

Concepts & Innovations

PHOENIX
CHEMICAL

Jan/Feb/Mar 2025

A New Benchmark in *High Performance* Pigment Dispersions

Cosmetic pigment dispersion properties just got better! Phoenix Chemical launches commercial availability of **Phoenate COPA**[®] (Castor Oil Phosphate), a pigment dispersing agent that is designed to help cosmetic formulators achieve the best possible results with organic and inorganic pigments.

Let's review its highly valued dispersion functions:

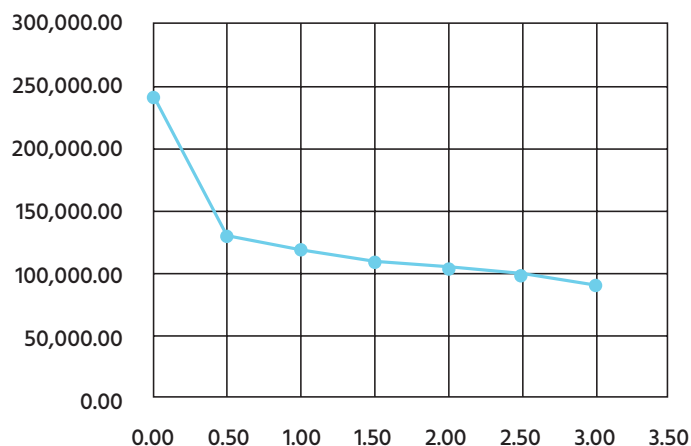
- **Dispersing Agent:** Delivers better coverage as it works to break down agglomerates into smaller particle size and improves wetting properties due to the hydrophilic benefits provided by phosphating and the ester's unsaturated castor moiety (primarily C18:1).
- **Anti-Caking Agent:** Improves product flow by preventing agglomeration
- **Emulsion Stabilizing Agent:** Evenly distributing pigments assists in emulsion formulation and improve texture and product longevity.

Additional Benefits with Inorganic Pigments

- **Phoenate COPA's** structure is Castor Oil modified with a single phosphate group (monophosphate) which provides an anionic (negative charge) compound. Anionic Dispersants are great to use with inorganic pigments such as Zinc Oxide or Titanium Dioxide as they are amphoteric oxides (possessing both positive and negative charge) and **Phoenate COPA** is naturally attracted to their cationic moiety. This results in a more uniform dispersion.

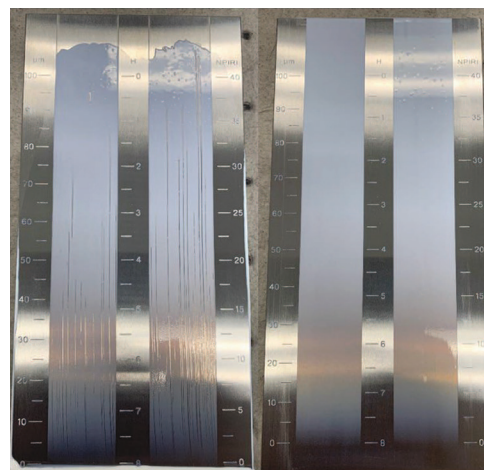
Phoenate COPA is a unique dispersing aid helpful to uniform pigment dispersion, significant viscosity reduction and reliable coverage.

.50% Dosage Effect of Phoenate[®] COPA



▲ Chart-Dosage Effect of Phoenate COPA

The dosage effect of **Phoenate COPA** to reduce dispersion viscosity is outlined in the figure above. Phoenate COPA was added in .50% increments to a Zinc Oxide dispersion with Polyglyceryl-8 Oleate as the primary dispersant.



▲ Phoenate COPA Impact on Hegman Drawdown

(Left) Hegman drawdown ARL-025-109 without **Phoenate COPA**, Zinc Oxide particle agglomerate visible in the form of a scratch. (Right) Hegman drawdown ARL 0125-110 with **Phoenate COPA** effectively breaking up agglomerates.

