

LexFilm[®] Spray

**Pour it in and spray it on...
for highly waterproof spray sunscreens**



Spray Sunscreens

Market

Broad interest in fast drying “Sport” formulations based on a hydro-alcoholic delivery system.

Convenience

For children, where application of emulsion is difficult, and time to dry on skin is limited.

Suitable for active, sporty lifestyle:

- Evaporation of alcohol leads to fast drying
- No thickeners (rheological agents) results in improved skin feel faster spreading
- No emulsifiers to interact with sebum on the skin



Key New Product Category



LexFilm Spray

INCI: Polyester-10 (and) Propylene Glycol Dibenzoate

High MW acid-functional polyester

- Acid functionality provides high adhesion while still being soluble in water-alcohol systems
- Polyester backbone provides good compatibility with emollients and UV absorbers

Aromatic Ester

- Propylene Glycol Dibenzoate is an extremely safe and effective emollient for sunscreen
- Super-solubilizer to prevent re-crystallization of Avobenzone on the skin



Key Features

Pourable Fluid

- Easy to work with and easy for manufacturing

Cost and Use Level

- 2%, the only excipient needed
- Contributes less formulation costs than other hydro-alcoholic compatible polymers

High Polarity Excipient

- Excellent solubilizer
- High dielectric constant to aid stability



Dielectric Constants of Common Materials

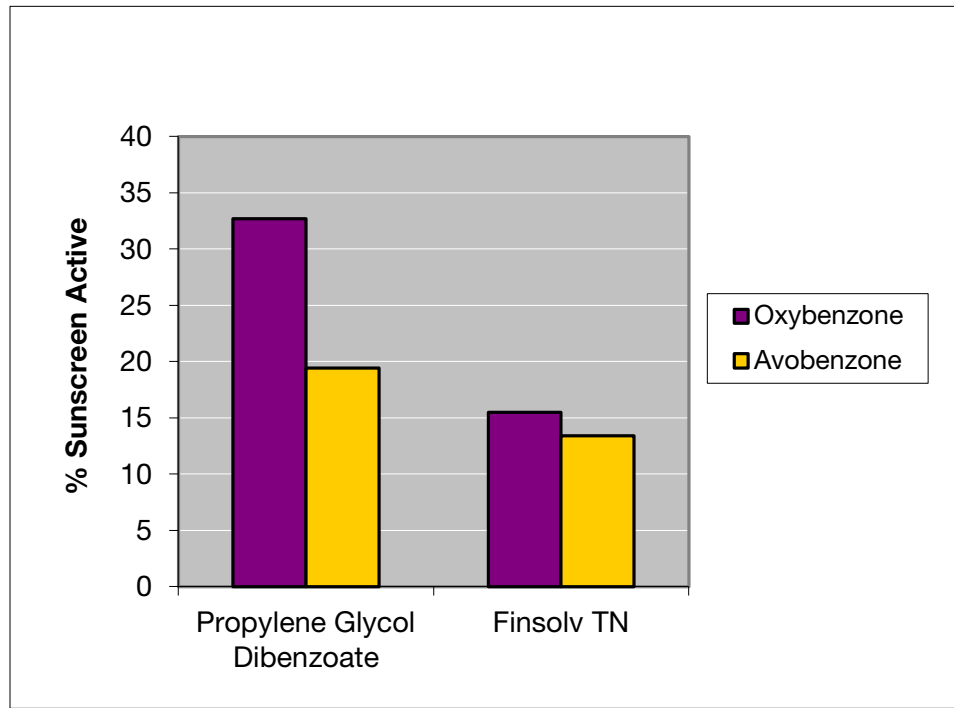
High polarity from high dielectric constant can lead to improved sunscreen performance and stability.

Benzophenone-3	13.0
Octocrylene	11.08
LexFilm® Spray	10.33
Lexgard® O	8.02
Lexorez® 100	6.25
Ethylhexyl salicylate	6.20
Diethylhexyl malate	5.78
Butyloctyl salicylate	5.35
LexFilm® Sun	4.90
Diethylhexyl 2,6-naphthalate	4.34
Diethylhexyl adipate	4.21
LexFeel® 7	4.00
Caprylic/Capric triglycerides	3.83
C12-15 alkyl benzoates (Finsolv TN)	3.78
Isopropyl myristate	3.24
Ethylhexyl stearate (palmitate)	3.05 (3.06)
Octyldodecyl neopentanoate	3.04
Mineral oil (& other hydrocarbons)	2.0-2.15



LexFilm Spray Contains a Super-Solubilizer

- Alcoholic system will have no problem solubilizing Avobenzone and Oxybenzone, but once on the skin, they could re-crystallize
- Propylene Glycol Dibenzoate is the most powerful excipient to prevent sunscreen re-crystallization



SPF 30 Water Resistant Sprays

- LexFilm Spray versus Dermacryl® at 2% polymer level.
- Five person in-vivo, very water proof methodology
- LexFilm Spray: 100% retention of SPF
- Dermacryl: 91% retention of SPF

	% w/w	% w/w
SDA 40-B anhydrous	62.50	62.50
LexFilm® Spray	4.00	0.00
Dermacryl®	0.00	2.00
Propylene Glycol Dibenzoate	0.00	2.00
Oxybenzone	5.00	5.00
Octisalate	5.00	5.00
Octinoxate	7.50	7.50
Homosalate	10.00	10.00
Avobenzone	2.00	2.00
Diethylhexyl Naphthalate	4.00	4.00
	100.00	100.00



Re-Test at Lower Level

SPF30 with LexFilm Spray at 2% as-is

- 94% retention of SPF

	% w/w
SDA 40-B anhydrous	64.50
LexFilm® Spray	2.00
Oxybenzone	5.00
Octisalate	5.00
Octinoxate	7.50
Homosalate	10.00
Avobenzone	2.00
Diethylhexyl Naphthalate	4.00
	100.00

Conclusion

- LexFilm Spray is highly waterproofing at 2% use level
- Superior to Dermacryl, yet lower cost
- Ease-to-use liquid (no dusting or powders)
- 100% retention possible at higher use levels



Status

Safety

- EpiDerm (mild) and EpiOcular (non-irritating) studies completed on LexFilm Spray.
- Emollient: historical data showing extremely low acute oral, dermal and inhalation tox data
- Emollient analogues indicate no genotoxicity based on read-across.

