Product Safety Assessment

MORSTIK™ Solvent Rubber-Based, Pressure-Sensitive Adhesives Based on Styrene-Isoprene-Styrene (SIS)

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Names
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Product Overview

- MORSTIK™ solvent rubber-based pressure-sensitive adhesives based on styrene-isoprene-styrene (SIS) copolymers are clear, amber-colored, resin solutions. They are a mixture of hydrocarbon resins and styrene-rubber copolymer dissolved in a blend of solvents. For further details, see Product Description.
- MORSTIK solvent rubber-based pressure-sensitive adhesives based on SIS are coated onto films, foils, and tapes in the production of removable tapes and labels. As the solvent dries, the resin remains tacky for use as a pressure-sensitive adhesive. These products offer a good balance of tack, peel adhesion, and shear resistance. For further details, see Product Uses.
- Dow does not sell MORSTIK solvent rubber-based pressure-sensitive adhesives based on SIS for direct consumer use. Consumers may use products such as removable tapes and labels that are manufactured with these adhesives. For further details, see Exposure Potential.
- Most health effects are related to the solvents used in these products. Eye contact with solvent vapor or mist during processing can cause severe irritation, pain, tearing, or corneal opacity. Skin contact can cause moderate irritation and blistering. Prolonged or repeated skin contact can cause de-fatting and drying of the skin. Inhalation of vapor or mist can cause irritation of the nose, throat, and lungs, headache, nausea, drowsiness, vomiting, fatigue, and central nervous system effects such as dizziness, lack of coordination, weakness, and unconsciousness, coma, and death. Ingestion can cause nausea, headache, diarrhea, drowsiness, dizziness, vomiting, lack of coordination, unconsciousness, coma, and death. Prolonged overexposure to some solvents can result in effects on the respiratory tract, kidney, liver, heart, blood, and central nervous system. For further details, see Health Information.
- The resins in MORSTIK™ solvent rubber-based pressure-sensitive adhesives based on SIS are expected to be inert in the environment and are not likely to accumulate in the food chain.

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They are expected to be practically nontoxic to fish and other aquatic organisms on an acute basis. The solvents used in MORSTIK solvent rubber-based pressure-sensitive adhesives based on SIS are readily biodegradable, have low potential to bioaccumulate, and range from practically nontoxic to toxic for aquatic organisms on an acute basis. For further details, see Environmental Information.

- MORSTIK solvent rubber-based pressure-sensitive adhesives based on SIS are extremely flammable prior to drying. Spilled product can result in potential slip hazards. For further details, see Physical Hazard Information.

Manufacture of Product

- **Locations** – MORSTIK™ solvent rubber-based pressure-sensitive adhesives based on SIS are produced at various global locations by Rohm and Haas Company, a wholly owned subsidiary of The Dow Chemical Company, and its global affiliated companies.

- **Process** – MORSTIK solvent rubber-based pressure-sensitive adhesives based on SIS are manufactured in batch operations using proprietary materials and technology.

Product Description

MORSTIK™ solvent rubber-based pressure-sensitive adhesives based on SIS are clear, amber-colored, resin solutions based on a mixture of hydrocarbon resins and styrene-rubber copolymers dissolved in a blend of solvents. They generally contain 35 to 54% resin with the balance methyl ethyl ketone, toluene, and heptane.

Product Uses

MORSTIK™ solvent rubber-based pressure-sensitive adhesives based on SIS are coated onto films, foils, and tapes made of polyester, polyvinyl chloride, and other flexible materials. The solvent is removed after the initial coating process. The dried resin is strong and tacky (sticky); suitable for use as a pressure-sensitive adhesive for mounting, quick-stick, and other applications. MORSTIK solvent rubber-based pressure-sensitive adhesives based on SIS are used primarily in removable tapes and labels.

Exposure Potential

MORSTIK™ solvent rubber-based pressure-sensitive adhesives based on SIS 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 MORSTIK solvent rubber-based pressure-sensitive adhesives based on SIS or in the various industrial or manufacturing facilities that use them. They are produced, distributed, and stored 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 ensure exposure guideline limits are not exceeded. See Health Information.

- **Consumer exposure to products containing MORSTIK™ solvent rubber-based pressure-sensitive adhesives based on SIS** – Dow does not sell these products for direct use.

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consumer use. Consumers may use finished goods – such as removable labels – that are manufactured with these adhesives, from which the solvents have been removed. Exposure to dried 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. For small spills, MORSTIK solvent rubber-based pressure-sensitive adhesives based on SIS should be absorbed with materials such as sand, silica gel, or sawdust. The resin components of MORSTIK solvent rubber-based pressure-sensitive adhesives based on SIS are expected to be inert in the environment and would likely adhere to soil or sediment if released to soil or water. The resin components would be removed via adsorption to biosolids during typical wastewater-treatment processes. The solvent components are readily biodegradable in soil and water and would be expected to be removed from water and soil environments, including biological wastewater-treatment facilities. The solvents photodegrade quickly in the atmosphere. Although the resin components are essentially non-biodegradable, they would be expected to slowly degrade in the environment by physical action or exposure to sunlight. See Environmental, Health, and Physical Hazard Information.

