

SILSOFT* E-Pearl PF emulsion

SPECIALTY FLUIDS - PERSONAL CARE



Assigned INCI Name: Polymethylsilsesquioxane (and) Dimethicone (and) Isohexadecane (and) Cetearyl Methicone (and) PEG-40 Stearate (and) Steareth-2 (and) Steareth-21.
 Preservative: Microcare† MPE.

Silsoft E-Pearl PF emulsion is a multi-functional ingredient that can provide many desirable benefits in personal care products. It can deliver an outstanding sensory experience with moist-feel, line blurring and skin brightening effects. Silsoft E-Pearl PF emulsion's multi-functionality is the result of a unique combination of ingredients.

Silsoft E-Pearl PF emulsion is exceptionally easy to use. Silsoft E-Pearl PF emulsion can enable formulators to add sensory to skin care products with high water content, even when the product contains more than 90% water. It can even be post-added to many existing formulations.

Key Features & Typical Benefits

- Extremely easy to use
- Cold processable
- Excellent dispersability in water
- Outstanding lubricity and spreadability
- Soft, smooth, silky feel
- Blurring of fine lines and wrinkles with light diffusion effects
- Paraben-free
- Can be post-added to many existing formulations
- Can be used in many water-based cosmetics
- Moisturizing
- Non-ionic properties

Potential Applications

- **Facial Products**
Masks Toners Moisturizers
- **Suncare Products**
Sunscreens Daily wears
- **Color Cosmetics**
BB and CC Creams Foundations Concealers
- **O/W Emulsions**
Creams Lotions Protective Products

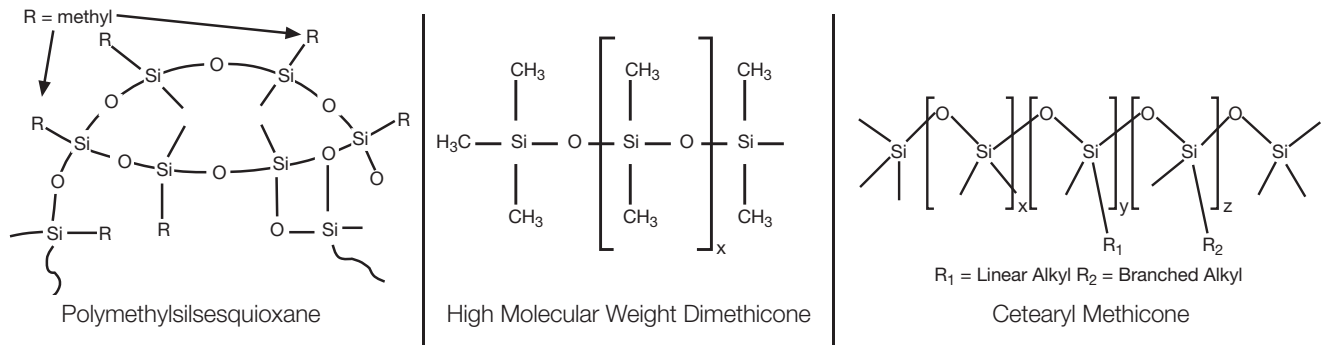
Typical Physical Properties⁽¹⁾

Appearance	Milky white
Viscosity, cP	2,000 - 10,000
Solids, %	52-62
Average Particle Size, Micron	1.0 - 10.0

(1) Typical properties are average data and are not to be used as or to develop specifications.

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Chemical Structures



Silsoft E-Pearl PF emulsion is a patent-pending, non-ionic emulsion of polymethylsilsesquioxane powder, high molecular weight dimethicone and an alkyl-functionalized polysiloxane.