Plant Derived Viscosity Building Agents

Biogel Castor Oil F/H

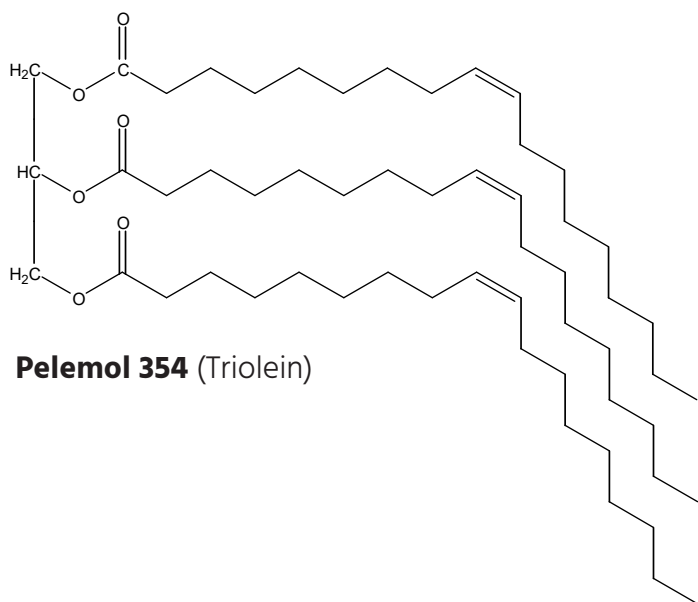
Formulating with viscosity building agents is a key to improving the sensory benefits of cosmetics. Phoenix is pleased to introduce new viscosity agents **Biogel Castor F/H** (Hydrogenated Castor Oil), and **Pelemol 354** (Triolein).

Biogel Castor Oil F/H, also known as Castor Wax, is commonly used as natural viscosity building agent for the cosmetic oil phase for texture and stability. Castor Oil has a high content of ricinoleic acid (90% in triglyceride) and is a hydroxy acid molecule having the presence of a hydroxyl group (OH on C12) and a carboxylic group (C18 Acid with a double bond at C9).

Due to hydrogenation, the double bond at C9 is reduced, creating a saturated product that is transformed into odorless wax. The product has a hydroxyl functionality of 2.7. The multiple hydroxyl groups build the viscosity of the oil phase.

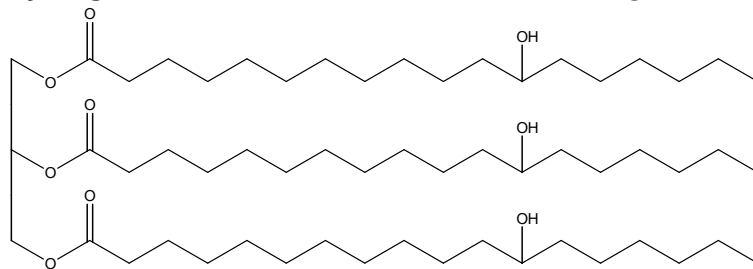
Consider **Biogel Castor Oil F/H** for applications including:

- improving the texture of a butter or serum
- lipstick
- eye shadow
- color cosmetics
- pencils
- stick products (antiperspirants and sunscreens)
- opacifiers.

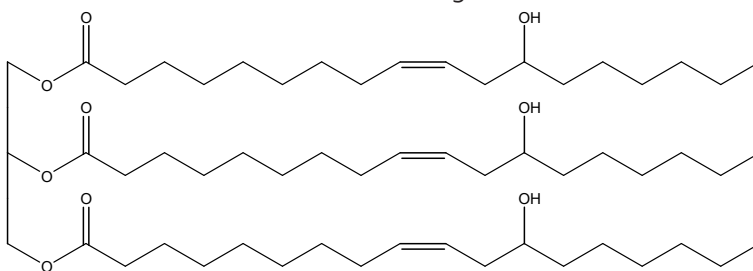


Pelemol 354 (Triolein)

Hydrogenated Castor Oil conforms to the following structure:



Castor Oil conforms to the following structure:



Pelemol 354

Pelemol 354 is a glyceryl triester meaning that glycerol is bound to three units of oleic acid (C18:1). As a naturally viscous liquid ester, it has the ability to control the viscosity of creams, lotions and conditioners. It also enhances the spreadability of cosmetic products. Lastly, as a long chain unsaturated ester, it is recognized as a skin conditioner and moisturizer.

