



# Need excellent adhesion to challenging substrates? Look no further.

## Consider NUCREL™ Acid Copolymers for your packaging and industrial applications.

Adhesive challenges. They're everywhere in the packaging and industrial worlds. Difficult substrates. Harsh chemicals. Tough environments. But through the years, and to this day, one name remains consistently trusted to meet the needs: NUCREL™ Acid Copolymers. These ethylene-acid copolymer resins provide outstanding, chemically resistant bonds to metal and many other materials. And for ease of application, NUCREL™ resins can be extruded, coextruded, or laminated on equipment designed to process polyethylene.

No matter what your adhesive requirements, count on NUCREL™ Acid Copolymers to offer dependable performance, especially when considering:

### Adhesion

- Excellent adhesion to foil, paper, and other polar substrates, eliminating the need for a separate primer

### Chemical resistance

- Resists delamination and seal failure even in harsh (acidic) environments
- Outstanding chemical resistance results in longer shelf life
- Good grease resistance

### Heat seal and hot-tack properties

- Low seal initiation temperatures and very good hot tack strength (melt strength)<sup>(1)</sup>
- Seals through contamination

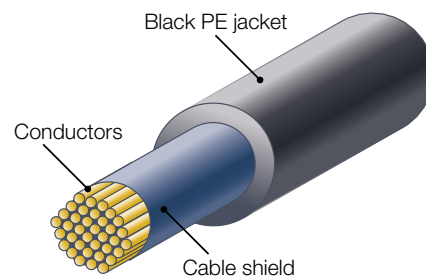
### Flexibility and improved processing

- Allows for high-speed extrusion coating and lamination
- Can be pigmented, painted, or plated
- Can be UV-stabilized for exterior applications.
- Useful as modifiers and concentrate carriers
- Foamable
- Can be cryo-ground for glass and metal coating applications

### Specialized grades

Formulated to improve properties important in both processing and product appearance:

- NUCREL™ HS (High Stability/High Speed) grades allow for high-speed processing due to improved thermal stability and are capable of running at thin coating thickness.
- NUCREL™ HC (High Clarity) film grades provide very low haze and high gloss for applications where transparency is important.
- NUCREL™ AE (Adhesion Enhancer) can be blended at 15-30% into LDPE providing reliable metal adhesion or higher line speed.



**Want more information** about specific grades of NUCREL™ Acid Copolymers? Check out the NUCREL™ Acid Copolymers product data sheets at [www.dow.com](http://www.dow.com), or use the contact information found on the last page of this document.

**Nucel**  
acid copolymers by

<sup>(1)</sup>For better heat seal performance, higher acid content copolymers are preferred. Hot-tack is related to the viscosity of the polymer.

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# Application grade guide

## Packaging applications

Packaging – especially food packaging – poses many obstacles for sealants. NUCREL™ Acid Copolymers are widely used in packaging applications including food and beverage, healthcare, and personal care products. Examples include aseptic packaging for liquids, condiment packaging, snack packaging, toothpaste laminates, and pharmaceutical sachets. NUCREL™ resins are an excellent choice where a strong bond is required to foil during extrusion coating. It also bonds to nylon in coextrusion. In addition, these resins offer heat sealability, hot-tack strength, and ease of processing.

## Consumer and industrial applications

NUCREL™ Acid Copolymers also have uses in a variety of non-packaging applications, where the benefits are similar to those found in packaging. Key markets on the industrial side include wire and cable, including adhesives for foil in cable jackets; as an adhesive surface in thermal lamination films for bonding to metals and fabrics, for example automotive headliners; and as an adhesive layer between SURLYN™ Ionomers and polyethylene in shock tubes in explosive detonator systems.



**Table 1:** Ethylene Methacrylic Acid Resins

NUCREL™ Acid Copolymers grade	Acid level and type	Melt index, dg/min	Tm (°C)	Tf (°C)	Vicat (°C)	Listed in DMF	Processing method	Adhesion to foil	Adhesion to PE	Product resistance*	Seal performance	Other important properties	Example application(s)
	%	ASTM D1238	ASTM D3418	ASTM D3418	ASTM D1525			*How well the material adheres to foil in the presence of acid					
Packaging													
0403	4 MAA	3	104	92	95		BF/Cast	N/A	High	N/A	N/A		Tie layer between polyethylene and SURLYN™ ionomers, bacon packaging
0407HS	4 MAA	7.5	110	85	90		EC	Med	High	Low	Good		Moist towelettes, alcohol swabs
0411HS	4 MAA	11	109	87	90	yes	EC	Med	High	Low	Good		Moist towelettes, alcohol swabs
0609HSA	6.5 MAA	9	104	83	88		EC	Med	High	Med	Good		Juice packaging
0910	8.7 MAA	10	100	82	81	yes	EC	Med-high	High	Med-high	Very good		Cup snacks, powdery foods, medical sachets
0910HS	8.7 MAA	10	103	84	86	yes	EC	Med-high	High	Med-high	Very good	More thermally stable	Applications requiring high melt stability like coextrusion to aluminum foil
0902HC	9 MAA	1.5	103	78	81		BF	N/A	High	Med-high	Very good	High clarity	Heat sealing
0903	9 MAA	2.5	101	83	81		BF	N/A	High	Med-high	Very good		Heat sealing to foil
0903HC	9 MAA	2.5	102	84	81		BF	N/A	High	Med-high	Very good	Superior optical properties	Shampoo bottles
0908HS	9.2 MAA	8	100	82	80		EC	Med-high	High	Med-high	Very good		Juice packaging
1202HC	11.5 MAA	1.5	99	77	75		BF	N/A	Med	N/A	Very good		Heat sealing
AE	Terpolymer	11	105	85	79		EC	Low-med	High	Very low	N/A	Designed for blending with LDPE	Extrusion lamination – snack packaging
Industrial grades													
599	10 MAA	450	98	69	65		EC/Cast film	N/A	N/A	N/A	Very good	Adhesion to fabric	Industrial grade – fabric stiffening
699	11 MAA	95	94	80	65		Compounding	N/A	N/A	N/A	N/A	Specialty	Color compounding
925	15 MAA	25	92	74	67		Various	High	N/A	N/A	N/A	Specialty	Versatile grade for property modification
960	15 MAA	60	91	73	62		Various	High	N/A	N/A	N/A	Specialty	Compounding/ blending

**Table 2:** Ethylene Acrylic Acid Resins

NUCREL™ Acid Copolymers grade	Acid level and type	Melt index, dg/min	Tm (°C)	Tf (°C)	Vicat (°C)	Listed in DMF	Processing method	Adhesion to foil	Adhesion to PE	Product resistance*	Seal performance	Other important properties	Example application(s)
	%	ASTM D1238	ASTM D3418	ASTM D3418	ASTM D1525			*How well the material adheres to foil in the presence of acid					
Packaging													
30705	6.2 AA	5.5	107	89	85		BF/EC	High	High	High	Good		General purpose sealant, and thermal lamination adhesive to foils
30707	7 AA	7	102	85	84	yes	BF/EC	High	High	High	Good		Toothpaste tube laminate, thermal lamination for cable shielding
30907	9 AA	7	98	83	77		BF/EC	High	Med	Very high	Very good		Toothpaste tube laminate, band-aids
31001	9.5 AA	1.3	99	80	79		BF	N/A	Med	N/A	Very good		Heat sealing
3990	9.5 AA	10	97	78	79	yes	EC	High	Med	Very high	Very good		Condiment packaging, snack packaging, tea bags, thermal lamination for cable shielding

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