

Paints and Coatings





Honeywell gives you the competitive edge...

Honeywell provides formulation flexibility

Honeywell's chemically diverse lines of low molecular weight A-C[®] performance polymers allow formulators to tackle a variety of development challenges. Our major lines of additives include:

- A-C Polyethylenes
 - Homopolymers
 - Oxidized
 - Copolymers
 - Ethylene Acrylic Acid
 - Ethylene Vinyl Acetate
 - Maleated
- A-C Polypropylenes
 - Homopolymers
 - Maleated
- ACumist[®] Micronized Polymers
 - Polyethylene Homopolymers
 - Oxidized HDPEs
 - Polypropylenes
 - Modified Polyethylene Blends
- AClyn[®] Ionomers



Our expertise can help you innovate

Honeywell has more than 50 years of experience in the field of polymer science. We were the first to produce polyethylene waxes, and years of innovation in product design and experience in solving problems for our customers have made our line of A-C polyethylenes the world's widest, most versatile family of low molecular weight polyethylene waxes.

Today, we remain one of the world's leading manufacturers of low molecular weight polyethylene polymers and copolymers. We have the know-how and technical expertise to consistently deliver products of the highest quality and help you with formulating challenges. Our customers also benefit from our vast industrial applications knowledge.

As a global player with operations or offices in over 100 countries, we provide the advantage of our global supply and customer service capabilities.

We help you grow your business

Whether your paints or coatings are water-based, solvent-based, energy cured, 100% solids or other forms,

A-C, ACumist and AClyn additives can help you meet your most demanding customers' needs.

Our additives improve abrasion resistance, control slip, provide antiblocking, modify solvent rheology and viscosity, control gloss, enhance moisture and chemical resistance, and modify the melt flow characteristics of thermoplastic resins.

The inherent nature of our additives is based on polyolefin chemistry, which brings additional properties like water, oil, chemical and grease resistance, and low density, where coating weight is a concern.

Contact us to help you formulate your next coating and give us the opportunity to help you grow your business. Our additives improve coating performance, leading to longer service life, consistent high quality and more satisfied customers.

Whether our products help grow your revenues, cut formulation or processing costs or create a competitive advantage for your company, the effect on your bottom line will be positive.

Abrasion resistance



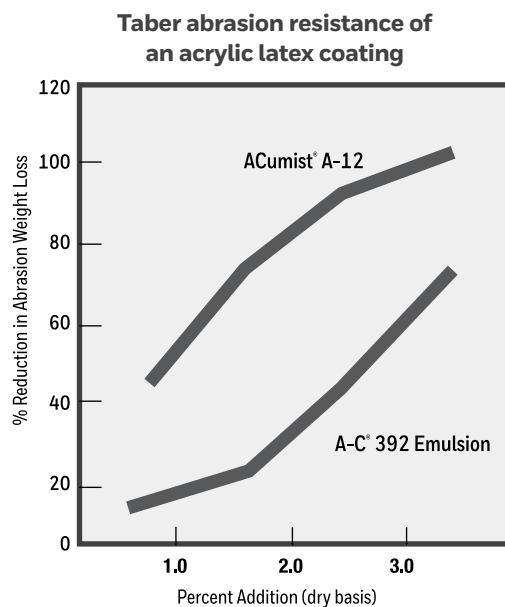
Abrasion is an all-encompassing term that covers marring, scuffing, rub-off, scratching and other damage to a film surface caused by an object rubbing against or sliding over it. In general, the abrasion resistance of a film is determined primarily by the toughness and degree of cross-linking of the resin system.

Once you select a resin system for your application, adding a small amount of an A-C or ACumist performance polymer to your formulation can be a cost-effective method for increasing the abrasion resistance, without affecting other important properties. Increasing mar and abrasion resistance leads to longer coating service life and reduced maintenance costs.

