SilDerm® Emulsifying BG

Polymethylsilsesquioxane
key to the perfect emulsifier
Natural Pigment Spacer
Stearically Stabilized
Prevents Agglomeration
More Natural Appearance

BACKGROUND

SilDerm® Emulsifying BG is a product comprised of a dispersion of Polymethylsilsesquioxane (PMSQ) in Butylene Glycol. PMSQ can be described by the formula [CH3SiO3/2]n[CH3Si(OH)O2/2]m. Realistically, it is easier to conceptualize PMSQ as a 3-dimensional matrix. The surface of which is populated by methyl and hydroxyl groups. By altering the ratio of n/m, we are able to modify the amphiphilic characteristics of the particles.

This modification in surface chemistry allows the PMSQ particles to exhibit unique behavior at the W/O or W/S interface. This behavior allows the particles to act as primary emulsifiers, eliminating or reducing the need for other emulsifiers. Generally, the **SilDerm® Emulsifying BG** is incorporated into the water phase. Simple diffusion during agitation drives the particles across the interface. As concentration increases, the particles search for thermodynamic stability, aggregating back at the interface.

SCIENCE

The aggregation of particles stearically stabilizes the droplets preventing coalescence. Depending on the formulation, rheological agents may be added to prevent creaming. Owing to its particulate nature **SilDerm® Emulsifying BG** will not be disrupted by high-shear/high-pressure processing. Variation in electrolyte levels and pH may effect individual emulsions. The main forces acting at the interface are van der Waals forces, electrostatic attractions, and surface tension. These forces are affected by particle composition, particle shape, and particle size. Van der Waals forces, the long-range attraction that exists between molecules are the most important for droplet stabilization by particulate emulsifiers. These forces are enhanced by induced dipole moments caused by random electron movement on either side of the interface.

Code Number: 30314

INCI Name: Butylene Glycol & Polymethylsilsesquioxane
INCI Status: Approved
REACH Status: Complies
CAS Number: 107-88-0 & 68554-70-1
EINCS Number: 203-529-7 & N/A

Origin: Synthetic
Processing:
GMO Free
No Ethoxylation
No Irradiation
No Sulphonation
Additives:
Preservatives: None
Antioxidants: None
Other additives: None
Solvents Used: Butylene Glycol
Appearance: Off-White Translucent Gel
Soluble/ Miscible: Practically Insoluble
100% Biodegradability
Microbial Count: <100 opg, No Pathogens

Suggested Use Levels: 0.5 - 15.0%
Suggested Applications:
Low emulsifier systems; Pigment spacer

Benefits of **SilDerm® Emulsifying BG**

- Natural Pigment Spacer
- No Need for additional Emulsifiers
- Prevents Agglomeration
- Prevents Coalescence

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BENEFITS

When used in conjunction with other particulates such as pigments, additional properties manifest themselves. **SilDerm® Emulsifying BG**'s 3-Dimensional structure allows it to interspace itself with the pigments preventing agglomeration. This translates into even more color development in decorative products, or more efficient UV absorbance for physical sunscreens. Lack of soft agglomerates allow for sheer products with a more natural appearance.

EFFICACY DATA

As seen in Figure 1, **SilDerm® Emulsifying BG** has been evaluated for a number of tactile qualities in order to best understand its strengths, and the formulations it would be best suited for. The overall feel in a finished good, as well as a raw material, make **SilDerm® Emulsifying BG** very flexible in formulation. In addition, it is visually appealing as a raw/on skin and elegant to formulate with. Along with these benefits, **SilDerm® Emulsifying BG** also offers some film forming properties, excellent cushion, and has the capacity to drastically improve the overall softness of the skin.

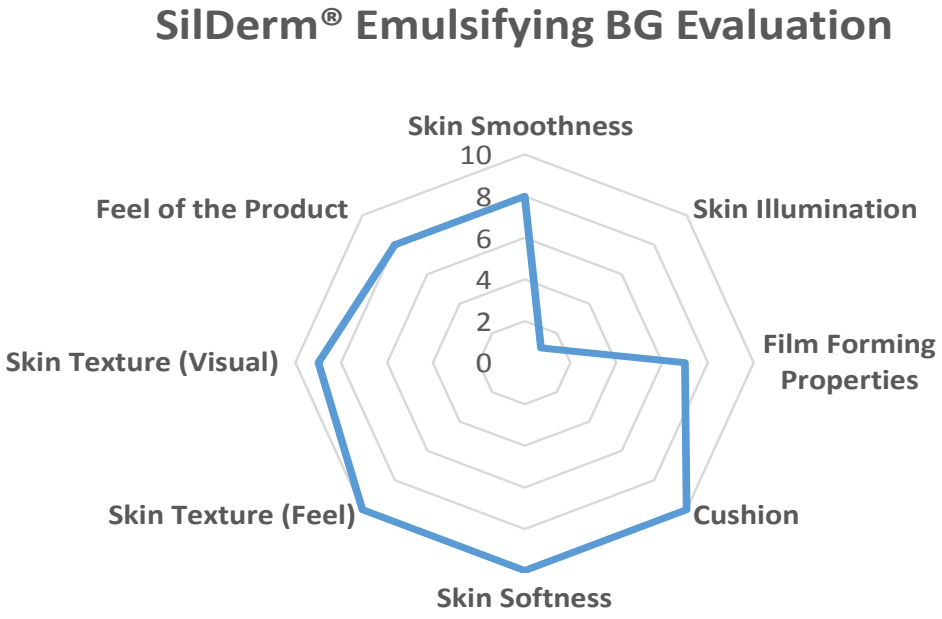

Figure 1. Overall product evaluation

References

1) M, Shirgholami. et al. 2011. Journal of Colloid and Interface Science. Fabrication of superhydrophobic polymethylsilsesquioxane nanostructures on cotton textiles by a solution-immersion process. 359(2): 530-535

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