Product Safety Assessment

TRITON™ RW-Series Surfactants


Select a Topic:
- Names
- Product Overview
- Manufacture of Product
- Product Description
- Product Uses
- Exposure Potential
- Health Information
- Environmental Information
- Physical Hazard Information
- Regulatory Information
- Additional Information
- References

Names
- TRITON™ RW-Series surfactants
- TRITON RW-20 surfactant
- TRITON RW-50 surfactant
- TRITON RW-150 surfactant

Product Overview
- The Dow Chemical Company (“Dow”) manufactures several nonionic specialty alkoxylate surfactants under the trade name TRITON™ RW-Series surfactants. TRITON RW-Series surfactants are supplied as clear to slightly hazy, yellow to amber liquids with a pungent odor.¹² For further details, see Product Description.
- TRITON RW-Series surfactants are used as emulsifiers, wetting agents, or detergents in a variety of industrial applications. Because the detergency of these products changes with acidity, they are useful in the separation of oils from wastewater and permit simple surfactant recovery and reuse.²³⁴ For further details, see Product Uses.
- Worker exposure to TRITON RW-Series surfactants is possible during manufacture, transport, or use. Exposure is minimized by engineering controls and the use of appropriate personal protective equipment. Consumers are not likely to have direct contact with these products. In the event of a spill, evacuate the area and stay upwind of the spill.¹ For further details, see Exposure Potential.
- Eye contact may cause severe irritation with corneal injury that may result in permanent impairment of vision, even blindness, and severe eye burns. Brief skin contact may cause moderate irritation with local redness. Prolonged skin contact may cause severe irritation with local redness and discomfort or an allergic skin reaction, and may result in absorption of harmful amounts. Inhalation may cause irritation of the upper respiratory tract. These products have low toxicity if swallowed.¹ For further details, see Health Information and request the relevant Safety Data Sheet from the Dow Customer Information Group.
- Although TRITON RW-Series surfactants are not readily biodegradable, they are expected to biodegrade slowly under typical environmental conditions. These products vary in water-solubility. They are not expected to accumulate in the food chain and range from slightly toxic to moderately toxic to aquatic organisms on an acute basis.¹ For further details, see Environmental Information.
- TRITON RW-Series surfactants are thermally stable under recommended storage and normal use conditions. Exposure to elevated temperatures can cause these products to decompose. Spilled product may result in a slipping hazard.¹ For further details, see Physical Hazard Information.

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Manufacture of Product

- **Locations** – Dow and its global affiliates manufacture TRITON™ RW-Series surfactants at facilities in North America.
- **Process** – TRITON RW-Series surfactants are manufactured by the reaction of t-alkyl primary amines with ethylene oxide using proprietary methods, chemistries, and formulations.

Product Description

TRITON™ RW-Series surfactants are alkylamine ethoxylates. Their solubility depends on the length of the polyoxyethylene chain, ranging from soluble in oil for shorter chains to highly water-soluble for surfactants with longer chains. These products are supplied as clear to slightly hazy, yellow to amber liquids with a pungent odor.

Product Uses

TRITON™ RW-Series surfactants are recommended for use in a variety of industrial applications as listed below. Because the detergency of these products changes with acidity, they are especially useful in the separation of oils from wastewater and permit simple surfactant recovery and reuse.

- Solvent-based degreasers for oil and fuel carriers, such as marine tankers, barges, tank trucks and railcars
- Emulsifiable concentrates for cleaning storage tanks, pipelines, refinery equipment, loading and transfer facilities, chemical facilities, and drilling rigs
- Heavy-duty detergents for metal cleaning, industrial maintenance, railroad equipment cleaners, car and truck washing, aircraft cleaners, paint stripping, and facility and equipment cleanup
- Emulsifiers for metal-working coolants and lubricants
- Secondary oil recovery by water flooding or open-pit mining of oil sands
- Industrial laundering and fabric degreasing
- Wetting agents for kier boiling of fabrics
- Emulsifiers for fiber lubricants
- Degreasers in annealing nylon fibers

Exposure Potential

TRITON™ RW-Series surfactants are used in the production of industrial and consumer products. Based on the uses for these products, individuals could be exposed through:

