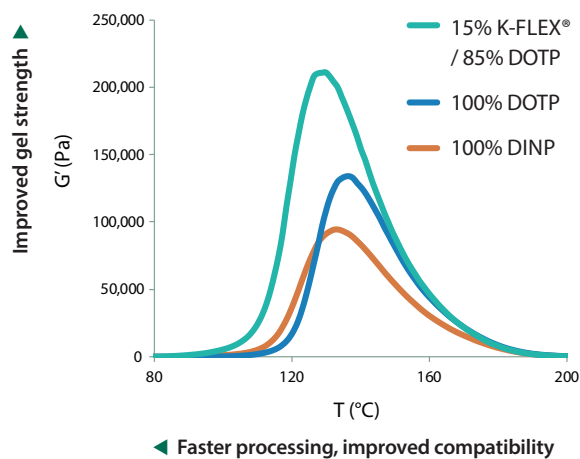


K-FLEX[®] Dibenzoate Plasticizers for Vinyl

K-FLEX[®] dibenzoate plasticizers from Emerald Kalama Chemical are high solvating, non-phthalate solutions for vinyl applications, such as flooring (wear layer/foam), melt compounding, extrusions, and plastisols (spread coatings, screen ink and more). They enable formulators to **economically achieve equal or improved performance relative to traditional phthalates**.

Other common phthalate alternatives, such as DOTP (dioctyl terephthalate), DIDC (1,2-cyclohexane dicarboxylic acid diisononyl ester), and soy-based or castor-oil-based chemistries, can fall short on performance — poor compatibility, migration/exudation, slow fusion, high gel temperatures, and low gel strength. K-FLEX[®] plasticizers can be **used alone or in blends to address these shortfalls and close the performance gap with phthalate replacements**.

Improved Gel Strength and Faster Fusion



Using a blend of 15% of a K-FLEX[®] dibenzoate plasticizer with 85% of DOTP (a common non-phthalate GP plasticizer), gel strength and processing times were significantly improved in contrast to DOTP or DINP alone.

AR2000 rheometer, parallel plates, 600 micron gap in oscillatory mode

Manufacturing Benefits for the Compounder

- **Enhanced manufacturing speed and output** through faster fusion, lower gel temperatures, and reduced dry blending times
- **Improved gel strength** results in less breakage on the web, leading to less rework and downtime.
- **Better performance on the rolls** (less bagginess) due to high solvation.
- **Improved economy:** Maintaining fusion at low temperatures allows for the reduction of higher-cost copolymer resin levels, resulting in improved product strength.
- **Easier handling and transport** due to low freeze points offered.

Performance Benefits for the Consumer

- **Reduced or eliminated exudation:** Plasticizer package compatibility is drastically improved, which reduces migration-related issues such as dirt pickup, a greasy surface, or delamination failures in the finished product.
- **Superior stain resistance:** PU topcoat performance can be extended in difficult to coat grooves, and flooring life can be prolonged where topcoat has been worn down from use.
- **Excellent extraction resistance:** Lifespan is extended for products used in contact with oily/greasy liquids.

Favorable Regulatory & Environmentally Friendly Profiles

Non-phthalate, low-VOC, certain global registrations, and EU REACH compliant, with listings for use in food contact applications (see country specific food contact regulations for specific use limitations/requirements)

Recommended Plasticizers for Vinyl & Plastics

K-FLEX® 975P

Description: Economical to use and created to offer a broad range of compatibility with polar polymers, with a low freeze point

Key Benefits: Optimized for performance in vinyl compositions, offering excellent stain resistance, durability, wear layer toughness

Recommended Applications: Highly recommended for PVC melt compounding and plastisols (pastes), such as consumer products and flooring

K-FLEX® 850P

Description: Tailored specifically for vinyl applications, with economy as a focus

Key Benefits: Promotes excellent stain and extraction resistance and reduced or eliminated exudation

Recommended Applications: Particularly recommended for plastisol flooring, where it imparts superior stain resistance and wear layer toughness, as well as plastisol consumer products and plastisol printing

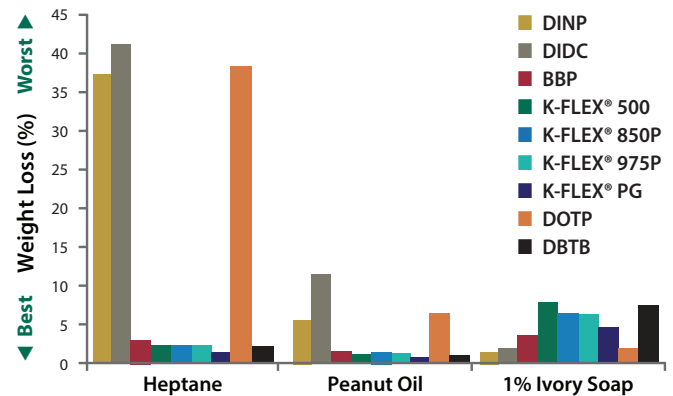
K-FLEX® PG

Description: Very high solvator specifically designed for vinyl, making it particularly useful in blends of plasticizers to tailor characteristics, with an extremely low freeze point and no GHS label requirements in the U.S. or Europe

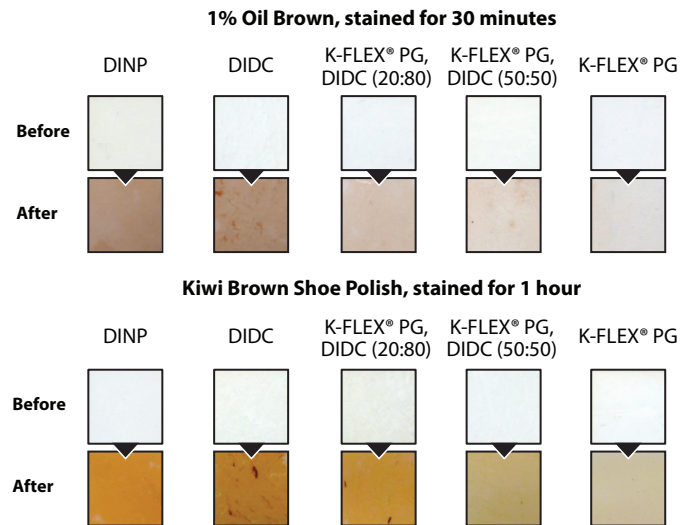
Key Benefits: Optimal stain resistance and durability properties

Recommended Applications: Effective in applications such as PVC melt compounding and plastisols, including consumer products, flooring, and printing

Excellent Extraction Resistance



Superior Stain Resistance



Fused vinyl tiles prepared with K-FLEX® dibenzoate plasticizers exhibit superior stain and extraction resistance compared to films made using common phthalates and non-phthalate alternatives.

Stain resistance with all K-FLEX® plasticizers is typically consistent with the results shown above for K-FLEX® PG.

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June 08, 2020

