



HALLBRITE® BHB

Globally-approved multifunctional sunscreen and make-up additive, high emolliency/low viscosity solubilizer, polarity-optimizing photostabilizer and high-performing agent for metal oxide dispersion and pigment wetting

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HALLBRITE® BHB

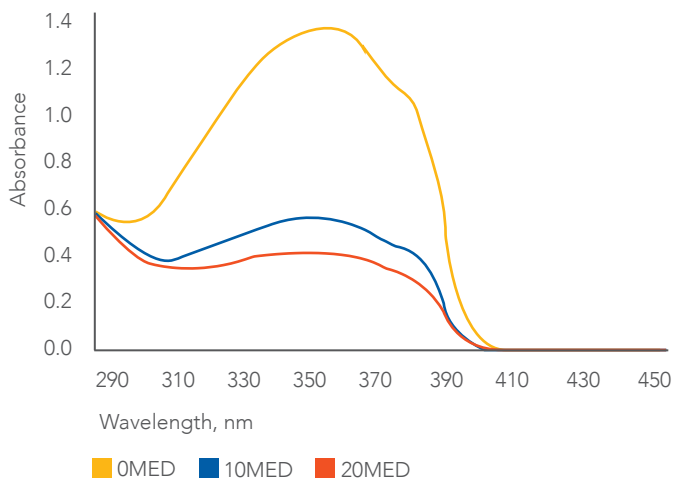
HallBrite® BHB is a highly effective sunscreen actives solvent, inorganic pigment wetter, emollient, moisturizer, and carrier/dispersant for mineral sunscreens. A low viscosity liquid of high polarity with elegant slip and feel, it is useful as a solvent and emollient in topical preparations for skin and hair. BHB optimizes the dielectric constant of the energy transfer media, allowing more effective return of UV filter molecules to their ground state, thus improving filter efficiency... which leads to better SPF and PFA performance.

POLARITY OPTIMIZATION

Sun exposure causes some UV filters, including Avobenzone, to degrade if they cannot transfer energy to other ingredients. Matching the polarity of the solvent system to that of the UV filters optimizes transfer of energy to the solvent system, thereby reducing UV filter degradation. Many solvents are not sufficiently polar (as measured by their dielectric constants), so replacing them with higher dielectric constant/higher polarity solvents reduces photo-instability.

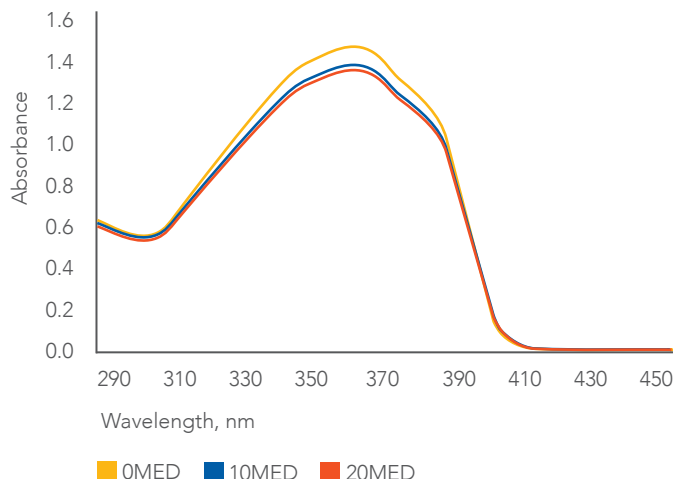
Low Dielectric Constant Medium

- Rapid Avobenzone absorbance loss
- Reduced sunscreen performance

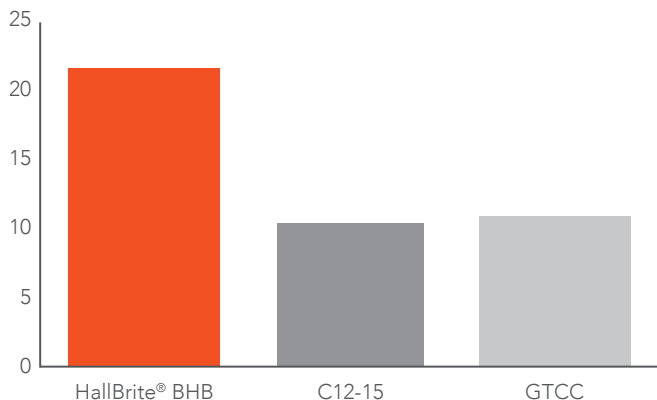


High Dielectric Constant Medium

- Minimal Avobenzone absorbance loss
- Maximum sunscreen performance



SPF COMPARISON



We compared the results of 10% cosmetic solvent in a simple sunscreen formula using 10% homosalate and 3% avobenzone as the filters. The formula using BHB produced higher SPF value as expected. All samples made with O/W emulsion system.

