PLANDOOL™

100% Plant Derived Esters

Your Beauty Partner
Nippon Fine Chemical



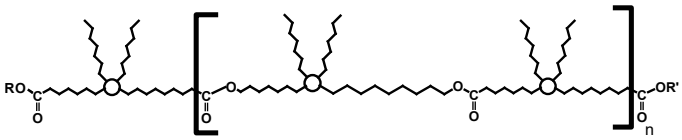
PLANDOOL™ G (Non-GMO) and H

Lanolin Alternative Esters

PLANDOOL™-G (Non-GMO)



INCI Name:
Bis-Behenyl/Isostearyl/ Phytosteryl Dimer Dilinoleyl Dimer Dilinoleate



Appearance: White or very light yellow waxy paste

Properties:

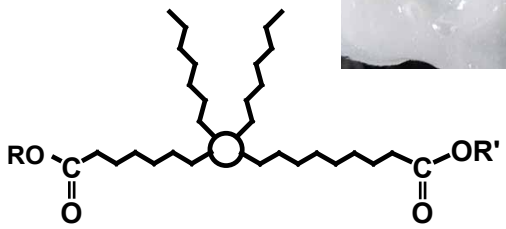
- Oligomer ester of dimer acid and dimer diol
- Unique moisture retention and richness
- High molecular weight material with melting point close to body temperature
- Adds unique smoothness to lip products
- Provides smoothness and moisture to hair; foam improvement in shampoos
- Adds gloss

Applications: Suncare, skincare, haircare & color cosmetics

PLANDOOL™-H



INCI Name:
Phytosteryl/Isostearyl/Cetyl/ Stearyl/Behenyl Dimer Dilinoleate



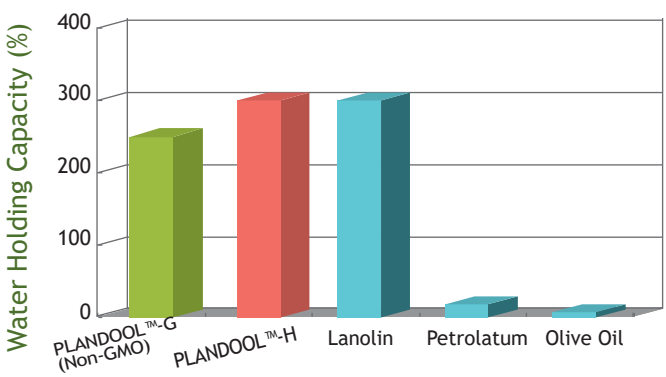
Appearance: Pale yellow paste

Properties:

- Lower molecular weight than PLANDOOL™-G, making it less greasy
- Provides moisture and controls adhesion to skin, hair and eyelashes
- Texture modifier for makeup & emulsion formulations
- Provides moisture to hair in rinse-off products
- Adds gloss

Applications: Suncare, skincare, haircare & color cosmetics

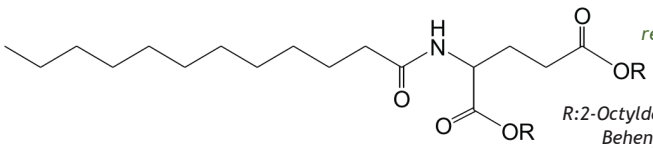
Water Holding Capacity



Procedure:
The test is conducted according to British Pharmacopoeia and water absorption capacity. Add 0.2-0.5 ml of water to 10g sample and knead. When water is no longer absorbed, this is the end point. Water holding capacity is shown as percentage of sample.

PLANDOOL™-LG Series

Amino Acid Esters



(PLANDOOL™ -LG1 representative structure)

R:2-Octyldodecanol, Phytosterol, Behenyl Alcohol residue

PLANDOOL™-LG1

INCI Name: *Phytosteryl/Behenyl/Octyldodecyl Lauroyl Glutamate*

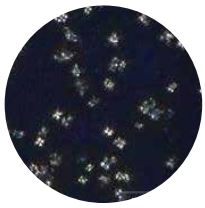
Appearance: White or light yellow solid wax

Properties:

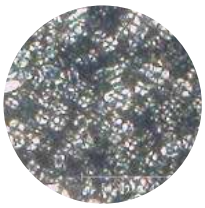
- Nippon Fine Chemicals original product
- Forms lamellar liquid crystals helping restoring skin barrier
- *Stratum corneum* repair ingredient

Applications: Suncare, skincare, haircare & color cosmetics

Conventional Product



PLANDOOL™-LG1



Excellent Lamellar creating ability; improves skin barrier function

Lamellar structure of PLANDOOL™-LG1 compared to a regular ester (polarized light)

PLANDOOL™-LG2



INCI Name: *Phytosteryl/Octyldodecyl Lauroyl Glutamate*

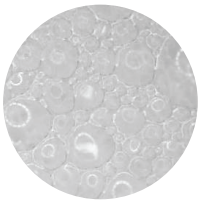
Appearance: Very light yellow liquid

Properties:

- Creates lamellar liquid crystals
- Provides moisture effects & skin barrier functions
- Improves foam quality

