Product Safety Assessment

DOWANOL™ PMA Glycol Ether Acetate [Propylene Glycol Methyl Ether Acetate]

Select a Topic:

Names

- CAS No. 108-65-6
- EC No. 203-603-9
- Propylene glycol methyl ether acetate
- PMA or PGMEA
- 2-Methoxy-1-methylethyl acetate
- 1-Methoxy-2-propanol acetate
- 1-Methoxy-2-propyl acetate
- 1-Methoxy-2-acetoxypropane
- 2-Acetoxy-1-methoxypropane
- Methoxypropylacetate
- DOWANOL™ PMA Glycol Ether Acetate

Product Overview

- Propylene glycol methyl ether acetate (PMA) is a colorless liquid with an ether-like odor. PMA is a relatively fast-evaporating, low-viscosity solvent. Dow manufactures and sells PMA and other propylene oxide-based glycol ethers under the trade name DOWANOL™ Glycol Ethers.[1,2] For further details, see Product Description.
- PMA is mainly used as a solvent for industrial paints and coatings in the automotive industry. It is also used as a solvent in the electronics industry and formulated into industrial and commercial products. Some specific examples are paints, inks, lacquers, varnishes, cleaners, coatings, ink removers, and pesticides.[3,4,5] For further details, see Product Uses.
- Because PMA is formulated into a broad range of products, consumer contact is possible. Workplace exposure is also possible.[1] For further details, see Exposure Potential.
- Eye contact with PMA may cause pain disproportionate to the level of irritation to eye tissues. Slight irritation with slight corneal injury may also result. Prolonged skin contact with PMA is essentially nonirritating. Repeated contact may cause irritation with local redness. Prolonged skin contact with very large amounts may cause dizziness or drowsiness. No adverse health effects are anticipated from a single inhalation of PMA vapor.[1] For further details, see Health Information.
- PMA, both liquid and vapor, is combustible. Vapors may travel a long distance and are an explosion hazard. Store away from direct sunlight and minimize sources of heat, spark, or flame. PMA is stable under recommended storage conditions. PMA is incompatible with strong acids and strong oxidizers and contact should be avoided.[1] For further details, see Physical Hazard Information.

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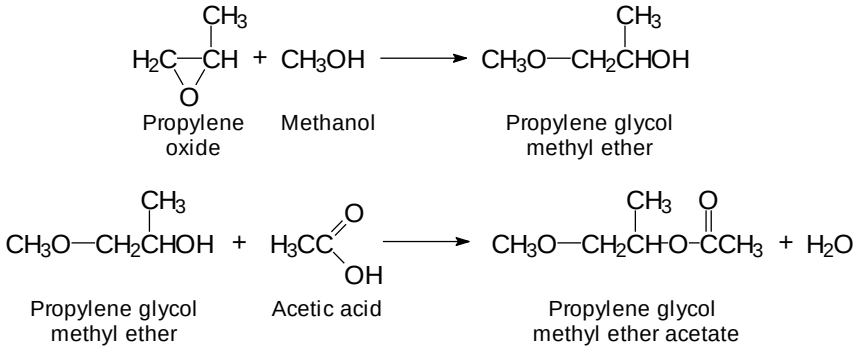
Manufacture of Product[5]

- **Capacity –** Western Europe is the largest producer and consumer of propylene oxide-based glycol ethers. The Dow Chemical Company ("Dow") produces propylene oxide-based glycol ethers in the United States at facilities in Louisiana and Texas, in Europe in Stade, Germany, and in China.
- **Process –** Propylene glycol ethers are manufactured in closed, continuous systems. Propylene glycol monomethyl ether (PM) is first produced by the reaction of propylene oxide with methanol using a catalyst. PMA is manufactured by reacting PM with acetic acid. The reaction sequence is shown below.



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Product Description[1,6]

Propylene glycol methyl ether acetate (PMA) is a colorless liquid with an ether-like odor. It is a relatively fast-evaporating, low-viscosity solvent. PMA is a propylene oxide-based, or P-series, glycol ether acetate. Dow manufactures and sells PMA and other P-series glycol ethers under the trade name DOWANOL™ Glycol Ethers. DOWANOL PMA contains minimum 99.5% 1-methoxy-2-propyl acetate

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Product Uses[2,3,4,5]

PMA is a carrier solvent for resins and inks that are not compatible with water. PMA is used with acrylics, epoxies, alkyds, polyesters, and other types of resins. PMA is used for the following industrial applications:

- Automotive paints and coatings
- Architectural coatings
- Metal-coil coatings
- Industrial maintenance coatings
- Electronics manufacturing
- Silk-screen printing inks
- Metal finishers

PMA is also formulated into household products such as:

- Cleaners
- Paints (including spray paint), lacquers, and varnishes
- Pesticides

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Exposure Potential

PMA is used in the production of industrial and consumer products. Based on the uses for PMA, the public could be exposed through:

- **Workplace exposure**[1,7] – Exposure can occur either in a PMA manufacturing facility or in the various industrial or manufacturing facilities that use PMA. Those working with PMA in manufacturing operations could be exposed during maintenance, sampling, testing, or other procedures. The primary modes of occupational exposure to PMA are skin contact or vapor inhalation. A Norwegian study found the highest potential for worker exposure occurs in metal production facilities, followed by aircraft lacquering sites. PMA exposure is avoided through the use of protective gloves and respiratory equipment. 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 PMA**[3] – PMA is not sold for direct consumer use, but it is used in household cleaning formulations, paints, and other products with which consumers may come into contact. The typical concentration of PMA in paints is 5 to 15% and occasionally as high as 20%. See Health Information.
- **Environmental releases**[1] – In the event of a spill, the focus is on containing the spill to prevent contamination of soil, sewers, and surface or ground water. Isolate the area. For small spills, PMA should be absorbed with sand or vermiculite. Collect the material in suitable and properly labeled containers. See Environmental Information, Health Information, and Physical Hazard Information.
- **Large release** – Industrial spills or releases are infrequent and generally contained. If a large spill does occur, isolate the area, keeping personnel out of low areas. PMA vapors are heavier than air. Keep upwind of spill. Ventilate the area. Eliminate all sources of ignition and ground and bond all containers and handling equipment. Use appropriate safety equipment. Contain spilled material if possible. Pump the material with explosion-proof equipment. If available, use foam to smother or suppress vapors. Pump recovered material into suitable and properly labeled containers.
- **In case of fire** – Keep people away and deny any unnecessary entry. Stay upwind. Keep out of low areas where fumes can accumulate. Vapors may travel a long distance and flashback can occur. Use of a direct water stream may spread fire. Wear positive-pressure, self-contained breathing apparatus (SCBA) and protective fire-fighting clothing, or fight the fire from a safe distance. Violent steam generation or eruption may occur upon application of direct water stream to hot liquids. Use water fog or fine spray, dry-chemical or carbon-dioxide extinguishers, or foam. Follow all emergency procedures carefully. See Environmental Information, Health Information, and Physical Hazard Information.

For more information, see the relevant Safety Data Sheet.

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Health Information[1,7]

Eye contact with PMA may cause pain disproportionate to the level of tissue irritation. Slight irritation with slight corneal injury may also result. Prolonged skin contact is essentially nonirritating. Repeated skin contact may result in local redness. Prolonged skin contact with very large amounts may cause dizziness or drowsiness. PMA did not cause an allergic reaction in animals. No adverse effects are anticipated from a single inhalation exposure to PMA.

PMA has very low toxicity if swallowed. Swallowing small amounts incidental to normal handling is not likely to cause injury. However, swallowing larger amounts may cause injury. Repeated inhalation exposure can cause nasal, liver and kidney effects.

There were no effects on the developing fetus and no genetic effects were observed.

For more information, see the relevant Safety Data Sheet.

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Environmental Information[1,Error! Bookmark not defined.]

PMA is not likely to accumulate in the food chain (bioconcentration potential is low) and is readily biodegradable. PMA is practically nontoxic to aquatic organisms on an acute basis.

For more information, see the relevant Safety Data Sheet.

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Physical Hazard Information[1]

PMA is combustible and vapors may travel a long distance. Store away from direct sunlight and minimize sources of ignition such as static build up, heat, spark, or flame. PMA is stable under recommended storage conditions. It can oxidize at elevated temperatures, and flammable vapors can be released. PMA is incompatible with strong acids and strong oxidizers; contact should be avoided.

During a fire, smoke may contain the original material in addition to varying compositions of toxic or irritating combustion products. Combustion products may include and are not limited to carbon monoxide and carbon dioxide. PMA vapors are heavier than air and may travel a long distance and accumulate in low areas. Flashback may occur.

For more information, see the relevant Safety Data Sheet.

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Regulatory Information

Regulations may exist that govern the manufacture, sale, transportation, use, and/or disposal of PMA. 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 (http://www.dow.com/webapps/msds/msdssearch.aspx)
- Contact Us (http://www.dow.com/oxysolvents/contact/index.htm)
- *DOWANOL™ PMA Technical Data Sheet,* The Dow Chemical Company, Form No. 110-00588-0812, August 2012.
- "1-Methoxy-2-Propanol Acetate," *SIDS Initial Assessment Report for 11 SIAM*, Organisation for Economic Co-operation and Development, January 23–26, 2001, U.S., UNEP Publications (http://www.inchem.org/documents/sids/sids/108656.pdf)

- "Propylene Glycol Ethers," *SIDS Initial Assessment Report for 17 SIAM,* Organisation for Economic Co-operation and Development, Arona, Italy, November 11–14, 2003 (http://www.inchem.org/documents/sids/sids/pges.pdf)
- Chinn, Henry, "Glycol Ethers," *Marketing Research Report: Chemical Economics Handbook,* SRI Consulting, July 2004

For more business information about PMA, visit Dow's Oxygenated Solvents web site. (http://www.dow.com/oxysolvents/index.htm)

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References

[1] *DOWANOL™ PMA Glycol Ether Acetate Material Safety Data Sheet*, The Dow Chemical Company
[2] *DOWANOL PMA Product Information Datasheet,* The Dow Chemical Company.
[3] "1-Methoxy-2-Propanol Acetate," *SIDS Initial Assessment Report for 11 SIAM*, Organisation for Economic Co-operation and Development, January 23–26, 2001, U.S., UNEP Publications, pages 117 and 119.
[4] Dow Oxygenated Solvents website – Applications Center (http://www.dow.com/oxysolvents/app/index.htm)
[5] Chinn, Henry, "Glycol Ethers," *Marketing Research Report: Chemical Economics Handbook,* SRI Consulting, July 2004, pages 52 and 53.
[6] Dow Oxygenated Solvents website: P-Series Glycol Ethers (http://www.dow.com/oxysolvents/prod/pseries.htm)
[7] "1-Methoxy-2-Propanol Acetate," *SIDS Initial Assessment Report for 11 SIAM*, Organisation for Economic Co-operation and Development, January 23–26, 2001, U.S., UNEP Publications, pages 112-113, 117-119, and 141.

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NOTICES:

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