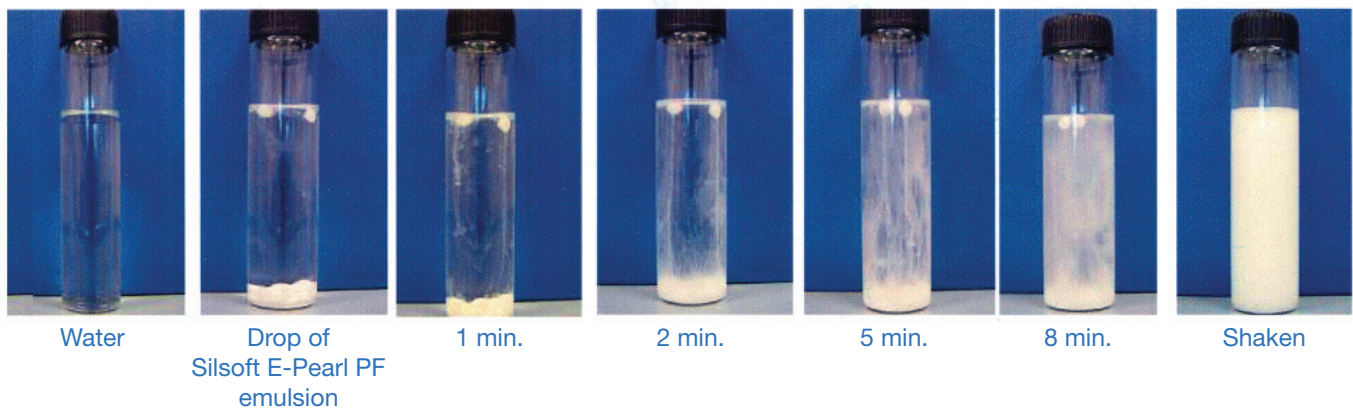
General Instructions for Use

Silsoft E-Pearl PF emulsion is extremely easy to use because it can be:

- dispersed in water by simply shaking;
- post-added to many existing formulations; and
- cold processed.

Recommended starting use level: 2-5%

Dispersion of 3% Silsoft E-Pearl PF Emulsion in Water



Note: Test results. Actual results may vary.

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SILSOFT* E-Pearl PF emulsion

Test Performance Data

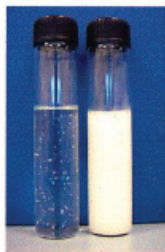
Silsoft E-Pearl PF Emulsion Typical Benefits

- Easy to formulate – simply by shaking
- Outstanding smoothness
- Excellent softness
- Long-lasting sensory and moisturized feel
- Blurring of fine lines
- Good texture feel for facial mask sheet
- Tack reduction

Facial Mask (FM) Formula	FM Base	FM with 3% Silsoft E-Pearl PF emulsion
	%	%
Purified Water	to 100	to 100
Glycerine	7	7
1,3 Butylene Glycol	4	4
Silsoft E-Pearl PF emulsion	0	3
Carbomer	0.15	0.15
Triethanolamine	0.15	0.15
Preservative	per label directions	per label directions

Product formulations are included as illustrative examples only. Momentive makes no representation or warranty of any kind with respect to any such formulations, including, without limitation, concerning the efficacy or safety of any product manufactured using such formulations.

Facial Mask Formula Without and With Silsoft E-Pearl PF Emulsion



Note: Test data. Actual results may vary.

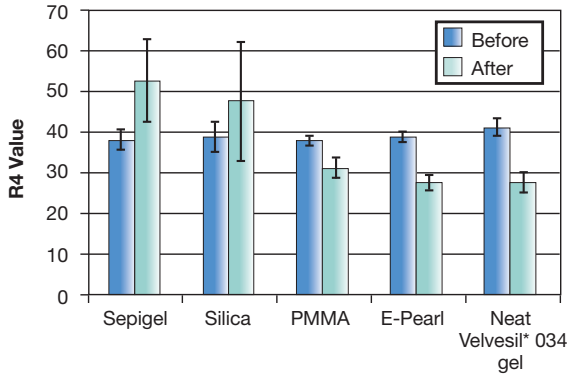
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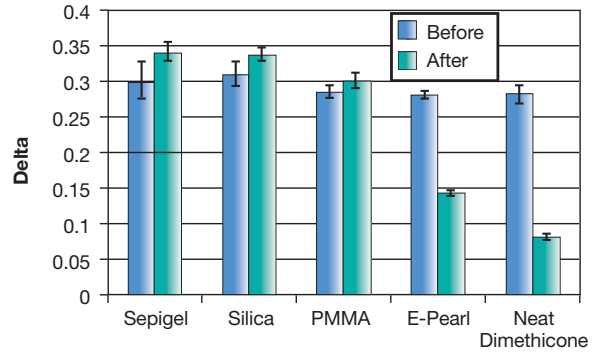
Test Performance Data (continued)