Applications: Suncare, skincare, haircare, color cosmetics & cleansing products

CONTROL



Rough foam

PLANDOOL™-LG2



Finer than control

Fine, rich and creamy foam; useful for face wash and cleansing agents

PLANDOOL™-LG3

INCI Name: *Phytosteryl/Behenyl/Octyldodecyl Lauroyl Glutamate*

Appearance: White or light yellow solid wax

Properties:

- Solid oil
- Creates lamellar liquid crystals
- Provides moisture effects & skin barrier functions

Applications: Suncare, skincare, haircare & color cosmetics

PLANDOOL™-LG4



INCI Name: *Phytosteryl/Behenyl/Octyldodecyl Lauroyl Glutamate*

Appearance: White or light yellow waxy paste

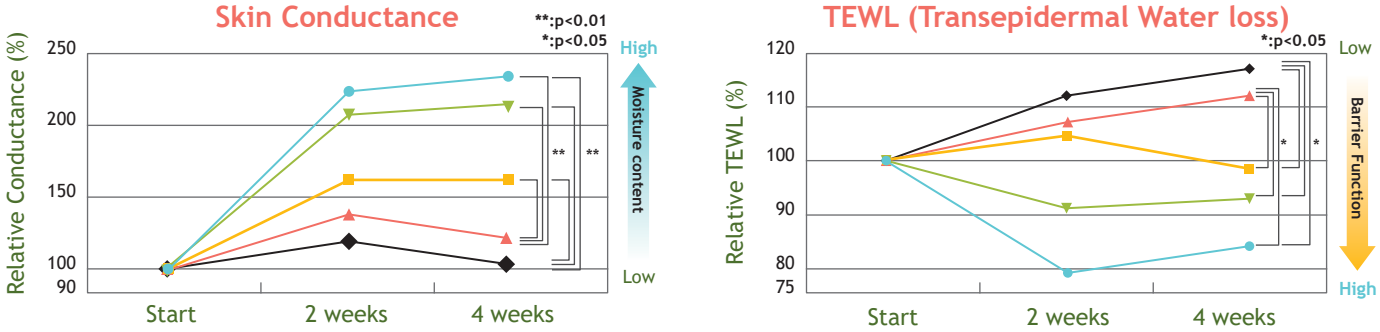
Properties:

- Create lamellar liquid crystals
- Provides moisture effects & skin barrier functions

Applications: Suncare, skincare, haircare & color cosmetics

Improvement of Skin Barrier Function

PLANDOOL™-LG Series reduces TEWL (Transepidermal Water Loss) and improves skin conductance (*Stratum corneum* moisture content).



Test Method:

PLANDOOL™ -LG1, -LG2, -LG3, and Liquid paraffin were added at 2% in four lotion samples. Along with a control formula, these samples were applied to the forearm of healthy human adults twice daily. Conductance of skin surface and TEWL were measured over time (20°C, 40%RH).

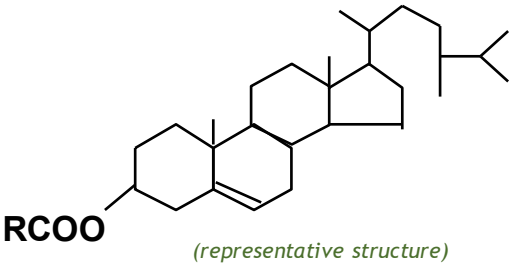
PLANDOOL™ PM

Phytosterol Esters

INCI Name: *Phytosteryl Macadamiate*

Appearance: White or light yellow waxy paste





(representative structure)

Properties:

- Similar structure to skin intercellular lipids for moisture barrier protection
- Excellent moisture and richness
- Creates lamellar liquid crystals at low temperature, close to body temperature
- High Water-holding capacity
- Improves moisture retention and TEWL
- Adds gloss

Applications: Suncare & skincare



Macadamia nuts

Melting Method of PLANDOOL™

- Place sample bottle in hot water or constant-temperature bath (higher than each melting point) *shown next*.
- Tighten the lid or sealed sample bottle and place in a plastic bag to prevent water from entering.
- Monitor melting condition with visual observation

Note: Heating above maximum recommended temperature may cause change in odor and/or color

Product Name	Melting Point (°C)	Maximum processing Temperature (°C)	Hot Hold (h)
PLANDOOL™ Lanolin Alternative Esters			
PLANDOOL™-G (Non-GMO)	~ 40	60~80	6~12
PLANDOOL™-H	~ 40	60~80	6~12
PLANDOOL™ Amino Acid Esters			
PLANDOOL™-LG1	~ 70	80~90	8~14
PLANDOOL™-LG2	N/A	Max 80	Max 8
PLANDOOL™-LG3	~ 60	70~80	6~12
PLANDOOL™-LG4	~ 50	60~80	6~12
PLANDOOL™ Phytosterol Esters			
PLANDOOL™-PM	~ 45	60~80	6~12

