Product Safety Assessment

PARALOID™ MBS Impact Modifiers


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Names
• PARALOID™ MBS Impact Modifier
• PARALOID Impact Modifier
• PARALOID Engineering Resin

Products include, but are not limited to:
• PARALOID BLX-3670
• PARALOID KCZ-201
• PARALOID KCZ-208X

PARALOID BTA Series
• PARALOID BTA-3NX
• PARALOID BTA-707
• PARALOID BTA-717
• PARALOID BTA-730
• PARALOID BTA-731
• PARALOID BTA-736SP

PARALOID EXL Series
• PARALOID EXL-2600J
• PARALOID EXL-2609
• PARALOID EXL-2618J
• PARALOID EXL-2620
• PARALOID EXL-2650J
• PARALOID EXL-2655
• PARALOID EXL-2668 SGP
• PARALOID EXL-2690
• PARALOID EXL-2691J
• PARALOID EXL-3600J
• PARALOID EXL-3650J
• PARALOID EXL-3691J

Product Overview
• PARALOID™ MBS impact modifiers are polymeric additives that improve the impact resistance of plastic parts. These products are manufactured as free-flowing white powders or granules and have a sweet odor. For further details, see Product Description.
• PARALOID™ MBS impact modifiers are added to many different types of plastic resins, which are then used in a wide variety of end-use applications, including packaging and film, building and construction, and automotive and transportation. For further details, see Product Uses.
PARALOID MBS impact modifiers are commercial products for industrial use. Workplace exposure is possible during manufacturing. Engineering controls and personal protection equipment reduce the potential for exposure. Consumer products such as plastic bottles, plastic films, and plastic packaging may contain these additives. For further details, see Exposure Potential.

Eye or skin contact with the product particles or dust during manufacturing can cause mechanical irritation (i.e., scratch the eye or skin). Repeated or prolonged inhalation of product dust can cause nausea, headache, dizziness, and irritation of the respiratory tract. Inhalation of monomer vapors from overheated products can cause irritation of the nose, throat, and lungs. For further details, see Health Information and the relevant Safety Data Sheet.

PARALOID™ MBS impact modifiers are high molecular weight polymers. They are nonvolatile, insoluble in water, and expected to be inert in the environment. PARALOID MBS impact modifiers are not likely to accumulate in the food chain and are expected to be practically nontoxic to aquatic organisms on an acute basis (EC50 greater than 100mg/L). For further details, see Environmental Information.

PARALOID MBS impact modifiers are stable under recommended storage and normal use conditions. PARALOID powders may form an explosive mixture if dispersed to the air. For further details, see Physical Hazard Information.

Manufacture of Product

**Locations** – The Dow Chemical Company and its global affiliates manufacture PARALOID™ MBS impact modifiers at facilities located in Jurong, Singapore; Lauterbourg, France; and Louisville, USA.

**Process** – PARALOID MBS impact modifiers are formed by emulsion copolymerization of methacrylate, butadiene, and styrene monomers, then dried into a powder using proprietary technology. Certain products are pelletized into granule form.

Product Description

PARALOID™ MBS impact modifiers are polymeric additives that improve the toughness, durability, and impact resistance of plastics. They are high molecular weight polymers that incorporate methacrylate, butadiene, and styrene monomers. They are marketed as free-flowing white powder or granules with a pungent, sweet odor.

PARALOID MBS impact modifiers used in food-contact applications are regulated under U.S. Food and Drug Administration (FDA) regulations 21CFR177.1010 and 21CFR178.3790 and under the European Commission Regulation (EU) No 10/2011. The maximum level of modifier allowed depends on the number, quantity, and type of modifiers in the formulation and is controlled by the manufacturer of the end product.

EXPOSURE POTENTIAL

PARALOID™ MBS impact modifiers 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 a facility that manufactures PARALOID MBS impact modifiers or in the various industrial or manufacturing facilities that use these products. Those working with these products in manufacturing, formulating, converting, or fabricating operations could be exposed during maintenance, sampling, testing, or other procedures. Due to the powdery nature of PARALOID products, good housekeeping is important. 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.
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- **Consumer exposure to products containing PARALOID MBS impact modifiers** – Dow does not sell PARALOID MBS impact modifiers for direct consumer use, but they are added to plastic resins that are used to manufacture a wide variety of films and plastics. PARALOID™ MBS impact modifiers used in food-contact applications are regulated under U.S. Food and Drug Administration (FDA) regulations 21CFR177.1010 and 21CFR178.3790, and under the European Commission Regulation (EU) No 10/2011. The maximum level of modifier depends on the number, quantity, and type of modifiers in the formulation, and is controlled by the manufacturer of the end product. See Health Information.

