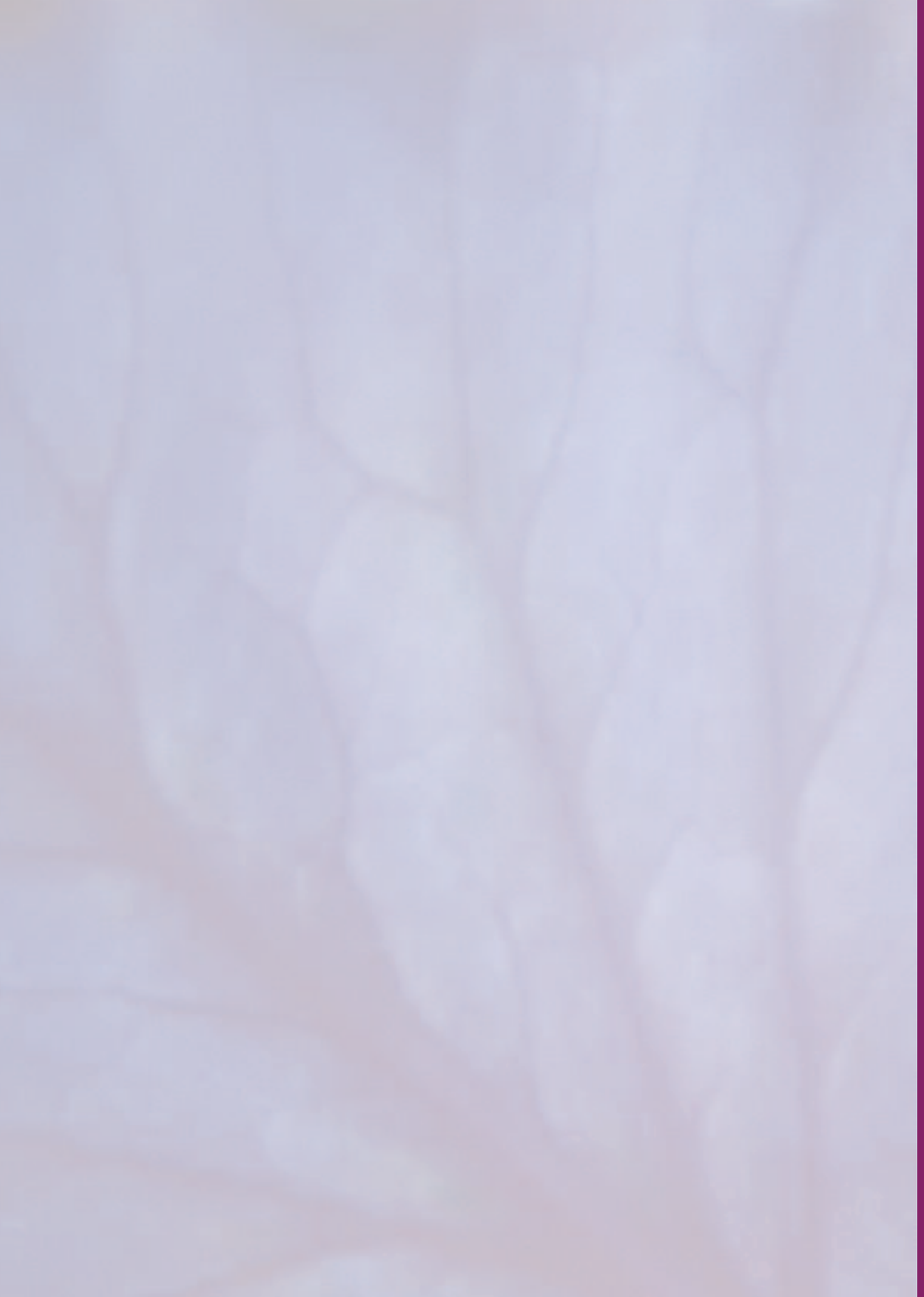
Exactly your chemistry.

