High Performance
Lipstick Products

PHOENIX CHEMICAL, INC.

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PELEMOL® ESTERS

Pelemols have multifunctional properties desirable in lipsticks. These properties include solvency, pigment wetting, lubricious substantivity, superior cushion, gloss, emolliency, spreadability, and moisturization. Additionally, several of the Pelemol Esters are 100% vegetable-derived.

PELEMOL® BB is the ester formed by the reaction of behenic acid with behenyl alcohol. It is completely vegetable-derived and exists as an off-white, 100% active, oil-soluble flake. **PELEMOL® BB**, when introduced into the oil phase of an emulsion, will build viscosity at low solids for a richer feel. It is, therefore, very cost-effective.

PELEMOL® CR is a 100% active, lipophyllic, vegetable-derived ester. It is a soft paste in consistency, melting at skin temperatures, and its lubriciousness and castor oil compatibility make it an excellent candidate for use in lipstick, make-up products, and powders. **PELEMOL® CR** contains a double bond and hydroxyl functionality. Unlike many esters, it is these electron rich groups that give **PELEMOL® CR** a degree of polarity that broadens its compatibility in cosmetic preparation where emulsifiers or other polar constituents may be employed.

PELEMOL® D-2000 is an oligomeric ester formed by the reaction of PPG-26 and Dimer Acid, synthetic and vegetable-derived. It is a clear viscous, extremely substantive, hydrophobic, pourable liquid. Substantivity to skin is so intense that repeated washing with warm water and soap does not completely remove the product. **PELEMOL® D-2000** is also tasteless and virtually odorless.

PELEMOL® DD is a 100% active, hydrophobic, completely vegetable-derived polyester formed by the reaction of dimer dilinoleyl alcohol and dimer dilinoleic acid. It possesses interesting properties and can be characterized as odorless, tasteless, colorless, and glossy.

PELEMOL® DISM is a 100% active liquid diester of an alpha hydroxy acid. This ester exhibits excellent skin feel characterized by cushion and emolliency leaving the skin soft and supple. **PELEMOL® DISM** is oil and silicone soluble and can be formulated with these materials in a variety of cosmetic products. **PELEMOL® DISM** is suitable for lipstick and lip products as well as make-up and skin formulations.

PELEMOL® DO is a 100% active liquid, hydrophobic, completely synthetic/vegetable derived ester formed by the reaction of decyl alcohol and oleic acid. It can be characterized as a relatively dry ester with a slight characteristic oleyl odor. It is useful in creams and lotions to reduce tack or as a vehicle to incorporate heavy oils into a formulation. **PELEMOL® DO** can also be used as a spreading aid or as a solubilizer. It is useful at 2 - 10% levels.

PELEMOL® DP-72 is the tetraester of dipentaerythritol and hydroxystearic acid/isostearic acid. This 100% active hydrophobic, occlusive, skin conditioning, emollient ester is similar to lanolin in feel and consistency. **PELEMOL® DP-72** is a paste with excellent water-holding capacity, due to the presence of hydroxyl groups in the molecule. Recommended use levels: 1 – 10%.

PELEMOL® DP-144B is a truly unique polyester. It is the reaction product of dipentaerythritol, tetrapolyhydroxystearic acid, and behenic acid. **PELEMOL® DP-144B** is 100% active, tacky, and substantive. It will hold three (3) times its weight in water and is a superior lipstick ester, producing moisturization and occlusive humectancy. Compared to lanolin based lipstick, **PELEMOL® DP-144B** increases the melting point of a lipstick by 5°C without sacrificing creaminess or payout. The stick demolds easier and **PELEMOL® DP-144B** has no odor and no taste.

PELEMOL® 6GPR is a 100% active, liquid, hydrophobic ester. It is vegetable-derived, polymeric octaester. It is very substantive to skin, lubricious, and glossy. **PELEMOL® 6GPR** also exhibits considerable cushion and spreadability. **PELEMOL® 6GPR** contains a castor oil moiety, ricinoleic acid. Since castor oil is composed of about 80% glyceryl ricinoleate, it is not surprising that **PELEMOL® 6GPR** polyglyceryl-6 ricinoleate functions as a pigment wetting and dispersing agent. These properties suggest that **PELEMOL® 6GPR** would be useful as a pigment wetting and grinding aid for lipstick products and for use in skin and make-up products.

