Product Safety Assessment

AMPLIFY™ TY Functional Polymers


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
- AMPLIFY™ functional polymers
- AMPLIFY TY 1052H functional polymer
- AMPLIFY TY 1053H functional polymer
- AMPLIFY TY 1054H functional polymer
- AMPLIFY TY 1151 functional polymer
- AMPLIFY TY 1351 functional polymer
- AMPLIFY TY 1352 functional polymer
- AMPLIFY TY 1353 functional polymer
- AMPLIFY TY functional polymer
- AMPLIFY TY 1354 functional polymer
- AMPLIFY TY 1451 functional polymer
- AMPLIFY TY 2451 functional polymer
- AMPLIFY TY 2551 functional polymer
- AMPLIFY TY 3351 functional polymer
- AMPLIFY TY 3352 functional polymer

Product Overview
- AMPLIFY™ TY functional polymers are high-performance maleic anhydride-grafted polyolefin plastics that have been engineered to meet specific end-use requirements or characteristics. Modification with maleic anhydride results in highly flexible and elastic polymers with excellent adhesion to a variety of surfaces. AMPLIFY TY functional polymers are manufactured as white to off-white pellets or granules. For further details, see Product Description.
- AMPLIFY TY polymers are used as tie layers for multilayer films and may be fabricated using blown film or extrusion coating processes. For further details, see Product Uses.
- Workplace exposure is possible at facilities that manufacture AMPLIFY TY functional polymers or use these polymers to manufacture other products. AMPLIFY TY functional polymers are not sold for direct consumer use. However, because they are used in consumer products and packaging, consumers may come in contact with them. Customers using AMPLIFY TY polymers for food- or medical-contact applications should ensure compliance with applicable regulations such as the U.S. Food and Drug Administration (FDA) regulations and European Union (EU) Directives. Please contact the Dow Customer Information Group for food contact compliance certificates. 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). Elevated temperatures during thermal processing may generate vapor levels sufficient to cause eye or respiratory irritation. Prolonged contact is essentially nonirritating to skin; however, mechanical injury can occur. Under normal processing conditions, the material is heated

®Trademark of The Dow Chemical Company (“Dow”) or an affiliated company of Dow
to elevated temperatures and contact with the material may cause thermal burns. No adverse respiratory effects are anticipated from a single exposure to polymer dust. Maleic anhydride, a minor component, may cause an allergic respiratory response in sensitive individuals. For further details, see Health Information and request the relevant Safety Data Sheet from the Dow Customer Information Group.

- AMPLIFY™ TY functional polymers are expected to slowly degrade in the environment. Due to their high molecular weight, they are not expected to accumulate in the food chain and they are not expected to be toxic to fish or other aquatic organisms. For further details, see Environmental Information.

- AMPLIFY™ TY polymers are stable under recommended storage and normal use conditions. Exposure to temperatures well above recommended processing temperatures can cause these polymers to decompose. For further details, see Physical Hazard Information.

Manufacture of Product


- Process – AMPLIFY™ TY polymers are produced by grafting maleic anhydride onto polyolefin-based polymers.

Product Description

AMPLIFY™ functional polymers are high-performance maleic anhydride-grafted polyolefin plastics that have been engineered to meet specific end-use requirements or characteristics. The maleic anhydride grafted (chemically bonded) onto polyethylene results in highly flexible and elastic polymers with excellent adhesion to polyamide (Nylon) and ethylene-vinyl alcohol (EVOH), metal, other polyolefins, cellulose, polyester, polycarbonate, and glass. AMPLIFY functional polymers are manufactured as white to off-white colored pellets or granules and typically have an acidic odor. Residual or "unbonded" maleic anhydride levels within these polymers are less than 0.09%.

Product Uses

AMPLIFY™ functional polymers are used to manufacture high-performance multilayer film structures for food, medical, and specialty packaging applications. These polymers add high flexibility, elasticity, and toughness to other polymer resins. Applications include:

- Adhesives and tie layers – for pet-food, flexible-food packaging, and other applications
- Extrusion coating – for food and medical packaging

Exposure Potential

AMPLIFY™ TY functional polymers are used in the manufacture of packaging products. Based on the uses for these polymers, individuals could be exposed through:

- Workplace exposure – Exposure can occur either in facilities that manufacture AMPLIFY TY functional polymers or in the various industrial or manufacturing facilities that use these polymers. They are produced, transported, stored, and consumed in closed systems. Those working with AMPLIFY TY functional polymers 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 prevent exposure. See Health Information.

- Consumer exposure to products containing AMPLIFY™ TY functional polymers – AMPLIFY TY polymers are not sold directly to consumers; however, food and medical packaging used by consumers may incorporate these products. Exposure to end-products manufacturing using these materials is not considered to present a risk to consumers. Customers using AMPLIFY™ TY polymers for food- or medical-contact applications should ensure compliance with applicable regulations such as the U.S. Food and Drug Administration (FDA) regulations and European Union (EU) Directives. Please contact the Dow Customer Information Group for food contact compliance certificates. 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. Sweep up small spills and collect product in suitable and properly labeled containers. If released, the polymers will tend to float in water and will be removed in biological wastewater treatment plants by adsorption to biosolids. See Environmental, Health, and Physical Hazard Information.

Footnotes:

10, 11 TradeMark of The Dow Chemical Company (“Dow”) or an affiliated company of Dow
Large releases – Industrial spills or releases are infrequent and generally contained. If a large spill does occur, the product should be captured, collected, and reprocessed or disposed of according to applicable governmental requirements. Keep upwind of spill. Spilled material may cause a slipping hazard. Ventilate the area of the spill, and use appropriate safety equipment. Prevent the material from entering ditches, sewers, waterways, and/or groundwater.

