

# Ramp up your summer beauty with safe and responsible sun protection

## SunSpheres™ BIO SPF Booster



Efficiently protecting your skin from damages induced by UV while benefiting from outdoors activities is key to your skin health and well-being.

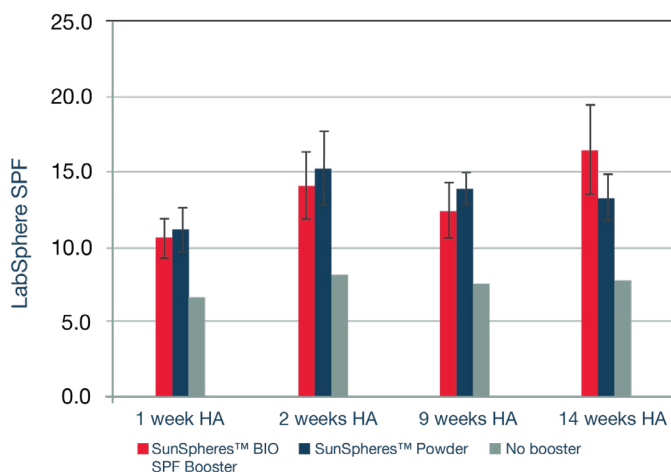
SunSpheres™ BIO SPF Booster is a highly performing, naturally derived and readily biodegradable SPF booster, which demonstrated SPF boosting performance at use levels as low as 1% and up to 3%.

Meant to be used with organic or inorganic UV filters, SunSpheres™ BIO SPF Booster is a versatile, multifunctional ingredient that delivers stabilizing, thickening and shear thinning properties in your formulations. The performance of this natural SPF booster has been validated through both in vitro and in vivo SPF studies.

### SunSpheres™ BIO SPF Booster for efficient sun care formulations

- Bio-derived SPF booster from PEFC (Programme for the Endorsement of Forest Certification) certified wood pulp
- 97% natural content (ISO 16128)
- Readily biodegradable
- Safe for the oceans
- For use with organic and inorganic UV filters
- Recommended use level of 1-3%
- Validated performance — SPF in vitro and in vivo testing
- Exhibits stabilizing, thickening and shear thinning properties
- Listed in catalogue of cosmetic ingredients in China
- INCI: Microcrystalline cellulose

Figure 1: In-vitro SPF heat aging studies

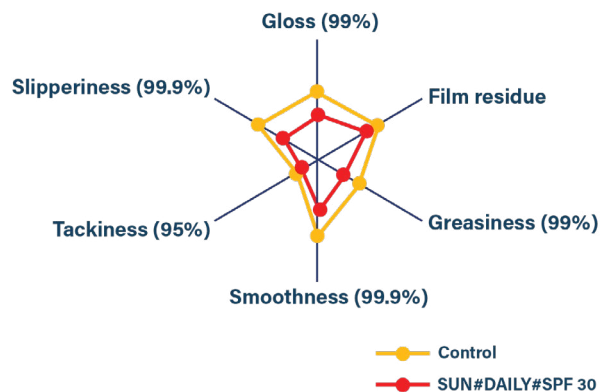


With 3% booster  
HA: heat age at 45°C

## O/W sunscreen with organic UV filters – in vivo SPF 37 (CPF 4301)

## Sensory assessment

Phase	Trade name / Supplier	INCI name	Wt%
A		Water / Aqua	60.75
	SunSpheres™ BIO SPF Booster / Dow	Microcrystalline Cellulose	1.50
	EcoSmooth™ Universal Fluid 75-H-450 / Dow	PEG / PPG-17 / 6 Crosspolymer	0.50
		Butylene Glycol	2.00
	VERSENE™ NA <sub>2</sub> Crystals Chelating Agent / Dow	Disodium EDTA	0.10
	SymSave H / Symrise	Hydroxyacetophenone	0.50
	ACULYN™ 38 Rheology Modifier / Dow	Acrylates / Vinyl Neodecanoate Crosspolymer	3.00
B	Procol CS-20-D / Making Cosmetics	Cetearyl Alcohol (and) Ceteareth-20	1.75
	Arlacel 165 / Spectrum	Glyceryl Stearate (and) PEG-100 Stearate	2.00
	CCT / Spectrum	Caprylic / Capric Triglyceride	5.00
	C12-15 Alkyl Benzoate / Making Cosmetics	C12-15 Alkyl Benzoate	5.00
	Parsol HMS / DSM	Homosalate	5.00
	Parsol EHS / DSM	Ethylhexyl Salicylate	5.00
	Parsol 1789 / DSM	Butyl Methoxydibenzoylmethane	3.00
C	Parsol 340 / DSM	Octocrylene	4.00
	TEA, 99% / Dow	Triethanolamine	0.40
D	Neolone PH 100 Preservative / DuPont	Phenoxyethanol	0.50



In SUN#DAILY#SPF30 formulation, the addition of 1.5% SunSpheres™ BIO SPF Booster leads to a formulation that is quicker to absorb, leaving the skin less glossy, less greasy, less slippery and slightly less tacky.

Table 1: In vivo testing of SunSpheres™ BIO SPF Booster (O/W with organic UV filters)

Formulations	Average in vivo SPF (5 subjects FDA 2011 static)	Standard deviation	% SPF boost over control	% SPF boost / unit SunSpheres™ BIO SPF Booster
Control – no booster	23.80	2.75		
With 1.5% SunSpheres™ BIO SPF Booster	36.70	4.36	54	36
With 3% SunSpheres™ BIO SPF Booster	36.59	2.81	54	18
With 3% SunSpheres™ Powder	37.61	2.75	58	19
Commercial sunscreen SPF 30 (all organic UV Filters)	35.69	4.06		

## Need more information?

Dow has extensive experience with sun care, beauty and personal care solutions. Leverage our expertise to help you determine which materials are best suited to your application. Simply visit [www.dow.com](http://www.dow.com) to learn how we can help you bring performance and processability to your products.

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