Consider **Pelemol 354** for applications including:

- Color Cosmetics: Binding Agent
- Skin Care: Anti-Aging Moisturizers, Lotions
- Ointments, Night Treatments, Salves, and Balms
- Hair Care: Volumizing Shampoos and
- Conditioners, Anti-Frizz Serums
- Bath Products: Face & Body Wash, Toning Oil
- Exfoliating Scrubs, Bar Soap

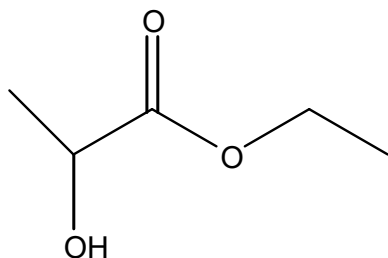
Consider **Biogel Castor Oil F/H** and **Pelemol 354** to help achieve the desired viscosity in beauty products.

Water Soluble Pelemol EL

Engineered to perform, **Pelemol EL** (Ethyl Lactate) is designed to spring-load cosmetic performance. Formulators are becoming increasingly aware of the versatility of this gentle ingredient.

Let's review its cosmetic alchemy. **Pelemol EL** is the α -hydroxy ester of ethanol and lactic acid.

Ethyl Lactate conforms to the following structure:



Pelemol EL is an effective solvent for skincare, hair care, make-up removal, toner formulas, bath products, and treatment products. **Pelemol EL** is the go-to material when you need to push the technical envelop as it is useful for hydrophilic and lipophilic applications. It is outstanding for emulsion concentrates.

Features

- Colorless
- Broad solubility profile
- Excellent Solvent
- Soluble in Isododecane
- Pelemol EL is Miscible (soluble in all proportions) in the following:
 - Water
 - Propylene Glycol
 - Ethanol
 - Isopropyl Myristate
 - Castor Oil
 - Cyclomethicone (D5)
 - Isononyl Isonanoate (Pelemol IN-2)
 - Pentaerythrityl Tetraethylhexanoate (Pelemol PTO)

Phoenix Beeswax Replacement

Our recommended beeswax replacement is a blend of **Pelemol BB** (Behenyl Behenate) and **Pelemol PHS-8** (Polyhydroxystearic Acid), two esters with conditioning benefits. The blend consists of **Pelemol BB** at 60% and **Pelemol PHS-8** at 40% for the total beeswax percentage in the product. This blend can be used directly into the formulation, there is no need to pre-blend them. This is meant to be a starting point in case there is a desire for

slightly harder texture (increase BB) or a desire for more tack (increase PHS-8). This beeswax replacement feels like beeswax! Applications for our beeswax replacement include: lip gloss, lip balms, eye shadow, hair pomades, styling wax and skin conditioning products.

Additionally, this beeswax replacement is strongly recommended for formulas that have potential syneresis problems.

Phase A	-1%W/W	-3%W/W	Functions
BIOGEL® Hemp Seed Butter¹ (Hydrogenated Hemp Seed Oil)	31.00	31.00	Emollient skin conditioning agent from hydrogenation of Cannabis Sativa Seed Oil
White Beeswax Granules NF, SP-422G² (Beeswax)	32.00	-	
Pelemol® BB¹ (Behenyl Behenate)	-	19.20	100% vegetable-derived ester. Adds structure, creaminess
Pelemol® PHS-8 (Polyhydroxystearic Acid)	-	12.80	100% vegetable-derived polyester
BIOGEL® Canola Butter¹ (Hydrogenated Canola Oil)	33.00	33.00	Soft paste that melts on contact with skin, spreads easily
Pelemol® P-810¹ (Propanediol Dicaprylate/Dicaprate)	4.00	4.00	100% vegetable-derived dry ester
	100.00	100.00	

Procedure: Combine all ingredients of Phase A and heat with mixing to 75 - 80°C until uniform. Pour into molds at 75°C.

1. Phoenix Chemical, Inc.
2. Strahl & Pitsch, Inc.

Eureka!

