Concepts & Innovations

PHOENIX CHEMICAL

Apr/May/Jun 2025

The *Amazing Alchemy* Of Pelemol CSIT

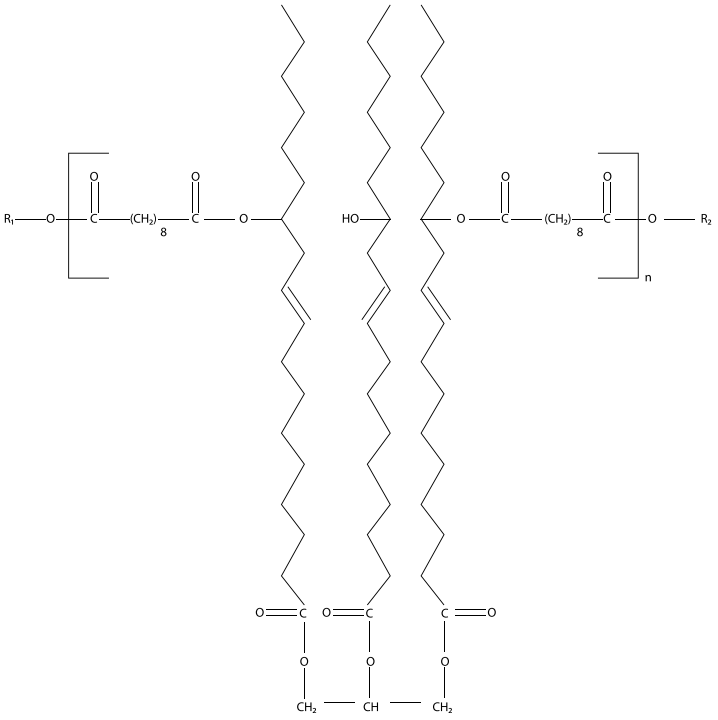
So why use **Pelemol CSIT** as your dispersing agent or cosmetic emollient you ask, it's simple: It's just smarter! **Pelemol CSIT** is proven to produce sunscreen and cosmetic pigment paste of good appearance while providing value added benefits of great moisturization, conditioning and smoothing for skin and hair. Let's review its cosmetic alchemy. **Pelemol CSIT** (Castor Oil Sebacate Isostearate Triethyl Citrate Tetramer) is a naturally derived viscous liquid polyester film-former.

Features:

- **Naturally Derived Polyester Film-Former**
  -It features a Hydrogenated Castor Oil / Sebacic Acid back-bone, end capped with Isostearyl and Triethyl Citrate. Com-prising three moieties Carboxyl, Hydroxyl and Ester.
- **Built in Wetting Agent**
  -Triethyl Citrate Ester is incorporated to lower surface ten-sion of the pigment to better displace air and water from pigment's surfaces and enhanced pentetration. Known for both high zinc oxide and TIO2 metal loading capabilities required for Sunscreen applications and high color pigment loading too.
- **Deagglomeration**
  -Wetted pigments improve shearing and provide efficient breakup of clumps.
- **Stabilization**
  -Dispersion Polymer is adsorbed by pigment assuring stability of pigment paste.
- **Enhanced Moisturization and Conditioning**
  -Its castor moiety enhances conditioning. It is also designed to smooth hair cuticles that have been damaged by the styling process. It provides cuticle sealing and delivers a well-conditioned appearance and healthier hair.

Pelemol CSIT is a unique functional specialty designed to spring- load performance of sunscreens,restorative hair repair and high-tech skin conditioning.

Pelemol CSIT conforms to the structure below where R1 is the Triethyl Citrate moiety and R2 is the Isostearyl moiety.