PELEMOL® GTAR is a 100% active, liquid, hydrophobic ester. It is vegetable-derived and functions as an emollient and pigment dispersant. It is formed by the acetylation of castor oil and possesses a slight characteristic castor odor. Among its other properties, **PELEMOL® GTAR** exhibits cushion, good play time, and high shine. These excellent properties make **PELEMOL® GTAR** highly useful in lipstick, make-up products, skin lotions, and creams at 1% - 20% levels.

PELEMOL® GTIS is a 100% active, liquid triester. The reaction product of glycerine and isostearic acid, **PELEMOL® GTIS** exhibits excellent cushion and is uniquely suited for use in lipstick, lip gloss, and other lip products where it can also be useful in modifying melting points. On rub-in, **PELEMOL® GTIS** leaves the skin with a lubricious and glossy appearance.

PELEMOL® ICB is a 100% active low viscosity, stable, vegetable-derived, liquid ester. It is both odorless and tasteless and exhibits excellent emolliency and skin spreadability characteristics. **PELEMOL® ICB** exhibits broad solubility in oils and silicone, and is useful as a melting point modifier in lipstick and make-up systems. It also imparts emolliency and sheen to lipsticks, and is suitable for anhydrous skin products or emulsion systems. Use levels of 2 – 5% are indicated in skin products and 5 – 10% in lipstick and lip products.

PELEMOL® II is the ester formed by the reaction of Isostearyl Alcohol and Isostearic Acid. **PELEMOL® II** is a 100% vegetable-derived clear liquid and imparts shine, spreadability and emolliency to skin. It is suitable for use in color cosmetics and in skin products at a level of 2 - 10%.

PELEMOL® ISB is a 100% active ester and exists as a soft, opaque, off-white paste at ambient temperatures. It melts at skin temperature and imparts an extremely emollient and soft feel to skin. **PELEMOL® ISB** is generally soluble in oil and insoluble in water. It is an effective moisture barrier and imparts "slip" to powders.

PELEMOL® ISHS is a 100% active emollient, completely vegetable-derived ester that is offered as a soft paste. It can also be described as an occlusive emollient that can help to reduce transepidermal water loss, keeping skin hydrated and soft.

PELEMOL® ODR is a 100% active, liquid ester. It is synthetic/vegetable-derived and is hydrophobic in nature. It functions as an occlusive moisturizer and is extremely emollient and substantive to skin. **PELEMOL® ODR** has both a double bond and hydroxy functionality. It could be expected to, and, in fact, exhibits a broad range of solubility characteristics. It can function as a pigment grinding aid and its solvency in castor oil, cyclomethicone, and other esters make **PELEMOL® ODR** of great interest for use in lipstick and in color cosmetics in general.

PELEMOL® PTL is a 100% active vegetable/synthetic-derived tetraester. Its appearance can be described as an opalescent soft paste. It is very hydrophobic, lubricious, and substantive to skin, functioning as an occlusive emollient. **PELEMOL® PTL** is readily dispersible in castor oil, in cyclomethicone, and in other esters.

PELEMOL® PHS-8 is a 100% active, all vegetable-derived polyester. It is a viscous, substantive, yellow liquid at ambient temperatures and as with any polymer, will tend to fractionate on cooling. Product clarity and homogeneity is restored on heating and stirring with no adverse effect on the product. **PELEMOL® PHS-8** has many nucleophillic sites and, although oil soluble, will complex water via hydrogen bonding on the skin surface. It will, therefore, function as a skin conditioner and humectant. Its substantivity and solubility profile strongly suggests its use in color cosmetics. **PELEMOL® PHS-8** also functions as a superior pigment wetting, grinding, and coating agent.

PELEMOL® TGC is a clear, oil-soluble, slightly yellow, slightly viscous triester. It is, in fact, surprisingly low in odor for a citrate triester. It is substantive to skin and extremely emollient. The hydroxyl functionality in **PELEMOL® TGC** makes it a uniquely effective wetting agent for pigments. In addition to its compatibility with castor oil, **PELEMOL® TGC** is a very effective pigment wetting and grinding vehicle for anhydrous pigment systems containing mineral oil, petrolatum, and/or microcrystalline wax due to **PELEMOL® TGC's** compatibility with hydrocarbons. **PELEMOL® TGC** also has the unique property of being miscible with cyclomethicone, the resulting solution being extremely "silky" and soft in feel.