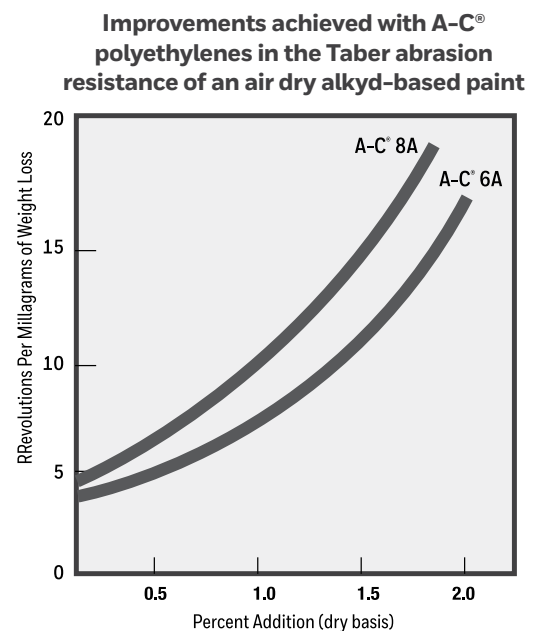
In most systems, wax particles protrude above the film surface. An abrading

surface rides on these particles, reducing its contact with the film and, consequently, reducing abrasion damage. Several properties of a wax, especially hardness and particle size, contribute to its effectiveness in increasing abrasion resistance. Harder polyethylenes usually perform better than softer ones (see Graph 1). Larger wax particles are generally more efficient than smaller ones to improve abrasion resistance (see Graph 2). The slip control contributed by the wax also provides some resistance to abrasion.

A-C performance polymers can be incorporated as water-based or solvent-based dispersions, emulsions, micronized particles, or larger dry forms, such as powders, pellets and pastilles.



GRAPH 1 ACumist A-12 micronized oxidized HDPE vs. A-C 392 oxidized HDPE emulsion. The larger micronized particles afford greater protection against abrasion.



GRAPH 2 A-C 8A vs. A-C 6A incorporated in to an air-dried alkyd-based paint. While both A-C products significantly improve abrasion resistance, the harder A-C 8A demonstrates higher abrasion resistance performance.

Slip and anti-block



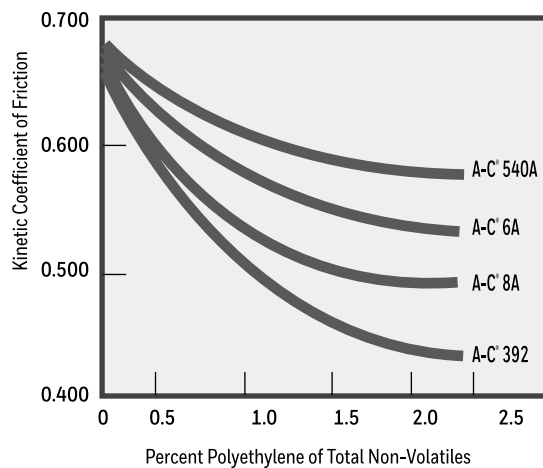
Slip, a measure of the coefficient of friction (COF), is an important property in many coatings applications. Slip is usually optimal within an upper and lower limit. For example, a coated bag that is too slippery may not stack properly. Yet, it must have sufficient slip to move easily along a production line.

Dispersed polyethylene at the surface of a coating is responsible for increased slip. The most effective polyethylene wax for any given situation is not always obvious. Sometimes, a combination of hard and soft polyethylenes will give you the greatest reduction in COF.

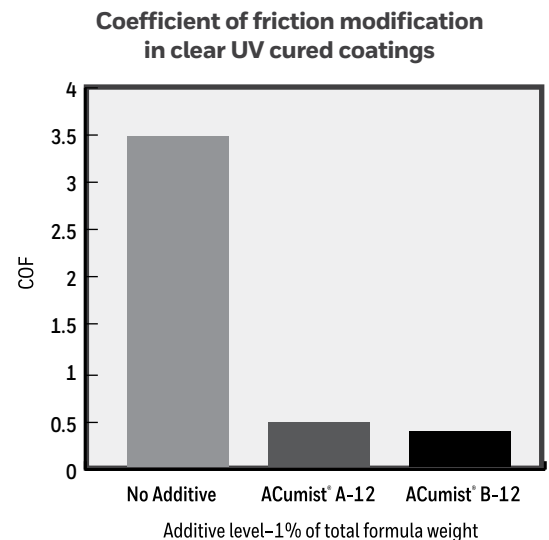
Different A-C polymer chemistries can provide varying levels of slip (see Graph 3). ACumist polyethylene micronized particles added to many types of coatings, at low levels, are very effective in reducing coefficient of friction (see Graph 4).