Applications

- Sun Care Dispersions with Enhanced Wear (Zinc Oxide and Titanium Dioxide)
- Moisturizing Sunscreen Products
- Binding Agent
- Natural Glossing Agent
- Bold Color Pigment Dispersions
- Lip Products - Gloss, Stick and Balms
  Other Color Cosmetics: Eyeshadow and Blush
- Skin Care-Anti-Aging Moisturizers, lotions and ointments
- Hair Conditioning- Repairing for cuticle and split ends

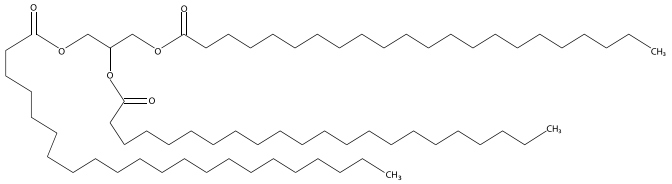
Phoenix Welcomes Triglycerides Line

Triglycerides are versatile cosmetic ingredients. They primarily function as emollients and viscosity building agents. They are triesters of glycerol. This means that glycerol is bound to three units of a given carboxylic acid. In form, glyceryl triesters range from light liquids, at the shortest chain lengths, to dense waxy solids, at the longest chain lengths and everything in between. Phoenix has you covered with a bountiful product offering featuring five liquid form triesters including: **Pelemol CCT**, a saturated mixed chain product, **Pelemol GTO** and **Pelemol GTIS**, branched chain products, **Pelemol GTAR,** acetylated hydroxy chain product, and two solid form triesters: **Pelemol GTB**, saturated linear chain product and **Pelemol GTHS**, a hydroxy acid chain product.

Solid Materials

Pelemol GTB

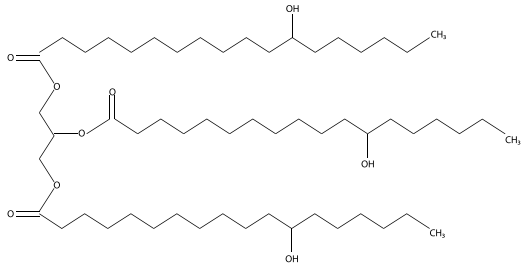
(Tribehenin) is the triester of glycerin and behenic acid (C22)



a long chain occlusive conditioning wax imparting a barrier for moisture retention on skin to promote skin's texture leaving it smoother and softer. Frequently employed as an emulsion stabilizer imparting a rich non greasy creamy feel. Popular applications include stick products (deodorants, lipsticks), moisturizing anti-aging creams lotions and hair conditioning.

Pelemol GTHS

(Trihydroxystearin) is the triester of glycerin and hydroxystearic acid.

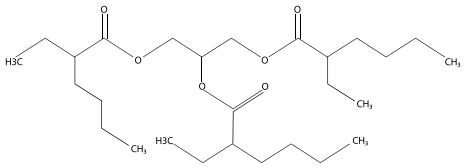


Pelemol GTHS is offered as a powdered material and functions as a rheology modifier and oil phase thickening agent. The product's multiple hydroxy groups build the viscosity of the oil phase while its saturated C18 chains contribute to richness and conditioning.

Liquid Materials

Pelemol GTO

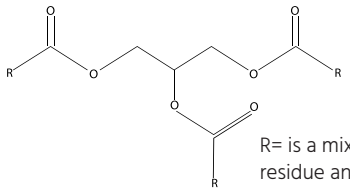
(Triethylhexanoin) is the triester of glycerin and 2-ethylhexanoic acid, a branched acid



It is an occlusive ester with light cushion and it spreads well. It is a popular choice for a variety of spray body formulations as well as cosmetic make-up applications including: powders, lipsticks and foundations.

Pelemol CCT

(Caprylic / Capric Triglyceride) is the triester of glycerin and caprylic (C8) and capric acids (C10).

