Product Safety Assessment

**IMPAXX™ Energy Absorbing Foam**

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**Names**
- IMPAXX™ Energy Absorbing Foam
- IMPAXX polystyrene foam
- Structural foam
- Polystyrene foam

**Product Overview**
- IMPAXX™ Energy Absorbing Foams are highly engineered polystyrene-based thermoplastic foams marketed by Dow Automotive, a business unit of The Dow Chemical Company. They are strong, lightweight, and low in density, having a closed cell structure. For further details, see Product Description.
- IMPAXX foams are mainly used for automotive applications. These foams are installed within vehicle cavities during automobile assembly. The foam’s primary function is dynamic impact energy absorption; enhancing passenger safety in the event of a crash. IMPAXX foams can also be used for structural panel applications. For further details, see Product Uses.
- Based on available data, repeated exposures to IMPAXX foams are not anticipated to cause significant adverse health effects. Solid additives that are encapsulated in the product are not expected to be released under normal processing or use conditions. For further details, see Health Information.
- Worker exposure is possible in a manufacturing facility or at facilities using these foams. Based on their extensive use in vehicles, consumers may be operating a vehicle manufactured with them. For further details, see Exposure Potential.
- IMPAXX™ foams are thermally stable at typical use temperatures and are expected to be inert in the environment. Nevertheless, exposure to highly elevated temperatures can cause these foams to decompose. IMPAXX foams are combustible and should be protected from flames and other high-heat sources. For further details, see Physical Hazard Information.

**Manufacture of Product**
- Locations – Dow manufactures IMPAXX™ Energy Absorbing Foams at facilities in Troy, Michigan, U.S.
• **Process** – IMPAXX™ foams are formed by extruding polystyrene polymer that has been formulated with blowing agents and other additives. The blowing agents expand when pressure is released at the extrusion die to form the foam.

**Product Description**

IMPAXX™ Energy Absorbing Foams are strong and lightweight highly engineered thermoplastics designed to maximize efficiency and minimize weight. They are fabricated from extruded polystyrene, which contains a flame-retardant system. They are blue in color and odorless. These foams maintain their structural stability at extremely cold temperatures. IMPAXX foams are recyclable and pass government flammability test requirements for interior automotive components.

**Product Uses**

IMPAXX™ Energy Absorbing Foams are mainly used for automotive applications. Their function is to absorb the impact energy in the event of a crash. IMPAXX foams are installed within bumpers, doors, headliners, knee bolsters, and pillars during automobile manufacture or retrofitted after vehicle assembly. They can be cut, shaped, or custom-fabricated to fit and fill packaging space within the vehicle or other cavities. IMPAXX foams may also be used for structural panel applications, such as load floors, sun shades, and sun visors. Other industries that may use these foams include commercial transportation (bus, truck, and rail).

**Exposure Potential**

IMPAXX™ Energy Absorbing Foams are used in automotive manufacturing and other transportation industries. Based on the uses for these products, the public could be exposed through:

- **Workplace exposure** – Exposure to IMPAXX foams is probable for workers in a facility that manufactures these foams and also at facilities that use IMPAXX foams in automotive or other applications. No precautions other than clean body-covering clothing should be needed. However, safety glasses or safety goggles are recommended for fabrication operations because particles and dust can be created during fabrication. Dust or particles of IMPAXX foams can be mechanically irritating to the eyes. Provide general and/or local exhaust ventilation to control airborne dust levels below the exposure guidelines and to reduce the potential for dust explosion. Gloves could also be used to protect from mechanical injury during fabrication and installation. Fabrication methods which involve cutting into these foams may release the blowing agent remaining in the cells. Provide adequate ventilation to assure localized concentrations are maintained below the lower flammable limit. Concentrations of the blowing agents incidental to proper handling are expected to be well below those which cause acute inhalation effects, and below exposure guidelines. For more information, see the Health and Physical Hazard Information sections of this document.

- **Consumer exposure to IMPAXX Energy Absorbing Foams** – IMPAXX™ foams are solid materials that are installed in automotive vehicles in a manufacturing or industrial setting. Based on their extensive use, consumers may be operating a vehicle manufactured with them. See Health Information.

- **Environmental releases** – Dispose of IMPAXX foam according to all governmental requirements. Requirements may vary in different locations. See Environmental Information.

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Large release – Due to the solid nature of IMPAXX™ Energy Absorbing Foams, releases are unlikely. A large amount of this material is not expected to be hazardous to the environment or surrounding community. See Environmental, Health, and Physical Hazard Information.

For more information, see the relevant Safety Data Sheet.

**Health Information**

Based on available data, repeated exposures to IMPAXX™ Energy Absorbing Foams are not anticipated to cause significant adverse health effects. Because of the physical state of IMPAXX foams, very few health concerns result from its handling. Dust or solid particles of IMPAXX foams may cause eye irritation or corneal injury due to mechanical action, as with any other solid particulate that may contact the eye. The dust may also cause irritation to the upper respiratory tract.

