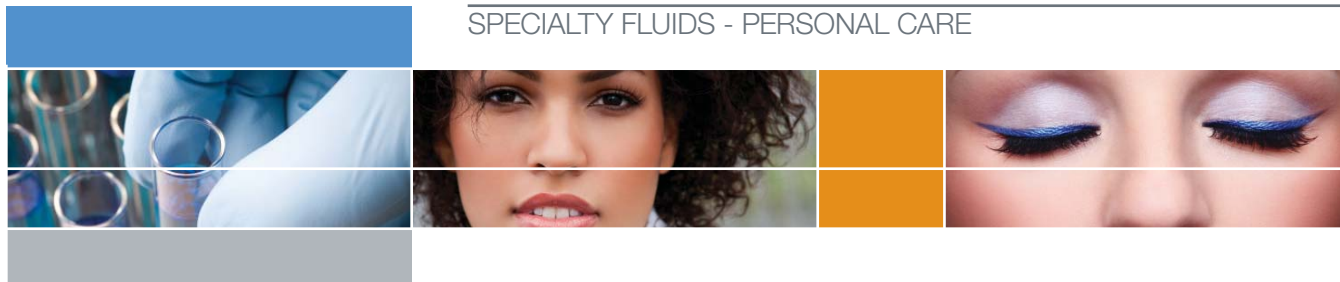


SILSOFT* 034 organosilicone fluid

SPECIALTY FLUIDS - PERSONAL CARE



Silsoft 034 organosilicone fluid may be an excellent candidate for use in personal care applications to modify the feel and improve the spreadability of a variety of cosmetic oils. It allows formulations that contain vegetable oils, cosmetic esters, petrolatum or mineral oil to feel less greasy. Silsoft 034 organosilicone is an outstanding option in skin care products to provide a silky afterfeel and to reduce the rub-on time of lotions and creams. The reduced rub-on time is due to better spreading of the oil in the formulation. In color cosmetic formulations, it can provide a silky afterfeel and significantly improve the dispersibility of inorganic pigments in formulations that contain organic oils.

Silsoft 034 organosilicone is a low molecular weight, low viscosity polysiloxane modified with an octyl pendant group. This modification with an octyl group makes the product compatible with most cosmetic oils and waxes. The compact trisiloxane backbone portion of the molecule provides a silky feel and delivers the unique ability to spread oils. In addition, Silsoft 034 organosilicone helps to disperse inorganic pigments in organic oils.

Potential Applications

Skin Care – Silsoft 034 organosilicone is compatible with most oils used in skin care formulations. It may find potential use for a variety of skin care formulations to provide a soft, non-tacky afterfeel, uniform coverage and reduced rub-on time.

Color Cosmetic – Silsoft 034 organosilicone is very effective as a dispersant for many inorganic pigments in oils. It is especially effective in dispersing pigments in oils, which makes this product useful in color cosmetic formulations such as foundations, liquid make-up, mascaras and eye shadows.

Bath Oils and Tanning Oils – Silsoft 034 organosilicone may find potential use in oil-based products to provide a silky afterfeel, reduce tack and improve the spreadability of the formulations on skin.

Hair Treatments – Silsoft 034 organosilicone may find potential use in oil-based hair treatments to provide a non-greasy feel and improve the wetting and spreading of the formulations on hair.

Typical Physical Properties

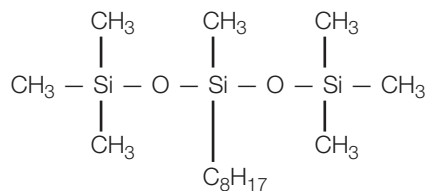
Appearance	Clear liquid
Viscosity @ 25°C, cSt	3
Pour Point, °C	-62
Flash Point, (ASTM D93), °C	110
Refractive Index n ²⁵ _D	1.413
Volatility 50°C	
8 hours, %	3.3
24 hours, %	6.2
5 days, %	22.7
Solubility (10%)	
Water	I
Ethanol	S
Isopropanol	S
White Mineral Oil (Gloria)	S
Cyclomethicone	S
Propylene Glycol	I
Isopropyl Myristate	S

I: Insoluble D: Dispersible S: Soluble

The INCI name for Silsoft 034 organosilicone fluid is: *Caprylyl Methicone*.

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Chemical Structure



Silsoft 034 organosilicone is composed of a compact trisiloxane backbone that provides a unique ability to spread oil and an alkyl pendant group that provides compatibility with most cosmetic oils and waxes.