In case of fire – Keep people away. Isolate the fire and deny unnecessary entry. Use a water fog or fine water spray, dry chemical fire extinguishers, carbon dioxide fire extinguishers, or foam to fight fire. Soak thoroughly with water to cool and prevent re-ignition, and cool surroundings with water to localize the fire zone. Hand-held dry chemical or carbon dioxide extinguishers may be used for small fires. If material is molten, do not apply direct water stream as it may spread the fire. Wear positive-pressure, self-contained breathing apparatus (SCBA) and protective firefighting clothing. If protective equipment is not available or not used, fight the fire from a protected location or safe distance. During a fire, smoke may contain the original material in addition to combustion products of varying composition which may be toxic and/or irritating. Combustion products may include, but are not limited to, carbon monoxide and carbon dioxide. Dense smoke is emitted when burned without sufficient oxygen. Follow emergency procedures carefully. See Environmental, Health, and Physical Hazard Information.

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

Health Information
Health information for AMPLIFY™ TY polymers is summarized on the relevant Safety Data Sheets. An overview of health information for AMPLIFY TY polymers appears below. However, these materials may also contain minor components or additives that have additional health risks. 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.

Eye contact – Contact with solid or dust may cause eye irritation or corneal injury due to mechanical action (scratch the eyes). Elevated temperatures during processing may generate vapor levels sufficient to cause eye irritation, such as discomfort and redness.

Skin contact – Prolonged contact with polymer pellets or granules is essentially nonirritating to skin; however, mechanical injury can occur. Contact with heated polymer during processing operations may cause thermal burns. No adverse effects are anticipated from skin absorption.

Inhalation – Vapors or fumes released during thermal processing may cause respiratory irritation. The minor component, maleic anhydride, may cause an allergic respiratory response in sensitive individuals.

Ingestion – These polymers have very low toxicity if swallowed. However, swallowing may cause choking or gastrointestinal blockage.

For specific FDA regulatory status information, consult the relevant Technical Information Sheet.

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

Environmental Information
Environmental information for AMPLIFY™ TY polymers is summarized on the relevant Safety Data Sheets. An overview of environmental information for AMPLIFY TY polymers appears below. However, these materials may also contain solvents or additives that have additional environmental impact. It is important to note that environmental impact associated with individual products may vary based on their formulation or intended use. The Safety Data Sheet is the preferred source for specific environmental information.

AMPLIFY™ TY functional polymers are nonvolatile and insoluble, and they will tend to float in water and eventually bind to soil, suspended solids, or sediment. Although, the polymers do not biodegrade, they will be expected to degrade slowly in the environment, including degradation by physical action or by exposure to sunlight. The polymers would likely be removed in biological wastewater treatment plants by adsorption to biosolids.
AMPLIFY™ TY Functional Polymers are not likely to accumulate in the food chain due to their high molecular weight, and they are not expected to be toxic to fish or other aquatic organisms.

For more information, see the relevant Safety Data Sheet.

Physical Hazard Information
AMPLIFY™ TY functional polymers are stable under recommended storage and normal use conditions. Exposure to temperatures well above normal processing temperatures can cause these polymers to decompose. Processing may generate irritating fumes and other decomposition products, such as aldehydes, alcohols, organic acids, and trace amounts of hydrocarbons. At temperatures exceeding the melt temperature, polymer fragments can be released.

Pneumatic conveying and other mechanical handling operations can generate combustible dust; do not permit dust to accumulate.

Spilled polymer pellets are a slipping hazard.

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

Regulations may exist that govern the manufacture, sale, transportation, use, and/or disposal of AMPLIFY™ TY functional polymers. These regulations may vary by city, state, country, or geographic region. Information may be found by consulting the relevant Safety Data Sheet, Technical Information Sheet, or Contact Us.

Additional Information
- Request the relevant Safety Data Sheet from the Dow Customer Information Group (www.dow.com/assistance/dowcig.htm)
- Contact US (www.dow.com/amplify/contact/contact.htm)
- AMPLIFY™ Functional Polymers website: (www.dow.com/amplify/index.htm)
- U.S. Food and Drug Administration (FDA), Department of Health and Human Services website, Code of Federal Regulations Title 21 webpage, (search 175.105 or 177.1520) (www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfCFR/CFRSearch.cfm)


References
Product Safety Assessment: AMPLIFY™ TY Functional Polymers

17 U.S. Food and Drug Administration, Department of Health and Human Services website, Code of Federal Regulations Title 21, Volume 3, CITE: 21CFR177.1520(c)6, revised April 1, 2008.

Back to top
Product Safety Assessment: AMPLIFY™ TY Functional Polymers

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.

The information herein is supplied upon the condition that the persons receiving same will make their own determination as to its suitability for their purposes prior to use. In no event will Dow be responsible for damages of any nature whatsoever resulting from the use of or reliance upon the information herein or the product to which that information refers.

Nothing contained herein is to be construed as a recommendation to use any product, process, equipment or formulation in conflict with any patent, and Dow makes no representation or warranty, express or implied, that the use thereof will not infringe any patent.

NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR OF ANY OTHER NATURE ARE MADE HEREUNDER WITH RESPECT TO INFORMATION OR THE PRODUCT TO WHICH INFORMATION REFERS.

Dow makes no commitment to update or correct any information that appears on the Internet or on its World-Wide Web server. The information contained in this document is supplemental to the Internet Disclaimer, www.dow.com/homepage/term.asp.

Back to top

Form No. 233-01124-MM-1013