Product Safety Assessment

4,5-Dichloro-2-octyl-4-isothiazolin-3-one (DCOIT)

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

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Names
- CAS No. 64359-81-5
- 4,5-dichloro-2-octyl-4-isothiazolin-3-one
- 4,5-Dichloro-2-octyl-4-isothiazolin-3-one
- 4,5-Dichloro-2-octyl-3(2H)isothiazolone
- DCOIT
- BIOBAN™ biocides
- ECOVANCE™ biocides
- KATHON™ 287T biocide
- SEA-NINE™ 211N marine antifouling agent
- VINYZENE™ biocides

Product Overview
- 4,5-Dichloro-2-octyl-4-isothiazolin-3-one (DCOIT) is an off-white solid with a moderately sweet, pungent odor. It is the active ingredient in a series of biocide formulations marketed by The Dow Chemical Company and its global affiliates.¹ For further details, see Product Description.
- DCOIT is a broad-spectrum biocide used for paints. It is also used for the preservation of masonry and other construction products, and formulated into silicone sealants, plastics, marine antifouling products, and wood.²,³,⁴ For further details, see Product Uses.
- Those working with DCOIT in manufacturing operations could be exposed during maintenance, sampling, testing, or other procedures. Dow does not sell DCOIT for direct consumer use, but it may be present at low levels in products used by consumers.⁵,⁶ For further details, see Exposure Potential.
- Eye contact may cause chemical burns and severe eye irritation with corneal injury. Permanent impairment of vision, even blindness is possible. Skin contact may be corrosive. This material is harmful if swallowed or inhaled, DCOIT is unlikely to be a carcinogen and does not pose a genotoxic hazard for humans.⁷,⁸ For further details, see Health Information.
- DCOIT is not persistent and quickly degrades in the environment to materials that in turn are readily biodegradable. DCOIT has a low risk to accumulate in the food chain and is highly toxic to fish and aquatic organisms on an acute basis.⁹,¹⁰ For further details, see Environmental Information.
- DCOIT is stable under recommended storage and use temperatures. Avoid contact with amines, mercaptans, oxidizers, and reducing agents. Refer to the specific product Safety Data Sheet for recommended storage temperatures.¹¹,¹² For further details, see Physical Hazard Information.

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**Manufacture of Product**

- **Locations** – The Dow Chemical Company and its global affiliates produce 4,5-dichloro-2-octyl-4-isothiazolin-3-one in facilities at several global sites.
- **Process** – DCOIT is produced by a complex and proprietary series of chemical reactions and separations. The chemical structure is shown below.

![Chemical Structure of DCOIT](image)

**Product Description**

4,5-Dichloro-2-octyl-4-isothiazolin-3-one (DCOIT) is an off-white solid. It is the active ingredient in a series of biocide formulations marketed by The Dow Chemical Company and its global affiliates. DCOIT formulations are marketed under the trade names BIOBAN™ biocides, KATHON™ biocides, and VINYZENE™ biocides.

**Product Uses**

4,5-Dichloro-2-octyl-4-isothiazolin-3-one (DCOIT) is a broad-spectrum antifungal biocide used for paints. It is also used for the preservation of masonry and other construction products, including wood. It is formulated into biocide products intended for silicone sealants, plastics, and marine antifouling applications. The function of this product can vary from fungicide/fungistat to bactericide/bacteristat and algicide/algistat depending on the concentration in the formulation.

**Exposure Potential**

4,5-Dichloro-2-octyl-4-isothiazolin-3-one (DCOIT) is used in the production of industrial and consumer products. Based on the uses for DCOIT, individuals could be exposed through:

- **Workplace exposure** – Exposure can occur in facilities that manufacture or formulate this material or in the facilities that use it. It is produced, distributed, and stored in closed systems. Those working with this product in manufacturing or formulating operations could be exposed during maintenance, sampling, testing, or other procedures. The greatest potential for exposure is via inhalation or skin contact. Each manufacturing facility should have a thorough training program for employees and appropriate work processes, ventilation, personal protective equipment, and safety equipment in place to limit exposure. See **Health Information**.

- **Consumer exposure to products containing DCOIT** – Dow does not sell formulations of this product for direct consumer use, but they are used at very low levels in aqueous products such as paints, adhesives and building materials that may be used by consumers. Always read the product information before use and carefully follow label and use instructions. See **Health Information**.

- **Environmental releases** – Small quantities of DCOIT may be released into the environment if products that contain it are spilled or discarded. In the event of a spill, the focus is on containing the spill to prevent contamination of soil, surface water, or groundwater. Small spills should be absorbed with sand or soil. If released to the environment, DCOIT will biodegrade in water or soil and photodegrade in the air. It will also be removed by biological wastewater-treatment facilities. DCOIT has a low risk to accumulate in the food chain and is highly toxic to fish and aquatic organisms on an acute basis. 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 material should be contained, collected, and reprocessed or disposed of according to all applicable governmental requirements. An approved respirator is recommended for emergency work. See Environmental, Health, and Physical Hazard Information.