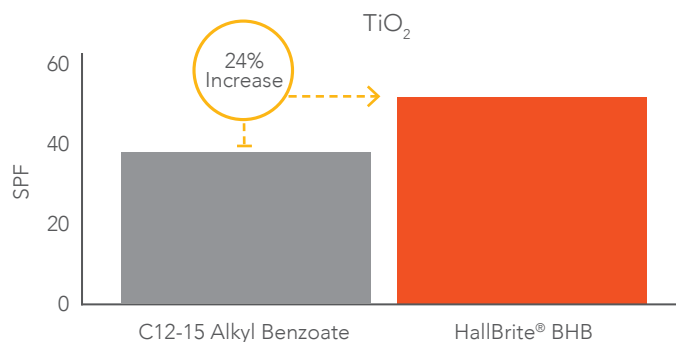
TECHNICAL DATA

- INCI Name: Butyloctyl Salicylate
- Virtually colorless, odorless and tasteless liquid
- Low freezing point (°C): < -25
- Low viscosity: 16 cSt (25°C)
- Polarity: dielectric constant (25°C) = 5.35
- Orally and dermally non-toxic
- Not a primary eye irritant
- Not a sensitizer per human RIPT study (hypoallergenic)
- Recommended use level: 2 – 10%

HOW BHB HELPS TiO₂

Experimental Sample	Sample 1	Sample 2
% HallBrite® BHB	60	
% C12-15 Alkyl Benzoate		60
% TX-80 (80% TiO ₂)	40	40
SPF	50	39
PFA	5	5
Critical wavelength (nm)	370	370

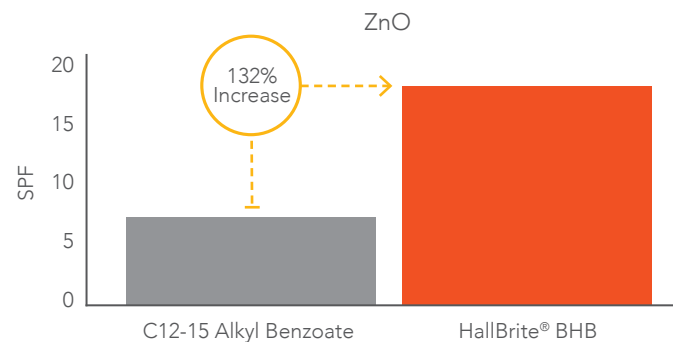
10mg of each dispersion sample applied on a HG 6 plate with no irradiation



HOW BHB HELPS ZNO

Experimental Sample	Sample 1	Sample 2
% HallBrite® BHB	60	
% C12-15 Alkyl Benzoate		60
% Z-Cote HP1 (97.5% ZnO)	40	40
SPF	18	7
PFA	6	6
Critical wavelength (nm)	372	375

10mg of each dispersion sample applied on a HG 6 plate with no irradiation

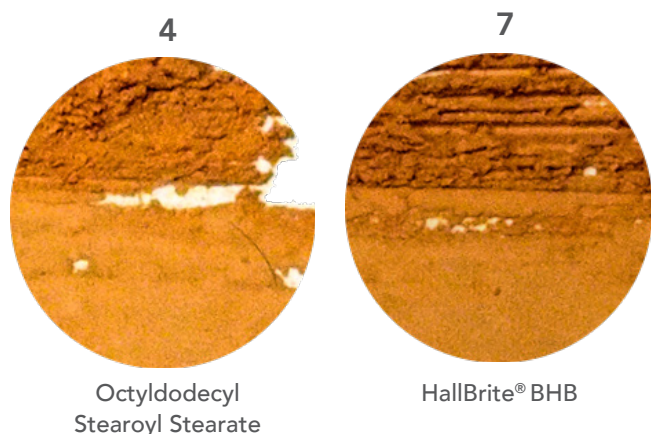


Dispersions with HallBrite® BHB increased SPF primarily by providing a more uniform dispersion of oxides through enhanced pigment wetting. The result: improved performance of inorganic filters in sunscreen systems.

COMPATIBILITY WITH METAL OXIDES CREATES MULTIFUNCTIONAL BENEFITS

When combined with a powdered pigment, HallBrite® BHB displaces more air, accelerates deagglomeration of the pigment particles and improves pigment spreadability, producing a more uniform film. Better pigment wetting improves color matching in cosmetics. With good pigment wetting, the color of the product in the container maintains its hue upon application to the skin.

IMPROVES COLOR MATCHING AND FOUNDATION DROP TEST RESULTS



ELIMINATES CONGLOMERATION



Indicates number of drops from 25cm before cracking appeared

HALLBRITE® BHB - EXCELLENT DISPERSION PROPERTIES

Trade Name	NCI Name	%
Sensient Unipure Black LC989	Black Iron Oxide	0.7
Sensient Unipure Red LC381	Red Iron Oxide	6.2
Sensient Unipure White LC981	Titanium dioxide	9.1
HallBrite® BHB or C12-15 Alkyl Benzoate	Butyloctyl Salicylate or C12-15 Alkyl Benzoate	11.4
Sensolene®	Ethylhexyl Olivatate	4.6
Eutanol G	Octyldodecanol	68.0

Dispersion of pigments mixed with spatula only



Dispersion with C12-15 Alkyl Benzoate



Dispersion with HallBrite® BHB

Remarkable differences between dispersions: the one with HallBrite® BHB does not separate and is creamier, darker, and easier to use.

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