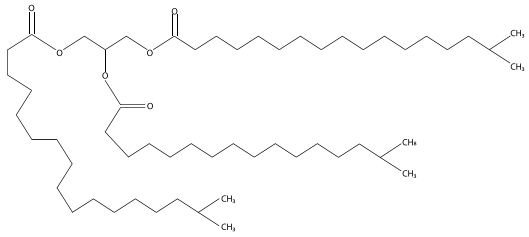


R= is a mixture of Caprylic Acid residue and Capric Acid residue

As a light ester, it is useful for achieving an innovative feel to improve the sensory benefits of cosmetics. It offers the ability to solubilize an array of lipophilic cosmetic raw materials, decrease tack and improve spreadability. These properties ensure success in an array of applications including: products around the eyes, fragrance spray, moisturizer, facial treatment, foundation, sunscreen, color make-up, anti-aging, concealer, creams and lotions

Pelemol GTIS

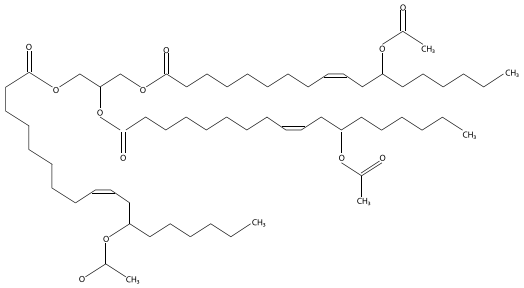
(Triisostearin) is the triester of glycerin and isostearic acid, a branched acid (iso).



It is a classic ester possessing cushion, excellent spread ability and shine (refractive index of 1.4636). As a naturally viscous ester, it has the ability to control the viscosity of cosmetics. It is suited for lipstick, lip gloss, eyeshadow, as well as skin care products. Its broad solubility makes it easy to formulate.

Pelemol GTAR

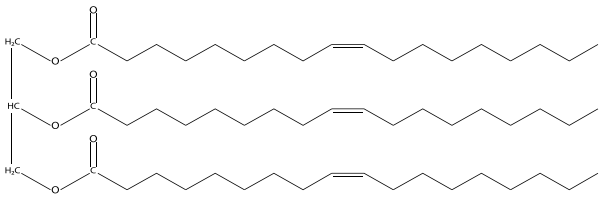
(Glyceryl Triacetyl Ricinoleate) is the triester of glycerin and acetyl ricinoleic acid.



It is a liquid ester with shine, cushion and occlusive slip making it a popular selection for lip and make-up products and conditioning skin lotions. Acetylation makes the product more hydrophobic and confers better w/o emulsification properties.

Pelemol 354

(Triolein) is the triester of glycerin and oleic acid.



It is a rich ester which is both conditioning and refatting. It imparts cushion and slip to cosmetic products. It combines the humectant moisture trapping property of glycerin with oleic acid's conditioning and moisturizing benefits. Applications include viscosity control, pigment binding, moisturizers, bath products and hair shampoos and conditioners.

Introduction to Sun Care

UV Radiation

It is important to know and understand electromagnetic radiation with wavelengths between 100 nm and 400 nm. In the UV (ultraviolet) range there is UVC, UVB, and UVA. UVB has a wavelength of 290-320 nm and comprises about 5% of the total UVR. UVB also stimulates the production of vitamin D, it causes erythema (sunburn) and is the primary cause of non-melanoma skin cancers. UVA has a wavelength of between 320-400 nm. It is important to note that UVA comprises approximately 95% of the total UVR. It causes photo-aging, stimulates tanning and pigmentation, causes sunburn and promotes skin cancer. Indirectly it creates free radicals in reactive oxygen species. Therefore, it is important to know that UVB causes sunburn while UVA contributes to aging, and both contribute to skin cancer.

Label Claims:

- **Sun Protection Factor (SPF):** This indicates a level of protection against sunburn (ERYTHEMA) which is primarily influenced by UVB protection. The accepted definition for SPF is as follows; The Minimum Erythemal Dose (MED) = The minimal quantity of radiant energy required to produce the first detectable reddening of fair human skin. SPF= MED with sunscreen applied / MED without sunscreen
- **UVA Claim:** there are different criteria and test methods used around the world.

