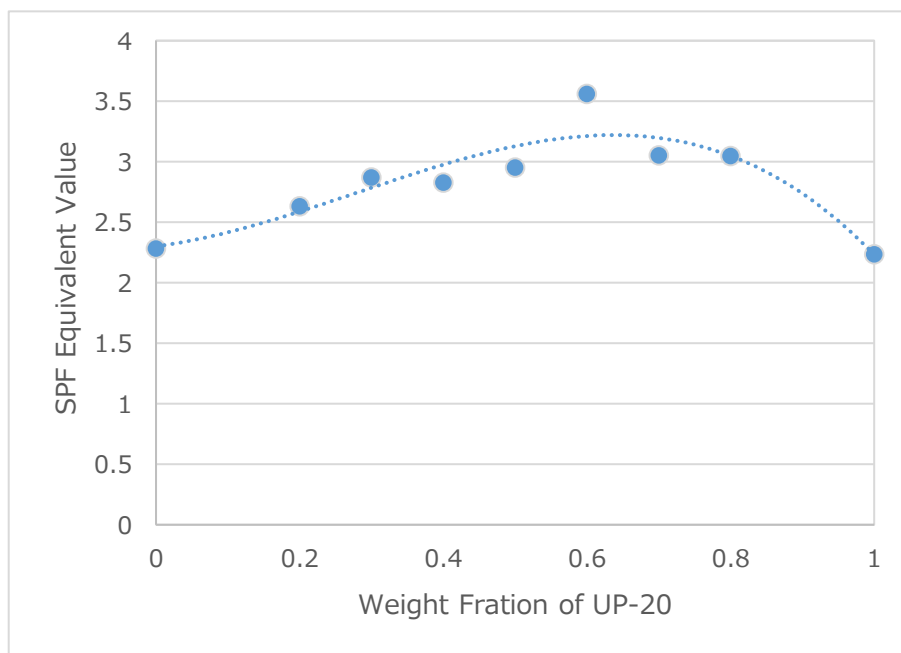


【Technical Data】		YAMAGUCHI MICA CO., LTD.																		
Title	Effect of UV-Shielding Mica UP Series in Formulation System ③ – Effects of Mixing UP-10 and UP-20 –																			
Category	Cosmetics	By	H. Asano	Date	Feb.24.2026															
(Summary)																				
We introduced the "UV-shielding mica UP series" at CITE JAPAN 2025. The UP series are functional ingredients whose ultraviolet shielding properties were identified through a detailed examination of the changes in natural mica caused by various processing steps. Furthermore, we proposed UP-10 and UP-20 with different average particle sizes. However, during the process of developing cosmetic formulations mixing both UP-10 and UP-20, a tendency for an increase of the UV-shielding effect was observed. Therefore, we prepared simple oily slurries of the UPs and examined their UV blocking effects using the SPF/PA value evaluation system. We report that the UV shielding effect increased most significantly at a weight fraction of approximately 0.6 to 0.7 of UP-20.																				
(Key Words)																				
mica, UV-Shielding, UP-10, UP-20, average particle size, mixing																				
(Introduction)																				
The "UV-shielding mica UP series" was introduced at CITE JAPAN 2025. When cosmetic formulations such as powder foundation and WO cream foundation were examined using this UP series, a tendency for an increase of the UV-shielding effect was observed in formulations prepared by mixing UP-10 and UP-20, which have different average particle sizes. Therefore, in order to confirm this tendency, we prepared slurries with simple compositions consisting of each UP and oil agent, and evaluated the UV-shielding effect of the applied film.																				
(Materials and Methods)																				
1. UV-Shielding Mica																				
In this experiment, UP-10 and UP-20 with the characteristics shown in the table on the right were used.		<table><tr><td>Product</td><td>Particle Size (μm)</td><td>Oil Absorption (mL/100g)</td><td>Bulk Density (g/ml)</td><td>Aspect Ratio</td></tr><tr><td>UP-10</td><td>10</td><td>62</td><td>0.13</td><td>65</td></tr><tr><td>UP-20</td><td>20</td><td>58</td><td>0.16</td><td>70</td></tr></table>				Product	Particle Size (μm)	Oil Absorption (mL/100g)	Bulk Density (g/ml)	Aspect Ratio	UP-10	10	62	0.13	65	UP-20	20	58	0.16	70
Product	Particle Size (μm)	Oil Absorption (mL/100g)	Bulk Density (g/ml)	Aspect Ratio																
UP-10	10	62	0.13	65																
UP-20	20	58	0.16	70																
2. Sample Preparation																				
UP Mixing Ratio: UP-10/UP-20 = 10/0, 8/2, 7/3, 6/4, 5/5, 4/6, 3/7, 2/8, 0/10																				
Oily Paste: White Vaseline/Liquid Paraffin #70 = 2/1																				
Slurry Preparation: The powder and oily paste are mixed at a weight ratio of 1/3 and uniformly dispersed using a roll mill.																				
3. Measurement																				
Equipment: JASCO Corporation SPF/PA Value Evaluation System																				
UV-Visible Spectrophotometer V-770, Integrating Sphere Unit ISV-922, SPF/PA Value Calculation Program VWSP-966, Sunscreen SPF/PA Starter Kit																				
Procedure: A fixed amount of slurry was placed in an SPF cell and applied with a glass application stick. To minimize experimental variability, the application and measurement were repeated six times for each sample.																				

(Results)

Variation of SPF Equivalent Values Due to Mixing of UP-10 and UP-20

The figure below shows the variation of SPF equivalent values for coatings of mixed slurries of UP-10 and UP-20. The UV-shielding effect increases at weight fractions of approximately 0.6 to 0.7, where UP-20 is present in a slightly higher amount. Although the evaluation system was simplified, mixing UP-10 and UP-20 appears to enhance UV-shielding effect through more efficient two-dimensional packing of plate-like particles with different sizes. In actual use, the coating condition on the skin is even more complex, and mixing the two powders is likely to provide a more beneficial effect in terms of UV-shielding effect.



(Conclusion)

Previously, we have suggested that replacing conventional extender pigments with the UP series could improve the UV-shielding effect of formulations. Based on the results of this study, we recommend using a mixture of UP-10 and UP-20 to further enhance the UV-shielding performance of formulations.