Product Safety Assessment

ROBOND™ Water-Based Acrylic or Water-Based Polyester Laminating Adhesives

Product Safety Assessment documents are available at www.dow.com/productssafety/assessfinder.

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Names
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- ROBOND Laminating Adhesives
- ROBOND L-2150 Laminating Adhesive
- ROBOND L-90M/C9R-101 Laminating Adhesive
- ROBOND L-430 Laminating Adhesive
- ROBOND L-49-189 Laminating Adhesive
- ROBOND L-53-103 Laminating Adhesive
- ROBOND L-62 Laminating Adhesive
- ROBOND L-76 Laminating Adhesive
- ROBOND L-77 Laminating Adhesive
- ROBOND L-90 Laminating Adhesive
- ROBOND L-90D Laminating Adhesive
- ROBOND L-100 Laminating Adhesive
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- ROBOND L-330 Laminating Adhesive

Product Overview
- ROBOND™ Water-Based Acrylic or Polyester Laminating Adhesives are one- or two-component products supplied as white, milky liquids.¹ For further details, see Product Description.
- ROBOND Water-Based Laminating Adhesives are used to laminate a variety of substrates for food packaging and other medium-performance packaging applications.² For further details, see Product Uses.
- Exposure can occur either in facilities that manufacture ROBOND Water-Based Laminating Adhesives products or in the various industrial or manufacturing facilities that use these products. ROBOND Water-Based Laminating Adhesives are not sold directly to consumers, but they are used in food packaging and other packaging applications with which consumers may come into contact. Products used for food-contact applications comply with U.S. FDA regulations. Exposure to cured and/or dried product is not considered to present a risk to consumers.³ For further details, see Exposure Potential.

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- Eye or skin contact may cause slight irritation. Inhalation of vapor or mist may cause headache, nausea, and irritation of the nose, throat, and lungs. For further details, see Health Information.

- The polymers in ROBOND™ Water-Based Laminating Adhesives are expected to slowly degrade in the environment. Due to their high molecular weight, the polymers are not expected to accumulate in the food chain, and they are not expected to be toxic to aquatic organisms on an acute basis. Isopropanol in the products is readily biodegradable, has a low tendency to accumulate in the food chain (bioconcentration potential is low), and is practically nontoxic to aquatic organisms on an acute basis. For further details, see Environmental Information.

- ROBOND Water-Based Laminating Adhesives are stable under recommended storage and normal use conditions. Keep these products from freezing and avoid contact with strong oxidizers. For further details, see Physical Hazard Information.

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Manufacture of Product

- Locations – ROBOND™ Water-Based Laminating Adhesives are manufactured in various global locations by Rohm and Haas Company, a wholly owned subsidiary of The Dow Chemical Company, and its global affiliates.

- Process – ROBOND Water-Based Laminating Adhesives are produced using proprietary processes and materials.

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Product Description

ROBOND™ Water-Based Laminating Adhesives are one- or two-component waterborne adhesives supplied as milky, white liquids. These products consist of approximately 38 to 42% resin solids in water or a one-to-one water/isopropanol blend. The two-component products use a colorless liquid coreactant (often CR9-101) to complete the curing process.

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Product Uses

ROBOND™ Water-Based Laminating Adhesives are used to laminate a variety of substrates, including treated polyolefins, polyvinylidene chloride (PVDC) coated substrates, metallized films, nylon, and treated polyesters. These laminations are used in medium-performance packaging applications, including packaging for snack foods, dry foods, and condiments. Products used in food-packaging applications comply with U.S. FDA regulations for food contact.

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Exposure Potential

ROBOND™ Water-Based Laminating Adhesives 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 ROBOND Water-Based Laminating Adhesives or in the various industrial or manufacturing facilities that use these products. ROBOND Water-Based Laminating Adhesives are produced, transported, and stored in closed systems. Those working with these products in manufacturing operations could be exposed during maintenance, sampling, testing, application, 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 exposure. See Health Information.

- Consumer exposure to products containing ROBOND Water-Based Laminating Adhesives – Dow does not sell ROBOND Water-Based Laminating Adhesives for direct consumer use. These products are used in packaging applications, including food packaging, so consumers may come into contact with dried and cured product. Exposure to dried and/or cured product is not considered to present a risk to consumers. 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. Respiratory protection is necessary for cleaning up spills and leaks. Small spills should be absorbed with materials such as sand. If released to the environment, the polymers will tend to float in water and will be removed in biological wastewater-treatment facilities by adsorption to biosolids. The isopropanol component will tend to remain in water. Since isopropanol is readily biodegradable, it is expected to be removed from water and soil environments, including biological 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, these products should be captured, collected, and reprocessed or disposed of according to applicable governmental regulations. Use appropriate personal protective equipment. Keep people away from and upwind of the release. Spills can create slippery conditions. Keep spills and cleaning runoff out of municipal sewers and open bodies of water. See Environmental, Health, and Physical Hazard Information.