The Sunscreen Market

Sunscreen market trends over the last 50 years

- **Functional Trends**: Including higher SPF's, broad-spectrum protection, convenience of application, and UV protection in daily moisturizers etc.
- **Ingredient Trends**: The "natural" trend is widespread across the whole personal care industry including suncare products. The ingredient trend also includes a trend to move away from organic or chemical sunscreens towards physical sunscreens such as TiO2 and ZnO , which are considered more natural. Lastly, the consumer wants their products "chemical free".
- **Aesthetic Trends**: This includes sunscreen lotions with a lighter, dryer feel and a more desirable appearance on the skin.
- **Regulatory Trends**: The regulatory trends seem to change on a daily basis. This includes UVA claims, SPF numbers, and permitted UV filters.

UV Filters:

- **Organic sunscreens:** Also known as chemical sunscreens, these products worked as sunscreens by absorbing UV radiation and converting it to heat energy.
- **Inorganic sunscreens:** These are known as physical sunscreens such as titanium dioxide and zinc oxide. Inorganic particles work as sunscreens by absorbing and scattering UV radiation.

In summary, new regulatory issues and technological limits have slowed down the race for higher and higher SPF's. Improved aesthetics, ease-of-use and the desire for natural ingredients are some of the key market drivers.

In today's sun care market, the products must be safe, have a high SPF, broad spectrum (UVA protection), ease of application, aestheti appeal (which includes a pleasant feel on the skin as well as being transparent), multifunctional, and low cost.

Although sunscreen products come in many forms such as creams, lotions, milks sprays, wipes, oils sticks and gels, the most popular forms include O/W emulsions and W/O emulsions.

Advantages of using emulsions:

- Aesthetics: Oily products can be applied to the skin in an elegant manner.
- Compatibility: Incompatible ingredients can be brought together.
- Inclusion of actives: Allows the chemist to deliver actives where needed on skin.
- Cost: Many formulas contain significant amounts of water.
- Formulation flexibility: Easy to modify viscosity, feel, and appearance.

Phoenix Sun Care

Pigment Dispersants
- Phoenate COPA
- Pelemol CSIT
- Pelemol PHS-8
- Pelemol 6GPR
- Pecosil PS-100
- Pecosil PS-112

Film Formers
- Giovarez AC–5099M
- Giovarez BTB–50
- Giovarez 1800
- Pecogel H-12/A
- Pecogel H-1220/A

O/W Emulsifier, SPF Enhancers, Counter Irritants
- Pecosil PS–100
- Pecosil PS-112

Pelemols Alkylene-Oxide Free W/O Emulsifiers
- Pelemol P – 1263
- Pelemol 3G22
- Pelemol 6GPR

Sunscreen Solvents
- Pelemol BIP–PC
- Phoenoxol BD–10P
- Pelemol P–810
- Pelemol P–99
- Pelemol PGDP
- Pelemol G7A
- Pelemol EL

1970s

It was considered good practice to have a good tan. During this decade science first links the sun with aging, and this was the first time SPFs were put on packaging.

1980s

A deep tan was still sought out. In the 80s water resistant products were introduced and there was little emphasis on self-tanning and sunburn.

1990s

Having a good tan was still desirable and fake tan products were promoted. People were beginning to educate themselves about skin cancer, but SPFs were still low.

2000s

There has been a greater emphasis on skin protection, the importance of UVA protection was recognized, there is an increased growth in self-tanners, and consumers demanded better aesthetics of the finished products.