Silsoft E-Pearl PF Emulsion Line Blurring and Smoothness on Leather

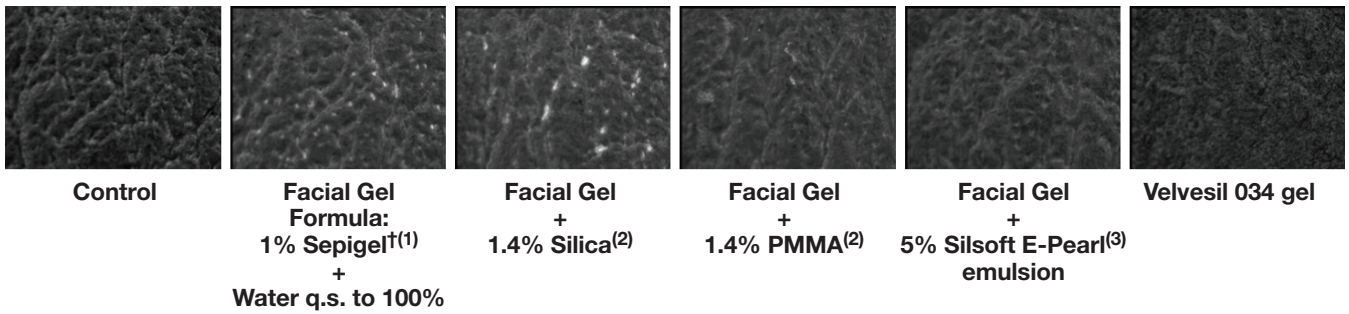
The Line Depth R4 Changes for Leather



Friction Coefficient Reduction



Application Level: 2mg/cm³



Suppliers:

- (1) Sepigel is a trademark of Societe D'Exploitation de Produits Pour Les Industries Chimiques (Seppic)
- (2) Kobo Products, Inc.
- (3) Momentive Performance Materials

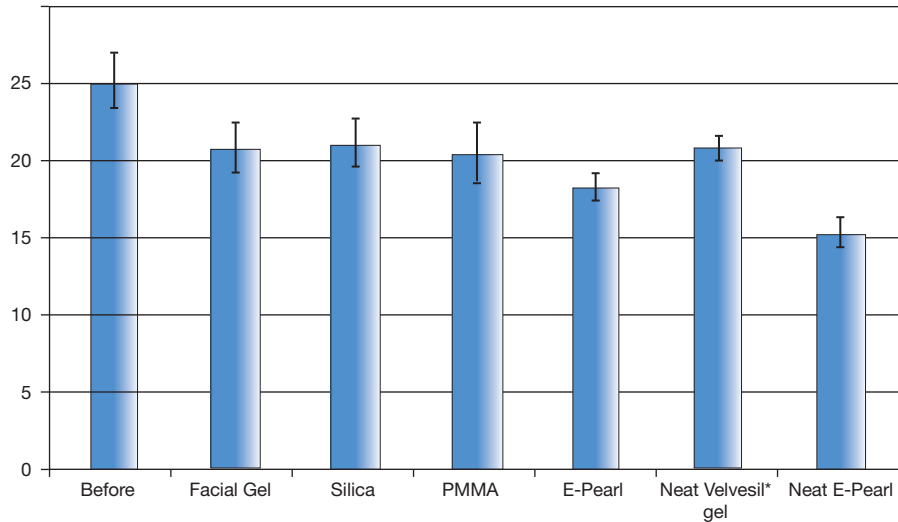
Note: Test data. Actual results may vary.

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† Sepigel is a trademark of SEPPIC, Inc.