- **In case of fire** – These products are not combustible unless evaporated to dryness. Dried residue can burn. Products can splatter above 100°C (212°F). Use extinguishing media appropriate for the surrounding fire. Firefighters should wear positive-pressure, self-contained breathing apparatus (SCBA) and protective suit. Keep fire water out of waterways and sewers to minimize the potential for environmental damage. Follow emergency procedures outlined in the Safety Data Sheet carefully. See Environmental, Health, and Physical Hazard Information.

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

### Health Information

Health information for ROBOND™ Water-Based Laminating Adhesives is summarized on the relevant Safety Data Sheet. It is important to note that health risks associated with individual products may vary based on the formulation or intended use. These products may also contain minor components or additives that have additional health risks. The Safety Data Sheet is the preferred source for specific health information. An overview of health information for these products appears below.

**Eye contact** – Direct contact may cause slight eye irritation.

**Skin contact** – Prolonged or repeated contact may cause slight skin irritation.

**Inhalation** – Inhalation of vapor or mist may cause headache, nausea, and irritation of the nose, throat, and lungs.

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

### Environmental Information

Environmental information for ROBOND™ Water-Based Laminating Adhesives is summarized on the relevant Safety Data Sheet. It is important to note that environmental risks associated with individual products may vary based on their formulation and/or intended use. The Safety Data Sheet is the preferred source for specific environmental information.

The polymers in ROBOND Water-Based Laminating Adhesives are insoluble in water and nonvolatile. If released to the environment, the polymers would initially disperse, eventually binding to soil, suspended particles, and sediment. Although the polymers are not biodegradable, they would be expected to degrade slowly in the environment, including degradation by physical action or by exposure to sunlight. The polymers would likely be removed in biological wastewater-treatment facilities by adsorption to biosolids. The polymers are not expected to accumulate in the food chain due to their high molecular weight, and they are not expected to be toxic to aquatic organisms on an acute basis.

The isopropanol in ROBOND Water-Based Laminating Adhesives is miscible in water and has moderate volatility. If released to the environment, isopropanol has a very low tendency to volatilize from water and minimal tendency to bind to soil and sediment. Isopropanol is unlikely to persist in the environment. The compound is readily biodegradable, which suggests that it will be removed from water and soil environments, including biological wastewater-treatment facilities. Isopropanol is not likely to accumulate in the food chain (bioconcentration potential is low) and is practically nontoxic (LC50/EC50 > 100 mg/L in the most sensitive species tested) to fish and other aquatic organisms on an acute basis.

For more information, request the relevant Safety Data Sheet from the Dow Customer Information Group.
Physical Hazard Information\(^{14,15}\)

ROBOND™ Water-Based Laminating Adhesives are stable under recommended storage and normal use conditions. Keep these products from freezing. Monomer vapors can be evolved when products are heated during processing operations. Containers may be hazardous when empty.

Dried residue can burn, and these products can splatter above 100°C (212°F). 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 ROBOND™ Water-Based Laminating Adhesives. These regulations may vary by city, state, country, or geographic region. Information may be found by consulting the relevant Safety Data Sheet or Contact Us.

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Additional Information

- Request Safety Data Sheets and Technical Data Sheets from the Dow Customer Information Group (www.dow.com/assistance/dowcig.htm)
- Contact Us (www.dow.com/packaging/contact/index.htm)
- ROBOND™ L 75 Laminating Adhesive (Technical Data Sheet), Packaging and Converting, Rohm and Haas Company, July 2006 (request from www.dow.com/assistance/dowcig.htm)
- ROBOND™ L-2150 Waterborne Laminating Adhesive (Technical Data Sheet), Packaging and Building, Rohm and Haas Company, October 2007 (request from www.dow.com/assistance/dowcig.htm)
- ROBOND™ L-62 Water-Based Adhesive (Technical Data Sheet), Packaging and Converting, Rohm and Haas Company, May 2003 (request from www.dow.com/assistance/dowcig.htm)

For more business information about ROBOND™ Water-Based Laminating Adhesives, visit the Dow Performance Packaging website at www.dow.com/packaging/solutions/robond_waterborne_adhesives.htm.

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References
8 ROBOND™ L75 Laminating Adhesive (Technical Data Sheet), Packaging and Converting, Rohm and Haas Company, July 2006, page 1.

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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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