Lipstick With Pelemol DISF

Pelemol DISF (Diisostearyl Fumarate) and **Pelemol CSIT** (Castor Oil Sebacate Isostearate Triethyl Citrate) are ideal for lipsticks that provide comfort and staying power all day. This smooth lipstick delivers shine and luxurious emollience to assure that lips remain soft. Long lasting color, shine, and moisturization can be achieved with the right products. It starts with making sure that the skin on your lips stays moisturized; this helps lip color to glide on smoothly and stay on! Five products that were essential to this end were **Pelemol BB, Pelemol PHS-8, Biogel Canola Butter, Pelemol OL, Biogel Canola Oil F/H** and **Pelemol CSIT.**

PHASE A	%W/W	Functions
Pelemol® BB[1] (Behenyl Behenate)	17.50	Imparts creamy richness, C:22 ester delivers conditioning.
Pelemol® PHS-8[1] (Polyhydroxystearic Acid)	9.30	Glossy, substantive polymeric dispersing aid which reduces surface tension between solid and liquid for uniform dispersion of pigment.
Biogel® Canola Butter[1] (Hydrogenated Canola Oil)	30.00	Provides conditioning and helps to lock in moisture and provide a hydrating effect.
Pelemol® OL[1] (Oleyl Lactate)	10.00	Delivers strong moisturization and smoothness.
Pecosil® G-5[1] (Dimethicone (and) Phenyl Methicone (and) Poly(C30-45 Olefin))	6.40	Delivers powdery high satin emollience.
Pelemol® DISF[1] (Diisostearyl Fumarate)	6.50	Extremely emollient liquid ester with shine and smoothness.
Giovarez® 1800[1] (Polyvinyl Stearyl Ether)	3.50	Enhances pigment gloss and also contributes a water-resistant film.
Biogel® Canola Oil/FH[1] (Hydrogenated Canola Oil)	5.50	Works to provide structure and impart creaminess
Pelemol® CSIT[1] (Castor Oil Sebacate Isostearate Triethyl Citrate Tetramer)	3.00	Enhances skin conditioning, smoothness, viscosity, staying power and wear. Supports overall color dispersion.
PHASE B		
Titanium Dioxide Color Grind ARL-026-046-3 (Titanium Dioxide CI 77891 (and) Ethyl Canolate (and) Polyhydroxystearic Acid (and) Hydroxystearic Acid)	2.85	
Red 40 Color Grind ARL-029-34-1 (Red 40 Lake CI 16035 (and) Ethyl Canolate (and) Polyhydroxystearic Acid (and) Hydroxystearic Acid)	4.65	
Covapate Unired LC 37792 (Ricinus Communis (Castor) Seed Oil (and) Red 7 Lake CI 15850)	0.55	
Black Iron Oxide Color Grind ARL-026-046-1 (CI 77499 (and) Ethyl Canolate (and) Polyhydroxystearic Acid (and) Hydroxystearic Acid)	0.25	

1. Phoenix Chemical, Inc.

Procedure: Combine PHASE A and begin mixing and heating to 75-80°C. Once uniform, add PHASE B and continue mixing until all color is dispersed and batch is uniform. Pour into molds at 75-80°C.

Chef's Corner
Chicken or Veal Marsala

Ingredients:

- 2 whole chicken breast, fillet and pound to 1/4" thickness or 1/2 lb veal breast, pounded to 1/4" thickness
- 4 oz all-purpose flour
- 1/4 tsp salt
- 1/4 tsp ground black pepper
- 2 oz olive oil
- 8 oz sliced mushrooms
- 4 oz marsala wine

A delicious, classic dish -- lightly coated filets braised with marsala, wine and mushrooms. Easy and ideal for both a quick weeknight entree or serving to company.

Add olive oil and butter to a large sautéing pan over low heat. Blend flour, pepper and salt; dredge chicken or veal cutlets in flour mix and add to pan, sautéing for 4-5 mins on 1 side and 3-4 mins on the other side until cooked through. Set aside.

Add 1 tsp flour mix to oil and butter in pan and stir until flour is coated. Add mushrooms to pan and sauté until mushrooms are cooked through and liquid is reduced. Add Marsala wine while stirring to make a thin roux. Add chicken or veal back to pan. Heat through and turn until evenly coated and serve.

A mushroom pasta is an excellent side dish. Serve with pinot grigio and crusty Italian bread!