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## Product Safety Assessment

### **REVOLAVE™ Concentrated Windscreen Washer**

Product Safety Assessment documents are available at: [www.dow.com/productsafety/finder/](http://www.dow.com/productsafety/finder/).

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#### Names

- REVOLAVE™ LG Concentrated Windscreen Washer
- REVOLAVE LG1 Concentrate

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#### Product Overview

- REVOLAVE™ LG windscreen washer products are alcohol/water solutions containing both nonionic and anionic detergents and potassium and sodium salts.<sup>1,2</sup> For further details, see [Product Description](#).
- REVOLAVE LG washer products are used in automotive applications to fill the windscreen fluid reservoir and related tubing in the vehicle engine compartment at the factory. The solutions may be diluted prior to filling.<sup>3,4</sup> For further details, see [Product Uses](#).
- REVOLAVE LG washer products are only sold to automotive manufacturers. Consumers may be exposed when refilling the fluid reservoir or by standing next to the windshield of a stationary vehicle when the controls are activated. Automotive factory workers and service personnel may be exposed when emptying and/or refilling the fluid reservoir or servicing the washer system.<sup>5,6</sup> For further details, see [Exposure Potential](#).
- Eye contact with these products may cause moderate eye irritation and corneal injury. Prolonged skin exposure is not likely to cause significant skin irritation or to result in absorption of harmful amounts. One component of these products has been shown to be a skin sensitizer. Inhalation of mists may cause irritation of the nose, throat, and lungs. These fluids have low toxicity if swallowed. Some components of these products have been reported to cause effects on the liver and central nervous system, as well as birth defects and fetal toxicity.<sup>7,8</sup> For further details, see [Health Information](#).
- Ethyl alcohol and isopropyl alcohol are readily biodegradable, unlikely to accumulate in the food chain, and are practically non-toxic to fish and other aquatic organisms.<sup>9,10</sup> For further details, see [Environmental Information](#).
- These products are stable under recommended storage and use conditions, although they are considered flammable. Avoid contact with strong oxidizers.<sup>11,12</sup> For further details, see [Physical Hazard Information](#).

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## Manufacture of Product

- **Production** – Dow produces REVOLAVE™ LG windscreen washer products at facilities in Europe.
- **Process** – These products are prepared by blending a proprietary mixture of surfactants, potassium and sodium salts, ethyl alcohol, isopropyl alcohol, and other ingredients with water.

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## Product Description<sup>13,14</sup>

REVOLAVE™ LG windscreen washer products are alcohol/water solutions containing both nonionic and anionic detergents and potassium and sodium salts. The REVOLAVE LG concentrated product is blue and the REVOLAVE LG1 product is fluorescent yellow-green in color.

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## Product Uses<sup>15,16</sup>

REVOLAVE™ LG windscreen washer products are used in automotive applications to fill the windscreen fluid reservoir and related tubing in the vehicle engine compartment at the factory. These products may be diluted prior to filling to obtain the proper temperature protection. The purpose of the solution is to remove dirt and contaminants from the vehicle windscreen (windshield). The solution in the reservoir is squirted, via an electric motor and tubing system, onto the outside of the windshield by activating manual controls inside the vehicle.

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## Exposure Potential<sup>17,18</sup>

REVOLAVE™ LG windscreen washer products are used in the production of vehicles. Based on the uses for these products, the public could be exposed through:

- **Workplace exposure** – Exposure can occur either in a REVOLAVE LG washer products manufacturing facility or in the various industrial or manufacturing facilities that install these fluids into vehicles. These products are produced, distributed, stored, and consumed in closed systems. Those working with these products in manufacturing 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, ventilation, and safety equipment in place to limit unnecessary exposure. See [Health Information](#).
- **Consumer exposure to products containing REVOLAVE LG washer products** – These products are only sold to automotive manufacturers; they are not sold in the consumer market. Consumers may be exposed when refilling the fluid reservoir or by standing next to the windshield of a stationary vehicle when the controls are activated. Automotive factory workers and service personnel may be exposed when emptying and/or refilling the fluid reservoir or servicing the washer motor and tubing. Always read the product information before use and follow the label/use instructions. See [Health Information](#).
- **Environmental releases** – Ethyl alcohol and isopropyl alcohol may slowly evaporate from products containing them. The compounds are very soluble in water, and when introduced, will have a tendency to remain in water. Because ethyl alcohol and isopropyl alcohol are readily biodegradable, they will be removed from water and soil environments, including sewage treatment plants. In the event of a spill, the focus is on containing the spill to prevent contamination of soil and surface or ground water. For small spills, REVOLAVE LG washer products should be absorbed with materials such as sand or sawdust. 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, the material should be captured, collected, and reprocessed or disposed of according to applicable governmental requirements. Eliminate all sources of ignition immediately. A positive-pressure, self-contained breathing apparatus (SCBA) with an approved full-face mask is recommended for emergency work. See [Environmental](#), [Health](#), and [Physical Hazard Information](#).
- **In case of fire** – Isolate the fire area and deny any unnecessary entry. Use carbon-dioxide or dry-chemical extinguishers to fight the fire. Do not use water. Use of a direct water stream may spread fire. Firefighters should wear positive-pressure, self-contained breathing apparatus (SCBA) and protective firefighting clothing. Follow emergency procedures carefully. See [Environmental](#), [Health](#), and [Physical Hazard Information](#).

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

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## Health Information<sup>19,20</sup>

**Eye contact** – These products may cause moderate eye irritation and corneal injury.

**Skin contact** – Prolonged exposure is not likely to cause significant skin irritation. These products may cause drying and flaking of the skin. Prolonged contact is not likely to result in absorption of harmful amounts. One component of these products has been shown to be a skin sensitizer.

**Inhalation** – Mists may cause irritation of the upper respiratory tract (nose and throat) and lungs. Excessive exposure may cause eye, nose, and throat irritation. Exposure for extreme durations or at high levels may result in lack of coordination, confusion, hypotension, hypothermia, circulatory collapse, respiratory arrest, or death.

**Ingestion** – These products have low toxicity if swallowed. Small amounts swallowed incidental to normal handling are not likely to cause injury, however, larger amounts may cause injury, including central nervous system effects, nausea, and vomiting. Signs of excessive exposure may include facial flushing, irregular heartbeat, or low blood pressure. Aspiration into the lungs may occur during ingestion of vomiting, causing lung damage or even death due to chemical pneumonia.

**Repeated doses** – Some components of these products have been reported to cause effects on the liver and central nervous system of both animals and humans.

**Other** – Ethyl alcohol, a component of these products, has been shown to cause birth defects and toxicity to the fetus in animal testing and in humans when ingested in large amounts during pregnancy. It can also interfere with male fertility. Isopropyl alcohol has been toxic to the fetus at high doses that were also toxic to the mother.

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

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## Environmental Information<sup>21,22</sup>

Ethyl alcohol and isopropyl alcohol have moderate volatility, and may slowly evaporate from products containing them. The substances are very soluble in water, and when introduced, will have a tendency to remain in water. The substances have a minimal tendency to bind to soil or sediment.

Ethyl alcohol and isopropyl alcohol are unlikely to persist in the environment. The compounds are readily biodegradable, which suggests the chemicals will be removed from water and soil environments, including biological wastewater treatment plants.

Ethyl alcohol and isopropyl alcohol are not likely to accumulate in the food chain (bioconcentration potential is low) and are practically non-toxic to fish and other aquatic organisms on an acute basis.

The detergents, which are present at small amounts in the product, are also biodegradable, unlikely to accumulate in the food chain, and are moderately toxic to fish and other aquatic organisms.

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

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### **Physical Hazard Information**<sup>23,24</sup>

These products are stable under recommended storage and use conditions. REVOLAVE™ LG washer products are flammable. Concentrated or undiluted products (containing higher levels of alcohols) are highly flammable. Some components of these solutions can decompose at elevated temperatures. Avoid contact with strong oxidizers.

For more information, request the relevant 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 REVOLAVE™ LG concentrated windscreen washer products. 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 Sheets ( request from Dow's Customer Information Group at: <http://www.dow.com/assistance/dowcig.htm>)
- Contact Us (<http://automotive.dow.com/contact/>)
- REVOLAVE™ LG Concentrate Concentrated Windscreen Washer, Technical Data Sheet, The Dow Chemical Company, Form No. 299-51484, January 2009 (request from Dow's Customer Information Group at <http://www.dow.com/assistance/dowcig.htm>)
- REVOLAVE LG1 Concentrated Windscreen Washer, Technical Data Sheet, The Dow Chemical Company, Form No. 299-51485, January 2009 (request from Dow's Customer Information Group at <http://www.dow.com/assistance/dowcig.htm>)

For more business information about REVOLAVE LG concentrated windscreen washer solutions, visit the [Dow Automotive](#) web site at [www.automotive.dow.com/](http://www.automotive.dow.com/).