- **Workplace exposure** – Exposure can occur either in facilities that manufacture TRITON RW-Series surfactants or in the various industrial or manufacturing facilities that use these products. Occupational exposure in manufacturing could occur during maintenance, sampling, testing, or other procedures. Each 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 TRITON RW-Series surfactants** – Dow does not sell TRITON RW-Series surfactants for direct consumer use. They are commercial products intended for industrial use. Consumers are not likely to have direct contact with these products. See Health Information.
- **Environmental releases** – In the event of a spill, the focus is on containing the spill to prevent contamination of soil, surface water, or groundwater and to minimize potential acute effects on associated ecosystems. The TRITON RW-Series surfactants vary in water-solubility and have low volatility. If released to the environment, most of these products tend to dissolve and remain in water. Although these products are not considered readily biodegradable, they are expected to degrade slowly in the environment and be removed by biological wastewater-treatment facilities. These products range from slightly toxic to moderately toxic to 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 product should be captured, collected, and reprocessed or disposed of according to applicable governmental requirements. Absorb spills with sand or soil. Do not use water for cleanup. Only trained and properly protected personnel must be involved in clean-up operations. Use appropriate safety equipment. Keep upwind of the spill. Ventilate the area of the spill or leak. Spilled product may result in a slipping hazard. Prevent product from entering soil, ditches, sewers, waterways, and/or groundwater. See Environmental, Health, and Physical Hazard Information.
- **In case of fire** – Keep people away. Isolate the fire and deny unnecessary entry. Use water fog or fine spray, dry-chemical or carbon-dioxide extinguishers, or foam to extinguish the fire. Alcohol-resistant foams are preferred. Do not use a direct water stream.
as it may spread the fire. Burning liquids may be moved by flushing with water to protect personnel and minimize property damage. Avoid accumulation of water. These products may be carried across the water surface, spreading the fire or contacting an ignition source. Firefighters should wear positive-pressure, self-contained breathing apparatus (SCBA) and protective firefighting clothing. Avoid contact with these products during firefighting operations. If contact is likely, change to full chemical resistant firefighting clothing with self-contained breathing apparatus. If this is not available, fight the fire from a remote location. Violent steam generation or eruption may occur upon application of direct water stream to hot liquids. During a fire, smoke may contain the original material in addition to combustion products of varying composition, which may be toxic and/or irritating. Combustion products may include but are not limited to nitrogen oxides, carbon monoxide, and carbon dioxide. See Environmental, Health, and Physical Hazard Information.

For more information, see the relevant Safety Data Sheet.

Health Information

Health information for TRITON™ RW-Series surfactants is summarized on the relevant Safety Data Sheets. These products may also contain minor components or additives that have additional health risks. 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. An overview of health information for these products appears below.

Eye contact – Contact may cause severe irritation with corneal injury that may result in permanent impairment of vision, even blindness. Chemical burns may occur.

Skin contact – Brief contact may cause moderate skin irritation with local redness. Prolonged contact may cause severe skin irritation with local redness and discomfort. Prolonged contact may also result in absorption of harmful amounts. A minor component in some products has caused an allergic skin reaction when tested in laboratory animals.

Inhalation – Vapor may cause irritation of the upper respiratory tract (nose and throat).

Ingestion – These products have low toxicity if swallowed. Small amounts swallowed incidentally as a result of normal handling operations are not likely to cause injury; however, swallowing larger amounts may cause injury.

For more information, see the relevant Safety Data Sheet.

Environmental Information

Environmental information for TRITON™ RW-Series surfactants is summarized on the relevant Safety Data Sheets. These products may also contain materials that have additional environmental impact. It is important to note that the environmental impact associated with individual products may vary based on formulation or intended use. The Safety Data Sheet is the preferred source for specific environmental information. An overview of environmental information for these products appears below.

TRITON RW-Series surfactants are nonvolatile (do not evaporate) and vary in water-solubility. If released to the environment, most of these products tend to dissolve or disperse and remain in water, with a significant fraction adsorbing to soil, sediments, and suspended particles. Although these surfactants are not considered readily biodegradable according to stringent Organisation for Economic Cooperation and Development (OECD) test guidelines (<60% degraded after 28 days per OECD 301D test), these results do not necessarily mean that the products will not biodegrade under environmental conditions. Laboratory and monitoring studies have shown that substances belonging to this surfactant category are efficiently removed in properly designed and operated biological wastewater-treatment facilities.

TRITON RW-Series surfactants are not likely to accumulate in the food chain (bioconcentration potential is low) and range from slightly toxic to moderately toxic (LC50/EC50 between 1 and 10 mg/L) to aquatic organisms on an acute basis.

For more information, see the relevant Safety Data Sheet.
Physical Hazard Information
TRITON™ RW-Series surfactants are thermally stable under recommended storage and normal use conditions. Exposure to elevated temperatures can result in decomposition. Spilled product can present a slipping hazard. Avoid contact with strong acids, strong bases, strong oxidizers, and strong reducing agents.

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 TRITON™ RW-Series surfactants. These regulations may vary by city, state, country, or geographic region. Information may be found by consulting the relevant Safety Data Sheet, Technical Data Sheets, or Contact Us.

Additional Information
- Safety Data Sheets (www.dow.com/webapps/msds/msdssearch.aspx)
- Contact Us (www.dow.com/surfactants/contact/index.htm)
- DOW Surfactants website (http://www.dow.com/surfactants/index.htm)
- Dow Surfactants Reference Chart, The Dow Chemical Company, Form No. 119-01491-0314 CDP (www.dow.com/surfactants/literature/index.htm)

For more business information about TRITON™ RW-Series surfactants, visit the Dow Surfactants web site at www.dow.com/surfactants/index.htm.

References
1. The Dow Chemical Company. TRITON™ RW-20 Surfactant, Material Safety Data Sheet
2. Union Carbide Corporation. TRITON™ RW-Series Surfactants. Form No. U6-2246
3. The Dow Chemical Company. Dow Surfactants Reference Chart. Form No. 119-01491-0314 CDP

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Back to top

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