



Food & Specialty Packaging

Accelerating Innovations in Flexible Packaging



Collaborate.
Innovate.
Accelerate.

Dear Packaging Professional:

It's never been more exciting to be part of the packaging industry! Every day companies are challenged to find new and innovative ways to engage consumers, and packaging has become a critical component in that effort. Simultaneously, packaging has to meet the on-the-go lifestyle of today's consumer and extend shelf life to reduce food waste, all the while being more sustainable in the effort to minimize packaging waste.

At Dow, we've experienced these challenges first hand and believe the development process can be smarter, easier, and faster.

We strive to do this through three core strengths:

- 1. Experts with Answers** – providing access to a vast network of experts across the entire value chain from polymer chemists, plastic converters, equipment manufacturers, and even brand owners and retailers.
- 2. Basics to Breakthroughs** – offering a broad portfolio of solutions – from adhesives & coatings to polyethylene resins. We're committed to raising the bar for materials used in packaging.
- 3. Collaborate to Innovate** – providing a new and exciting take on what it means to collaborate in the 21st century: Pack Studios, a new collaboration facility where we take great ideas and turn them into packaging reality.

This brochure aims to introduce you to our business. Whether it's a slight product improvement or a complete overhaul, we look forward to introducing you to our team and bringing your next idea to life.

The Food & Specialty Packaging Team
The Dow Chemical Company

Collaborate. Innovate. Accelerate.

Successful development in the flexible packaging market segment begins with collaboration. Dow goes beyond our material science expertise to bring packaging converters a suite of tools and solutions that make innovation easier and faster.

As Dow continues to push forward, we're more dedicated than ever to our customers around the world – responding to your needs through active collaboration in search of fresh ideas, and with responsive sales and technical resources that are committed to earning your trust and aiding your success.

Experts with Answers

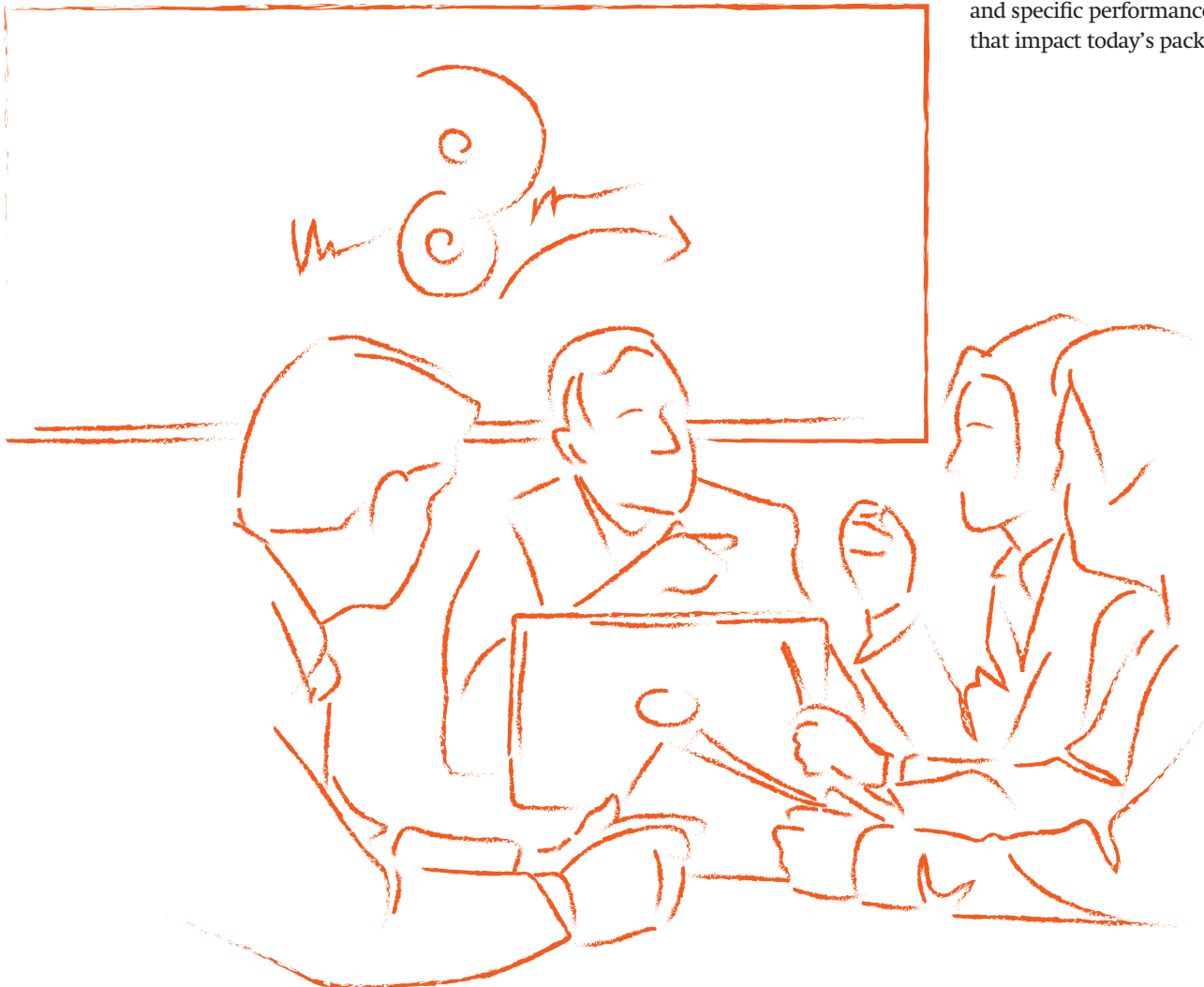
Dow has the technical and market specialists, resources, and industry relationships to deliver innovative ideas and solutions to our customers. Years of hands-on experience qualify Dow's Technical Service and Development (TS&D) professionals to help you solve your problems quickly. Additionally, we offer considerable help and training in a variety of industry-related issues, including specialized polyolefin resin and adhesive training, sustainability issues, FDA and regulatory assistance, screw design, extrusion and fabrication assistance, rheology design and modeling, and more.

