



Your Dreams, Our Challenge



FREQUENTLY ASKED QUESTIONS

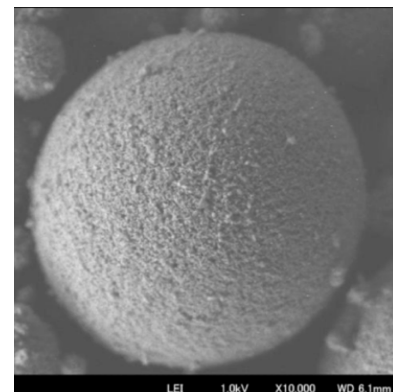
about RESIFA™ SOLESPHERE™ H-33 and H-53 Silica for SPF Boosting of Sunscreen Formulations



FREQUENTLY ASKED QUESTIONS ABOUT RESIFA™ SOLESPHERE™ H-33 AND H-53 SILICA FOR SPF BOOSTING OF SUNSCREEN FORMULATIONS

Q – What are the benefits of RESIFA SOLESPHERE silica for sunscreens?

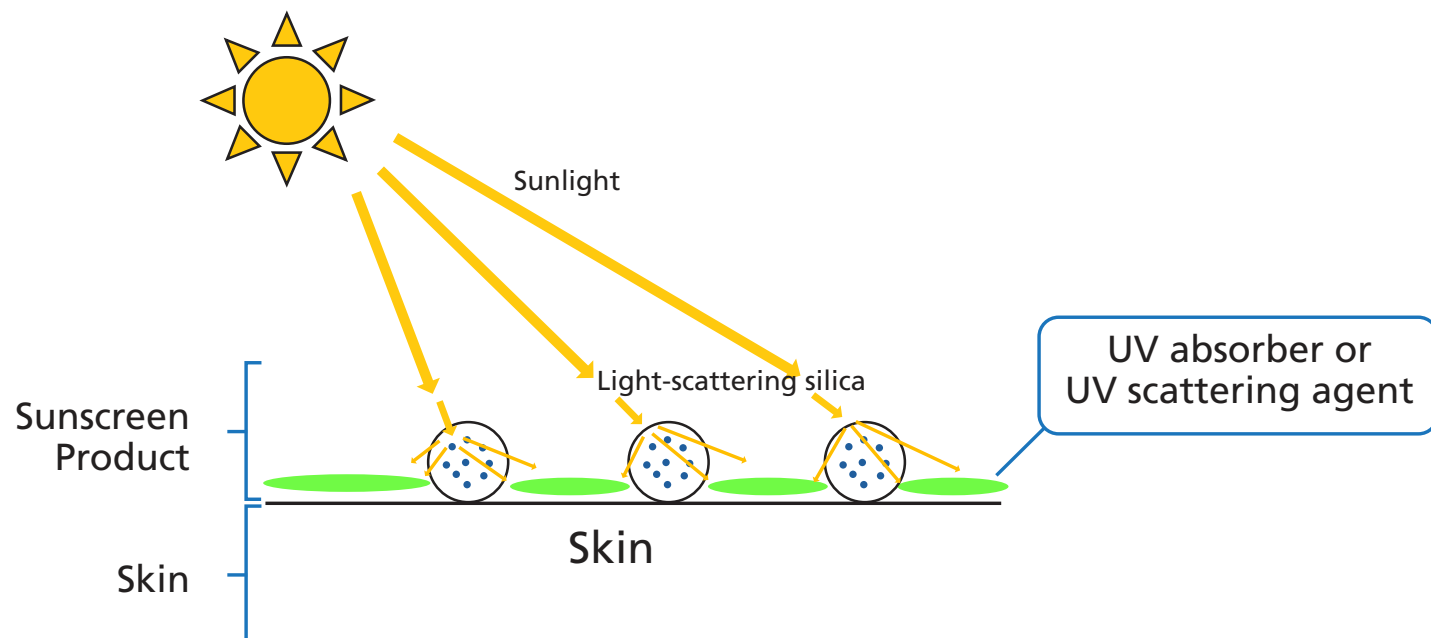
SOLESPHERE silica function really well as additives of O/W, W/O and anhydrous formulations. They can provide SPF boost and enhance the surface smoothness and dispersibility. Made from silicon dioxide, these inert particles are environmentally safe, non-nanoparticle, non-plastic and non-petroleum based. Their near-perfect spherical shape enables more consistent formulations that spread more smoothly on the skin. They have a low coefficient of friction, providing superior tactile and visual aesthetics. The microspheres are strong and do not deform easily when pressed, so formulations using them glide easily. Besides the SPF boost, the key advantage to SOLESPHERE silica is its spreadability, feel and texture of the formulation is also enhanced.



Q – Why were SOLESPHERE H-33 and H-53 developed?

The FDA restricts the loading levels of organic and inorganic UV actives. This can make it difficult for formulators to achieve SPF 15 rating or high and broad spectrum. Adding SOLESPHERE silica to organic and inorganic sunscreen formulations makes it possible to boost SPF to the required or desired level or to be able to claim “broad spectrum” effectiveness. If the desired SPF levels are already achieved, using SOLESPHERE silica can allow the quantity of UV actives to be reduced while still meeting the desired SPF rating. This is especially important for inorganic formulations that contain titanium dioxide and/or zinc oxide where using SOLESPHERE silica can reduce the product's white appearance and improve spreadability and incorporation into the skin.

