Product Safety Assessment

AFFINITY™ Polyolefin Plastomers

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Select a Topic:
Names
Product Overview
Manufacture of Product
Product Description
Product Uses
Exposure Potential
Health Information
Environmental Information
Physical Hazard Information
Regulatory Information
Additional Information
References

Names

- CAS No. 26221-73-8
- AFFINITY™ polyolefin plastomers
- AFFINITY EG 8100G polyolefin plastomer
- AFFINITY EG 8150G polyolefin plastomer
- AFFINITY EG 8185 polyolefin plastomer
- AFFINITY EG 8200G polyolefin plastomer
- AFFINITY GA 1900 polyolefin plastomer
- AFFINITY GA 1950 polyolefin plastomer
- AFFINITY KC 8852G polyolefin plastomer
- AFFINITY LG 8185 polyolefin plastomer
- AFFINITY PF 1140G polyolefin plastomer
- AFFINITY PF 1146G polyolefin plastomer
- AFFINITY PF 1162G polyolefin plastomer
- AFFINITY PL 1280G polyolefin plastomer
- Ethene-1-octene copolymer
- AFFINITY POPs
- AFFINITY PL 1281G1 polyolefin plastomer
- AFFINITY PL 1840G polyolefin plastomer
- AFFINITY PL 1845G polyolefin plastomer
- AFFINITY PL 1850G polyolefin plastomer
- AFFINITY PL 1880G polyolefin plastomer
- AFFINITY PL 1881G polyolefin plastomer
- AFFINITY PL 1888G polyolefin plastomer
- AFFINITY PT 1450G1 polyolefin plastomer
- AFFINITY PT 1451G1 polyolefin plastomer
- AFFINITY SL 8110G polyolefin plastomer
- AFFINITY SQ 1503UE polyolefin plastomer
- AFFINITY VP 8770G1 polyolefin plastomer

Product Overview

- AFFINITY™ polyolefin plastomers are engineered to meet specific characteristics and use requirements. A plastomer is a polymer that softens when heated and hardens when cooled, yet remains flexible. Dow manufactures AFFINITY polyolefin plastomers as translucent or white pellets. AFFINITY polyolefin plastomers are extremely strong and durable at both high and low temperatures.¹ For further details, see Product Description.
- AFFINITY polyolefin plastomers are molded, blown, and cast into flexible containers and films for packaging. These highly versatile plastics are shaped into multilayer bags and pouches, shrink films, molded goods, and heavy-duty bags and sacks. Some packaging examples are processed meats, cheeses, cereal, snack foods, fresh produce, juice pouches, and health and hygiene product packaging. They are also used as adhesives, binders, and modifiers to impart desired polymer characteristics.² For further details, see Product Uses.
- Occupational exposure is possible at facilities that manufacture AFFINITY polyolefin plastomers, facilities that use these products to manufacture packaging or other products,
and at facilities that use packaging made from them. Workplace exposure is minimized through engineering controls and the use of personal protective equipment. AFFINITY™ polyolefin plastomers are not sold directly to consumers; however, they are used in packaging and other goods handled by consumers. AFFINITY polyolefin plastomers used for food-contact applications comply with standards set by the U.S. Food and Drug Administration (FDA) and European Union (EU) Directives concerning food-contact. Several AFFINITY polyolefin plastomers have also obtained “No Objection” status with the Canadian Health Products and Food Branch (HPFB). For further details, see Exposure Potential.

- Eye contact with polymer solid or dust may cause irritation or corneal injury due to mechanical action (scratch the eyes). Vapor from heated material may irritate the eyes. Skin contact is essentially nonirritating. Skin contact with heated material may cause a burn. Vapors generated during thermal processing may cause respiratory irritation. No adverse respiratory effects are anticipated from a single exposure to dust. For further details, see Health Information.

- AFFINITY polyolefin plastomers are expected to be inert in the environment. They are not expected to accumulate in the food chain and are not biodegradable. If introduced into water, these polymers will float. Ingestion of pellets by fish or waterfowl may present a choking hazard. For further details, see Environmental Information.

- AFFINITY polyolefin plastomers are stable under recommended storage conditions and use. Exposure to temperatures well above recommended processing temperatures can cause these polymers to decompose. Thermal decomposition products can include and are not limited to aldehydes, alcohols, organic acids and well as trace amounts of hydrocarbons. Spilled pellets can be a slipping hazard. For further details, see Physical Hazard Information.

Manufacture of Product

- **Capacity** – Dow produces AFFINITY™ polyolefin plastomers at facilities in Freeport, Texas and Plaquemine, Louisiana, USA; and in Tarragona, Spain.

- **Process** – AFFINITY polyolefin plastomers are produced using INSITE™ technology from Dow Plastics. INSITE technology is based on a proprietary metallocene catalyst that makes it possible to control molecular design with precision and predictability.
Product Description
A plastomer is a polymer that softens when heated and hardens when cooled, yet remains flexible. AFFINITY™ polyolefin plastomers are made from ethylene-octene copolymers. They are characterized as odorless, low molecular weight, low crystallinity copolymers. This translates to better performance during manufacturing and superior clarity, flexibility, durability, and bond strength compared to conventional ethylene-vinyl acetate and styrene-butadiene copolymers. AFFINITY polyolefin plastomers are also extremely strong and durable at both high and low temperatures. Dow manufactures AFFINITY polyolefin plastomers as translucent or white pellets and sells them for industrial use only.

