

# Matrifuse™ S-1

*dispersant*

Highly effective pigment dispersant for optimum coverage and sensory in sun care and color cosmetics



**Enables smooth spreading for even coverage and improved product performance**

**Broad pigment and oil compatibility with high formulation clarity**

**Convenient handling with improved stability for simplified formulating**

## DESCRIPTION

Creating high performance beauty products that inspire confidence just got simpler. Designed as a convenient liquid dispersion blend, new **MATRIFUSE™ S-1** dispersant effectively separates the agglomerates of pigment particles and significantly decreases the viscosity of formulations, which allows for higher pigment loading applications with more uniform spreading, intense color, and refreshing sensory. Whether you're formulating products to protect skin, conceal flaws or accentuate features, **MATRIFUSE™ S-1** dispersant enables the coverage you need to let true beauty shine through.

INCI: Polyhydroxystearic Acid (and) Neopentyl Glycol Diethylhexanoate

## PRODUCT FORM AND HANDLING

**MATRIFUSE™ S-1** dispersant is supplied as an amber to brown anhydrous liquid. Its use level depends primarily on the pigment loading and the average pigment surface area. The typical use level for **MATRIFUSE™ S-1** dispersant is 3-5 wt% per pigment weight for

non-nano sized pigments. The use level may be increased up to 20 wt% per pigment weight for nano sized pigments. Other properties such as pigment type and coating may also affect the use level.

## KEY FEATURES AND BENEFITS

- Provides high loading and uniform pigment dispersion with intense color
- Compatible with a broad range of oils and pigments
- Enables low energy processing with phase stability improvement
- Produces smooth, low viscosity formulations that spread easily during application and provide even coverage
- Enhances refreshing, conditioning product sensory
- High Natural Content; Renewable Carbon Index = 0.79

## APPLICATIONS

**MATRIFUSE™ S-1** dispersant is recommended for creating a variety of pigmented personal care applications such as sunscreens and color cosmetics. It can also be incorporated as a processing aid for pigment predispersions.

**Lubrizol**

# Maximize Aesthetics & Color

## INCREDIBLE CLARITY WITH BROAD OIL COMPATIBILITY

**MATRIFUSE™ S-1** dispersant has been designed to maximize clarity in a variety of oil systems. It is highly compatible with synthetic or natural cosmetic emollients and is miscible in silicone oils when mixed with bridging emollients such as Isododecane or Neopentyl Glycol Diethylhexanoate. Figures 1-2 display the clarity that can be achieved with various cosmetic emollients and silicones.

Figure 1. 3 wt% **MATRIFUSE™ S-1** dispersant in different cosmetic emollients with high clarity

The vials from left to right are as follows:

1. Caprylic/Capric Triglyceride
2. C12-C15 Alkyl Benzoate
3. Octyldodecanol
4. Isododecane
5. Mineral Oil
6. Jojoba Oil

### Synthetic and Natural Emollients

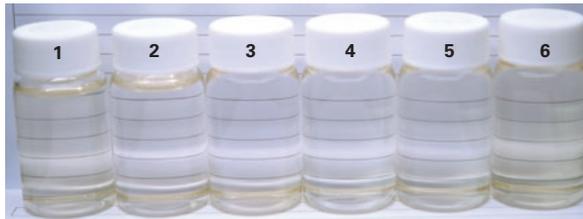


Figure 2. 3 wt% **MATRIFUSE™ S-1** dispersant is miscible in different types of silicone with high clarity. Q.S. to 100% with Isododecane

The vials from left to right are as follows:

1. 40% Cyclopentasiloxane in Isododecane
2. 30% Dimethicone (5 cSt) in Isododecane
3. 70% Caprylyl Methicone in Isododecane

### Silicones



## UNIFORM PARTICLE SIZE FOR INTENSE COLOR

**MATRIFUSE™ S-1** dispersant effectively separates the agglomerates of organic and inorganic pigment particles to enable superior pigment loading in applications. Figure 3 demonstrates its ability to produce 60 wt% inorganic pigment predispersions with optimal particle size distributions. The reduction in size of pigment particles also increases the optical transparency of formulations, revealing truer and more vibrant color.

