



# FACT SHEET – AMPLIFY™ TY Functional Polymers

AMPLIFY™ TY Functional Polymers are a comprehensive portfolio of tie layer resins for sophisticated multi-layer packaging.

- AMPLIFY™ TY Functional Polymers from The Dow Chemical Company (“Dow”) are a new range of resins specially-designed for use in sophisticated multi-layer food packaging, providing a valuable extension to the existing AMPLIFY™ Functional Polymers family.
- AMPLIFY™ TY Functional Polymers include a portfolio of interlayer adhesion products that can be used in a wide range of barrier packaging applications, particularly food and specialty packaging.
- The portfolio is designed to address a key challenge facing package designers and manufacturers – how to effectively combine different materials in order to deliver a sophisticated package structure with longer shelf life, weight reduction and process simplification.
- This industry need has opened the door for barrier structures in need of effective tie layers: the AMPLIFY™ TY portfolio offers interlayer adhesion products designed to help hold a package together during processes such as hot filling, cooling, shipping, display and consumer use.

## About AMPLIFY™ TY Functional Polymers

- AMPLIFY™ TY Functional Polymers are designed to adhere materials such as EVOH or polyamide with film or other substrates in order to help improve overall package performance.
- The portfolio includes commercial products for polyethylene and polystyrene-based barrier film structures, and developmental grades for polypropylene-based barrier film structures. Research is also underway to offer new opportunities for Polyethylene Terephthalate (“PET”) -based barrier film structures..

## Tailored Features and Benefits

- Primarily designed for flexible applications, they can also be used in rigid packaging applications such as multi-layered blow molded bottles and containers, and thermoformed barrier sheet.
- AMPLIFY™ TY Functional Polymers can combine excellent technologies of Dow’s family of AMPLIFY™ products with the range of TYMOR™ tie resins products that was acquired with Rohm and Haas, resulting in a powerful combination of research, knowledge and excellence that is being used to benefit the specialty packaging market segment.
- AMPLIFY™ TY Functional Polymers are designed to suit various adhesion requirements and different production processes, making them a very versatile choice for tie-layer adhesion demands (see table overleaf).
- Converters using blown and cast processing with **polyethylene-based structures** can choose from:
  - fully-formulated products, requiring no blending, offering an enhanced, reliable adhesion for standard applications;
  - an enhanced offering designed for demanding applications such as adhesion to ionomers and processes requiring deep-draw thermoforming or fast-quenching;
  - concentrates specifically designed for high dispersion, high efficiency, or versatility offering opportunities to customize equipment, application and performance needs.
- For **polystyrene-based structures**, a formulated option offered at 5.0 MI for processing ease has been designed for flexible and rigid packaging applications such as convenience foods and baby food. The polymer demonstrates excellent adhesion between polystyrene and EVOH for example, making it suitable for thermoformed multilayer sheet.
- Experimental formulated solutions are being offered as developmental grades for **polypropylene-based structures** with a 5.0 melt flow rate polymer for general performance rigid packaging and a 4.5 melt flow rate polymer suitable for high performance rigid and flexible film.

## Extended Product Range For Specific Sealant Demands

- AMPLIFY™ TY Functional Polymers are the latest product portfolio added to the AMPLIFY™ Functional Polymers family. Designed specifically for food and specialty packaging applications, they offer a broad range of properties and enhanced performance to compounding, adhesives, tie layers, and more.
- Apart from AMPLIFY™ TY Functional Polymers, the range of AMPLIFY™ products includes:
  - **AMPLIFY™ IO Functional Polymers** – these ionomers are modified ethylene acrylic acid copolymers and are available in sodium and zinc grades. They are designed for food packaging, tie layers and sealants; medical packaging; sporting goods and impact modification of nylon.
  - **AMPLIFY™ EA Functional Polymers** – these polymers are ethylene-ethyl acrylate (EEA) copolymers suitable for lamination film, flexible tubing and hose and tie layer adhesives.
  - **AMPLIFY™ GR Functional Polymers** – these distinct polymers are maleic anhydride (MAH) grafted polyolefins. They are used as adhesive tie layers in composite pipes, as thermoplastic powder coatings, and as an impact modifier for nylon in durable applications.

## Overview of Current Product Offering

Product	MAH Graft Level	Density (g/cc) ASTM D 792	Melt Index g/10 min ASTM D 238	Recommended Loading	Adhesion	Applications
AMPLIFY™ TY 1052H	High	0.87	1.25	PA: 10-15% EVOH: 20-25%	PE, PP, NYLON, EVOH	Flexible & Rigid
AMPLIFY™ TY 1053H	High	0.96	2.0	PA: 6-15% EVOH: 12-20%	PE, NYLON, EVOH	Flexible & Rigid
AMPLIFY™ TY 1054H***	High	0.90	2.0	PA: 10-15% EVOH: 20-25%	PE, NYLON, EVOH	Flexible & Rigid
AMPLIFY™ TY 1151	Medium	0.92	2.5	PA: 15-25% EVOH: 30-40%	PE, NYLON, EVOH	Flexible & Rigid
AMPLIFY™ TY 1351	Low	0.92	2.1	100%	PE, NYLON	Flexible
AMPLIFY™ TY 1352	Low	0.92	1.0	100%	PE, NYLON, EVOH	Flexible
AMPLIFY™ TY 1353	Low	0.92	2.0	100%	PE, NYLON, EVOH	Flexible & Rigid
AMPLIFY™ TY 1451	Low	0.91	1.7	100%	PE, NYLON, EVOH, Ionomer	Flexible & Rigid
AMPLIFY™ TY 3351	Medium	0.94	5.0	100%	PS, PE, NYLON, EVOH	Rigid & Semi-Rigid
AMPLIFY™ TY 3352**	Medium	0.94	5.0	100%	PS, PE, NYLON, EVOH	Rigid & Semi-Rigid
XUS 69101.00****	Low	0.90	5.0*	100%	PE, NYLON, EVOH	Rigid
XUS 69100.00****	Low	0.90	4.5*	100%	PE, NYLON, EVOH	Flexible & Rigid

\*Melt Flow Rate \*\* Available in Europe \*\*\* Available in Asia Pacific \*\*\*\*Developmental product of Dow

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