Collaborate to Innovate

Dow collaborates across the value chain and around the globe. Proactive engagement with customers, the marketplace, stakeholders and industry experts enables us to help develop the best packaging solutions for customers. We truly value the collaborative spirit of our customers and take an active approach to making connections across the value chain.

We also actively participate in industry alliances as well as global advocacy groups that are dedicated to promoting the sustainability of plastic. These activities help our team stay on the leading edge of market trends which drive innovation.

Focusing exclusively on food and specialty packaging applications allows a thorough understanding of the distinctive challenges and specific performance requirements that impact today's packages.





Pack Studios

Pack Studios accelerates packaging innovations for customers by leveraging Dow's know-how, industry relationships, broad product portfolio, and application and testing capabilities.

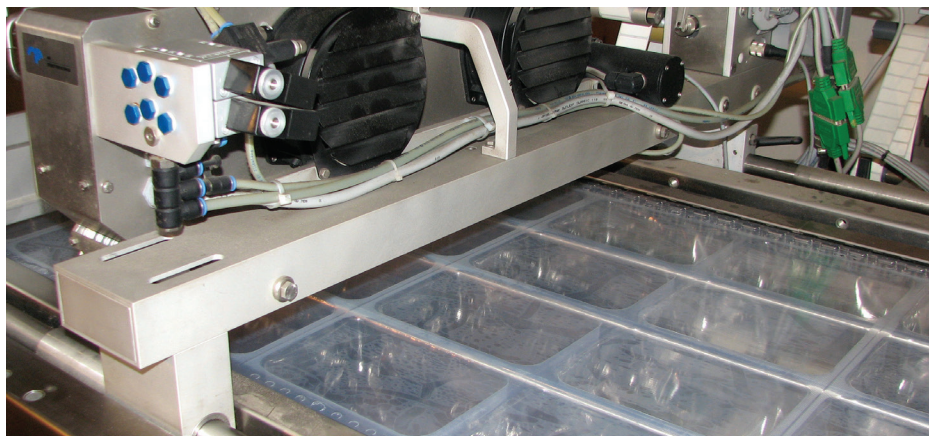
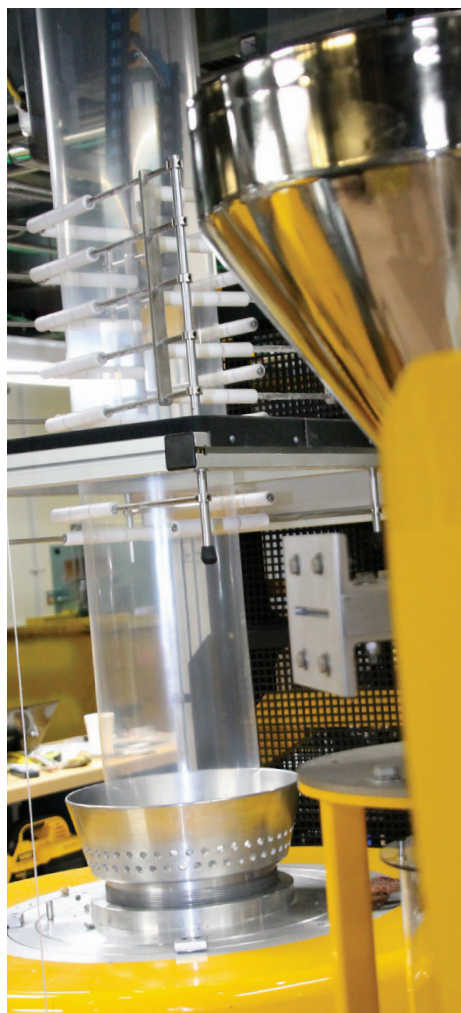
Pack Studios puts professionals from across the value chain at your disposal – experience, knowledge, and insights accessible from virtually anywhere in the world.

This powerful combination of collaboration and capabilities promises the potential for considerably faster go-to-market timelines and a consistent pipeline of high performance products that enables growth for Dow customers.



For Dow's North American customers, Pack Studios-Freeport in Freeport, Texas, offers arguably the industry's finest facilities, including:

- Collaboration Room
- Sensory Science Lab
- Extrusion Coating Line
- Three Lamination Lines (plus slitting capabilities)
- Alpine 7-Layer Line
- Shrink Tunnel Packaging Line
- Vertical Form Fill Seal Packaging Line
- Blow Molder
- Physical and Analytical Testing Labs



Basics to Breakthroughs

Dow's spectrum of film resins and adhesives has been developed to meet the ever-increasing demands of the flexible packaging industry, with particular focus on the food and specialty packaging marketplace. Dow has extensive experience serving the needs of the following applications:

- Bag-in-box applications
- Case-ready packaging
- Collation shrink
- Dry food packaging
- Flexible extrusion coating
- Freezer-to-microwave packaging
- Fresh-cut produce packaging
- Frozen food packaging
- Liquid packaging
- Meat & cheese packaging
- Medical packaging
- PE pouch packaging
- Peel-seal adhesives
- Retort pouch
- Shelf-stable packaging
- Stand-up pouch
- Unitization packaging