PELEMOL® TISC is a viscous, slightly yellow, 100% active liquid, triisostearyl ester of citric acid. Citric acid is a tetrafunctional molecule containing three carboxy and one hydroxy group. In **PELEMOL® TISC**, the three carboxy groups are esterfied leaving a free hydroxy group. This free hydroxy group creates a degree of hydrophilicity, facilitating emulsification and wetability. **PELEMOL® TISC** is soluble in most vegetable and mineral oils, esters, and cyclomethicone. It is insoluble in water, ethanol, and glycols. **PELEMOL® TISC** is all vegetable-derived.

PELEMOL® GTHS is a modified hydrogenated Castor Oil that functions as an effective rheological modifier in cosmetic formulations. Rheological modifiers for cosmetic applications containing oils are a challenging proposition and continue to be challenging for the formulator attempting to achieve cosmetic efficacy. Most cosmetic compositions are thickened by clays, fumed silica and structuring waxes, of which, clays are most commonly used. The usage level and processing are formulation dependent.

PELEMOL® D3GP is a new developmental mixed ester specifically targeted for use in lipstick applications. **PELEMOL® D3GP** is a 100% vegetable-derived functional equivalent to animal based mixed alkyl cholesterol and lanosterol based esters that are used in lipstick.

PELEMOL® DISM is a liquid diester of an alpha hydroxy acid. This ester exhibits excellent skin feel characterized by cushion and emolliency leaving the skin soft and supple. **PELEMOL® DISM** is oil and silicone soluble and can be formulated with these materials in a variety of cosmetic products. **PELEMOL® DISM** is suitable for lipstick and lip products as well as make-up and skin formulations. Recommended use levels: 2 – 10%.

PELEMOL® P-810 is the diester formed by the reaction of 1,3-propanediol and caprylic/capric acids. It is a 100% active, easily pourable, clear, water-white, and virtually odorless liquid. **PELEMOL®P-810** is characterized by two significant properties, 100% vegetable-derived and extremely dry.

Pelemol Esters continued after the chart...

Characteristics of Phoenix Chemicals Lipstick Products

Products	Gloss	Moisturizer	Natural	Cushion	Occlusive Humectant	Substantive	Conditioner	Pigment Wetting	Pigment Dispersing
Pelemol BB			●						
Pelemol CR		●	●				●		
Pelemol DISA		●					●		
Pelemol D-899	●			●		●			
Pelemol D3GP	●		●	●					
Pelemol DISM				●		●			
Pelemol DP-72	●	●				●	●		
Pelemol GTAR	●			●				●	
Pelemol ICB		●				●	●		
Pelemol II	●								
Pelemol ISB		●	●				●		
Pelemol ISHS	●		●		●		●		
Pelemol ODR						●	●		
Pelemol P-810			●						
Pelemol PTL		●							
Pelemol PHS-8	●	●	●			●			
Pelemol P3D	●		●						
Pelemol 6GPR	●		●					●	
Pelemol DD	●		●	●		●			
Pelemol GTIS	●		●	●					
Pelemol D5R-V	●		●	●					
Pelemol T91854	●		●		●		●		●
Pelemol TGC				●				●	●
Pelemol TISC				●				●	●
Pelemol TT			●				●		
Pelemol VL		●	●	●	●	●	●		
Pelemol D-2000	●	●	●		●	●			
Pelemol. GTHS		●	●						
Pelemol 3G22			●						
Pelemol DISD			●						
Pelemol DO			●	●		●	●		
Pelemol DP-144B	●	●		●	●	●	●		
Phoenate COPA								●	●
Giovarez AC-5099M	●								
Giovarez 1800	●								
Giovarez BTB-50									
Goivarez P-0580									
Pecosil AS-16		●							
Pecosil AS-18		●							
Pecosil AS-22		●							
Pecosl AS-26		●							
Pecosil ARS-09	●	●							
Pecosil ARS-12		●							
Pecosil F-112				●	●	●			
Pecosil DB		●			●				
Pecosil DCU		Coupling Agent							
Pecosil FSH -150									
Pecosil FST-300									
Pecosil FST-412									
Pecosil FSL-150									
Pecosil FSL-300									
Pecosil FSU-150									
Pecosil FSU-300									

