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## Product Safety Assessment

### TRITON™ CF Series Surfactants

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#### Names

- CAS No. 60864-33-7
- CAS No. 70955-69-0
- CAS No. 68603-58-7
- CAS No. 160799-28-0
- TRITON™ CF-10 Surfactant
- TRITON CF-21 Surfactant
- TRITON CF-87 Surfactant
- TRITON CF-32 Defoamer
- TRITON CF-76 Surfactant
- TRITON CF-10 (90% Actives) Surfactant
- Poly(oxy-1,2-ethanediyl),  $\alpha$ -(phenylmethyl)- $\omega$ -(1,1,3,3-tetramethylbutyl) phenoxy-
- Amines, C<sub>12-14</sub>-tert-alkyl amine, ethoxylated propoxylate
- 4-Nonylphenoxy polyethoxy polypropoxy ethyl acetal

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#### Product Overview

- TRITON™ CF surfactants are nonionic, yellow liquids with a mild odor. These surfactants are soluble in water and a range of other chemicals. They are compatible with anionic, cationic, and other nonionic surfactants.<sup>1,2,3,4</sup> For further details, see [Product Description](#).
- TRITON CF surfactants are used primarily in industrial and institutional cleaning applications and as rinse aids and wetting agents.<sup>5,6,7,8,9</sup> For further details, see [Product Uses](#).
- Exposure can occur either in facilities that manufacture TRITON CF surfactants or in the various industrial or manufacturing facilities that formulate and use these products. TRITON CF surfactants are formulated into products such as cleaners and paints, which may be used by consumers.<sup>10</sup> For further details, see [Exposure Potential](#).
- Eye contact may cause slight to severe irritation with corneal injury, which may result in permanent vision impairment, even blindness. Prolonged skin contact may cause slight irritation with local redness and drying and flaking of the skin. These products have low toxicity if swallowed.<sup>11,12</sup> For further details, see [Health Information](#).
- TRITON CF surfactants will biodegrade slowly in water and soil under environmental conditions and will be removed by biological wastewater-treatment facilities. These surfactants range from practically nontoxic to toxic to aquatic organisms on an acute basis.<sup>13,14</sup> These surfactants have low bioaccumulation potential in the aquatic food chain. For further details, see [Environmental Information](#).
- TRITON CF surfactants are stable under recommended storage and normal use conditions, but can decompose at elevated temperatures.<sup>15</sup> For further details, see [Physical Hazard Information](#).

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## **Manufacture of Product**

- **Locations** – The Dow Chemical Company manufactures TRITON™ CF surfactants at facilities in South Charleston, West Virginia, USA.
- **Process** – TRITON CF surfactants are manufactured using proprietary methods, chemistries, and formulations.

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## **Product Description**<sup>16,17,18,19,20,21</sup>

TRITON™ CF surfactants are nonionic, yellow liquids with a mild odor. These products contain 75% to 100% active surfactant. They are soluble in water and a range of other chemicals, including alcohols, glycols, acetone, aromatics, chlorinated solvents, ketones, and esters. These products are chemically stable in dilute solutions of nonoxidizing acids or alkaline solutions, including phosphoric and weaker acids. They are compatible with anionic, cationic, and other nonionic surfactants.

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## **Product Uses**<sup>22,23,24,25,26</sup>

TRITON™ CF surfactants are used in industrial and institutional cleaning applications as cleaners, rinse aids, wetting agents, and dispersants in specific applications listed below:

- TRITON CF-10 surfactant – machine dishwashing, metal cleaners, pigment dispersions, pulp and paper processing, textile processing
- TRITON CF-21 surfactant – ion-exchange resin cleaners, metal cleaning, pigment dispersion, pulp and paper processing, textile processing
- TRITON CF-32 defoamer – food and dairy cleaners, machine dishwashing
- TRITON CF-76 surfactant – food and dairy cleaners, metal cleaning
- TRITON CF-87 surfactant – rinse aids, wetting agents

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## **Exposure Potential**<sup>27</sup>

TRITON™ CF surfactants are used in the formulation of industrial and consumer products. Based on the uses for this product, the public could be exposed through:

- **Workplace exposure** – Exposure can occur either in facilities that manufacture TRITON CF surfactants or in the various industrial or manufacturing facilities that formulate and 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 CF surfactants** – TRITON CF surfactants are not sold for direct consumer use. However, they are formulated into cleaners and paints, which may be used by consumers. Always read product information before use and follow label instructions. 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. Do not use water for cleanup. Absorb small spills with sand or dirt. Collect in suitable and properly labeled containers. Once introduced to water, TRITON CF surfactants will remain in water. These products would biodegrade slowly in water and soil under environmental conditions and would be removed by wastewater-treatment facilities. See [Environmental](#), [Health](#), and [Physical Hazard Information](#).