Fumes or vapor released during thermal operations such as hot-wire cutting of IMPAXX foams may cause eye and respiratory irritation.

Concentrations of the blowing agent incidental to proper handling are expected to be well below those which cause acute inhalation effects and are below exposure guidelines. Based on available data, repeated exposures are not anticipated to cause significant adverse effects. Additives are encapsulated in the product and are not expected to be released under normal processing conditions or foreseeable emergency.

Handling IMPAXX foams will not cause reaction or irritation to the skin. Skin absorption is unlikely due to the physical properties of IMPAXX foams.

Swallowing of IMPAXX foams is unlikely because it is a solid material. There is a very low risk of toxicity if the product is swallowed. Harmful effects are not anticipated from swallowing small amounts. Choking or blockage of the digestive tract is possible if the product is swallowed. In case of ingestion, do not give laxatives and do not induce vomiting unless directed to do so by medical personnel.

For more information, see the relevant Safety Data Sheet.

**Environmental Information**

Bioconcentration of IMPAXX™ Energy Absorbing Foams is not expected because of their relatively high molecular weight. If released or spilled onto soil, IMPAXX foams are expected to remain in the soil. If released or spilled into water, these products will float. Surface photodegradation of the material is expected with exposure to sunlight. However, no appreciable biodegradation is expected. IMPAXX foams are not expected to be acutely toxic to aquatic organisms. IMPAXX foams contain a substance which is classified by the European Union Chemical Bureau Technical Committee on Existing and New Substances Chemical Agency as dangerous for the environment. However, recent studies on aquatic organisms have shown that articles such as extruded polystyrene foams do not need to be classified for environmental hazard.

For more information, see the relevant Safety Data Sheet.
Physical Hazard Information

Fire / Explosion Considerations
IMPAXX™ Energy Absorbing Foams contain a flame retardant to inhibit accidental ignition from small fire sources; however, they are combustible and should be protected from flames and other high-heat sources.

- During a fire, dense smoke is produced. The smoke may contain the original material in addition to combustion products of varying composition which may be toxic and/or irritating.
- Based on combustion toxicity testing, the products of combustion from these foams are not more acutely toxic than the products of combustion from common building materials such as wood.
- In smoldering or flaming conditions, carbon monoxide, carbon dioxide and carbon are generated. Additional combustion products may include hydrogen chloride, hydrogen fluoride, or trace amounts of hydrogen bromide.
- In the case of fire, follow emergency procedures carefully. A positive pressure, self-contained breathing apparatus (SCBA) with a full-face mask approved by NIOSH is recommended for emergency work. Keep people away. Isolate fire and deny unnecessary entry. Soak thoroughly with water to cool and prevent re-ignition.
- If material is molten, do not apply direct water stream. Instead, use a fine water spray or foam. Cool surroundings with water to localize the fire zone.

Mechanical cutting, grinding or sawing of IMPAXX foams can cause formation of dusts. To reduce the potential for dust explosion, do not permit dust to accumulate.

Fabrication methods which involve cutting into this product may release the blowing agent(s) remaining in the cells. Provide adequate ventilation to assure localized concentrations in release areas are maintained below the lower flammable limit. This product is combustible and may constitute a fire hazard if improperly used or installed. When installed, this product should be adequately protected as directed by national and local regulations or instructions in the specific application brochure.

Storage Considerations
IMPAXX Energy Absorbing Foams are thermally stable at typical use temperatures and hazardous polymerization will not occur. However, exposure to elevated temperatures (570°F; 300°C) can cause the product to decompose. Under high-heat, non-flaming conditions, small amounts of aromatic hydrocarbons such as styrene and ethylbenzene may be generated. Avoid contact with oxidizing materials. Avoid contact with aldehydes, amines, esters, liquid fuels, or organic solvents.

When large quantities of this product are stored or fabricated, foaming agents may be released. Carefully follow product use and storage guidelines.

For more information, see the relevant Safety Data Sheet.

Regulatory Information
Regulations may exist that govern the manufacture, sale, transportation, use, and/or disposal of IMPAXX™ Energy Absorbing Foams. 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.

For more information, see the relevant Safety Data Sheet.
Additional Information

- Safety Data Sheets (http://www.dow.com/webapps/msds/msdssearch.asp)
- Contact Us (http://automotive.dow.com/automotive/after/contact/index.htm)

For more business information about IMPAXX™ Energy Absorbing Foams, visit the Dow Automotive website at http://automotive.dow.com/.

References

1 IMPAXX™ 500 Energy Absorbing Foam Tech Data Sheet, The Dow Chemical Company, Form No. 172-01475-599 AMA
3 IMPAXX 500 Energy Absorbing Foam Material Safety Data Sheet, The Dow Chemical Company, I.D. No. 1005722/0000
4 IMPAXX™ 500 Energy Absorbing Foam Material Safety Data Sheet, The Dow Chemical Company, United Kingdom Version
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Form No. 233-00581-MM-0315X