Figure 3. Dispersion data for non-nano Triethoxycaprylylsilane coated cosmetic pigments. Formulation contains 60 wt% pigments, ~3 wt% **MATRIFUSE™ S-1** dispersant, and ~37 wt% Caprylic/Capric Triglyceride.

Pigment Type	Titanium Dioxide	Zinc Oxide	Yellow Iron Oxide	Red Iron Oxide	Black Iron Oxide
Max Pigment Level Tested	60%	60%	60%	60%	60%
Magnification x400					

To achieve the best results, mix **MATRIFUSE™ S-1** dispersant in the oil phase until homogeneous. Then add pigments with stirring or homogenization. A three roll mill is highly recommended for in-house dispersions.



Get brilliant results and vibrant color with **MATRIFUSE™ S-1** dispersant.

# Optimize Coverage & Sensory

## RHEOLOGICAL MODIFICATION AND APPLICATION BENEFITS

**MATRIFUSE™ S-1** dispersant helps to lower the viscosity of the pigment predispersions, allowing formulators to create stable low viscosity applications with less additives and superior flow aesthetics. This enables a product to be spread more evenly during application, which enhances skin coverage and can ultimately help to improve UV protection provided by sun care products.

Our Mattifying Liquid Foundation SPF 50 demonstrates **MATRIFUSE™ S-1** dispersant's compatibility with ZnO and Fe<sub>2</sub>O<sub>3</sub> as well as its ability to produce a high pigment loading, low viscosity foundation that goes on smoothly with uniform coverage.

Formula 1: Mattifying Liquid Foundation SPF 50, CC-F0026(EU)

Ingredient	Trade Name	Wt. %
Isododecane		15.00
Dicaprylyl Ether		2.00
<b>Polyhydroxystearic Acid (and) Neopentyl Glycol Diethylhexanoate</b>	<b>MATRIFUSE™ S-1 dispersant</b>	<b>2.00</b>
Zinc Oxide (and) Triethoxycaprylylsilane		25.00
CI 77891 (and) Triethoxycaprylylsilane		12.50
CI 77492 (and) Triethoxycaprylylsilane		3.00
CI 77491 (and) Triethoxycaprylylsilane		0.50
CI 77499 (and) Triethoxycaprylylsilane		0.15
Boron Nitride		2.00
Lauryl PEG-10 Tris(trimethylsiloxy)silylethyl Dimethicone		4.00
Caprylyl Methicone		3.00
Isododecane (and) Disteardimonium Hectorite (and) Propylene Carbonate		3.00
Fragrance		0.15
Deionized Water		21.20
Phenylpropanol (and) Propanediol (and) Caprylyl Glycol (and) Tocopherol		0.50
<b>Water, Glycerin, Pseudoaltermonas Ferment Extract, Xanthan Gum, Caprylyl Glycol, Ethylhexylglycerin, Proline, Alanine, Serine, Sodium Phosphate, Sodium Hydroxide</b>	<b>XPERTMOIST® molecular film</b>	<b>5.00</b>
Magnesium Sulfate		1.00

Figure 4. Viscosity Reduction with 2 wt% **MATRIFUSE™ S-1** dispersant

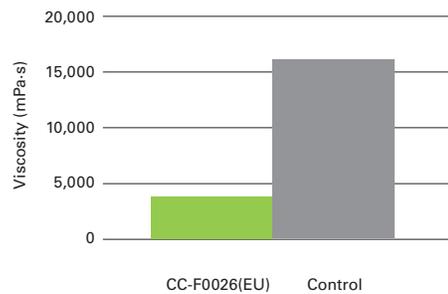
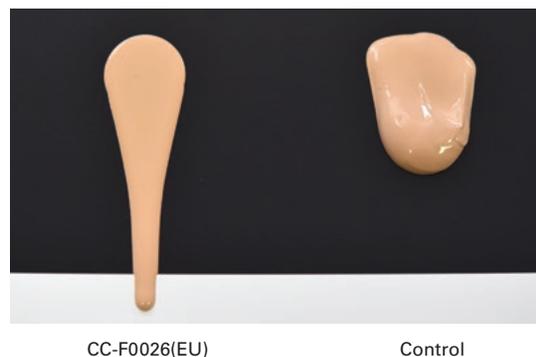