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- **Large release** – Industrial spills or releases are infrequent and generally contained. If a large spill does occur, evacuate the area. Keep upwind of the spill and ventilate the area. Only trained and properly protected personnel must be involved in clean-up operations. Spilled product may cause a slipping hazard. Use appropriate safety equipment. See [Environmental, Health](#), and [Physical Hazard Information](#).
- **In case of fire** – Keep people away. Isolate the fire and deny any unnecessary entry. Use water fog, dry-chemical or carbon-dioxide extinguishers, or foam 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. Follow emergency procedures carefully. Keep fire water out of waterways and sewers 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](#).

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### Health Information<sup>28,29</sup>

Health information for TRITON™ CF surfactants 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 products may also contain minor components or additives that have additional health risks. An overview of health information for these products is below.

**Eye contact** – Contact may cause slight to severe irritation with corneal injury, which may result in permanent vision impairment, even blindness. Chemical burns may occur.

**Skin contact** – Brief contact may cause slight irritation with local redness and drying and flaking of the skin. Prolonged contact is unlikely to result in absorption of harmful amounts.

**Inhalation** – At room temperature, exposure to vapor is minimal due to the low volatility of the products. A single exposure to vapor is unlikely to cause adverse effects, but excessive exposure may cause irritation to the nose, throat, and lungs.

**Ingestion** – These products have low toxicity if swallowed. Swallowing small amounts incidental to normal handling operations is not likely to cause injury; however, swallowing larger amounts may cause injury.

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

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### Environmental Information<sup>30,31</sup>

TRITON™ CF surfactants are soluble in water and have low vapor pressure. These surfactants will reside in water when introduced into the environment.

TRITON CF surfactants pose a low risk to the environment. Although they are not readily biodegradable (less than 60% biodegradation over a 28-day period per OECD 301F test guidelines), these products are expected to biodegrade slowly under typical environmental conditions. They will be removed from water and soil environments, including wastewater-treatment facilities.

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TRITON™ CF surfactants are not likely to accumulate in the food chain (low bioconcentration potential). TRITON CF surfactants range from practically nontoxic (LC<sub>50</sub> >100 mg/L) to toxic (EC<sub>50</sub> of 1 to 10 mg/L) to aquatic organisms on an acute basis.

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

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### Physical Hazard Information<sup>32</sup>

TRITON™ CF surfactants are stable under recommended storage and normal use conditions. Exposure to elevated temperatures can cause these products to decompose. Decomposition products depend upon temperature, air supply, and the presence of other materials. Avoid contact with strong acids, strong bases, strong oxidizers, and strong reducing agents.

Spilled product can be a slipping hazard.

For more information, request the 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 TRITON™ CF 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 Sheet](#), or [Contact Us](#).

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### Additional Information

- Safety Data Sheet ([www.dow.com/webapps/msds/msdssearch.aspx](http://www.dow.com/webapps/msds/msdssearch.aspx))
- Contact Us ([www.dow.com/surfactants/contact/index.htm](http://www.dow.com/surfactants/contact/index.htm))
- Product Literature for TRITON™ CF surfactants ([www.dow.com/surfactants/literature/](http://www.dow.com/surfactants/literature/))

For more business information about TRITON CF surfactants, visit the Dow Surfactants website at [www.dow.com/surfactants/](http://www.dow.com/surfactants/).

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### References

- <sup>1</sup> TRITON™ CF-10 Surfactant Product Information, Technical Data Sheet, The Dow Chemical Company, Form No. 119-01868-1107, page 1.
- <sup>2</sup> TRITON™ CF-21 Surfactant Product Information, Technical Data Sheet, The Dow Chemical Company, Form No. 119-01869-1107, page 1.
- <sup>3</sup> TRITON™ CF-32 Defoamer Product Information, Technical Data Sheet, The Dow Chemical Company, Form No. 119-01870-1107, page 1.
- <sup>4</sup> TRITON™ CF-76 Surfactant Product Information, Technical Data Sheet, The Dow Chemical Company, Form No. 119-01871-1107, page 1.
- <sup>5</sup> TRITON™ CF-10 Surfactant Product Information, Technical Data Sheet, The Dow Chemical Company, Form No. 119-01868-1107, page 1.
- <sup>6</sup> TRITON™ CF-21 Surfactant Product Information, Technical Data Sheet, The Dow Chemical Company, Form No. 119-01869-1107, page 1.
- <sup>7</sup> TRITON™ CF-32 Defoamer Product Information, Technical Data Sheet, The Dow Chemical Company, Form No. 119-01870-1107, page 1.