Pecogel H-12/A Humectant *Film Former*

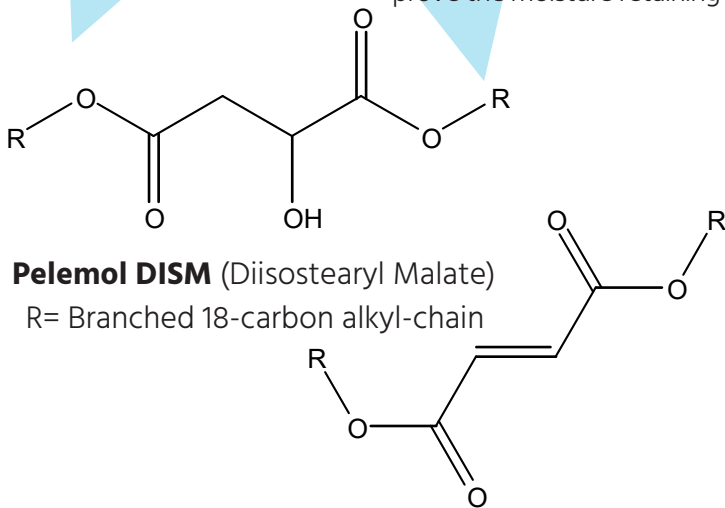
Pecogel H-12/A (VP/Polycarbamyl Polyglycol Ester) is an outstanding non-ionic aqueous polymeric hydrogel used to lock moisture into skin care products. The product is comprised of a vinylpyrrolidone homopolymer and a hydrophilic polyurethane which is well recognized as a cosmetic film former.

Pecogel H-12/A contributes humectancy by retaining water in the polymer matrix. From a dry film state, it will absorb moisture from the atmosphere until it reaches equilibrium, retaining its film integrity. The absorbed moisture acts as a plasticizer for the polymer. This enables the dried film to be both flexible and non-tacky, while remaining water resistant.

Water is the essence of healthy skin; **Pecogel H-12/A** will improve the moisture retaining qualities of personal care products!

The unique properties of this cosmetic hydrogel suggest its use in:

- Facial Masks
- Concealers
- Sunscreens
- Bath Products
- Shaving Products
- Conditioners



Pelemol DISM (Diisostearyl Malate)

R= Branched 18-carbon alkyl-chain

Pelemol DISF (Diisostearyl Fumarate)

R= Branched 18-carbon alkyl-chain

The Ultimate Lip care

To maintain the healthiest lips, use glossy moisturizing products that will keep lips soft and pliable. Two products which best serve as means to this end are the dialkyl esters, **Pelemol DISM** (Diisostearyl Malate) and **Pelemol DISF** (Diisostearyl Fumarate). These esters are extremely emollient and deliver cushion. **Pelemol DISM** is the diester of isostearic alcohol and malic acid, an α -hydroxy-diacid.

Pelemol DISF is the diester of isostearic alcohol and fumaric acid. Both esters feature the branched C18:0 alkyl chain (Isostearyl) at each end. Malic Acid and Fumaric Acid are 4 carbon diacids.

These two esters are also ideal for a variety of topical applications such as high performance moisturizing creams and lotions, as well as color make-up and eyeshadow.

Chef's Corner Linguine *with* Shrimp Scampi

Ingredients:

- Kosher salt
- 1-1/2 pounds of linguine
- 6 tbsp (3/4 stick) unsalted butter
- 5 tbsp good olive oil
- 9 cloves of sliced garlic
- 2 pounds large shrimp (about 32 shrimp), peeled and de-veined
- 1/2 tsp freshly ground black pepper
- 3/4 cup chopped fresh Italian parsley
- Grated zest of 1 lemon
- 1/2 cup freshly squeezed lemon juice (4 lemons)
- 1/2 Lemon, thinly sliced in half-rounds
- 1/4 tsp hot red pepper flakes

A quick meal to pull together for dinner when you are home late!

Drizzle some oil in a large pot of boiling salted water, add 1 tbsp of salt and the linguine, cook for 7 to 10 mins, or according to the directions on the package.

Meanwhile, in another large (12"), heavy-bottomed pan, melt the butter and olive oil over medium-low heat. Add the garlic Sauté for 1 minute. Add the shrimp, 1 tbsp of salt, and the pepper and sauté until the shrimp have just turned pink, about 5 mins, stirring often. Remove from heat, add parsley, lemon zest, lemon juice, lemon slices, and red pepper flakes. Toss to combine.

When the pasta is done, drain the cooked linguine and then put it back in the pot. Immediately add the shrimp and sauce, toss well, and serve!