Product Uses
AFFINITY™ polyolefin plastomers are used in the following applications:
- Polymer modification – to enhance clarity, sealability, and toughness
- Adhesives – as binders and hot-melt adhesives
- Sealant layers
- Agriculture – for silage film
- Meat and cheese packaging
- Heavy duty sacks and bags
- Recreational products
- Molded goods – in storage containers and lids
- Bakery films – in bread wrappers
- Display packaging
- Dry foods – to package cereals, snacks, cake mixes
- Fresh produce packaging – in breathable produce bags that allow oxygen and carbon dioxide to flow through, keeping produce fresher longer
- Flexible pouches – juices and other liquids, bag-in-box products
- Artificial turf
- Diapers and feminine hygiene
- Industrial liners
- Medical products and packaging
- Stretch hoods
- Frozen foods packaging
- Shrink films

Exposure Potential
AFFINITY™ polyolefin plastomers 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 either facilities that manufacture AFFINITY polyolefin plastomers or facilities that use these products. Engineering controls and the use of appropriate personal protective equipment minimize the potential for worker exposure. Avoid breathing process fumes. Good housekeeping and control of dusts are necessary for safe handling of product. Pneumatic equipment and other mechanical handling operations can generate combustible dust. To reduce the potential for dust explosions, electronically bond and ground equipment and do not allow dust to accumulate. Each manufacturing facility should have a thorough training program for employees and appropriate work processes and safety equipment in place to limit unnecessary exposure. See Health Information.
• Consumer exposure to products containing AFFINITY™ polyolefin plastomers – Dow does not sell these materials for direct consumer use; however, they are used in food packaging and durable molded goods that may come into contact with consumers. AFFINITY polyolefin plastomers used for food-contact applications comply with standards set by the U.S. Food and Drug Administration (FDA) and European Union (EU) Directives concerning food-contact.16,17 Several AFFINITY polyolefin plastomers have also obtained “No Objection” status with the Canadian Health Products and Food Branch (HPFB). See Health Information.

• Environmental releases – AFFINITY polyolefin plastomers are nonvolatile (do not evaporate), inert solids. If released to soil or water, they will stay in soil or water. These polymers float and are not biodegradable. Spilled polymer may be a slipping hazard. In the event of a spill, contain the material if possible. Prevent the material from entering soil, ditches, sewers, waterways, or groundwater. Sweep up small spills and collect the material in suitable and properly labeled containers. See Environmental, Health, and Physical Hazard Information.

• Large release – Industrial spills or releases are infrequent and generally contained. If a large spill does occur, the material should be collected and reprocessed or disposed of properly. Use appropriate safety equipment. See Environmental, Health, and Physical Hazard Information.

• In case of fire – Keep people away. Isolate the fire and deny unnecessary entry. Firefighters should wear positive-pressure, self-contained breathing apparatus (SCBA) and protective firefighting clothing or fight the fire from a safe distance. Hazard combustion products may include and are not limited to: carbon monoxide and carbon dioxide. Extinguish all ignition sources. Use water fog or fine spray, carbon-dioxide or dry-chemical extinguishers, or foam. A direct water stream may spread the fire. Follow emergency procedures carefully. See Environmental, Health, and Physical Hazard Information.

For more information, see the relevant Safety Data Sheet.

Health Information18

Eye contact – Eye contact with solid polymer or dust may cause irritation or corneal injury due to mechanical action (scratch the eyes). Elevated temperatures may generate vapor levels sufficient to cause eye irritation. Effects may include discomfort or redness.

Skin contact – Prolonged skin contact is essentially nonirritating (mechanical injury only). Under normal processing conditions this material may be heated to elevated temperatures. Skin contact with heated material may cause burns. No adverse effects are anticipated by skin absorption.

Inhalation – No adverse effects are anticipated from a single exposure to dust. Vapors released during thermal processing may cause respiratory irritation. Use an approved air-purifying respirator when vapors are generated at increased temperatures or when dust or mist is present.

Ingestion – These products have very low toxicity if swallowed. Harmful effects are not anticipated from swallowing small amounts; however, swallowing pellets may cause choking.

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

AFFINITY™ polyolefin plastomers are nonvolatile, inert plastics. If introduced into soil, they are expected to remain in soil. They will float in water. These materials will not bind to soil or sediment. AFFINITY polyolefin plastomers are not considered biodegradable, but they are likely to degrade slowly in the environment by a combination of physical, chemical, and biological processes. Surface degradation can occur upon exposure to sunlight.

AFFINITY polyolefin plastomers are not likely to accumulate in the food chain due to their high molecular weight. Although these materials are nontoxic, in pellet or bead form they may cause adverse effects (choking) if ingested by waterfowl or aquatic life.

For more information, see the relevant Safety Data Sheet.

Physical Hazard Information

AFFINITY™ polyolefin plastomers are stable under recommended storage conditions and use. Exposure to temperatures well above normal processing temperatures can cause these plastomers to decompose. Processing may release fumes and other decomposition products. At temperatures exceeding melt temperatures, polymer fragments can be released.

Processing dust can be a potential explosion hazard. Practice good housekeeping. Do not allow dust to accumulate. Spilled plastomer pellets can be a slipping hazard.

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 AFFINITY™ polyolefin plastomers. 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)
- Safety Data Sheets and Technical Data Sheets (www.dow.com/elastomers/lit/tds/index.htm)
- Contact Us (www.dow.com/elastomers/contact/index.htm)
AFFINITY™ Polyolefin Plastomers – Realizing Your Packaging Potential, The Dow Chemical Company (Plastics, North America), Form No. 258-11801

AFFINITY PL 1280G Polyolefin Plastomer, Technical Information Sheet, The Dow Chemical Company, Form No. 400-00071420en

For more business information about AFFINITY polyolefin plastomers, visit the Dow Elastomer web site at www.dow.com/elastomers/products/affinity.htm.

References

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