KHP-048
Beard Balm

Part 1

• **JOS10M5** - Kobo Products: *Simmondsia Chinensis (Jojoba) Seed Oil (And) Silica*	45.00%
• JOJOBA OIL - Vantage: *Simmondsia Chinensis (Jojoba) Seed Oil*	27.00%
• **KOBOGUARD® NATURAL 3000-CCT70** - Kobo Products: *Glyceryl Hydrogenated Rosinate (And) Caprylic/Capric Triglyceride*	4.00%
• LexFeel™ Natural - Inolex: *Heptyl Undecylenate*	4.00%

Part 2

• Ozokerite Wax White SP 1020P - Strahl & Pitch: *Ozokerite*	7.50%
• **PM WAX 82** - Toray/Kobo Products: *Polyethylene (And) Microcrystalline Wax*	3.50%
• **SunBoost ATB** - Kobo Products: *Argania Spinosa Kernel Oil (And) Tocopheryl Acetate (And) Bisabolol*	5.00%
• **PLANDOOL™-H** - Nippon/Kobo Products: *Phytosteryl/Isostearyl/Cetyl/Stearyl/Behenyl Dimer Dilinoleate*	2.00%
• **PLANDOOL™-LG2** - Nippon/Kobo Products: *Phytosteryl/Octyldodecyl Lauroyl Glutamate*	2.00%

Manufacturing Procedure

1. Add part 1 to main beaker heat to 80˚C prop mix at slow to moderated speed until uniform.
2. Add part 2 to main beaker prop mix until waxes have melted and batch is uniform.
3. Add part 3 to main beaker prop mix until uniform.
4. Pour into components at 70˚C.

Description

This beard balm well help condition facial hair and reduce roughness or itchiness. JOS10M5 is a blend of jojoba oil and silica that helps thicken the formula as well as moisturizes facial hair. KOBOGUARD® NATURAL 3000-CCT70 is a natural origin film former that helps increase the formulas wear. PM WAX 82 is one of the waxes used to give the formula its structure. PLANDOOL™-H and PLANDOOL™-LG2 are two plant based lanolin alternatives that work as emollients and moisture barriers. Lastly SunBoost ATB is a proprietary ratio of anti-oxidant, anti-irritant and anti-inflammatory agent that conditions the facial hair.

KLG-124A
Hydrating Lip Balm

Part 1

• **PLANDOOL™-H** - Nippon Fine Chemical/Kobo Products: *Phytosteryl/Isostearyl/Cetyl/Stearyl/Behenyl Dimer Dilinoleate*	32.00%
• COSMOL™ 222 - Ikeda Corp.: *Diisostearyl Malate*	16.00%
• **KOBOGUARD® NATURAL 3000-CO55** - Kobo Products: *Glyceryl Hydrogenated Rosinate (And) Ricinus Communis (Castor) Seed Oil*	13.00%
• **HL7M5** - Kobo Products: *Hydrogenated Polyisobutene (And) Silica*	10.50%
• **LUSPLAN™ DD-DA7** - Nippon Fine Chemical/Kobo Products: *Dimer Dilinoleyl Dimer Dilinoleate*	8.00%
• EUTANOL G - BASF: *Octyldodecanol*	5.50%
• Silkflo® 364 - Vantage: *Hydrogenated Polydecene*	4.00%
• Shea Butter - Jeen International: *Butyrospermum Parkii (Shea) Butter*	3.00%
• Microcrystalline Wax SP-89 - Strahl & Pitch: *Microcrystalline Wax*	2.50%
• **Hyacharming®** - Focus Freda/Kobo Products: *Sodium Hyaluronate (And) Ricinus Communis (Castor) Seed Oil (And) Hydrogenated Castor Oil (And) Tocopherol*	1.00%

Part 2

• Jeenate® 4SW - Jeen International: *Synthetic Wax*	1.50%

Part 3

• **SunBoost ATB Natural** - Kobo Products: *Argania Spinosa Kernel Oil (And) Tocopheryl Acetate (And) Bisabolol*	2.00%
• D Panthenol - DSM: *Panthenol*	1.00%

Manufacturing Procedure

1. Combine part 1 and heat to 90-95˚C while prop mixing until homogeneous.
2. Cool to 70-79˚C, then add part 2.
3. Cool batch to 70˚C and add part 3.

Description

This lip balm is formulated to nourish and hydrate with a rich, buttery texture and natural ingredients, designed to soothe and soften lips with a glossy, non-sticky finish. It features PLANDOOL™-H, a lanolin replacement ester that provides adhesion and locks in moisture. The formula also contains HL7M5, which adds gloss, stability, and helps suspend particles. The plant-derived ester LUSPLAN™ DD-DA7 contributes to the glossy finish. The film-former KOBOGUARD® NATURAL 3000-CO60 serves as a natural alternative to hydrogenated polyisobutene, improving texture while enhancing moisture retention and protection. Hyacharming®, an ultra-fine sodium hyaluronate dispersed in oil, enhances the moisturizing feel of the balm. Additionally, SunBoost ATB Natural is a combination of argan oil, bisabolol, and vitamin E that improves sun protection while also nourishing, conditioning, and soothing the lips.