Film Former	Lubricious	Odorless	Tasteless	Slip	Barrier	Rheology Modifier	Mold Release	Improves Spreadability	Emollient
						●			●
	●								●
	●								Light
						●			●
		●	●						●
		●							Silky
●	●				●				●
	●								
	●	●	●						Dry-Med
								●	Light
	●								Very
									Mildly
	●								Non-Oily
		●	●						Dry
	●								
									Tacky
	●								
		●	●						Very
									Viscous
									Light
	●							●	Buttery
	●				●				●
		●	●		●				Tacky
						●			●
	●					●			●
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	●			●	●		●	●	
	●			●	●		●	●	

PELEMOL® ESTERS continued

PELEMOL®P3D is a 100% vegetable polyester derived from 1,3 propanediol and dimer dilinoleic acid. It is a 100% active, slightly yellow, pourable liquid. **PELEMOL® P3D** is slightly tacky, substantive, glossy and has no taste or odor. Its solubility in castor oil and esters make it an ideal ester for lipsticks, lip balms and other lip products. Additionally, **PELEMOL® P3D's** insolubility in water and alcohol contributes to long wear properties in leg make-up and sunscreen products.

PELEMOL® D5R-V has been developed as an effective replacement for Cyclomethicone D_5. **PELEMOL® D5R-V** is composed of a scientifically chosen blend of **PELEMOL® P-810** (Propanediol Dicaprylate/Caprate) and **PELEMOL® DISM** (Diisostearyl Malate) to achieve identical flow, spreadability, initial feel, softness and cushion on rub-in that is associated with Cyclomenticone D_5.

PELEMOL® T91854 is the polymeric ester principally composed of the reaction product of isostearyl alcohol and trilinoleic acid. It is a dark amber liquid and has no taste and virtually no odor. **PELEMOL® T91854** is very emollient and extremely glossy on skin. Its properties strongly suggest its use in lipstick, lip products and in color cosmetics as a pigment dispersant. **PELEMOL® T91854** is an occlusive skin conditioning and viscosity increasing agent. **PELEMOL® T91854** is 100% vegetable-derived.

PELEMOL® VL is a clear, slightly yellow, 100% active liquid mixed ester. It is developed as a 100% vegetable-derived replacement for lanolin oil. **PELEMOL® VL**'s tactile properties, physical properties, and solubility characteristics make it a very viable candidate to replace lanolin oil.

PELEMOL® 3G22 is a 100% active, solid, all vegetable-derived monoester of behenic acid and polyglycerin-3. As such, each molecule contains four unreacted, free hydroxy groups at one end and one long C_{22} alkyl moiety as a behenate ester at the other end.

PELEMOL® DISD is the diester formed by the reaction of isosteryl alcohol and dimer dilinoleic acid. It is a 100% vegetable-derived, light yellow, clear liquid at ambient temperatures. **PELEMOL® DISD** owes its liquidity to its highly branched configuration. It is extremely emollient and exhibits considerable "playtime". **PELEMOL® DISD** is useful in color cosmetics such as lipstick, make-up, foundations, mascara and eye products.

PHOENATE® COPA is the monophosphate ester of castor oil and is offered as a 100% active clear, yellow, liquid. It functions as a pigment dispersing and coating agent. **PHOENATE® COPA** is anionic in character and will hydrogen bond with hydroxy groups on a pigment surface. The resultant castor oil coating enhances the pigments dispersibility in castor oil and other oily phases.

GIOVAREZ® TRANSFER-RESISTANT POLYMERS

are film formers that dry to a water- insoluble film. These glossy, water in-soluble films are highly effective in transfer-resistant systems. Recommended use level is approximately 5%.

GIOVAREZ® 1800 is the homopolymer of octadecyl vinyl ether. It is a 100% active, water- insoluble, waxy, nonionic resin. When cast on a glass plate from a molten state, it forms a continuous, glossy, somewhat soft film. Since it melts at about 45ºC, it can easily be incorporated into waxes where it can be utilized as a melting point depressant.