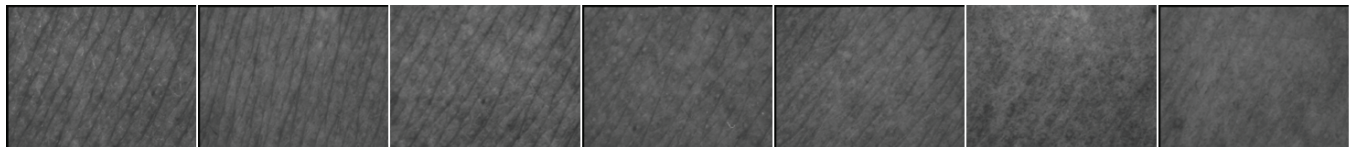
SILSOFT* E-Pearl PF emulsion

Test Performance Data (continued)

Silsoft E-Pearl PF Emulsion Line Blurring on Skin

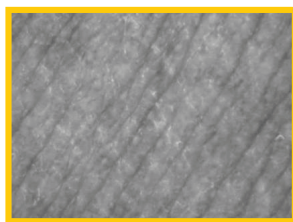


Application Level 2mg/cm²



Control	Facial Gel Formula: 1% Sepigel + 7% Glycerine + 4% 1,3 Butylene Glycol + Water q.s. to 100%	Facial Gel + Silica	Facial Gel + PMMA	Facial Gel + Silsoft E-Pearl emulsion	Velvessil 034 gel Neat	Silsoft E-Pearl emulsion Neat
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Magnified Comparison of Outstanding Results with Silsoft E-Pearl emulsion Neat on Skin



Before using Neat E-Pearl



After using Neat E-Pearl

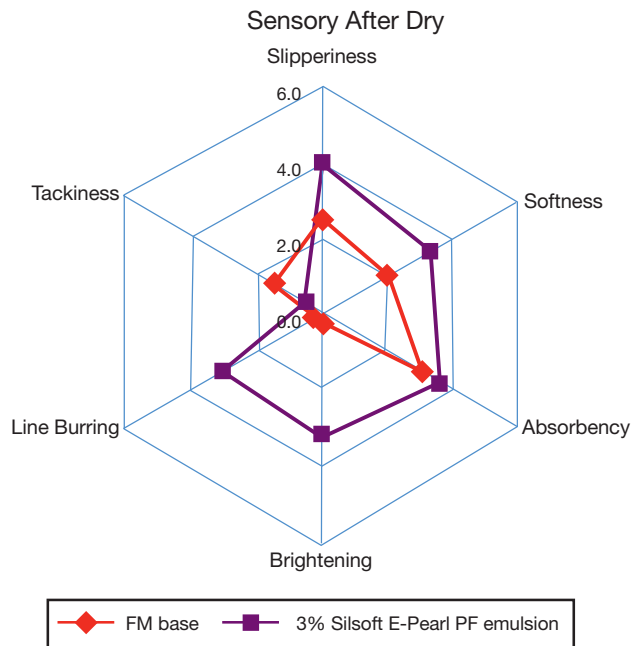
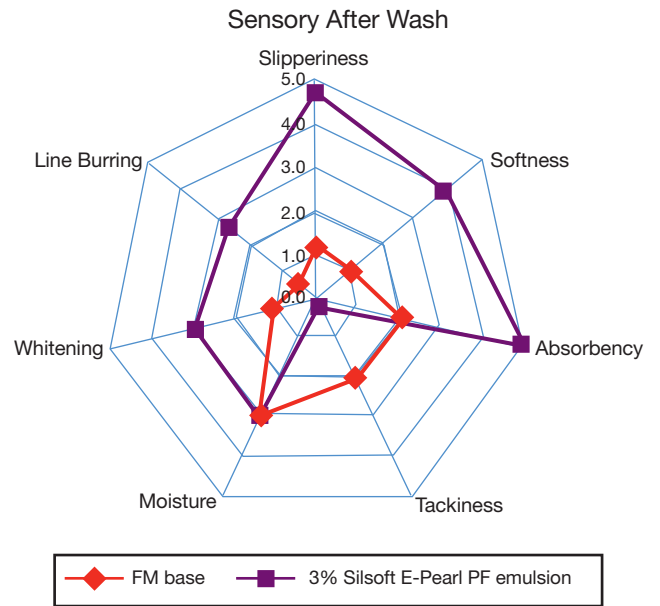
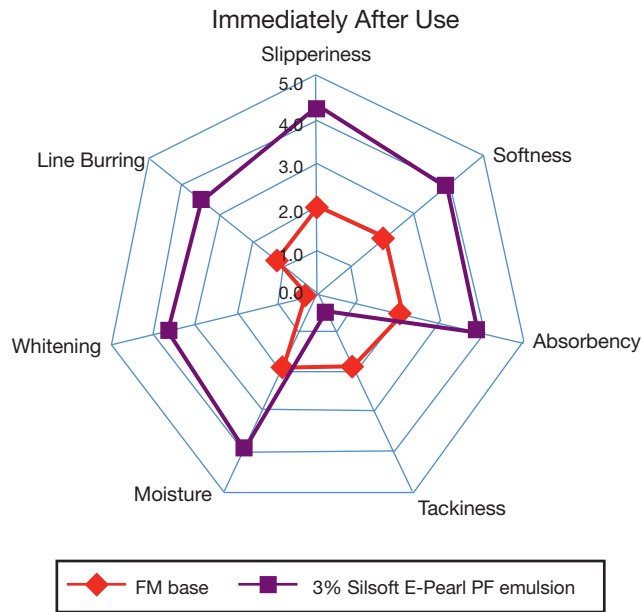
Note: Test data. Actual results may vary.