Figure 5. CC-F0026(EU) exhibits more consistent color intensity, smoother flow and even spreading during application



**Hide flaws, protect skin or accentuate features with uniform coverage thanks to **MATRIFUSE™ S-1** dispersant.**



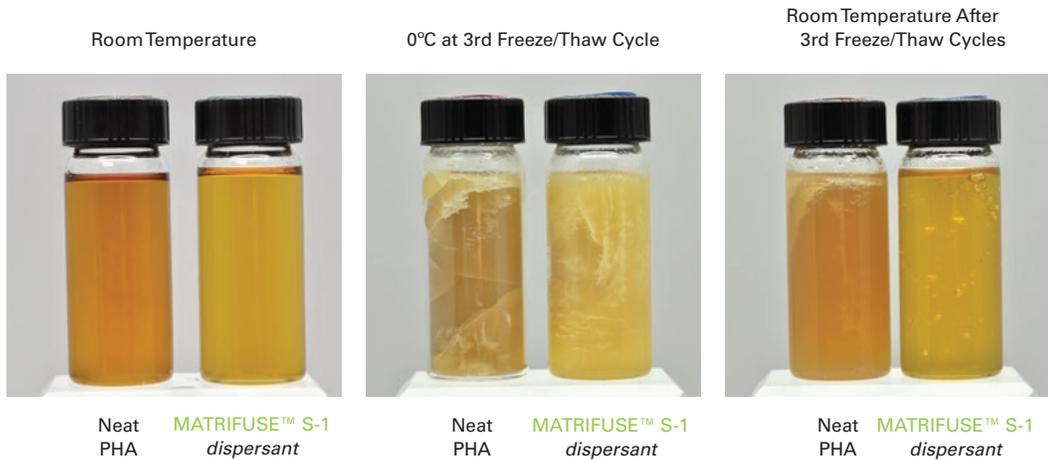
**MATRIFUSE™ S-1** dispersant enables the formulation of smooth spreading formulations with light skin feel.

## Improve Stability

### PROCESSING AND STABILITY IMPROVEMENT

Polyhydroxystearic Acid (PHA) is a high viscosity, honey-like material commonly used in pigmented sun care and cosmetic applications. PHA often crystallizes and phase separates below room temperature, compromising a formulation's stability. A liquid dispersion blend, **MATRIFUSE™ S-1** dispersant, is designed to provide easier handling while minimizing low temperature crystallization and settlement typical of PHA. The low temperature comparison in Figure 6 shows that **MATRIFUSE™ S-1** dispersant maintains homogeneity after being exposed to extreme low temperature conditions, therefore maintaining product integrity and improving its shelf life.

Figure 6: **MATRIFUSE™ S-1** dispersant (right) maintains product stability vs. Neat PHA (left) after 3 freeze/thaw cycles.



**MATRIFUSE™ S-1** dispersant makes creating high performance beauty products that inspire confidence simple.

In addition to improved phase stability at lower temperatures, compatibility with cosmetic pigments and emollients, **MATRIFUSE™ S-1** dispersant demonstrated superior dispersing properties in both sun care and color cosmetic applications with enhanced spreadability, coverage, and sensory properties for anhydrous systems, w/o emulsions, and o/w emulsions.



For more information on our compass sustainability strategy please visit [Go.Lubrizol.com/Compass](http://Go.Lubrizol.com/Compass)

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