Performance

A variety of personal care formulations can benefit from the performance characteristics of Silsoft 034 organosilicone fluid. Outlined below are the major performance characteristics:

- can provide a silkier afterfeel to personal care formulations that otherwise have a tacky or greasy feel
- improves the spreadability and the surface coverage of vegetable oils, cosmetic esters, petrolatum and mineral oil in personal care formulations by lowering the surface tension of the oil
- reduces the rub-on time of creams and lotions by enhancing the spreading of the oil in the formulations
- can improve the dispersibility of fine solids, such as pigments and inorganic sunscreens, in organic oils

The performance of Silsoft 034 organosilicone fluid may be formulation dependent.

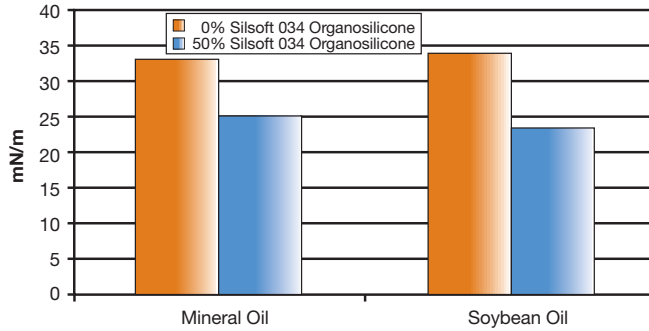
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Performance Data

Silsoft 034 organosilicone has the ability to lower the surface tension of mineral oil, vegetable oil and cosmetic esters, which improves their ability to spread.

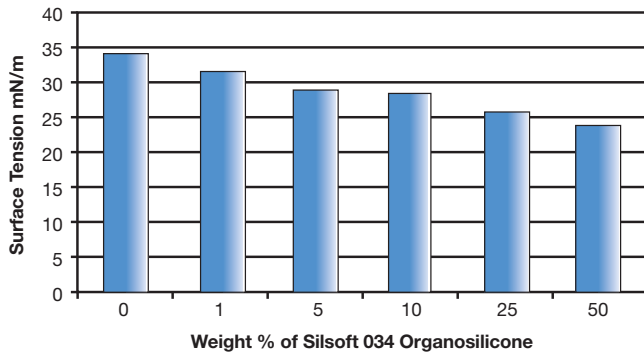
The graph below illustrates that the surface tension of mineral oil and soybean oil can be lowered by using Silsoft 034 organosilicone.

Figure 1: Effect of Silsoft 034 Organosilicone on the Surface Tension of Oils



This next chart illustrates that Silsoft 034 organosilicone can be used effectively at a 1.0-5.0% level to achieve surface tension reduction.

Figure 2: Surface Tension of Soybean Oil as a Function of Silsoft 034 Organosilicone Concentration

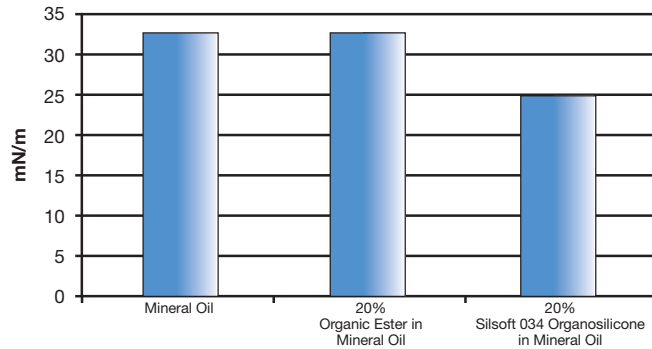


SILSOFT* 034 Organosilicone Fluid

Performance Data (continued)

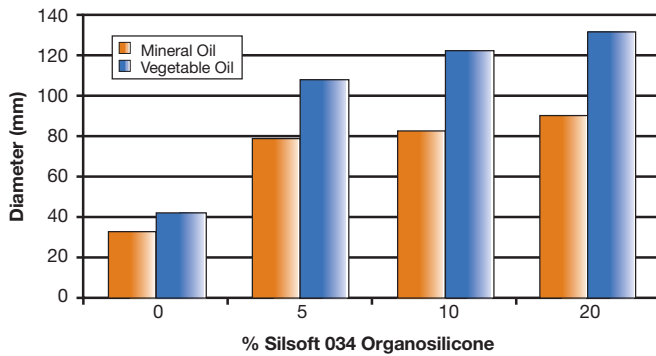
Surface tension reduction of oils corresponds to important end use characteristics such as ease of application, spreading and uniform coverage. Silsoft 034 organosilicone is more effective at lowering the surface tension of mineral oil than other organic esters that are commonly used in cosmetic formulations. The graph below shows how Silsoft 034 organosilicone lowers the surface tension of mineral oil better than other organic esters.

