

CosmoSurf®



Feel-Good Natural Film-Forming Polymers

Consumers demand natural ingredients in their personal care products. With sun care there is also concern about residuals in the oceans. Why choose a synthetic film former when there are ocean-friendly, natural options offering the feel and performance to please even a discerning customer?

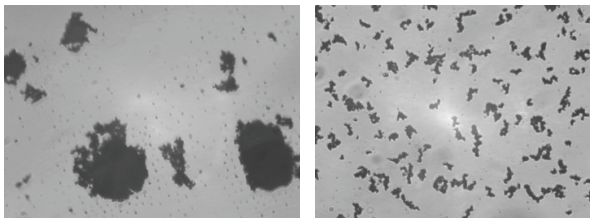
The CosmoSurf® Difference

CosmoSurf® polymers are excellent film-forming polymers that provide up to 80 minutes of water resistance in emulsions and (alcohol-based) spray products. CosmoSurf® is a flexible polymer platform, resulting in the ability to create and modify aesthetics, while adding other benefits such as pigment dispersion and avoiding 'white-out' upon application onto wet skin that is common for free-radical based film forming polymers.

About

CosmoSurf® polymers are made following the 12 Principles for Green Chemistry. The polymers consist of natural and renewable starting materials and are not made using traditional free-radical based polymerization processes and are therefore free of residual vinyl-type monomers, initiators and catalysts.

88% of consumers want you to help them make an environmental difference. CosmoSurf® can help you do that.



50wt% dispersion® of TiO₂ in caprylic/capric triglyceride without (left) and with 5% CosmoSurf DDG-20 (right)



Left side of arm: with traditional free radical film former showing 'white-out' Right side of arm: with CosmoSurf® polymer showing uniform film formation and no 'white-out'

Alcohol-based spray sunscreen application on wet skin

The multi-function characteristics of CosmoSurf® polymers allows for the creation of simple yet beautiful formulations, that allow for the removal of separate ingredients such as aesthetic modifiers and dispersing aids. The CosmoSurf® natural film forming polymer line up consists of two main product lines: CE- and DG-series that are based on citric acid and dimer acid, respectively.

Key Takeaways

- Naturally derived, non-free radical film forming polymers
- Water resistance up to 80 minutes with tunable aesthetics
- Free from vinyl-type monomers and residual catalysts
- Wet skin application
- Pigment dispersion capabilities
- Lowers surface tension
- Global compliance (including China)



CosmoSurf	Properties and benefits			Formulation type		Natural		Aesthetics
	Film formation	Wet skin application	Pigment dispersion	Emulsions	Alcohol sprays	Raw materials	WholeFoods Premium	Skin feel
CE-100	-	✓	✓	✓	✓	✓	-	Light, non-greasy
CE-140	✓	✓	✓	✓	-	✓	✓	Light, slightly waxy
CE-250	✓	✓	✓	✓	-	✓	✓	More waxy after feel
DDG-20	✓	✓	✓	✓	✓	✓	-	Light, non-greasy, non-sticky
DDG-28	✓	✓	✓	✓	✓	✓	-	Light, slightly waxy, mitigates dry alcohol feel
DGSi	✓	✓	✓	✓	✓	-	-	Very light, silicone-like slip

Formulation Guidelines

Use levels:

- Film formation and water resistance: typical use level 2% - for very high oil contents 3-4%
- Wet skin application in presence of free radical film former (CosmoSurf CE-100): 4-5%
- Pigment dispersion: data being generated

Emulsion systems:

General:

- For solid or semi-solid CosmoSurf® polymers, heating to min. 60°C is required for dissolution

Chemical UV filter systems:

- Add CosmoSurf® polymers to oil phase together with UV filters

Mineral systems – film formation:

- Add CosmoSurf® polymers to oil phase with bulk of the oil phase ingredients, after mineral filter dispersion step has been completed

Mineral systems – primary dispersion aid:

- Add CosmoSurf® polymer to main oil/ester and dissolve
- Add ZnO/TiO₂ and mix well until smooth
- Add remainder of oil phase ingredients

Emulsifiers:

- There are no known incompatibilities of CosmoSurf® polymers with certain emulsifiers
- Emulsifiers with too high of detergency activity may negatively impact water resistance performance – an example of recommended emulsifier is glyceryl monostearate

Alcohol (spray) systems:

Add CosmoSurf® polymers to the mixture of organic UV filters:

- Combine all organic UV filters and heat to ~60°C
- When system is clear, add CosmoSurf® polymer
- Upon cooling, add esters/oils and add alcohol

References

1. OnePulse for Futerra, November 2018