Clariant

Functional Chemicals Division

Silicones for Personal Care

SilCare™ Silicones



SilCare™ Silicones for Personal Care

General Introduction

A new era of silicone performance is here. SilCare is a new line of silicone-based personal care ingredients that offers the personal care formulator new options in putting the mildness, substantivity and special feel of silicone to work in the next generation of consumer products. This line of organosilicones has been specially designed with the needs of the personal care formulator in mind, with patented new technologies that offer state of the art functionality.
The SilCare line – consisting of different fluids, waxes and actives, offers the best of both worlds: traditional silicone-based ingredients and next generation products that break new ground in creating perceivable benefits in consumer products.

The SilCare™ Silicones Range

	Trade Name SilCare™ Silicone	INCI-Name	Product Description	General Application
FLUIDS	15M60 15M50 15M40 15M30	Phenyl Trimethicone	Clear, colorless, high purity phenyl substituted silicone fluids in different viscosities (ranges 5 cs to 500 cs) and refractive indices (1.44 to 1.49)	· Skin Care · Hair Care · Hand and body creams and lotions · Suncare creams and lotions · Antiperspirants/Deodorants · Gel formulation · Color Cosmetics · Lipstick compositions · Bathing compositions · Shaving compositions · Makeup remover
	31M60* 31M50 31M40 31M30	Caprylyl Trimethicone	Clear, colorless, high purity caprylyl substituted silicone fluids in different viscosities (ranges 5 cs to 500 cs) and refractive indices (1.41 to 1.44)	
	41M10* 41M15 41M20* 41M30*	Hexyl Methicone Caprylyl Methicone Lauryl Methicone Stearyl Methicone	Clear, colorless and odorless high purity silicones that are compatible with most organic cosmetic ingredients with different volatilities (100% volatile to non-volatile) and alkyl substitution (range 25% – >30%)	
	1M71	Stearoxytrimethylsilane	Clear, colorless, odorless fluid, 95+% active liquid deliverable form of stearyl alcohol.	
WAXES	41M40* 41M50* 41M65 41M70 41M80 41M90	C20 – 24 Alkyl Methicone C24 – 28 Alkyl Methicone Stearyl Dimethicone C20 – 24 Alkyl Dimethicone C24 – 28 Alkyl Dimethicone C30+ Alkyl Dimethicone	White, odorless high purity alkyl substituted silicone waxes with different softening points (range 20°C – >70°C)	· Gel formulations · Oil thickener · Thickeners for Emulsions · Lipstick compositions · Antiperspirant/Deodorant cream and stick compositions
ACTIVES	180M10* 180M20 180M30*	Trimethylsilyl Trimethylsiloxy Lactate Trimethylsilyl Trimethylsiloxy Glycolate Trimethylsilyl Trimethylsiloxy Salicylate	Clear, colorless hydrophobic liquids with similar efficacy like hydroxy acids but with minimal irritation or inflammation	· Anti-aging skin care products · Anti-acne products
	1M75	Glycine Soja (Soybean) Oil and Retinoxytrimethylsilane	Clear, yellowish, odorless hydrophobic fluid, 12% active liquid derivative of retinol, readily soluble in most anhydrous cosmetic formulations	

* Products not registered in Europe (EINECS)

SilCare™ Silicone Fluids

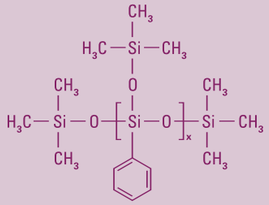
Your best choice of liquid silicones

SilCare Silicone fluids are high purity, colorless fluids for personal care formulations. They are silicone-hydrocarbon hybrids, which are ideally compatible with both hydrocarbon based and silicone base fluids. They combine the typical benefits connected with silicone fluids like shine, gloss, detackification, conditioning action and silky skin feel with ease of formulation. The low viscosity grades are excellent spreading agents with superior spreading compared to a purely hydrocarbon structure like dicaprylyl ether. Due to the wide range of viscosities, refractive indices, and degrees of organic substitution, Clariant can offer the cosmetic formulator the organosilicone fluid that is ideally suitable for the respective formulation.