Q – How do they boost SPF?





SOLESPHERE silica has two mechanisms to boost SPF. First, the microspherical structure of SOLESPHERE silica allows for better spreadability and creates a thin forming film onto the skin. This helps disperse the UV active ingredients more uniformly throughout the application process. Secondly, the unique, uniform structure of the silica plays a big part in creating an SPF boost. The silica particles have high specific surface areas and large pores that scatter UV light. The light is scattered from the multiple pores of silica, then the scattered light goes on to the UV filter or UV scattering agent (see image). The more UV light that is scattered when it hits the lotion, the less light that needs to be absorbed with UV active ingredients. That means

SOLESPHERE particles can be added to organic formulations using safer UV filters to achieve the desired SPF. In addition, SOLESPHERE silica particles are very stable over a wide temperature range and will not deform.

Q – Are silica microspheres harmful to humans or the environment?

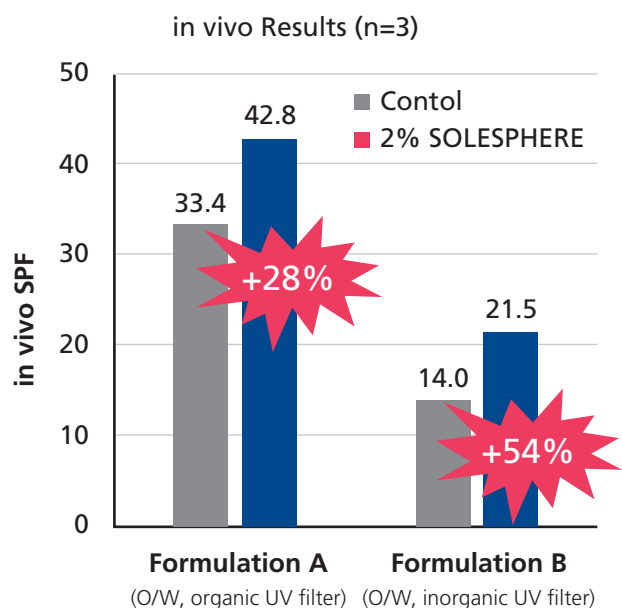
No. Silica is a naturally occurring mineral. Because of this, amorphous and hydrated silicas are GRAS (generally recognized as safe) ingredients for use in personal care products like skincare, cosmetics and sunscreens. RESIFA SOLESPHERE microspherical silica are amorphous, safe for the human body and the environment. The silica has several certifications for safety and sustainability including Ecocert- and COSMOS, Kosher and Halal.

Q – How were RESIFA SOLESPHERE microspheres tested?

AGC Si-Tech Company, Ltd. tests show that SOLESPHERE microspherical silica gels significantly increase the SPF in prototypical sunscreen formulations when measured in vitro and in vivo testing. We have measured in vivo based on JIST (Japan) and FDA test standards. Formulations with silica have stable SPF and viscosity. have improved spreadability, feel and texture. Formulations with silica have stable SPF, improved spreadability, feel and texture.

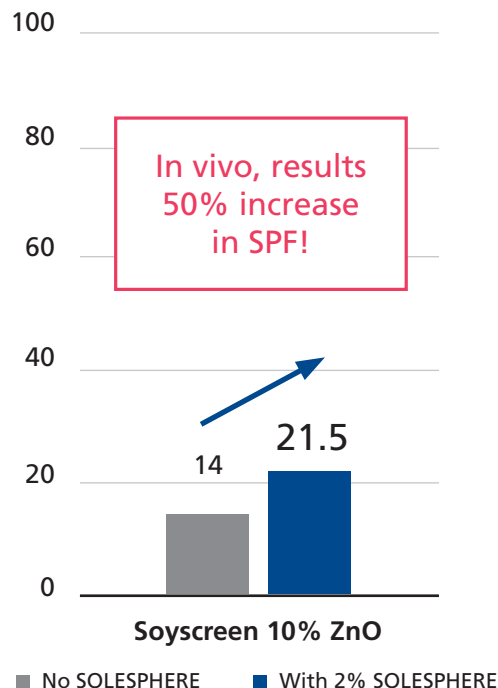


We have found that 2-3% of silica adds a significant boost to SPF to both organic and inorganic UV actives. The impact is greater with inorganic UV actives especially in W/O formulations. In-vivo results for formulations using SOLESPHERE with organic UV actives (left) and inorganic UV actives (right) demonstrate the ability for SOLESPHERE to work with various UV actives and O/W and W/O formulations.



Formulation A: Preliminary examination of SPF measurement according to ISO24444:2019

Formulation B: Preliminary examination of SPF measurement according to FDA 2011 Static



SPF measurement in accordance to ISO24444:2019



RESIFA™ SOLESPHERE™ microspherical silica enhance the surface smoothness and dispersibility of sunscreen and skincare formulations. They are manufactured by AGC in Japan and are available throughout the world. AGC Chemicals Americas is headquartered in Exton, Pennsylvania and is a global subsidiary of AGC Inc., a multinational corporation.

To learn more about fine silicas for skincare, or for help determining the right silica for your application, visit www.resifasolesphere.com or contact an AGC product expert at 1-800-424-7833.