Product Safety Assessment

*MOR-AD™ Industrial 100% Solids Laminating Adhesives*


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Names

- MOR-AD™ industrial 100% solids laminating adhesive
- MOR-AD M-600 series moisture cure, one-part urethane laminate adhesives

Product Overview

- MOR-AD™ 100% solids laminating adhesives are one-part, solvent-free polyurethane pre-polymers. They are viscous (thick) straw-colored liquids with a sweet odor. For further details, see Product Description.
- MOR-AD 100% solids laminating adhesives are used as structural adhesives for bonding fiber-reinforced plastics, engineering plastics, primed metals, wood composite cores, and other materials. For further details, see Product Uses.
- Those working with MOR-AD 100% solids laminating adhesives in manufacturing operations could be exposed during maintenance, sampling, testing, application, or other procedures. Consumer exposure to cured adhesive is expected to be negligible. For further details, see Exposure Potential.
- Health information provided is for uncured products, which are intended for industrial use only. Eye contact with product vapor or mist may cause irritation with pain and tearing. Skin contact may cause moderate irritation or an allergic response. These products can be harmful if inhaled or swallowed. Repeated or prolonged exposure can result in lung damage. For further details, see Health Information.
- If released to the environment, these products would be expected to be inert in the environment. Due to their high molecular weight, the cured polyurethane polymers are not expected to accumulate in the food chain, and acute aquatic toxicity is expected to be low. For further details, see Environmental Information.
- MOR-AD 100% solids laminating adhesives are stable at typical storage and use conditions. Avoid contact with strong oxidizers, acids, peroxides, bases, and amines. These products should be kept away from moisture to avoid hazardous polymerization. For further details, see Physical Hazard Information.
Manufacture of Product

- **Locations** – Rohm and Haas Company, a wholly owned subsidiary of The Dow Chemical Company, produces MOR-AD™ 100% solids laminating adhesives at facilities in Ringwood, Illinois, USA.
- **Process** – MOR-AD 100% solids laminating adhesives are formulated in batch operations using proprietary materials and technology.

Product Description

MOR-AD™ 100% solids laminating adhesives are one-part, solvent-free polyurethane prepolymer. They are viscous (thick) straw-colored liquids with a sweet odor. Once applied, they cure (react to solidify and harden) by contact with moisture.

Product Uses

MOR-AD™ 100% solids laminating adhesives are sold for industrial use only and used as structural adhesives for bonding fiber-reinforced plastics, engineering plastics, primed metals, wood composite cores, and other materials. Structural insulated panels for walls, roofs, and flooring systems are fabricated with this type of adhesive. The adhesives are usually applied using roll-coating or bead or ribbon extrusion techniques in both semi-continuous and continuous laminating processes. The cured bonds are resistant to heat, cold, and moisture.

Exposure Potential

MOR-AD™ 100% solids laminating adhesives are used in the production of industrial and consumer products. Based on the uses for these products, the public could be exposed through:

- **Workplace exposure** – Exposure can occur in a facility that manufactures MOR-AD 100% solids laminating adhesives or in the various industrial or manufacturing facilities that use these products. They are produced, distributed, and stored in closed systems. Those working with MOR-AD 100% solids laminating adhesives 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 MOR-AD 100% solids laminating adhesives** – These products are sold for industrial use only. Some types of building and construction materials may contain these adhesives. Consumer contact with cured adhesive is expected to be negligible. Cured MOR-AD adhesives are not expected to present a health risk. See Health Information.
- **Environmental releases** – Due to the use pattern for these products, releases to the environment are expected to be minimal. If released, the cured polyurethane polymers will tend to float in water and will be removed in wastewater treatment facilities by adsorption to sludge. In the event of a spill, the focus is on containing the spill to prevent contamination of soil and surface or ground water. Respiratory protection is necessary for cleaning up spills and leaks. For small spills, MOR-AD 100% solids laminating adhesives should be absorbed with materials such as sand, sawdust, or soil. See Environmental, Health, and Physical Hazard Information.
- **Large release** – Industrial spills or releases are infrequent and generally contained. If a large spill does occur, MOR-AD 100% solids laminating adhesives should be captured, collected, and reprocessed or disposed of according to applicable governmental requirements.
Evacuate personnel to safe areas. Ventilate the area. Floors may be slippery. An approved positive pressure, self-contained breathing apparatus (SCBA) with a full-face mask is recommended for emergency work. See Environmental, Health, and Physical Hazard Information.

- **In case of fire** – Deny any unnecessary entry into the area. Use large amounts of water, carbon-dioxide or dry-chemical extinguishers, or foam to fight the fire. Do not allow water to enter containers. Firefighters should wear positive-pressure, self-contained breathing apparatus (SCBA) and protective firefighting clothing. Toxic and irritating gases may be released during a fire. Follow emergency procedures carefully. Prevent fire-water run-off from entering drains or water ways to minimize the potential for environmental damage. 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 MOR-AD™ 100% solids laminating adhesives 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. These materials may contain 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. Uncured MOR-AD 100% solids laminating adhesives are intended for industrial use only. Cured MOR-AD 100% solids laminating adhesives are not expected to present a health risk.

**Eye contact** – Contact may cause eye irritation with pain or tearing.

**Skin contact** – Contact may cause moderate skin irritation with reddening of the skin. Skin sensitization may occur even at low concentrations in susceptible individuals.

**Inhalation** – Can be harmful if inhaled, with headache, nausea, vomiting, coughing, or irritation of nose, throat, and lungs. Inhalation may result in respiratory sensitization with asthma symptoms, difficulty breathing, tightness in the chest, shortness of breath, or lung damage.

**Ingestion** – Can be harmful if swallowed, with severe irritation of the mouth, throat, and digestive tract, nausea, vomiting, diarrhea, gastrointestinal irritation, or abdominal pain.

**Repeated exposure** – Long-term exposure to diisocyanates can result in lung damage, including reduced lung function, which may be permanent.

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

Environmental Information

Environmental information for MOR-AD™ 100% solids laminating adhesives is summarized on the relevant Safety Data Sheets. The environmental risks associated with individual products vary based on formulation. The Safety Data Sheet is the preferred source for specific environmental information.

The cured polyurethane polymer is insoluble and will tend to float in water and adsorb to soil or sediment.
Although the cured polyurethane polymer is essentially non-biodegradable, it will be expected to slowly degrade in the environment, including degradation by physical action or by exposure to sunlight.

The cured polyurethane polymer is not expected to accumulate in the food chain due to its high molecular weight, and acute aquatic toxicity is expected to be low.

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

Physical Hazard Information

MOR-AD™ 100% solids laminating adhesives are stable at typical storage and use conditions. Avoid contact with strong oxidizers, acids, peroxides, bases, and amines. MOR-AD 100% solids laminating adhesives should be kept away from water (moisture) to avoid the potential for hazardous polymerization.

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 MOR-AD™ 100% solids laminating adhesives. These regulations may vary by city, state, country, or geographic region. Information may be found by consulting the relevant Safety Data Sheets, Product Information Sheets, or Contact Us.

Additional Information

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

For more business or technical information about MOR-AD 100% solids laminating adhesives, go to the web site for Dow Building Solutions or MOR-AD™ M600 Series.

References

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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