Typical Properties

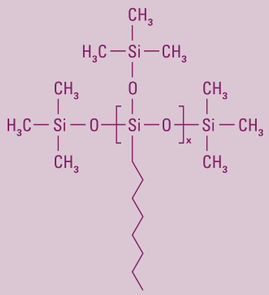
	Trade Name SilCare™ Silicone	Appearance	Molec. Weight	Visc. at 25°C in CS	Ref. Index at 25°C	Spec. Grav. at 25°C	Flashpoint °C
Phenyl Trimethicones	15M60	clear fluid		<5	1.44	0.92	116
	15M50	clear fluid		15 – 30	1.46	0.98	109
	15M40	clear fluid		50 – 200	1.47	1.00	180
	15M30	clear fluid		200 – 500	1.49	1.05	131
Caprylyl Trimethicones	31M60*	clear fluid		<5	1.41	0.84	106
	31M50	clear fluid		15 – 30	1.42	0.88	106
	31M40	clear fluid		50 – 200	1.43	0.92	110
	31M30	clear fluid		200 – 500	1.44	0.94	119
Alkyl Methicones	41M10*	clear fluid	306	~5	1.41	0.84	82
	41M15	clear fluid	334	~5	1.42	0.84	107
	41M20*	clear fluid	390	~10	1.43	0.83	>121
	41M30*	clear fluid	474	~25	1.44	0.83	>121
Stearoxytrimethylsilane	1M71	clear fluid			1.44	0.82	>131

* Products not registered in Europe (EINECS)



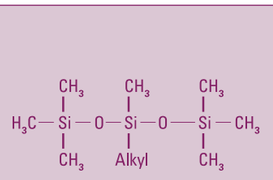
SilCare™ Silicone 15M60 – 30

These SilCare products are branched, phenyl substituted silsesquioxanes. The four products differ in their degree of polymerization, with SilCare 15M60 being the pure 100% volatile compound with n=1. The refractive index of this class of substances increases with increasing viscosity with SilCare 15M30 having the highest refractive index of 1.49.



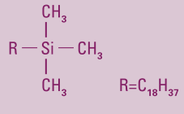
SilCare Silicone 31M60 – 30

These unique SilCare products are branched, n-octyl-substituted silsesquioxanes. The four products differ in their degree of polymerization. Typical sensory benefits, associated with silicones are obtained with this family of products. Structurally, they are strongly related to the well-known phenyltrimethicones, but they bear non-aromatic alkyl groups instead of a phenyl group.
Following the protocol of ASTM method E 1490-92 entitled "Sensory Evaluation of Materials and Products" a test panel was established at Clariant to compare the sensory properties of phenyl and caprylyl trimethicones. Although the sensory properties of both classes are comparable in the neat oil phase at comparable viscosities, in emulsion significant differences can occur, with the caprylyl trimethicones generally showing a "drier" emollience compared to the corresponding phenyl trimethicones.



SilCare Silicone 41M10 – 30

These SilCare products are linear alkyl methyl siloxanes with a trisiloxane structure. Depending on the chain length of the pending alkyl group, volatility and occlusivity will vary.
SilCare 41M10 and 15 will completely volatilize, leaving no silicone residue. They can be used to replace D5/D6 cyclomethicone in formulations.



SilCare Silicone 1M71

SilCare 1M71 stearoxytrimethylsilane is a clear, odorless and colorless fluid. This product is a 95%+ active liquid deliverable form of stearyl alcohol, which is readily soluble in most organic cosmetic formulations at room temperature, with no preheating required. SilCare 1M71 can be used to thicken emulsions of O/W type and makes it possible to include stearyl alcohol in formulations, which are not stable if stearyl alcohol is used as a starting material. Additionally, the formulations also exhibit higher gloss.

