



### Spider Ester ESO Treatment Butter with Beta Hydroxy Acid & Vitamin E

<u>Component</u>	<u>wt %</u>
Shea Butter	69.0
Spider Ester ESO	20.0
Beeswax	5.0
Salicylic Acid	1.0
Tocopherol Vitamin E	1.0
Silica Cab -O-Sil M-5	4.0

#### Procedure:

1. Heat Shea Butter, Spider Ester and Beeswax to 55°C until Beeswax is completely melted.
2. Add Salicylic Acid, Tocopherol Vitamin E and Silica Cab-0-Sil M-5 and cool.

### Spider Ester ESO Lip Balm with SPF & Vitamins

<u>Component</u>	<u>wt %</u>
Petrolatum	63.65
Spider Ester ESO	10.00
Ascorbic Acid Vitamin C	0.10
Octyl Methoxycinnamate	7.50
Octocrylene	7.00
Oxybenzone	6.00
Octyl Salicylate	5.00
Tocopherol Vitamin E	0.25
Grapefruit Fragrance	0.50

#### Procedure:

1. Disperse the Vitamin C in the Spider Ester.
2. Melt Petrolatum and add sunscreens and Spider Ester/Vitamin C mixture.
3. When product is clear add Vitamin E and Fragrance.
4. Cool and Fill

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#### DISCLAIMER

We believe that the information in this technical data sheet is an accurate description of the typical uses of the product. However, we disclaim any liability for incidental or consequential damages, which may result from the use of the product that are beyond its control. Therefore, it is the user's responsibility to thoroughly test the product in their particular application to determine its performance, efficacy and safety. Nothing contained herein is to be considered as permission or a recommendation to infringe and patent or any other intellectual property right.

Spider Ester® is a registered trademark of SurfaTech Corporation. Spider Esters® are covered by U.S. Patent 7,569,607, U.S. Patent 7,473,707; U.S. Application 20080319069; U.S. Application 20090170943; U.S. Application 20090171057; others pending.



# SPIDER ESTERS®

## TECHNICAL DATA SHEET

### POLAR OILS?

One of the first concepts that we learn in chemistry is polarity. Specifically the expression “likes dissolve likes”. If you put oil and water in the same beaker and stop mixing, they will separate into two phases very quickly.

One approach to keep oil and water in one phase is to make emulsions. To achieve this chemists have developed surfactants, which possess both water-soluble and oil-soluble portions in the same molecule.

Many surfactants are “soluble” in water, meaning they produce clear “solutions”. However, surfactant concentration in solution is not uniform throughout the solution. It is highest at the interfaces and in micelles, for exactly the same reason water and oil separates (lowest free energy state). Surfactants rotate or twist at the surface assuming the conformation that results in the lowest free energy. Surfactants provide surface tension reduction, emulsification, wetting and detergency.

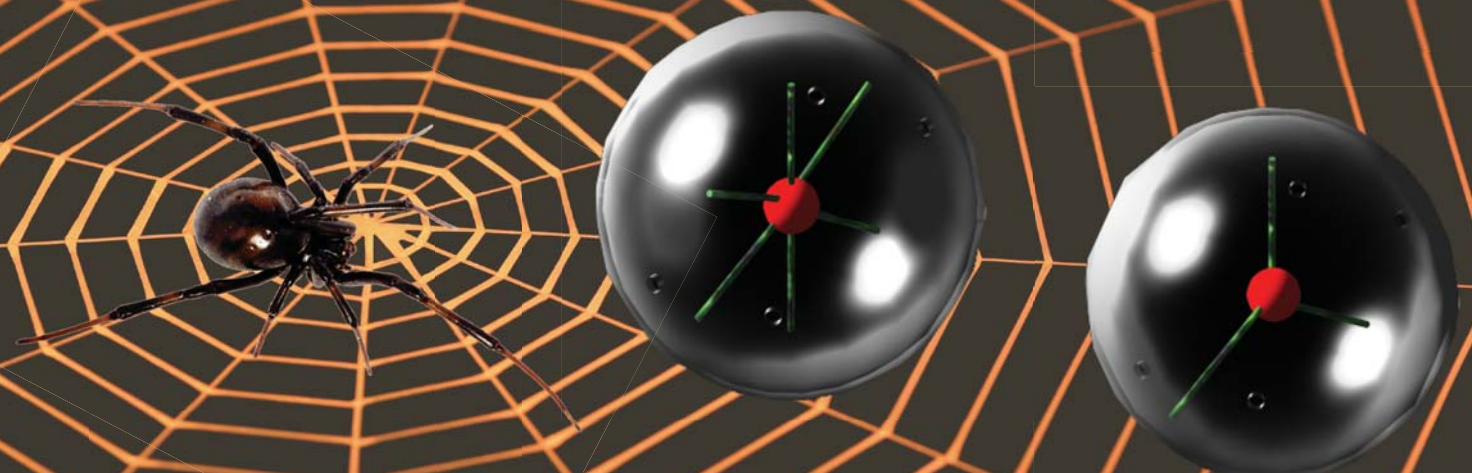
Now imagine a molecule where the structure, makes it impossible to rotate or twist. Such a molecule would not be a surfactant despite the presence of