Controlled slip allows coated coil stock to move through forming equipment with less defects, allows high speed filling of beverage cans, and provides easy stacking and removal of bags or cans from shelves, allowing downstream customers to handle and display products more easily. Coatings modified with Honeywell's additives for improved slip control can provide increased production efficiencies, less returns and consistent customer satisfaction.

When two surfaces come into contact, especially under pressure or elevated temperatures, they may stick together. This is called blocking. The anti-blocking property of a coating (its release properties) lets such surfaces separate easily from each other.



GRAPH 3 Comparison of various A-C grades demonstrating their ability to control the Coefficient of Friction at various dosage rates.



GRAPH 4 Demonstration of ACumist A-12 and ACumist B-12 micronized polyethylenes lowering the Coefficient of Friction at a low dosage rate in a UV-cured coating.

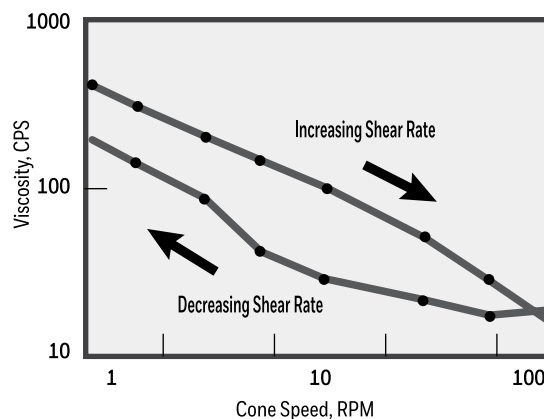
Other advantages of using Honeywell's performance polymers

Rheology control

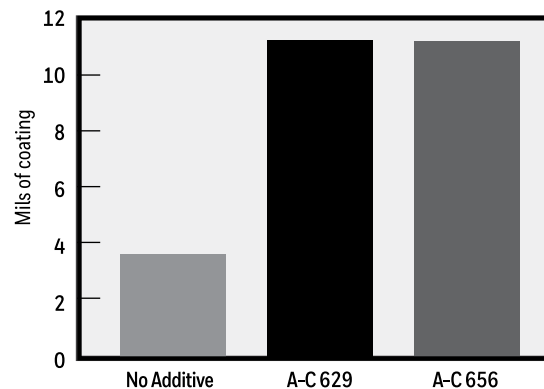
In a formulated coating system, rheology control is critical during application of the coating and while it is in storage. Coating systems rely on thixotropic properties during storage (no shear) to keep them from settling, ease application (high shear), and prevent sag after application (see Graph 5). When added to solvent-based formulations, A-C polyethylenes form gel structures and provide very effective pigment suspension and sag control (see Graph 6), resulting in more uniform color distribution, and easier application with less drip on vertical surfaces.

Gloss control (matting)

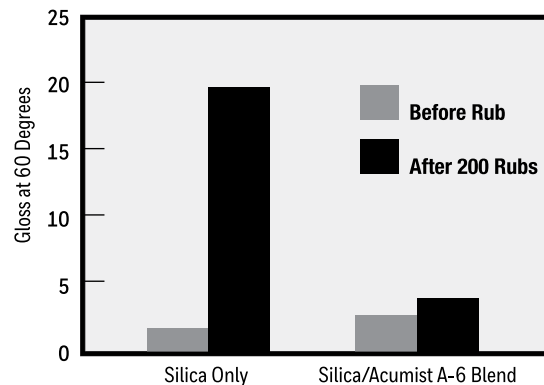
In low concentrations, A-C or ACumist polyethylenes have a minimal effect on gloss. At higher concentrations, however, they can be used as flattening agents either alone, or in combination with silicas. More significantly, ACumist particles protect silica matted coatings from burnishing at extremely low doses (see Graph 7).



GRAPH 5 Typical thixotropic nature of a solvent gelled with A-C PE.



GRAPH 6 Demonstration of A-C 629 and A-C 656 oxidized PEs to improve sag resistance in an air-dried alkyd coating. The addition of 1% A-C increased sag resistance by three times.



GRAPH 7 Gloss Control – Dead Flat Water-Based Polyacrylic Coating. 6% Silica as the sole matting agent, vs. silica with ACumist A-6 blended at a 90:10 ratio. ACumist A-6 added to the silica affords excellent anti-burnishing protection to the coating.