Compatibility

SilCare™ Silicone alkylsilicone fluids are compatible with most ingredients typically used in cosmetic formulations, and therefore are very easy to formulate. They are compatible in any proportion with ethanol (95%), isopropanol, longer chain alcohols up to stearyl alcohol, aliphatic solvents (e.g. heptane), mineral oil, long chain esters (e.g. isopropyl myristate), alkyl methicones, alkyl dimethicones, cyclomethicones and low viscosity dimethicones.

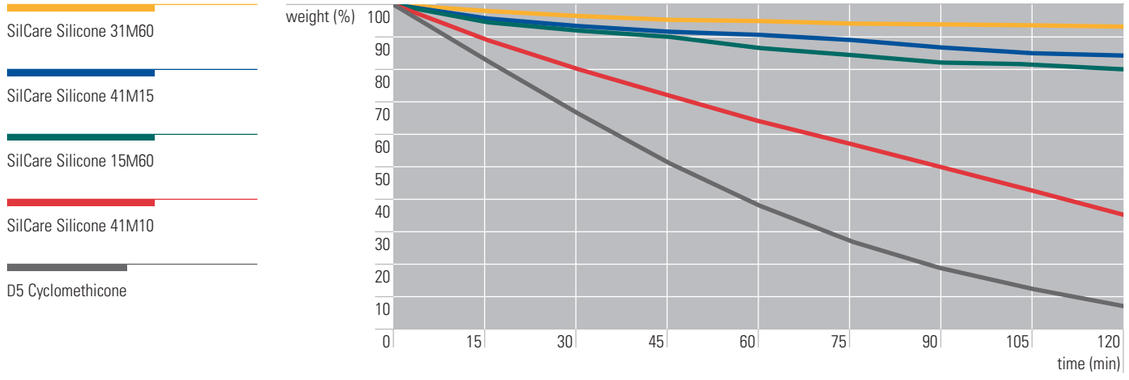
Compatibilization

SilCare alkylsilicone fluids can be used to compatibilize cosmetic base oils which are normally not miscible with each other. This behavior is especially pronounced for SilCare 15M60, 15M50, 31M60, 31M50, 41M10 and 41M15. By addition of a small amount (10 – 15%) of alkylsilicone fluid it is possible to mix incompatible fluids like dimethicone 50 cst and low viscous mineral oil. Thus, alkylsilicones offer a cost effective way to create homogenious and stable emulsions.

Volatility

SilCare Silicones 15M60 (phenyl trimethicone), 31M60 (caprylyl trimethicone), 41M10 (hexyl methicone) and 41M15 (caprylyl methicone) are completely volatile and leave no residue after evaporation. Fig. 1 shows a comparison of volatility (measured as weight loss on a thermogravimetric scale at 60°C) against cyclopentasiloxane. Due to their lower volatility a longer lasting temporary conditioning effect can be generated.