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## References

- <sup>1</sup> REVOLAVE™ LG Concentrate Concentrated Windscreen Washer, Technical Data Sheet, The Dow Chemical Company, Form No. 299-51484, January 2009, page 1.
- <sup>2</sup> REVOLAVE LG1 Concentrated Windscreen Washer, Technical Data Sheet, The Dow Chemical Company, Form No. 299-51485, January 2009, page 1.
- <sup>3</sup> REVOLAVE LG Concentrate Concentrated Windscreen Washer, Technical Data Sheet, The Dow Chemical Company, Form No. 299-51484, January 2009, page 1.
- <sup>4</sup> REVOLAVE LG1 Concentrated Windscreen Washer, Technical Data Sheet, The Dow Chemical Company, Form No. 299-51485, January 2009, page 1.
- <sup>5</sup> REVOLAVE LG1 Material Safety Data Sheet, The Dow Chemical Company, July 22, 2009, pages 2–4.
- <sup>6</sup> REVOLAVE LG Concentrate Material Safety Data Sheet, The Dow Chemical Company, June 30, 2009, pages 2–4.
- <sup>7</sup> REVOLAVE LG1 Material Safety Data Sheet, The Dow Chemical Company, July 22, 2009, page 5.
- <sup>8</sup> REVOLAVE LG Concentrate Material Safety Data Sheet, The Dow Chemical Company, June 30, 2009, page 5.
- <sup>9</sup> REVOLAVE LG1 Material Safety Data Sheet, The Dow Chemical Company, July 22, 2009, page 6.
- <sup>10</sup> REVOLAVE LG Concentrate Material Safety Data Sheet, The Dow Chemical Company, June 30, 2009, pages 6–7.
- <sup>11</sup> REVOLAVE LG1 Material Safety Data Sheet, The Dow Chemical Company, July 22, 2009, pages 1 and 4–5.
- <sup>12</sup> REVOLAVE LG Concentrate Material Safety Data Sheet, The Dow Chemical Company, June 30, 2009, pages 1 and 4.
- <sup>13</sup> REVOLAVE LG Concentrate Concentrated Windscreen Washer, Technical Data Sheet, The Dow Chemical Company, Form No. 299-51484, January 2009, page 1.
- <sup>14</sup> REVOLAVE LG1 Concentrated Windscreen Washer, Technical Data Sheet, The Dow Chemical Company, Form No. 299-51485, January 2009, page 1.
- <sup>15</sup> REVOLAVE LG Concentrate Concentrated Windscreen Washer, Technical Data Sheet, The Dow Chemical Company, Form No. 299-51484, January 2009, page 1.
- <sup>16</sup> REVOLAVE™ LG1 Concentrated Windscreen Washer, Technical Data Sheet, The Dow Chemical Company, Form No. 299-51485, January 2009, page 1.
- <sup>17</sup> REVOLAVE LG1 Material Safety Data Sheet, The Dow Chemical Company, July 22, 2009, pages 2–4 and 6.
- <sup>18</sup> REVOLAVE LG Concentrate Material Safety Data Sheet, The Dow Chemical Company, June 30, 2009, pages 2–4 and 6–7.
- <sup>19</sup> REVOLAVE LG1 Material Safety Data Sheet, The Dow Chemical Company, July 22, 2009, page 5.
- <sup>20</sup> REVOLAVE LG Concentrate Material Safety Data Sheet, The Dow Chemical Company, June 30, 2009, page 5.
- <sup>21</sup> REVOLAVE LG1 Material Safety Data Sheet, The Dow Chemical Company, July 22, 2009, page 6.
- <sup>22</sup> REVOLAVE LG Concentrate Material Safety Data Sheet, The Dow Chemical Company, June 30, 2009, pages 6–7.
- <sup>23</sup> REVOLAVE LG1 Material Safety Data Sheet, The Dow Chemical Company, July 22, 2009, pages 1 and 4–5.
- <sup>24</sup> REVOLAVE LG Concentrate Material Safety Data Sheet, The Dow Chemical Company, June 30, 2009, pages 1 and 4.

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