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Test Performance Data (continued)

Sensory Enhancement: Facial Mask (FM)



Facial Mask Base + 3% Silsoft E-Pearl PF emulsion

Enhanced:

- Softness and absorbency
- Line blurring
- Brightness
- Slipperiness

Reduced tackiness

Note: Test results. Actual results may vary.

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Sample Formulations

Moisturizing and Protecting Hand Cream

	Trade Name	Chemical Name / INCI Name	%
A	Water	Aqua	Up to 100.0
	Glycerin	Glycerin	2.5
	Disodium EDTA	Disodium EDTA	0.05
B	Tego† Care 450 (2)	Polyglyceryl-3 Methylglucose Distearate	2.5
	Cithrol GMS 40 (3)	Glyceryl Stearate	1.5
	Lanette† 16 (4)	Cetyl Alcohol	1.0
	Crodamol MM (3)	Myristyl Myristate	1.2
	Shea Butter	Butyrospermum Parkii (Shea Butter)	2.0
	Macadamia Oil	Macadamia Ternifolia Seed Oil	2.0
	Crodamol GTCC (3)	Caprylic/ Capric Triglyceride	2.0
	Arlamol† PS15E-LQ (3)	PPG-15 Stearyl Ether	1.0
	BHT	BHT	0.1
	Silsoft 034 organosilicone fluid (1)	Caprylyl Methicone	2.0
	SF 1202 (1)	Cyclopentasiloxane	4.0
C	Carbopol† Ultrez-10 (5)	Carbomer	0.20
	Water	Aqua	10.0
	Trietanolamine	Trietanolamine	0.2
D	Silsoft E-Pearl PF emulsion (1)	Water (and) Polymethylsilsesquioxane (and) Dimethicone (and) Isohexadecane (and) Cetearyl Methicone (and) PEG-40 Stearate (and) Steareth-2 (and) Steareth-21	2.0
	Hydrovance† (6)	Hydroxyethyl Urea	1.5
	Fucogel† 1000 PP (7)	Biosaccharide Gum-1	1.0
	Preservative		q.s.
	Fragrance	Fragrance	q.s.

Procedure:

- Mix all the ingredients of water phase A; heat to 75 °C.
- Mix all the ingredients of phase B; heat to 70 °C.
- Add B to phase A with intensive stirring. Homogenize the mixture 1-2 minutes (Ultra Turrax-9500 rpm).
- Cool to 50 °C with gentle stirring.
- Add the solution of Carbopol Ultrez-10 in water, mix for 5 minutes and then add Triethanolamine (Adjust pH ≈ 6.0-7.0).
- Add the ingredients of phase D and mix until uniform. Cool to room temperature.

