. Swallowing small amounts incidental to normal handling is not likely to cause injury; however, swallowing larger amounts may cause injury. Aspiration into the lungs may occur during ingestion or vomiting resulting in rapid absorption and injury to other body systems. Chemical pneumonia may occur.

Repeated exposure – In animal testing, effects have been observed in the liver, kidneys, and adrenal glands following repeated overexposure to these products.

For more information, request the relevant Safety Data Sheet from the [Dow Customer Information Group](#).

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Environmental Information^{22,23}

DOWCLENÉ™ cleaning fluids are generally used in enclosed systems, so releases to the environment are expected to be minimal. The main components in DOWCLENÉ™ products range from moderately to highly volatile, and may evaporate from products containing them.

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However, most DOWCLENETM fluids are highly soluble in water, and therefore once introduced, will have a tendency to remain in water. They have minimal tendency to bind to soil or sediment.

Modified alcohol-based DOWCLENETM products are unlikely to persist in the environment. The components are readily biodegradable according to Organisation for Economic Co-operation and Development (OECD) guidelines, which suggest the chemicals will be removed from water and soil environments, including biological wastewater treatment plants.

Some DOWCLENETM products contain hydrocarbon components, which have a low density and are not soluble in water, therefore they would tend to float on the water surface. Because these fluids evaporate easily, hydrocarbon based fluids released into the environment would tend to partition into the air where they are expected to degrade rapidly. These materials are inherently biodegradable and would also be removed from water and soil environments, including wastewater treatment systems.

Most DOWCLENETM cleaning fluids have a low bioconcentration potential (tendency to build up in the food chain) and are practically non-toxic to fish and other aquatic organisms. However, some of the DOWCLENETM fluids contain a hydrocarbon component that may increase the bioconcentration potential. Because of their high toxicity, hydrocarbon based DOWCLENETM fluids may pose long-term adverse risk to aquatic organisms.

For more information, request the relevant Safety Data Sheet from the [Dow Customer Information Group](#).

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Physical Hazard Information^{24,25}

Most DOWCLENETM cleaning fluids and their vapors are combustible. These products are thermally stable under recommended storage and use conditions, but exposure to elevated temperatures can cause these products to decompose.

Avoid contact with strong acids, strong bases, strong oxidizers, and halogenated organic compounds. Avoid direct sunlight.

For more information, request the relevant Safety Data Sheet from the [Dow Customer Information Group](#).

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Regulatory Information

Regulations may exist that govern the manufacture, sale, transportation, use, and/or disposal of DOWCLENETM cleaning fluids. 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](#).

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Additional Information

- Safety Data Sheet – Request from the Dow Customer Information Group: (www.dow.com/assistance/dowciq.htm)
- Contact Us (www.dow.com/safechem/contact/index.htm)

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- *DOWCLENÉ™ 1601 – A Viable Alternative for Industrial Component Cleaning*, Brochure, The Dow Chemical Company, Form No. CH 111-078-E-0205, February 2005
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- *DOWCLENÉ™ PX-16S Cleaning Fluid*, Product Information Sheet, The Dow Chemical Company, Form No. CH 111-162-E-0200, February 2000
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For more business information about DOWCLENÉ™ products, visit the Dow [SAFECHEM](http://www.dow.com/safec hem) web site at www.dow.com/safec hem/product/dowclene.htm.

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References

- ¹ *DOWCLENÉ™ 1611 Cleaning Fluid Material Safety Data Sheet*, The Dow Chemical Company, October 16, 2008, page 4.
- ² SAFECHEM website – Products & Services: DOWCLENÉ
(<http://www.dow.com/safec hem/product/dowclene.htm>).
- ³ *DOWCLENÉ 1611 Cleaning Fluid Material Safety Data Sheet*, The Dow Chemical Company, pages 3–4.
- ⁴ *DOWCLENÉ 1621 Cleaning Fluid Material Safety Data Sheet*, The Dow Chemical Company, July 27, 2009, pages 4–5.
- ⁵ *DOWCLENÉ™ PX-43S Cleaning Fluid Material Safety Data Sheet*, The Dow Chemical Company, November 27, 2008, pages 4–5.
- ⁶ *DOWCLENÉ 1611 Cleaning Fluid Material Safety Data Sheet*, The Dow Chemical Company, October 16, 2008, page 4.
- ⁷ *DOWCLENÉ 1601 Cleaning Fluid Material Safety Data Sheet*, The Dow Chemical Company, November 3, 2008, pages 1 and 4.
- ⁸ *DOWCLENÉ 1611 Cleaning Fluid Material Safety Data Sheet*, The Dow Chemical Company, October 16, 2008, page 4.
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- ¹⁰ *DOWCLENÉ 1611 Cleaning Fluid*, Product Information Sheet, The Dow Chemical Company, Form No. 245-01301 06/05, June 2005, page 1.
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- ¹⁴ DOWCLENETM PX-16S, PX-33, PX-36, PX-43S Cleaning Fluids, Brochure, The Dow Chemical Company, Form No. CH 111-710-E-0802, August 2002, pages 2–3.
- ¹⁵ SAFECHEM website – Products & Services: DOWCLENETM (<http://www.dow.com/safecem/product/dowclene.htm>).
- ¹⁶ SAFECHEM Market Information.
- ¹⁷ DOWCLENETM 1621 Cleaning Fluid Material Safety Data Sheet, The Dow Chemical Company, July 27, 2009, pages 2–4.
- ¹⁸ DOWCLENETM 3670 Cold Cleaner AIII Material Safety Data Sheet, The Dow Chemical Company, June 8, 2004, pages 1, 2–3, 4–5, and 7.
- ¹⁹ DOWCLENETM 1601 Cleaning Fluid Material Safety Data Sheet, The Dow Chemical Company, November 3, 2008, pages 1–2 and 4–5.
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- ²⁴ DOWCLENETM 3670 Cold Cleaner AIII Material Safety Data Sheet, The Dow Chemical Company, June 8, 2004, pages 5–6.
- ²⁵ DOWCLENETM 1601 Cleaning Fluid Material Safety Data Sheet, The Dow Chemical Company, November 3, 2008, pages 1 and 4.

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NOTICES:

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