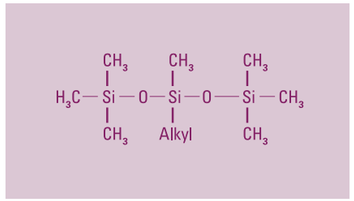
Fig. 1: Comparison of Volatility



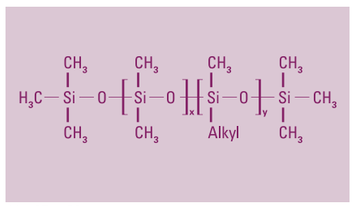
SilCare™ Silicone Waxes

Your way to sensorial enhancement

SilCare alkyl methicone and dimethicone waxes are white, odorless, chemically inert high purity alkyl substituted silicone waxes, which are compatible with most organic ingredients. With product softening points between 20°C and >70°C the variety of formulations where these types of waxes can be incorporated in order to achieve the typical sensory benefits associated with silicones is extensive. The typical features include the compatibility with silicones and many organic ingredients, the wide range of melting points, and the reduction of transepidermal water loss, all of which contribute to the value of the products in skin protection and substantivity to skin and hair. In skin care formulations all products will improve gloss, smoothness, detackification, emolliency, occlusion and water repellency. They can be used as viscosity builders in creams and lotions. The high melting waxes 41M70 – 80 may be used at minimum concentrations of 5% to gel a wide range of oil phases. The melt viscosities of the alkyl methicone waxes 41M40 – 50 are very low while the melt viscosities of the alkyl dimethicone waxes 41M70 – 80 range 5 – 10 times higher.



41M10 – 50



41M65 – 80

Typical Properties

Trade Name SilCare™ Silicone		Avg. Molec. Weight	Soft Point °C	Melt. Visc at SP +10°C	Spec. Gravity at 25°C
Alkyl Methicone / Dimethicone Waxes	41M40	530	~20	10cs	0.80
	41M50	586	~45	20cs	0.80
	41M65	1944	~30	20cs	0.85
	41M70	2224	>50	45cs	0.85
	41M80	2504	>60	80cs	0.85

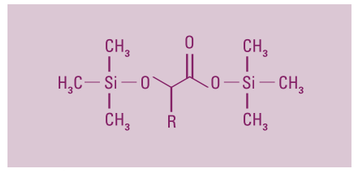
SilCare™ Silicone Actives

Your Choice of high performing actives

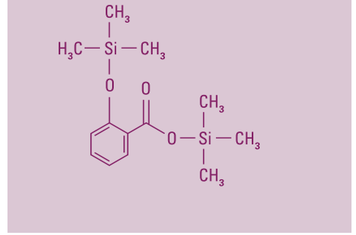
With the unique SilCare™ Silicones 180M10 – 30 and 1M75 Clariant offers a new era of silylated actives to the personal care market. All products provide excellent oil solubility, mildness, low irritancy and – last but not least – overall high performance.

SilCare Silicones 180M10 – 30

SilCare trimethylsilylated hydroxycarboxylates are bis-trimethylsilylated derivatives of their corresponding acids: lactic acid, glycolic acid and salicylic acid. All three products are clear, colorless and hydrophobic liquids with 97%+ purity. SilCare trimethylsilylated hydroxycarboxylates offer similar efficacy like hydroxy acids, but with minimal irritation or inflammation. Anhydrous formulations containing SilCare Silicones 180M10, 180M20 and 180M30 have been tested on humans sensitive to lactic acid "stingers" with minimal adverse reaction. Approx. 25% w/w of SilCare 180M10 and 180M20 correspond to an effective concentration of lactic or glycolic acid of 10%. 20% of SilCare 180M30 correspond to 10% of salicylic acid. SilCare bis(trimethylsilyl)hydroxycarboxylate products have been tested for compatibility with a wide range of ingredients typically used in cosmetic formulations. The following ingredients were found to be compatible in all proportions with SilCare bis(trimethylsilyl)hydroxycarboxylates: aliphatic solvents (e.g. heptane), mineral oil, long chain esters (e.g. isopropyl palmitate), alkyl silicones, trimethylsiloxysilicates, cyclomethicones and low viscosity dimethicones. The following ingredients were found to be chemically reactive with SilCare bis(trimethylsilyl)hydroxycarboxylates: water, ethanol 95%, isopropanol, longer chain alcohols up to stearyl alcohol and carboxylic acids. It is therefore recommended to use SilCare Silicones 180M10 – 30 only in anhydrous, oily formulations.