Figure 1: Relative Price/Relative Performance

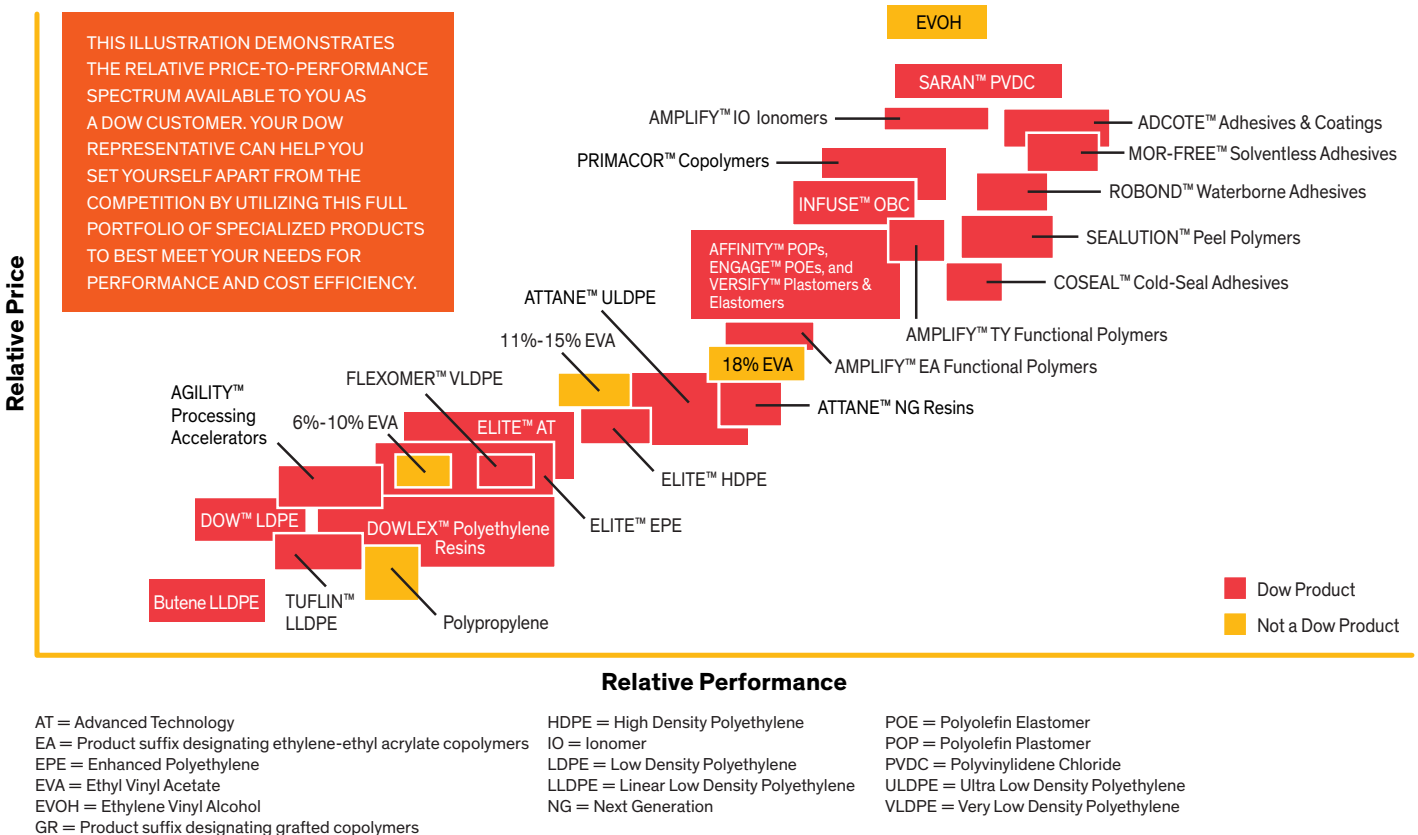


Table 1: Dow Products for Flexible & Specialty Packaging

Resin Family	Targeted Product Uses	Key Properties
AFFINITY™ Polyolefin Plastomers	<ul style="list-style-type: none"> Sealant in packaging for aggressive foods/ environments 	<ul style="list-style-type: none"> Superior sealability Excellent abuse resistance
AGILITY™ Performance LDPE	<ul style="list-style-type: none"> LDPE and LLDPE blends and multi-layer structures 	<ul style="list-style-type: none"> Fast, efficient processing Excellent optics
AMPLIFY™ Functional Polymers	<ul style="list-style-type: none"> Sealants and tie layers 	<ul style="list-style-type: none"> Excellent adhesion Durability/abuse resistance
AMPLIFY™ TY Functional Polymers	<ul style="list-style-type: none"> Formulated and concentrate tie layers 	<ul style="list-style-type: none"> Excellent adhesion & low gel
AMPLIFY™ IO Ionomers	<ul style="list-style-type: none"> High performance sealing in multi-layer films and metal adhesion 	<ul style="list-style-type: none"> Low seal initiation, caulkability/seal through contamination and broad packaging window and strong metal adhesion
ATTANE™ Ultra Low Density Polyethylene (ULDPE) Resins	<ul style="list-style-type: none"> High tear and puncture applications, especially those needing superior optics 	<ul style="list-style-type: none"> Superior tear and abuse properties Very good optics
ATTANE™ Next Generation (NG) ULDPE Resins	<ul style="list-style-type: none"> Abuse layers in food packaging films Downgauging 	<ul style="list-style-type: none"> Tear and abuse properties a step above ATTANE™ ULDPE
DOW™ Low Density Polyethylene (LDPE) Resins	<ul style="list-style-type: none"> Lower physical performance films requiring high clarity 	<ul style="list-style-type: none"> Excellent optics and processability
DOWLEX™ Polyethylene Resins	<ul style="list-style-type: none"> Applications requiring high performance LLDPE films Downgauged films for converters seeking higher output 	<ul style="list-style-type: none"> Better physical properties and processability versus hexene and butene LLDPE resins
ELITE™ Enhanced Polyethylene (EPE) Resins	<ul style="list-style-type: none"> Structural layers in films needing better performance or lower cost 	<ul style="list-style-type: none"> Higher modulus combined with increased toughness Other unique property combinations including several sealant options
ELITE™ High Density Polyethylene (HDPE) Resins	<ul style="list-style-type: none"> Applications requiring moisture and grease barrier, or stiffness (modulus) Abuse layers in food packaging films 	<ul style="list-style-type: none"> Moisture barrier High modulus with very good processability