- **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. Positive-pressure, self-contained breathing apparatus (SCBA) with an approved full-face mask is recommended for emergency work. Eliminate sources of ignition and avoid the use of spark-producing tools. Use only explosion-proof equipment; ground and bond all containers and handling equipment. See Environmental, Health, and Physical Hazard Information.

- **In case of fire** – Deny any unnecessary entry into the area. Fight advanced fires from a protected location. Use water spray, carbon-dioxide or dry-chemical extinguishers, or foam to fight the fire. Firefighters should wear positive-pressure, self-contained breathing apparatus (SCBA) and protective firefighting clothing. Immediately withdraw all personnel from the area in case of rising sounds from venting safety devices or discoloration of the container. Solvent vapors are heavier than air and can accumulate in low-lying places and flash back. Heated material can form flammable or explosive mixtures with air. 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.

### Health Information

Health information for MORSTIK™ solvent rubber-based pressure-sensitive adhesives based on SIS 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 products may 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 MORSTIK solvent rubber-based pressure-sensitive adhesives based on SIS appears below. Most health effects are related to the solvents used in these products.

**Eye contact** – Contact with the solvents in these products can cause severe eye irritation with pain and tearing. Exposure to these products may result in temporary corneal injury and corneal opacity.

**Skin contact** – Contact can cause moderate skin irritation and blistering. Prolonged or repeated contact can cause de-fatting and drying of the skin, which can lead to irritation and dermatitis. Some solvents used in these products are potential skin sensitizers and are harmful if absorbed through intact skin.

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Inhalation – Inhalation of solvent vapor or mist can cause irritation of the nose, throat, and lungs; headache, nausea, drowsiness, vomiting, fatigue; and central nervous system effects such as dizziness, lack of coordination, weakness, and unconsciousness, coma, and death.

Ingestion – Ingestion can cause nausea, headache, diarrhea, drowsiness, dizziness, vomiting, lack of coordination, unconsciousness, coma, and death. Aspiration into the lungs may cause lung inflammation, pulmonary edema, and death.

Repeated exposure – Prolonged overexposure to some of the solvents can affect the respiratory tract, kidney, liver, heart, blood, and central nervous system.

Other – An increased level of birth defects, fetal mortality, and delayed fetal development have been reported in animal exposure studies on toluene, a solvent used in some MORSTIK™ solvent rubber-based pressure-sensitive adhesives based on SIS. Exposure to methyl ethyl ketone, a solvent used in some of these products, can affect the central nervous system.

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

Environmental Information

The resin components of MORSTIK™ solvent rubber-based pressure-sensitive adhesives based on SIS are nonvolatile, high molecular weight resins, which are slightly soluble in water and are expected to be inert in the environment. If released to soil or water, the resin components would likely adhere to soil or sediment and would be removed by adsorption to biosolids during typical wastewater-treatment processes. Although the resin components are essentially non-biodegradable, they would be expected to slowly degrade in the environment by physical action or exposure to sunlight.

The resin components of MORSTIK solvent rubber-based pressure-sensitive adhesives based on SIS are not likely to accumulate in the food chain due to their high molecular weight (bioconcentration potential is low). These resins are expected to be practically nontoxic to fish or other aquatic organisms on an acute basis.

If released to soil or water, the solvents would likely evaporate to the atmosphere. They are readily biodegradable (toluene: 100% degradation in 14 days under OECD 301C test conditions; methyl ethyl ketone: 98% degradation in 28 days under OECD 301D test conditions; n-heptane: several studies show more than 60% biodegradation within 10 days or less, using inoculum sources of soil, groundwater, and wastewater activated sludge). This suggests their rapid and complete removal from water and soil environments, including typical biological wastewater-treatment facilities. They also readily photodegrade in the atmosphere. The solvents are unlikely to persist in the environment and range from practically nontoxic to toxic to aquatic organisms on an acute basis.

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

Physical Hazard Information

MORSTIK™ solvent rubber-based pressure-sensitive adhesives based on SIS are stable at recommended storage and normal use conditions. They are extremely flammable before drying. Avoid sources of ignition and the use of spark-producing tools. Use only explosion-proof...
equipment; ground and bond all containers and handling equipment. Spilled product can result in potential slip hazards.

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 MORSTIK™ solvent rubber-based pressure-sensitive adhesives based on SIS. 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.

Additional Information

- Request Safety Data Sheet from the Dow Customer Information Group (www.dow.com/assistance/dowcig.htm)
- Contact Us (www.dow.com/assistance/thoughts.htm)
- “Toluene, CAS No. 108-88-3, Screening Information Data Set Initial Assessment Profile for SIAM 11, Organization for Economic Cooperation and Development (OECD), United Nations Environmental Programme (UNEP), January 23–26, 2001 (http://webnet.oecd.org/Hpv/UI/handler.axd?id=7884f777-7ca7-4745-a30e-8eb6ec7a4df7)
- “C7–C9 Aliphatic Hydrocarbon Solvents Category,” Screening Information Data Set Initial Assessment Profile for SIAM 30, Organization for Economic Cooperation and Development (OECD), United Nations Environmental Programme (UNEP), April 20–22, 2010 (http://webnet.oecd.org/Hpv/UI/handler.axd?id=a78c4ebc943-ca-b49c-5034972e75dc)

For more business information about MORSTIK™ adhesives, visit the Dow web site for MORSTIK adhesives at www.dow.com/products/product-line/morstik/.

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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