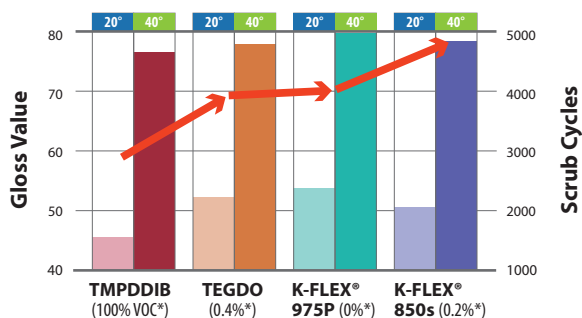




K-FLEX® Low-VOC Coalescents for Paints & Coatings

K-FLEX® dibenzoate coalescents are excellent, ultra-low-VOC solutions for paints and coatings, enabling formulators to meet regulatory requirements while achieving an **ideal balance of performance and value**. In addition to contributing excellent performance characteristics, benzoate chemistries have favorable regulatory and environmentally-friendly profiles: non-phthalate, low-VOC, non-SVHC, global registrations, REACH compliant. Classified as non-SVHC and non-PBT, K-FLEX® dibenzoates are label-free in the EU under CLP and GHS regulations. K-FLEX® 975P and K-FLEX® 850P are also risk-phrase-free.

Scrub Resistance and Gloss in Interior Paint



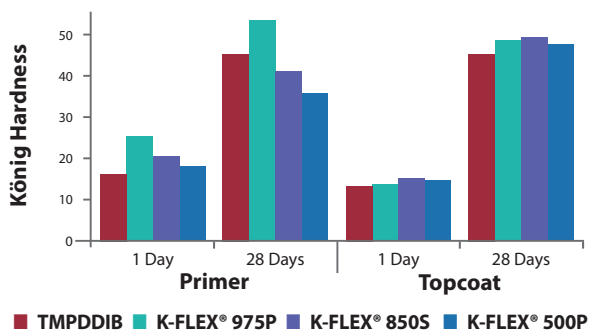
K-FLEX® coalescents increase scrub resistance and gloss while maintaining block resistance, open time.

Acrylic copolymer gloss, coalescent level 38 lbs/100 gal.

* ISO 11890-2 GC Area % Results

■ Gloss 20°
■ Gloss 40°
■ Scrub

Hardness in Direct-to-Metal Coatings



K-FLEX® coalescents have excellent permanence in the polymer film, resulting in good film hardness and corrosion resistance.

Next Generation Products

Dibenzoate chemistries are increasingly common as replacements for higher-VOC coalescents such as 2,2,4-trimethyl-1,3-pentanediol monoisobutyrate (TMPDMIB). This is because they provide comparable—or, in some cases, improved—performance properties in addition to enabling lower VOC levels to meet regulatory requirements and consumer demand. Dibenzoate coalescents are also very compatible with typical coating polymers and have greater permanence in the polymer film, resulting in **stronger, better coalesced films with excellent performance characteristics**, including:

- Optimal surface appearance through superior **gloss and clarity**,
- Excellent **scrub resistance, hardness development, and salt fog resistance**, and
- Similar **dirt pick-up resistance, block resistance and Tg suppression** vs. high-VOC coalescents.

As polar coalescents, K-FLEX® dibenzoates are used to coalesce polar polymers, including acrylic types such as styrene or ethylene copolymers, polyvinyl acetate and acrylics. Dibenzoate blends have been tailored to yield liquids with good handling and tailored performance features in the end-use application. Emerald Kalama Chemical offers the classic dibenzoates and blends, as well as innovative grades and blends more recently developed to satisfy the needs of the evolving marketplace.



Emerald Performance Materials®
Kalama Chemical

Emerald's R&D team uses a wide variety of analytical instruments to evaluate coalescent performance in applications such as paints and coatings, including an MFFT bar (top) and a scrub tester (bottom).

Recommended Products for Paints and Coatings:

K-FLEX® 975P

Economical to use and created to offer a broad range of compatibility with polar polymers, with improved handling due to its lower freeze point.

K-FLEX® 850S

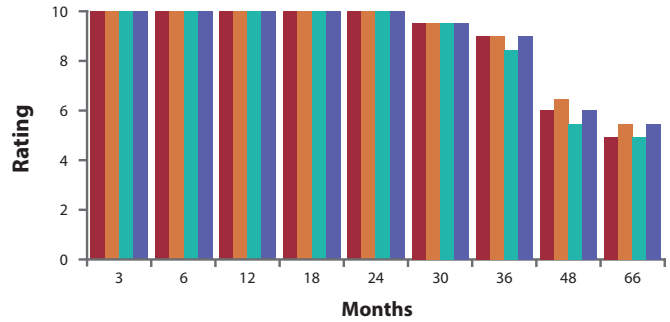
Economical to use and tailored to provide good handling and excellent compatibility in waterborne systems.

K-FLEX® 500

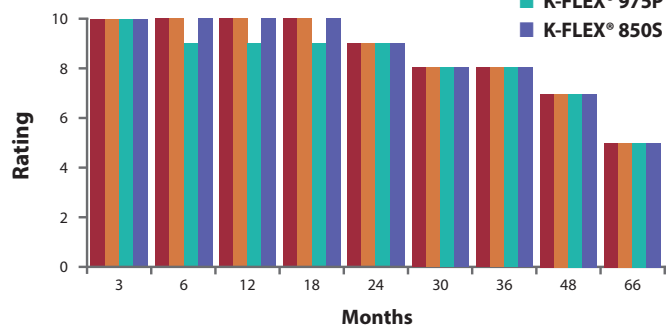
This recently introduced blend was designed expressly for the coatings industry, with ultra-low VOC content to help coating formulators meet the most stringent VOC regulations.

Emerald Kalama Chemical is a business group of Emerald Performance Materials, a manufacturer of additives and polymers that make your products last longer, look, taste, smell, or perform better. We are a world-scale producer of toluene oxidation products, shipping over 500 million pounds annually to approximately 75 countries across the globe. Products include benzoic acid and various benzoate and dibenzoate ester, alcohol and aldehyde derivatives for food preservatives, flavor and fragrance ingredients, plasticizers and industrial applications. With manufacturing in Kalama, WA (US), Rotterdam, Netherlands, and Widnes, UK, we serve customers globally.

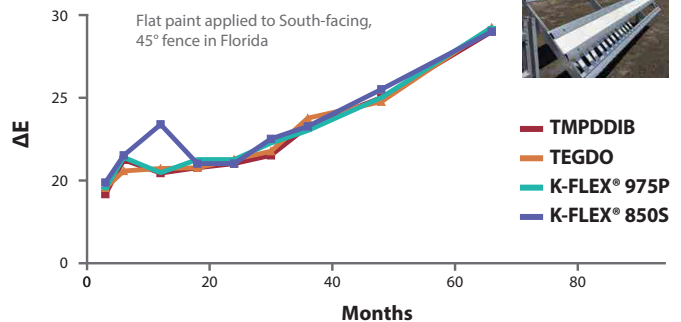
Dirt Pick-Up with Flat Paint: South-Facing



Dirt Pick-Up with Flat Paint: North-Facing



UV Stability (Blue Tint Color Change)



K-FLEX® 975P and 850S demonstrate improved or equivalent exterior exposure vs. high-VOC coalescents. Results are part of a 5-year exterior weathering fence study. Flat, all-acrylic formulation, coalescent 7.7 lbs/100 gal.

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