ELITE™ Advanced Technology (AT) Polyethylene Resins	<ul style="list-style-type: none"> Seal layer in laminated or coextruded film structures Sealability with processability 	<ul style="list-style-type: none"> Sealability (higher hot tack and broader window) Excellent processability
FLEXOMER™ Very Low Density Polyethylene (VLDPE) Resins	<ul style="list-style-type: none"> Applications requiring a tough film but not requiring high clarity 	<ul style="list-style-type: none"> Toughness
PRIMACOR™ Copolymers	<ul style="list-style-type: none"> Sealants and tie layers Foil laminations 	<ul style="list-style-type: none"> Excellent adhesion to numerous substrates, including cellulotics
SARAN™ Barrier Resins	<ul style="list-style-type: none"> High-performance barrier packaging 	<ul style="list-style-type: none"> Exceptional barrier performance across diverse environments
SEALUTION™ Peel Polymers	<ul style="list-style-type: none"> Easy-peel applications 	<ul style="list-style-type: none"> Consistent peel performance
TUFLIN™ Linear Low Density Polyethylene (LLDPE) Resins	<ul style="list-style-type: none"> Applications requiring general purpose films 	<ul style="list-style-type: none"> Intermediate LLDPE performance in many areas
VERSIFY™ Plastomers	<ul style="list-style-type: none"> Tie layer where optics is valued 	<ul style="list-style-type: none"> Distinctive combination of seal, hot tack and optics Excellent adhesion to PE and PP

resins for flexible packaging by



AFFINITY™ Polyolefin Plastomers



AFFINITY™ Polyolefin Plastomers offer superior sealability, great abuse resistance, excellent optics, and competitive cost to practically any packaging application.

ATTANE™ Ultra Low Density Polyethylene



These resins provide exceptional puncture and tear resistance, excellent clarity, very good sealability, and good processability vs. competitive metallocene.

AGILITY™ Performance LDPE



These LDPE resins are specifically formulated to offer fast and efficient processing – plus excellent optics, strength, and stability – for LDPE, LDPE blends, and multi-layer film structures.

DOW™ HDPE Resins



For high output jobs requiring toughness and barrier protection, DOW™ High Density Polyethylene (HDPE) Resins offer efficient performance in mono-layer or multi-layer structures.

AMPLIFY™ Functional Polymers



Easy to process with excellent adhesion to metalized polyolefins, cellulose, polyester, and PVDC, AMPLIFY™ polymers offer many advantages for flexible packaging.