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- <sup>8</sup> TRITON™ CF-76 Surfactant Product Information , Technical Data Sheet, The Dow Chemical Company, Form No. 119-01871-1107, page 1.
- <sup>9</sup> TRITON™ CF-87 Surfactant Product Information, Technical Data Sheet, The Dow Chemical Company, Form No. 119-01872 JMS0707, page 1.
- <sup>10</sup> TRITON™ CF-10 Surfactant Material Safety Data Sheet, The Dow Chemical Company, May 22, 2012, Fire Fighting Measures, Accidental Measures, Handling and Storage, Exposure Controls, and Stability and Reactivity.
- <sup>11</sup> TRITON™ CF-10 Surfactant Material Safety Data Sheet, The Dow Chemical Company, May 22, 2012, Hazards Identification and Toxicological Information.
- <sup>12</sup> TRITON™ CF-21 Surfactant Material Safety Data Sheet, The Dow Chemical Company, June 8, 2012, Hazards Identification and Toxicological Information.
- <sup>13</sup> TRITON™ CF-32 Surfactant Material Safety Data Sheet, The Dow Chemical Company, June 1, 2012, Ecological Information.
- <sup>14</sup> TRITON™ CF-76 Surfactant Material Safety Data Sheet, The Dow Chemical Company, May 15, 2012, Ecological Information.
- <sup>15</sup> TRITON™ CF-10 Surfactant Material Safety Data Sheet, The Dow Chemical Company, May 22, 2012, Stability and Reactivity.
- <sup>16</sup> TRITON™ CF-10 Surfactant Material Safety Data Sheet, The Dow Chemical Company, May 22, 2012, Composition and Physical and Chemical Properties.
- <sup>17</sup> TRITON™ CF-10 (90% Actives) Surfactant Material Safety Data Sheet, The Dow Chemical Company, June 1, 2012, Composition and Physical and Chemical Properties.
- <sup>18</sup> TRITON™ CF-21 Surfactant Material Safety Data Sheet, The Dow Chemical Company, June 8, 2012, Composition and Physical and Chemical Properties.
- <sup>19</sup> TRITON™ CF-32 Surfactant Material Safety Data Sheet, The Dow Chemical Company, June 1, 2012, Composition and Physical and Chemical Properties.
- <sup>20</sup> TRITON™ CF-76 Surfactant Material Safety Data Sheet, The Dow Chemical Company, May 15, 2012, Composition, Physical and Chemical Properties.
- <sup>21</sup> TRITON™ CF-87 Surfactant Material Safety Data Sheet, The Dow Chemical Company, June 12, 2012, Composition and Physical and Chemical Properties.
- <sup>22</sup> TRITON™ CF-10 Surfactant Product Information, Technical Data Sheet, The Dow Chemical Company, Form No. 119-01868-1107, page 1.
- <sup>23</sup> TRITON™ CF-21 Surfactant Product Information, Technical Data Sheet, The Dow Chemical Company, Form No. 119-01869-1107, page 1.
- <sup>24</sup> TRITON™ CF-32 Defoamer Product Information, Technical Data Sheet, The Dow Chemical Company, Form No. 119-01870-1107, page 1.
- <sup>25</sup> TRITON™ CF-76 Surfactant Product Information, Technical Data Sheet, The Dow Chemical Company, Form No. 119-01871-1107, page 1.
- <sup>26</sup> TRITON™ CF-87 Surfactant Product Information, Technical Data Sheet, The Dow Chemical Company, Form No. 119-01872 JMS0707, page 1
- <sup>27</sup> TRITON™ CF-10 Surfactant Material Safety Data Sheet, The Dow Chemical Company, May 22, 2012, Fire Fighting Measures, Accidental Measures, Handling and Storage, Exposure Controls, and Stability and Reactivity.
- <sup>28</sup> TRITON™ CF-10 Surfactant Material Safety Data Sheet, The Dow Chemical Company, May 22, 2012, Hazards Identification and Toxicological Information.
- <sup>29</sup> TRITON™ CF-21 Surfactant Material Safety Data Sheet, The Dow Chemical Company, June 8, 2012, Hazards Identification and Toxicological Information.
- <sup>30</sup> TRITON™ CF-32 Surfactant Material Safety Data Sheet, The Dow Chemical Company, June 1, 2012, Ecological Information.
- <sup>31</sup> TRITON™ CF-76 Surfactant Material Safety Data Sheet, The Dow Chemical Company, May 15, 2012, Ecological Information.
- <sup>32</sup> TRITON™ CF-10 Surfactant Material Safety Data Sheet, The Dow Chemical Company, May 22, 2012, Stability and Reactivity.

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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.

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