Product Safety Assessment
NEOLONE™ MxP Preservative

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Names
• CAS No. 2682-20-4
• CAS No. 122-99-6
• CAS No. 99-76-3
• CAS No. 94-13-3
• NEOLONE™ MxP preservative
• 2-Methyl-4-isothiazolin-3-one
• Methylisothiazolinone
• Methylisothiazolinone, Phenoxyethanol, Methyl Paraben, Propyl Paraben (INCI name)
• Phenoxyethanol
• Methyl Paraben
• Propyl Paraben
• 2-Methyl-3(2H)-isothiazolone
• MIT

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Product Overview
• NEOLONE™ MxP preservative is a broad-spectrum antimicrobial product based on the active ingredient 2-methyl-4-isothiazolin-3-one (methylisothiazolinone). This product is formulated as a clear, colorless to pale-yellow liquid. For further details, see Product Description.
• NEOLONE MxP preservative is added to cosmetics and personal-care products to prevent or retard bacterial growth. NEOLONE MxP preservative is formulated into leave-on skin- and sun-care products, antidandruff shampoos, and many other personal-care products. For further details, see Product Uses.
• Worker exposure to NEOLONE MxP preservative is possible during manufacture, transport, or use. Consumers may use personal-care products that contain NEOLONE MxP preservative. For further details, see Exposure Potential.
• In the industrial setting, eye contact with undiluted product may cause severe irritation and possible permanent eye injury. The solvents in this product can be absorbed through intact skin. Skin contact may cause severe irritation. Some individuals may experience sensitization through skin contact. Inhalation of product vapor or mist during processing may cause severe irritation to the nose, throat, and lungs, as well as central nervous system effects. For further details, see Health Information.
• Methylisothiazolinone, the main active ingredient in NEOLONE MxP preservative, is not persistent and is quickly degraded in the environment. Methylisothiazolinone has a low risk of
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accumulating in the food chain and is considered highly toxic to aquatic organisms on an acute basis.³,⁴ For further details, see Environmental Information.
• NEOLONE MxP preservative is stable under recommended storage and use conditions.⁷ For further details, see Physical Hazard Information.

Manufacture of Product
• **Capacity** – NEOLONE™ MxP preservative is formulated in Buchs, Switzerland, by ACIMA Chemical Industries, a wholly owned subsidiary of The Dow Chemical Company.
• **Process** – NEOLONE MxP preservative is manufactured using proprietary Dow materials and technology. The chemical structure of the active substance 2-methyl-4-isothiazolin-3-one is shown below:

![Chemical Structure](image)

Product Description⁸,⁹,¹⁰
NEOLONE™ MxP preservative is a broad-spectrum antimicrobial product based on the active ingredient 2-methyl-4-isothiazolin-3-one or methylisothiazolinone. It prevents or retards the growth of bacteria, yeasts, and molds. NEOLONE MxP preservative is formulated as a clear, colorless to pale-yellow liquid with less than 1.6% active ingredient. The level is further reduced when formulated into the final product. This product formulation also contains phenoxyethanol and parabens. Phenoxyethanol is a solvent with antimicrobial properties. Parabens are preservatives that are highly effective in preventing the growth of fungi and bacteria.

Product Uses¹¹,¹²,¹³
NEOLONE™ MxP preservative is globally approved for use as a preservative in cosmetics and personal-care products. The active ingredients protect cosmetics and personal-care products from spoilage resulting from inadvertent contamination by the consumer during use. NEOLONE MxP preservative is used as a preservative and bacterial-growth inhibitor in the following types of leave-on personal-care products:
• **Hair care** – shampoos, gels
• **Skin care** – lotions and creams, moisturizers
• **Sunscreens** – including avobenzone products
• **Cosmetics

Exposure Potential¹⁴,¹⁵
NEOLONE™ MxP preservative is used in the production of personal-care products and cosmetics. Based on this, the public could be exposed through:
• **Workplace exposure** – Those working with NEOLONE MxP preservative in manufacturing and/or formulating 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 and safety equipment in place to limit exposure. See Health Information.
• **Consumer exposure to products containing NEOLONE™ MxP preservative** – NEOLONE MxP preservative is not sold for direct consumer use, but it is formulated into personal-care products, such as hair- and skin-care items, used by the general public. The main active ingredient methylisothiazolinone is globally approved for safety in concentrations of up to 0.01% by weight (100 ppm). Always read and follow product label instructions before use. See Health Information.