Figure 3: Equilibrium Surface Tension



This next chart illustrates that Silsoft 034 organosilicone has the ability to enhance the spreading of mineral oil and vegetable oil.

Figure 4: Effect of Silsoft 034 Organosilicone on the Spreadability of Oils



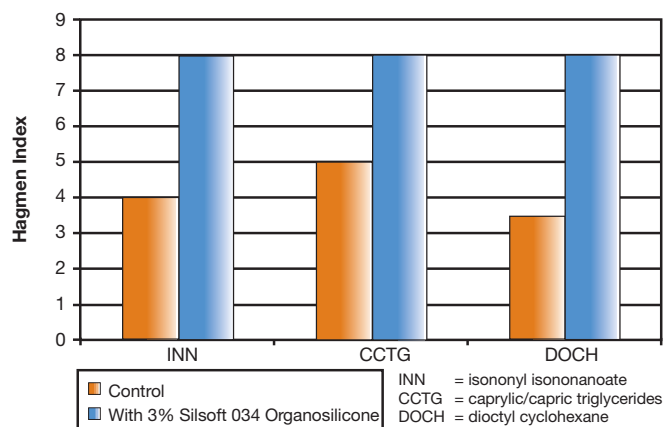
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Performance Data (continued)

Silsoft 034 organosilicone also enhances the dispersion of solids and pigments in a variety of oils. It is especially effective for dispersing pigments and inorganic sunscreens.

In the evaluation below, dispersions were prepared by incorporating dry pigments (blend of iron oxides and zinc oxide) into mineral oil. Silsoft 034 organosilicone was used at a 1.0% level, based on the oil. Particle size was determined using a GRIND GAUGE and is reported using the Hegman Scale (1-coarse, 8-fine).

Figure 5: TiO₂ Dispersibility in Various Carriers



Model Formulations

Bath Oil

Description: Bath oil formulation that is water dispersible and provides a non-greasy afterfeel.

Formula:

Ingredients	Wt Percent
White Mineral Oil	80.0
Isopropyl Myristate	7.5
Oleth-2	7.5
Silsoft 034 Organosilicone	5.0
Fragrance	qs

Mixing Instructions: Combine the ingredients with good mixing. Mix until uniform.

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Performance Data (continued)

Foundation Cream

Description: Unique foundation cream formulation that exhibits uniform pigment delivery and good afterfeel.

Formula:

Ingredients	Wt Percent
Phase I	
Stearic Acid	12.0
Isopropyl Myristate	1.0
Glyceryl Monostearate	2.0
Polysorbate 60 NF	1.0
Sorbitan Monostearate	2.0
Phase II	
Propylene Glycol	12.0
Pigments ⁽¹⁾	10.0
Water	qs
Phase III	
Silsoft 148 Silicone	2.0
Silsoft 034 Organosilicone	2.0
(1) Pigment Composition:	
Microna Matte White	79.6 parts
Red	9.6
Yellow	9.8
Black	1.0

Mixing Instructions: Heat Phase I to 65°C (149°F), add Phase II with mixing, followed by Phase III. Cool to 35°C (95°F), continue mixing.

Waterproof Mascara Remover

Description: Waterproof mascara remover formulation that exhibits effective spreading and wetting on skin, which enhances mascara removal.

Formula:

Ingredients	Wt Percent
Phase I	
Stearic Acid	12.0
Isopropyl Myristate	1.0
Glyceryl Monostearate	2.0
Polysorbate 60 NF	1.0
Sorbitan Monostearate	2.0
Phase II	
VS-7158 Volatile Silicone	20.0
Isopropyl Myristate	25.0
Silsoft 034 Organosilicone	1.5

Mixing Instructions: Mix components of Phase I and Phase II separately. Combine the two phases. Optional ingredients such as water, oil soluble dye and fragrance can be included as needed.

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Patent Status

Technical subject matter in this publication is described and protected by one or more of the following U.S. Patents and their foreign counterpart patents and/or patent applications: U.S. Patent No. 5,561,099. Other U.S. and foreign patents and/or patent applications not listed covering the subject matter may be relevant.

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MOM-131-047-80E-GL 02/11 Printed in U.S.A.

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