- **Environmental releases** – Based on the use patterns for these products, the potential for release to the environment is expected to be low. In the event of a spill, the focus is on containing the spill to prevent contamination of soil, surface water, or groundwater. These polymers are not soluble in water and are expected to be nontoxic to aquatic organisms on an acute basis. See Environmental, Health, and Physical Hazard Information.

- **Large release** – Industrial spills or releases are infrequent and generally contained. If a large spill does occur, use personal protective equipment and avoid breathing dust. PARALOID powders are combustible and have the potential to create explosive mixtures in air. Eliminate all ignition sources and ensure adequate ventilation. Wear compatible chemically resistant gloves. Use water spray to keep dust to a minimum. Sweep up and shovel spilled product into suitable containers for disposal. Spilled material can create slippery conditions. See Environmental, Health, and Physical Hazard Information.

- **In case of fire** – Isolate the fire and deny unnecessary entry. Do not use a direct water stream as it may create a potentially explosive airborne dust mixture. Fight the fire with carbon-dioxide or dry-chemical extinguishers or a fine water spray. Firefighters should wear positive-pressure, self-contained breathing apparatus (SCBA) and protective firefighting clothing. 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.

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**Health Information**

Health information for PARALOID™ MBS impact modifiers is summarized on the relevant Safety Data Sheets available from the Dow Customer Information Group. 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 appears below.

**Eye contact** – Direct contact with product dust may result in slight eye irritation due to mechanical action (scratches to the eye) rather than chemical irritation.

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

**Inhalation** – Repeated or prolonged inhalation of product dust can cause nausea, headache, dizziness, and irritation of the respiratory tract.

**Repeated exposure** – Prolonged or repeated exposure to product dust can cause lung irritation.

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

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**Environmental Information**

PARALOID™ MBS impact modifiers are high molecular weight polymers that are nonvolatile, insoluble in water, and expected to be inert in the environment. Although polymers are considered essentially nonbiodegradable, they will likely be removed via sorption to sediment, suspended solid and organic matter. This will render them less bioavailable, further reducing toxicity.

PARALOID MBS impact modifiers are not likely to accumulate in the food chain due to their high molecular weight (bioconcentration potential is low), and are expected to be practically nontoxic to aquatic organisms on an acute basis (EC₅₀ greater than 100mg/L).

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

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Physical Hazard Information\textsuperscript{1,4}
PARALOID\textsuperscript{TM} MBS impact modifiers are stable under recommended storage and normal use conditions. In case of thermal decomposition, these products can release hazardous vapors. Thermal decomposition may yield methacrylic, butadiene, and styrene monomers. Thermal decomposition is dependent on time, temperature, and shear.

PARALOID powders are combustible and are dust explosion hazards. Good housekeeping, engineering controls, and proper ventilation are essential for safe handling. Store and use away from all ignition sources. Avoid accumulation of product dusts. Include flammability, reactivity or incompatibility information here – usually pulled from SDS.

For more information, request the relevant 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 PARALOID\textsuperscript{™} MBS impact modifiers. 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.

Additional Information
- Dow Customer Information Group ([www.dow.com/assistance/dowcig.htm](http://www.dow.com/assistance/dowcig.htm))
- Contact Us ([www.dow.com/additives/contact/](http://www.dow.com/additives/contact/))
- Safe Handling of PARALOID\textsuperscript{™} Impact Modifier and Processing Aid Powders, Rohm and Haas Company, June 2006 ([www.dow.com/assets/attachments/business/pbm/Paraloid_PowderPA_new.pdf](http://www.dow.com/assets/attachments/business/pbm/Paraloid_PowderPA_new.pdf))

For more business information about PARALOID\textsuperscript{™} MBS impact modifiers, visit the Dow Plastics Additives web site at [www.dow.com/additives/](http://www.dow.com/additives/).

References
1 The Dow Chemical Company. PARALOID\textsuperscript{™} EXL-2650J Powder, Safety Data Sheet.
3 The Dow Chemical Company. PARALOID\textsuperscript{™} BTA Series – MBS Impact Modifiers for PVC Film and Sheet, Technical Data Sheet. Form No. 874-01401.
4 Rohm and Haas Company. Safe Handling of PARALOID\textsuperscript{™} Impact Modifier and Processing Aid Powders.
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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