GIOVAREZ® AC-5099M is a 50% solution of an acrylic polymer (Cyclo Alkyl Methacrylate Copolymer) in Permethyl™ 99AD (Isododecane, Permethyl Corp.). It is a clear, almost water-white liquid, which dries to a glossy, continuous, hard, water-insoluble film. When formulated into cosmetic products, the polymer film becomes more flexible due to oils and esters present in the formulated product which act as plasticizers for the acrylic film.

GIOVAREZ™ BTB-50 is a 50% solution of an acrylic polymer (Alkyl Methacrylate Copolymer) in Permethyl 99AD (Isododecane, Permethyl Corp.). It is a clear, almost water-white liquid, which dries to a glossy, clear, continuous, hard but flexible, water-insoluble film. When formulated into cosmetic products, the polymer film becomes more flexible due to oils and esters present in the formulated product which act as plasticizers for the acrylic film.

GIOVAREZ™ P-0580 is a unique *solvent- free* 35% polyurethane emulsion. Aliphatic based and free of isocyanate monomers, **GIOVAREZ™ P-0580** forms a tough yet flexible coating. Moreover, it exhibits excellent non-yellowing UV stability and is compatible with water-based acrylics. The product forms a high gloss, abrasion resistant coating which is derived from a low viscosity easy-to-apply aqueous emulsion.

PECOSIL® SILICONES

PECOSIL® AS-A Series
These products comprise a series of alkyl or alkyl aryl polydimethyll siloxane waxes wherein alkyl or alkyl/aryl functionality varies to produce waxes of different consistency which is used to modify feel and import various properties to cosmetic products.

The products are described as:

	PHYSICAL FORM	INCI	CAS NO.	EINECS
PECOSIL®AS-16	Liquid	Cetyl Dimethicone	191044-49-2	Polymer Exempt
PECOSIL®AS-18	Liquid to Paste	Stearyl Dimethicone	67762-83-8	Polymer Exempt
PECOSIL® AS-22	Gel	Behenyl Dimethicone	820212-36-0	Polymer Exempt
PECOSIL®AS-26	Soft wax	Cerotyl Dimethicone	820212-37-1	Polymer Exempt
PECOSIL® ARS-09	Liquid	Phenylisopropyl Dimethicone	68037-77-4	Polymer Exempt
PECOSIL® ARS-12	Liquid	(Proposed) Lauryl Phenylisopropyl Dimethicone	N/A	Polymer Exempt

The **PECOSIL® AS** series are also used for the following purposes: eliminating syneresis, as lubricants in deodorants sticks, to improve mold release for lipstick and soap bars, as bonding agents for hot pour or pressed powder, application where "slip" is desirable, imparting barrier properties to enhance moisturizing in creams, lotions, water resistancy in sunscreen products, and high gloss in lipsticks particularly with the use of **PECOSIL® ARS-09**.

The **PECOSIL® FS Series**

PECOSIL® FSL-150, FSL-300, FSH-150, FSH-300, FSU-150, FSU-300 a line of fluorinated organo-functional silicones.

PECOSIL® FS fluorosilicones are both hydrophobic and oleophobic, whereas dimethicone is only hydrophobic. **PECOSIL® FSL** and **FSH** therefore would be preferentially used in sunscreens for sweat proof products (oil repellency), hair shampoos and conditioners for sebum control and quick drying.

In color cosmetics, the **PECOSIL®** fluorosilicone series would contribute to long wear cosmetics, particularly foundations and blushes, where oil control (sweat proofing) is critical. Use of these products is also dictated in long wear lipstick where their hydrophobic and oleophobic nature produces desired results.

Additionally, **FSL-150** has more elegant, silky and luxurious tactile properties than dimethicone. With the ability to vary the length of the silicone backbone (n and m) and the number of fluorine atoms per molecule (m and x), we are able to produce cosmetic raw materials with a range of viscosities and aesthetics.

PECOSIL® DCU is a clear, liquid, 100% active silicone ester. In addition to imparting silicone emolliency and "cushion" in skin formulations, it possesses the special property of being miscible with both water and castor oil. It can also function as a silicone-water coupling agent.

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