Suppliers:

- Momentive Performance Materials
- †Tego is a trademark of Evonik Goldschmidt GmbH.
- Croda; †Arlamol is a trademark of Uniqema Americas LLC.
- BASF; †Lanette is a trademark of Cognis IP Management GmbH.
- †Carbopol is a trademark of Lubrizol Advanced Materials, Inc.
- †Hydrovance is a trademark of Akzo Nobel Surface Chemistry LLC.
- †Fucogel is a trademark of Societe La Biochimie Appliquee (Solabia).

Product formulations are included as illustrative examples only. Momentive makes no representation or warranty of any kind with respect to any such formulations, including, without limitation, concerning the efficacy or safety of any product manufactured using such formulations.

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Sample Formulations (continued)

Refreshing Lotion

Phase	Ingredients	INCI Name	Wt (%)
A	Deionized Water	Water	70.855
	Disodium EDTA	Disodium EDTA	0.15
	Pemulen† TR-1 Polymer ⁽²⁾	Acrylates/C10-30 Alkyl Acrylate Crosspolymer	0.20
	Hydrolite†-6 ⁽³⁾	1,2- Hexanediol	5.00
	Glycerin	Glycerin	2.00
B	Glyceryl Stearate ⁽⁴⁾	Glyceryl Stearate	0.50
	Jeamate 6000 DS ⁽⁵⁾	PEG-150 Distearate	5.00
	Dermol 99 ⁽⁴⁾	Isononyl Isononanoate	4.00
	Element14* PDMS 50 silicone oil ⁽¹⁾	Dimethicone	3.00
	Velvesil* 034 organosilicone gel ⁽¹⁾	Caprylyl Methicone (and) C30-45 Alkyl Cetearyl Dimethicone Crosspolymer	1.50
C	Deionized Water	Water	1.00
	Tris Amino ⁽⁶⁾	Tromethamine	0.22
D	Silsoft E-Pearl PF emulsion ⁽¹⁾	Water (and) Polymethylsilsesquioxane (and) Dimethicone (and) Isohexadecane (and) Cetearyl Methicone (and) Steareth-21	5.00
E	Deionized Water	Water	1.00
	Germall† II ⁽⁷⁾	Diazolidinyl Urea	0.50
F	Fragrance	Fragrance	0.075

Procedure:

1. Add EDTA in main vessel; mix until dissolved.
2. Disperse Pemulen powder under high speed mixing until uniform.
3. Add remaining phase A ingredients. Heat to 70-75 °C.
4. Combine phase B ingredients in separate vessel. Heat to 70-75 °C.
5. Emulsify phase B into phase A with high speed mixing. Homogenize if necessary.
6. Pre-mix phase C ingredient until tromethamine is dissolved.
7. Add to main vessel. Batch will thicken.
8. Add Silsoft E-Pearl PF emulsion while mixing. Homogenize to ensure homogenous dispersion. Begin cooling to 40 °C.
9. Premix phase E until powder is dissolved. Add to batch at 40 °C.
10. Cool batch to 35 °C. Fragrance and package as desired.

Suppliers:

- (1) Momentive Performance Materials
- (2) †Pemulen is a trademark of Lubrizol Advanced Materials, Inc.
- (3) †Hydrolite is a trademark of Symrise AG
- (4) Alzo International, Inc.
- (5) Jeen International, Inc.
- (6) Angus Chemical Company
- (7) †Germall is a trademark of Ashland Licensing and Intellectual Property LLC, Aqualon Company, Hercules Incorporated and ISP Investments Inc.

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Sample Formulations (continued)