**In case of fire** – Isolate the fire and deny unnecessary entry into the area. Firefighters should wear positive-pressure, self-contained breathing apparatus (SCBA) and protective firefighting clothing and avoid contact with this material during firefighting operations. Use water fog or fine spray, dry-chemical or carbon-dioxide extinguishers, or foam. Alcohol-based foam is preferred. Use of a direct water stream may spread the fire. If possible, contain fire-water run-off to minimize the potential for environmental damage. Follow emergency procedures carefully. See Environmental, Health, and Physical Hazard Information.

For more information, request the Safety Data Sheet from the Dow Customer Information Group.

### Health Information

Health information for products containing 4,5-dichloro-2-octyl-4-isothiazolin-3-one (DCOIT) 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. DCOIT biocide formulations may contain minor components or additives that have additional health risks. The Safety Data Sheet is the preferred source for specific health information. The health information that appears below focuses on the active ingredient.

**Eye contact** – Contact may cause severe irritation with corneal injury, which may result in permanent vision impairment, even blindness. Chemical burns to the eye may occur. The low concentrations of DCOIT used in typical consumer applications and products are unlikely to pose a risk of serious eye injury.

**Skin contact** – Brief contact may cause skin burns with pain, severe local redness, swelling, and tissue damage. Prolonged or widespread skin contact may result in sensitization and an allergic response. The low concentrations of DCOIT used in typical consumer applications and products are unlikely to pose a risk of skin irritation or serious health effects in humans.

**Inhalation** – Inhalation of product vapor or mist during processing may cause severe irritation to the upper respiratory tract (nose and throat) and lungs. Prolonged and excessive exposure may cause lung injury.

**Ingestion** – Swallowing large amounts of DCOIT may result in gastrointestinal irritation.

**Repeated exposure** – Not expected to cause any additional significant adverse effects.

**Other** – Given the lack of significant end-organ toxicity, genotoxic potential, and endocrine activity, DCOIT is unlikely to demonstrate a carcinogenic potential.

For more information, request the Safety Data Sheet from the Dow Customer Information Group.

### Environmental Information

4,5-Dichloro-2-octyl-4-isothiazolin-3-one (DCOIT) has a low volatility and is slightly soluble in water. Once introduced into the aquatic environment, DCOIT will partition into sediment, where it will be rapidly degraded to readily biodegradable substances. DCOIT is unlikely to persist in the environment. It will be removed from waste water by wastewater-treatment facilities.
DCOIT has a low risk to accumulate in the food chain (bioconcentrate) and is highly toxic to fresh and saltwater fish, invertebrates and algae, and is highly toxic to plants. DCOIT exhibits low toxicity to soil microorganisms, earthworms, and birds.

For more information, request the Safety Data Sheet from the Dow Customer Information Group.

Physical Hazard Information\textsuperscript{23,24}  
4,5-Dichloro-2-octyl-4-isothiazolin-3-one (DCOIT) is stable under recommended storage and use conditions, but can decompose at elevated temperatures. Some DCOIT formulations contain flammable solvents and must be handled accordingly.

Avoid contact with oxidizing agents, reducing agents, mercaptan compounds, and amine compounds.

For more information, request the Safety Data Sheet from the Dow Customer Information Group.

Regulatory Information  
Regulations may exist that govern the manufacture, sale, transportation, use, and/or disposal of 4,5-dichloro-2-octyl-4-isothiazolin-3-one (DCOIT). These regulations may vary by city, state, country, or geographic region. Additionally, these products may have to comply with regulations for biocides in some geographic regions. Information may be found by consulting the relevant Safety Data Sheet or Contact Us.

Additional Information  
- Request the Safety Data Sheet from the Dow Customer Information Group (www.dow.com/assistance/dowcig.htm)
- Contact Us (www.dow.com/microbial/contact/)

For more business information about 4,5-dichloro-2-octyl-4-isothiazolin-3-one (DCOIT) formulations, visit the Dow Microbial Control web site at www.dow.com/microbial/about/.
References

8. SEA-NINE™ 211N Antifouling Agent Material Safety Data Sheet, Rohm and Haas Company, February 8, 2008, Hazards Identification and Toxicological Information.
10. SEA-NINE™ 211N Antifouling Agent Material Safety Data Sheet, Rohm and Haas Company, February 8, 2008, Ecological Information.
20. SEA-NINE™ 211N Antifouling Agent Material Safety Data Sheet, Rohm and Haas Company, February 8, 2008, Hazards Identification and Toxicological Information.
22. SEA-NINE™ 211N Antifouling Agent Material Safety Data Sheet, Rohm and Haas Company, February 8, 2008, Ecological Information.

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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.

The information herein is supplied upon the condition that the persons receiving same will make their own determination as to its suitability for their purposes prior to use. In no event will Dow be responsible for damages of any nature whatsoever resulting from the use of or reliance upon the information herein or the product to which that information refers. Use biocides safely. Always read the product information before use and follow the label/use instructions.

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