• **Environmental releases** – Because NEOLONE MxP preservative is formulated into personal-care products, small quantities could enter wastewater-treatment facilities when consumer products are washed off or discarded. The main active ingredient methylisothiazolinone biodegrades readily in both water and soil environments, including removal by wastewater-treatment facilities. Methylisothiazolinone is highly toxic to aquatic organisms. 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 focus is on immediate containment to prevent contamination of soil and surface or ground water. Ventilate the area. Cleanup personnel must wear an approved respirator. Dike the spill and absorb with inert solids such as sand or soil. Sweep or vacuum up spillage and collect in suitable and properly labeled containers. Dispose of inert solids with absorbed methylisothiazolinone according to all applicable governmental requirements. See Environmental, Health, and Physical Hazard Information.

• **In case of fire** – Isolate the area and deny any unnecessary entry. Use water spray or fine mist, foam, or dry-chemical or carbon-dioxide (CO₂) extinguishers to fight the fire. A direct water stream may spread the fire. Firefighters should wear positive-pressure, self-contained breathing apparatus (SCBA) and protective firefighting clothing. Contain fire water if possible to minimize the potential for environmental damage. Follow emergency procedures carefully. See Environmental, Health, and Physical Hazard Information.

For more information, see the relevant Safety Data Sheet.

**Health Information**¹⁶,¹⁷,¹⁸,¹⁹

The safety of methylisothiazolinone has been assessed by the Cosmetic Ingredient Review (CIR) Expert Panel. The CIR Expert Panel evaluated the scientific data and concluded that methylisothiazolinone is safe for use as a cosmetic ingredient in concentrations up to 100 ppm. The CIR Expert Panel has also evaluated the safety of phenoxyethanol and parabens for use as cosmetic ingredients. The panel determined that those compounds are safe for use in cosmetics and personal-care items.

**Eye contact** – Contact with undiluted product can cause severe irritation and possible permanent eye injury.

**Skin contact** – Contact with undiluted product can cause severe skin irritation. The solvents in this product can be absorbed through intact skin. Sensitization by skin contact is possible in some individuals.

**Inhalation** – Inhalation of product vapor or mist during processing can cause severe irritation of the nose, throat, and lungs. Prolonged excessive inhalation of product vapor or mist during processing can cause central nervous system (CNS) effects.

**Ingestion** – This product is harmful if swallowed.

**Chronic exposure** – Prolonged or repeated overexposure to the solvents in this product can cause damage to the liver, kidneys, and lungs as well as changes in the blood.

For more information, see the relevant Safety Data Sheet.

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Environmental Information

Methylisothiazolinone, the main active ingredient in NEOLONE™ MxP preservative, is soluble in water and, when introduced to the environment, will have a tendency to migrate to or remain in water.

Methylisothiazolinone is unlikely to persist in the environment. It is rapidly degraded to intermediates that are in turn readily biodegradable. As a result, the substance is expected to rapidly biodegrade in both water and soil environments, including biological wastewater-treatment facilities.

Methylisothiazolinone is not likely to accumulate in the food chain (bioconcentration potential is low) and is highly toxic to aquatic organisms on an acute basis.

Phenoxyethanol, also called ethylene glycol phenyl ether, is readily biodegradable, has a low tendency to accumulate in the food chain (low bioconcentration potential), and is practically nontoxic to fish and other aquatic organisms on an acute basis.

Parabens are expected to biodegrade in the environment and are not likely to accumulate in the food chain (low bioconcentration potential). Propylparaben is toxic to aquatic organisms. Methylparaben is moderately toxic to fish and other aquatic organisms.

For more information, see the relevant Safety Data Sheet.

Physical Hazard Information

NEOLONE™ MxP preservative is stable under recommended storage and use conditions.

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 NEOLONE™ MxP preservative. 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

- Contact Us (www.dow.com/microbial/contact/index.htm)
- NEOLONE MxP Preservative Global Cosmetic Dossier Version 6, Rohm and Haas Company, May 24, 2011 (request from the Dow Customer Information Group)

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“Methylparaben CASRN: 99-76-3,” Hazardous Substances Data Bank (HSDB), U.S. National Library of Medicine, TOXNET, website (http://toxnet.nlm.nih.gov/cgi-bin/sis/htmlgen?HSDB) type methylparaben or 99-76-3 in the search box, then click the [search] button


For more business information about NEOLONE MxP preservative, visit the Dow Microbial Control website at www.dow.com/microbial/.

References
1. NEOLINE™ MxP Preservative Material Safety Data Sheet, Rohm and Haas Company, July 24, 2009, pages 1 and 3.

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23 “Methylparaben CASRN: 99-76-3,” Hazardous Substances Data Bank (HSDB), U.S. National Library of Medicine, TOXNET, Environmental Fate & Exposure section.

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