DOW™ LDPE Resins



Excellent for high output jobs and consumer packaging, DOW™ Low Density Polyethylene (LDPE) Resins are a cost-effective, all-purpose resin workhorse.

AMPLIFY™ IO Ionomers



AMPLIFY™ IO Ionomers are distinctive ionomers of ethylene acrylic acid copolymers well suited for use as sealants and tie layers in packaging applications.

DOWLEX™ Polyethylene Resins



DOWLEX™ Polyethylene Resins allow downgauging without a loss of structural integrity or processing efficiency. Good clarity and seal strength add to the package.

AMPLIFY™ TY Functional Polymers



The AMPLIFY™ TY product family includes a broad portfolio of high performance concentrate and formulated tie layer resins suitable for adhesion between PE, EVOH, Polyamide, PET, PP, etc. across a wide range of multi-layer barrier packaging formats and end-uses.

ELITE™ Enhanced Polyethylene (EPE) Resins



ELITE™ EPE Resins can be custom designed to upgrade desired performance features over conventional polyolefins, creating films with distinctive balances of performance, cost, and processability.

ELITE™ Advanced Technology (AT) Resins



ELITE™ AT (Advanced Technology) Polyethylene Resins offer the flexibility to tailor molecular weight distribution, short-chain branching distribution, and long chain branching specific to an application's end-use requirements.


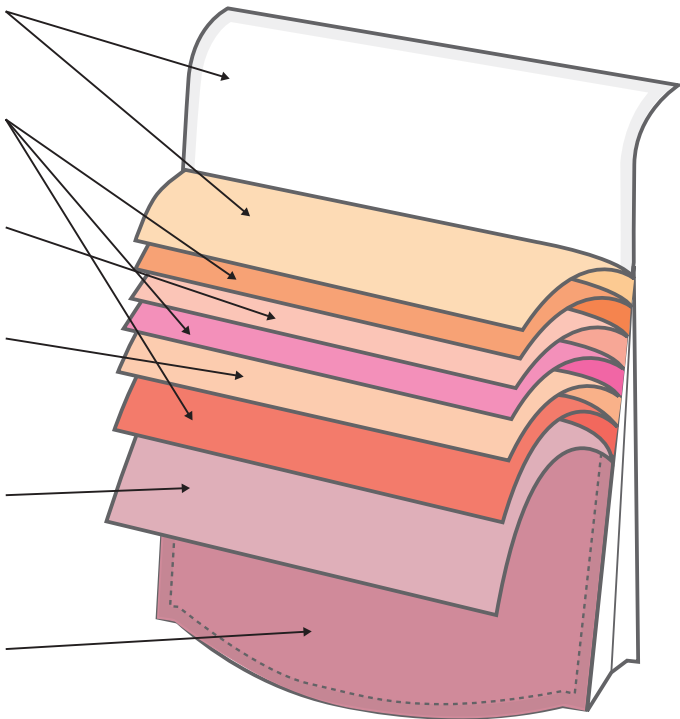
<p>FLEXOMER™ Very Low Density Polyethylene</p>  <p>Flexomer very low density polyethylene resins</p> <p>FLEXOMER™ VLDPE Resins enable efficiencies in blown film production. Finished films demonstrate excellent strength, toughness, and flexibility.</p>	<p>SEALUTION™ Peel Polymers</p>  <p>Sealution peel polymers</p> <p>SEALUTION™ Peel Polymers can help create easy-open packages that have consistent peel performance and resist splitting, tearing, shredding, and stringing.</p>
<p>PRIMACOR™ Copolymers</p>  <p>Primacor copolymers</p> <p>PRIMACOR™ Copolymers offer exceptional adhesion to foil and other polar substrates, resist aggressive chemicals and oils, and demonstrate excellent ESCR and good impact resistance.</p>	<p>TUFLIN™ Polyethylene Resins</p>  <p>Tuflin linear low density polyethylene resins</p> <p>TUFLIN™ Linear Low Density Polyethylene (LLDPE) Resins and TUFLIN™ MDPE Resins are used in numerous film applications including many for food and specialty packaging.</p>
<p>SARAN™ Barrier Resins</p>  <p>Saran barrier resins</p> <p>SARAN™ Resins are recognized as the premium oxygen and moisture barrier products for food packaging. High barrier properties allow for thin gauges and reduced packaging.</p>	<p>VERSIFY™ Plastomers</p>  <p>VERSIFY™ resins offer excellent adhesion to polyethylene and polypropylene and an outstanding combination of optics, sealing, and hot tack performance, as well as elasticity, flexibility, softness, and compatibility in blends.</p>