water-soluble and oil-soluble portions of the molecule. Such products do not reduce surface tension, are water insoluble, and have a great affinity for polar phases. In short they are polar oils.

Spider Esters are such molecules. Their structure at lowest free energy is a sphere. The sphere is made up of three portions; a polar core holding polar legs and a non-polar fatty cap. This structure allows for entrapment of polar materials in an oil phase. The unique thing about these products is that when they are heated the polar legs expand and allow gaps in the outer non-polar layer of the sphere. Polar actives are attracted inside the sphere to their lowest free energy, which is up against the polar legs. Then by cooling the sphere closes and the polar materials become entrapped.

The stylized structure below demonstrates the effect.

SPIDER STRUCTURE



“The ability to formulate polar actives into oil phases for release to the hair and skin offers the formulator significant opportunities to make new products.”

## SPIDER ESTER SOLUBILITY

Solvent (10% Weight)	Spider Ester™ ESO	Spider Ester™ GEC
Water	Milky	Milky
Propylene glycol	Translucent	Translucent
Isopropanol	Soluble	Soluble
Sorbitol	Translucent	Soluble
Cyclomethicone	Translucent	Translucent
Sunflower Oil	Soluble	Soluble
Isododecane (99A)	Soluble	Soluble

## ACTIVES SOLUBILIZED

Spider Esters® solubilize:

- Sun Screens
- Antioxidants
- Enzymes
- Salicylic Acid
- Vitamins
- DHA
- Peptides
- Drugs

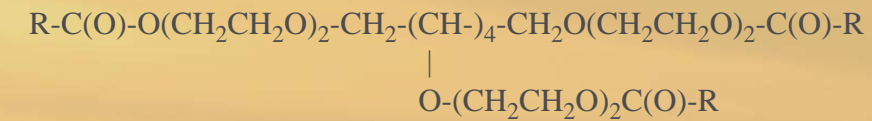
## INCI REGISTERED PRODUCTS

SurfaTech® Name	INCI Name
Spider Ester® ESO	Sorbeth-2 Hexaoleate
Spider Ester® GEC	Glycereth-6 Tricocoate

## REPRESENTATIVE PRODUCTS

### Spider Ester® ESO

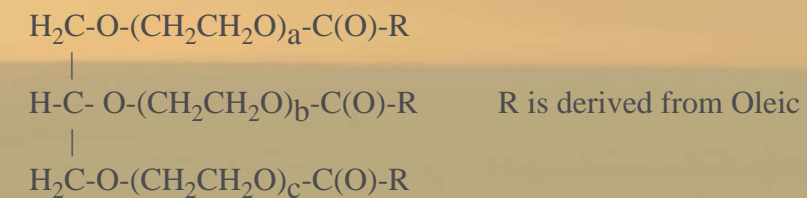
INCI: Sorbeth-2-hexa-oleate



R is derived from Oleic.

### Spider Ester® GEC

INCI: Glycereth 6 tricocoate



## FORMULATIONS

Spider Ester GEC	Sunscreen Stick
Component	wt %
Silsurf Resin 5580	12.50
Microcrystalline Wax 190/195	3.25
Ozokerite 1070	16.50
Spider Ester GEC	15.00
Silsurf 208-612	4.00
Isostearyl Neopentionate	23.75
Octocrylene	7.50
Oxybenzone	3.00
Avobenzon	2.00
Silica Spheres MSS-500	12.50

Procedure:

1. Add first 6 ingredients to Vessel and heat until waxes melt.
2. Add Sunscreens and mix until uniform.
3. Add Silica Spheres and mix until uniform.

“Once entrapped in the spider molecule the material contained therein is released based upon partition coefficient. The active establishes an equilibrium with the oils on the skin.”