180M10/20

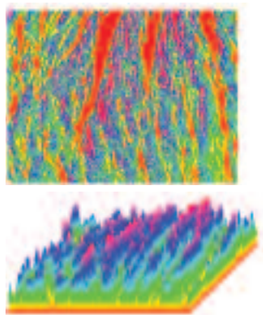


180M30

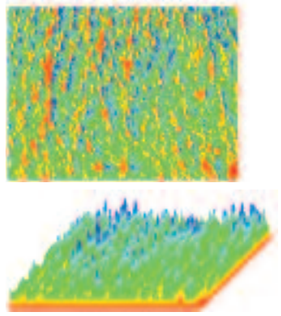
SilCare Bis(trimethylsilyl) Hydroxycarboxylates

Trade Name SilCare™ Silicone	Name	CAS	Visc. in CS	Boiling Point	Refractive Index at 21°C	spec. Gravity at 25°C
180M10*	Bis(trimethylsilyl)lactate	17596-96-2	~5	200/1atm	1.4053	0.90
180M20	Bis(trimethylsilyl)glycolate	33581-77-0	~5	45/1mm	1.4119	0.91
180M30*	Bis(trimethylsilyl)salicyclate	3789-85-3	5	80/1mm	1.4775	0.99

* not registered in the EU



Before Treatment

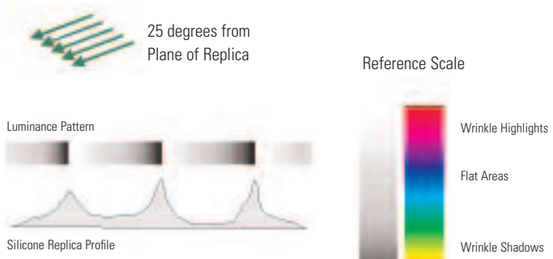


After 90 days

Efficacy characteristics

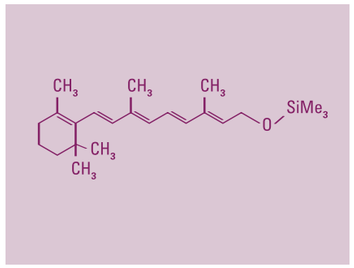
Anhydrous lotion and ointment formulations containing 25% w/w bis(trimethylsilyl)lactate (SilCare™ Silicone 180M10) were tested over a 90-day period on a test panel of over 100 subjects to determine the efficacy of delivery of this derivative of lactic acid on the skin. Relative to baseline and relative to lotion and ointment formulations not containing the test material, the following factors showed statistically significant improvement by the test panel: reduction of fine lines, of coarse wrinkling, of roughness, of redness, of mottled pigmentation as well as reduction of yellowing. Silflo (Cu Derm Corporation) silicone facial skin replicas were prepared at the beginning of the 90-day period and again at the end of the 90-day period and compared. A collimated light source directed at 25 degrees from the plane of the replica was then used to scan the replica surfaces. The black-white luminescence pattern was the converted to a color scale (red = black; blue = white) for ease of viewing. The figures show the ingredient´s effect on skin after exposure for 90 days.

Image Analysis of Skin Replicas



Skin Replicas produced with
Silflo (CuDerm Corporation)

SilCare™ Silicone 1M75 Retinoxytrimethylsilane in Soybean Oil



SilCare 1M75 retinoxytrimethylsilane in soybean oil is a clear yellowish, odorless fluid. This product is a 12% active liquid derivative of retinol, which is readily soluble in most anhydrous cosmetic formulations at room temperature.

The following ingredients were found to be compatible in all proportions with SilCare 1M75:

Aliphatic solvents (e.g. heptane), mineral oil, long chain esters (e.g. isopropyl palmitate), alkyl silicones, trimethylsiloxysilicates, cyclomethicones and low viscosity dimethicones. The following ingredients were found to be chemically reactive with SilCare 1M75: water, ethanol 95%, isopropanol, longer chain alcohols up to stearyl alcohol and carboxylic acids. It is therefore recommended to use SilCare Silicone 1M75 only in anhydrous, oily formulations.

Exactly your chemistry.

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