Figure 2: Suggested Dow Products for Multi-layer Functionalities

<p>Sealants: AFFINITY™ Polyolefin Plastomers AMPLIFY™ IO Ionomers DOWLEX™ Polyethylene Resins SEALUTION™ Peel Polymers</p>
<p>Tie Layers: AMPLIFY™ TY Functional Polymers AMPLIFY™ EA Functional Polymers PRIMACOR™ Copolymers</p>
<p>Barrier: ELITE™ HDPE Resins SARAN™ Barrier Resins SARANEX™ Films</p>
<p>High or Low Temperature Resistance: ATTANE™ ULDPE Copolymers DOWLEX™ Polyethylene Resins ELITE™ EPE Resins</p>
<p>Toughness: AFFINITY™ Polyolefin Plastomers ATTANE™ ULDPE Copolymers ATANE™ NG Resins DOWLEX™ Polyethylene Resins ELITE™ EPE Resins FLEXOMER™ VLDPE Resins</p>
<p>Optics – For Printability & Aesthetics: AFFINITY™ Polyolefin Plastomers ATTANE™ ULDPE Copolymers DOW™ LDPE DOWLEX™ Polyethylene Resins VERSIFY™ Plastomers</p>



Every plastic package has a distinctive purpose and specific physical requirements for fulfilling that purpose. Whether fabricating mono-layer or multi-layer structures, Dow has the product portfolio and knowledge to help effectively match the plastics with the purpose to help you create efficiency and value. Figure 2 illustrates some of the options available.

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ADCOTE™ Solvent-borne Adhesives



Specially formulated to withstand heat and aggressive contents, ADCOTE™ adhesives are used with a wide variety of substrates for applications such as food, medical, and industrial packaging.

AQUALAM™ Aqueous Laminating Adhesive



These water-based PU dispersions are distinctly applicable for flexible films and cellulosic substrates. They provide high initial bond performance and offer very good clarity for excellent optics.

COSEAL™ Cold-Seal Adhesives



This family of water-based emulsions offers adhesion to a wide range of substrates, as well as low odor properties for use in food packaging.

LAMAL™ Laminating Adhesives



Polyether urethane components of a two-component laminating adhesive system, LAMAL™ adhesives are alcohol reducible and used in numerous flexible packaging applications for food.

MOR-FREE™ Solventless Adhesives



These solventless adhesives offer many advantages, including fast cure, long mixed pot life, excellent bonding to numerous substrates, and they meet FDA regulations for low- to high-performance packaging requirements.

OPULUX™ Optical Finishes



OPULUX™ Optical Finishes feature a breakthrough acrylic bead technology and polymer design to create packages with distinctive finishes, intriguing matte appearance, and enhanced color retention.

ROBOND™ Water-borne Adhesives



ROBOND™ L Series Adhesives meet a wide range of laminating adhesive needs, from general purpose label applications, to flexible laminations for food packaging, to applications requiring improved heat and chemical resistance.



Collaborate. Innovate. Accelerate.

Dow's goal is straightforward and simple: to be your first choice for collaborative development of better packaging. For more literature, technical data sheets, or other helpful information regarding Dow products for flexible packaging in food and specialty packaging applications, or to discover more about the many other advantages Dow can offer you, please visit dowpackaging.com.

Additional contact information is listed on the back of this brochure. The Dow Food & Specialty Packaging team looks forward to working with you on your next breakthrough in packaging.

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- use as a critical component in medical devices that support or sustain human life; or
- use specifically by pregnant women or in applications designed specifically to promote or interfere with human reproduction.

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