Anti-burnishing and Abrasion Resistance
Dead Flat Water-Based Polyacrylic Coating.
Comparison of a polyacrylic water-based coating matted with silica vs a 90:10 blend of Silica:ACumist A-6.

Moisture and chemical resistance

Because of their hydrophobic nature, A-C polyethylenes provide increased moisture resistance. This is an important feature in applications such as anti-transpirant fruit coatings, anti-corrosion coatings, and many types of polishes. As these polymers are relatively chemically inert, they resist acids, bases and many types of solvents at ambient temperatures.

Melt flow

As low molecular weight thermoplastic materials, A-C performance additives can be used to alter the melt flow properties of higher molecular weight film formers. This characteristic is useful in powder coatings, enhancing buffability in floor finishes where flow is determined by a combination of pressure and frictional heating, and thermoplastic coatings to lower melt viscosity, improve substrate wetting and speed up set times.



Driving your business forward

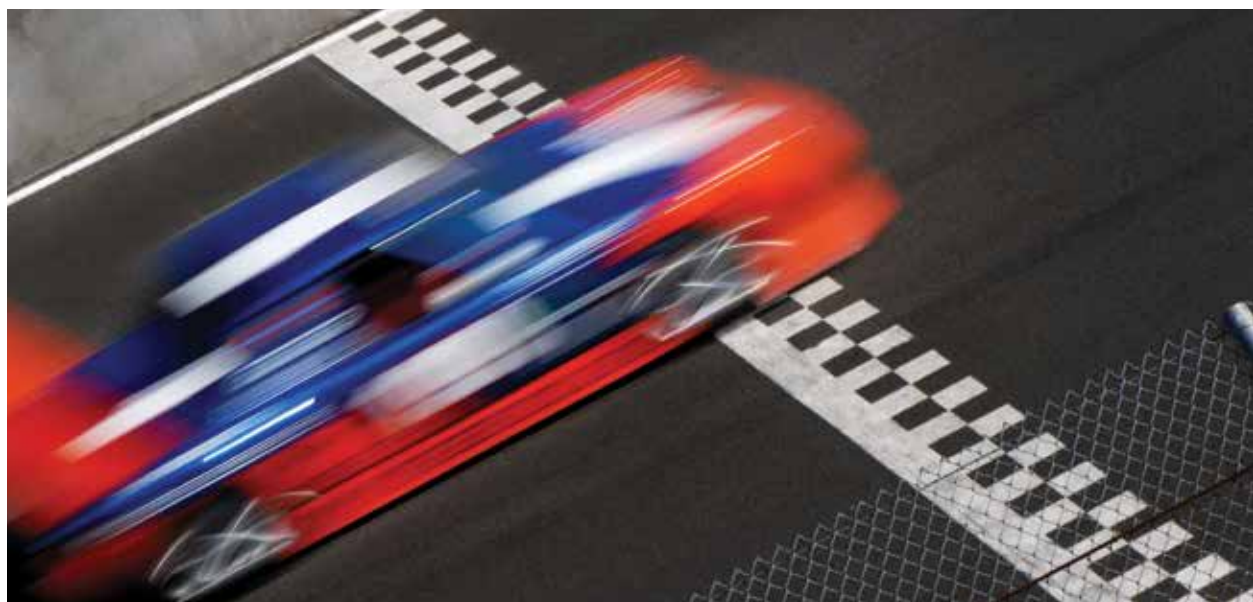


Honeywell's performance additives offer many important advantages and properties that can be utilized effectively in a wide variety of applications. Multi-functional performance enhancements – such as abrasion resistance, slip control and anti-blocking – can be achieved, all with one additive in many cases. Our additives allow you to produce more efficiently, and deliver higher performing products to your customers very cost-effectively.

Learn how to put the power of A-C, ACumist and AClyn performance additives to work for you. Visit www.honeywell-additives.com for more detailed information or to request a product sample.

If you would like to speak to one of our dedicated account managers, chemists, or a customer service representative, please call the appropriate office in your region.

We are dedicated to helping you grow your profitability by developing products that keep your customers satisfied and grow their demand.



For additional information or to contact us, please visit:
honeywell-additives.com

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