Moisturizing Serum

	Trade Name	Chemical Name / INCI Name	%
A	Water	Aqua	Up to 100.0
	Keltrol† CG-SFT (2)	Xanthan Gum	0.1
	Glycerin	Glycerin	2.0
	Disodium EDTA	Disodium EDTA	0.05
	Arlatone† 2121 (3)	Sorbitan Stearate (and) Sucrose Cocoate	4.0
B	Crodamol MM (3)	Myristyl Myristate	2.0
	Tegosoft† OS (4)	Ethylhexyl Stearate	3.0
	Cetiol† CC (5)	Dicaprylyl Carbonate	2.0
	Jjoba Oil	Simmondsia Chinensis (Jojoba) seed oil	1.0
	SF 1202 (1)	Cyclopentasiloxane	2.0
	Silsoft 034 organosilicone fluid (1)	Caprylyl Methicone	2.0
C	OptaSense RMA 110 (3)	Sodium Polyacrylate (and) Isotridecyl Isononanoate (and) Trideceth-6	0.7
D	Silsoft E-Pearl PF emulsion (1)	Water (and) Polymethylsilsesquioxane (and) Dimethicone (and) Isohexadecane (and) Cetearyl Methicone (and) PEG-40 Stearate (and) Steareth-2 (and) Steareth-21	1.5
	D-Panthenol (5)	D-Panthenol	0.5
	Moist 24 (6)	Imperata cylindrica root extract (and) water (and) glycerin (and) PEG-8 (and) carbomer	1.5
	Hydrovance† (7)	Hydroxyethyl Urea	3.0
	Preservative		q.s.
	Fragrance	Fragrance	q.s.

Procedure:

1. Disperse Xanthan Gum in Glycerin, then add other ingredients of part A.
2. Heat to 80 °C. Homogenize A for 1 minute (8000 rpm) and allow to swell for 20 minutes.
3. Mix all the ingredients of oil phase B; heat to 70 °C.
4. Add phase B to phase A with intensive stirring. Homogenize the mixture for 1-2 minutes (Ultra Turrax-9500 rpm).
5. Cool to 50-60 °C with gentle stirring.
6. Add thickener, OptaSense RMA 110.
7. Homogenize (2000-3000 rpm) for 1 minute with stirring. Then mix the product for 5 minutes.
8. Cool to 40-45 °C. Add ingredients of part D and mix until uniform. Cool to room temperature.

Suppliers:

- (1) Momentive Performance Materials
- (2) †Keltrol is a trademarked product sold by and licensed to CP Kelco U.S., Inc.
- (3) Croda; †Arlatone is a trademark of Uniqema Americas LLC. OptaSense is a trademark of Croda, Inc.
- (4) †Tegosoft is a trademark of Evonik Goldschmidt GmbH.
- (5) BASF; †Cetiol is a trademark of Cognis IP Management GmbH.
- (6) Sederma
- (7) †Hydrovance is a trademark of Akzo Nobel Surface Chemistry, LLC.

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SILSOFT* E-Pearl PF emulsion

Patent Status

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Product Safety, Handling and Storage

Customers should review the latest Material Safety Data Sheet (MSDS) and label for product safety information, safe handling instructions, personal protective equipment if necessary, and any special storage conditions required for safety. MSDS are available at www.momentive.com or, upon request, from any Momentive Performance Materials (MPM) representative. For product storage and handling procedures to maintain the product quality within our stated specifications, please review Certificates of Analysis, which are available in the Order Center. Use of other materials in conjunction with MPM products (for example, primers) may require additional precautions. Please review and follow the safety information provided by the manufacturer of such other materials.

Limitations

Customers must evaluate Momentive Performance Materials products and make their own determination as to fitness of use in their particular applications.

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Emergency Service

Momentive Performance Materials maintains an around-the-clock emergency service for its products.

<u>Location</u>	<u>Emergency Service Provider</u>	<u>Emergency Contact Number</u>
Mainland U.S., Puerto Rico	CHEMTREC	1-800-424-9300
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Canada	CHEMTREC	1-800-424-9300
Europe, Israel	NCEC	+44 (0) 1235239670
Middle East	NCEC	+44 (0) 1235239671
Asia Pacific (except China)	NCEC	+44 (0) 1235239670
China	NCEC	+86-10-5100-3039
Latin America (except Brazil)	NCEC	+44 (0) 1235239670
Brazil	SOS Cotec	08000111767 or 08007071767
All other locations world wide	NCEC	+44 (0) 1235239670
At sea	Radio U.S. Coast Guard in U.S. waters NCEC in International waters	+44 (0) 1235239670

For Health related calls, contact Momentive Performance Materials at +1-518-233-2500 (English only).

DO NOT WAIT. Phone if in doubt. You will be referred to a specialist for advice.

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