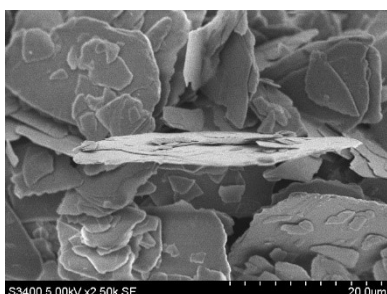


【Technical Data】		 YAMAGUCHI MICA CO., LTD.			
Title	UV-Shielding Mica UP series-				
Category	Cosmetics	By	H. Asano	Date	May.8.2025
(Summary) Compared to talc, mica powder has a higher aspect ratio and elastic modulus, as well as superior thermal stability. For these reasons, it has been used in plastic materials to enhance properties such as rigidity, warpage resistance, reduction of molding shrinkage, heat resistance and vibration damping. In cosmetics, it has been used as an extender pigment that provides texture, luster, smoothness, and transparency. However, while plastic materials demand light resistance and cosmetics require UV protection, the UV-shielding properties of mica powder—which is often used in relatively high proportions—have not received much attention. Therefore, we revisited the characteristics of natural mica and examined the changes caused by various treatment processes. As the results, we discovered that mica powder has previously unknown UV shielding properties, and would like to introduce our new mica brand, the "UV Shielding Mica UP Series." (Key Wors) Muscovite, mica, UV Shielding					
(Introduction) At Yamaguchi Mica, we have long focused on the production and sale of natural mica powders. In recent years, as the demand for added functionality has increased, we have worked to enhance the performance of natural mica through improvements in manufacturing processes, surface treatments, and composite techniques. However, due to the nature of natural materials, such enhancements have also led to changes in the inherent characteristics of the mica itself. Meanwhile, across industries such as plastics and cosmetics—both of which make extensive use of mica—UV protection and light resistance remain key challenges. In response, we revisited the effects of manufacturing methods on the properties of natural mica, and explored combinations of processes that could influence its performance in the ultraviolet region. Through this work, we successfully developed a new UV-Shielding Mica that shows reduced transmittance from the UV-A region toward shorter wavelengths. We are proud to introduce this innovation as part of our new "UV-Shielding Mica – UP Series."					
(Implemented Activities) 1. UV-Shielding Mica Using a newly developed production method, we prepared two grades of UV-shielding mica: UP-10 and UP-20. 2. Transmittance Measurement UP-10 was dispersed in a silicone resin coating solution and applied onto a polypropylene film. The resulting sample was measured for transmittance using a spectrophotometer. 3. Comparison with Conventional Mica A powder foundation was formulated using conventional natural mica (Y-1800) of the same particle size as UP-10. The UV-shielding performance of the two samples was then compared.					

(Results)

1. SEM Images of UV-Shielding Mica UP-10 and UP-20



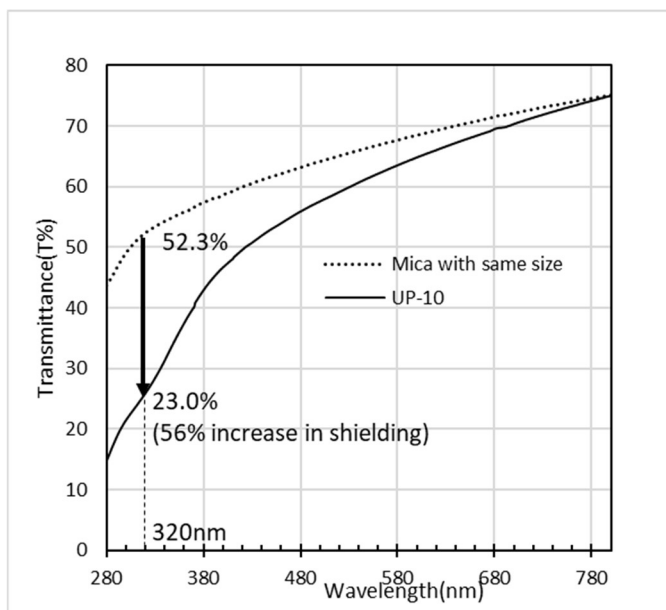
Observed UV-Shielding Mica

Left: UP-10 Right: UP-20

UP-10 has an average particle size of approximately 10 μm, while UP-20 is around 20 μm. Both are plate-like powders with smooth surfaces.

2. Transmittance

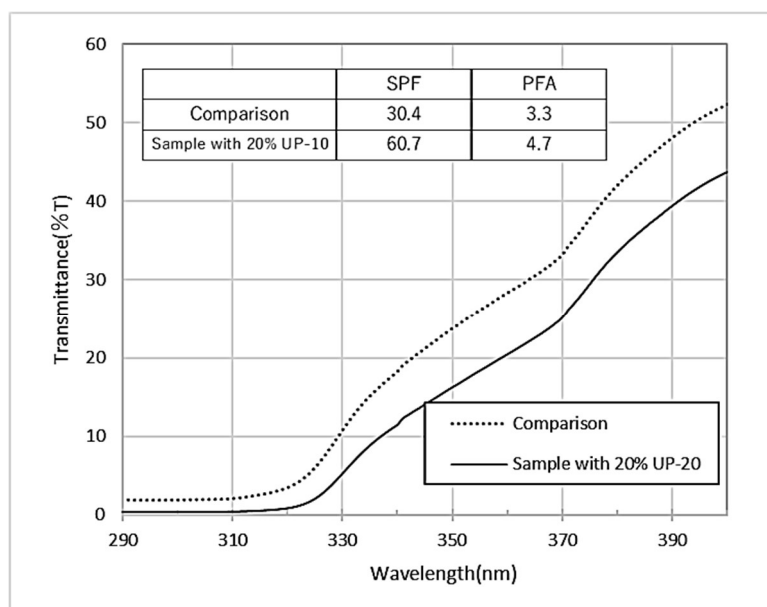
The right figure shows the measurement results of UP-10 and natural mica Y-1800 of the same particle size. UP-10 has a breakpoint near 400 nm and shows a decreasing trend toward the UV region.



3. UV Protection Efficacy in Powder Foundation

Powder foundations were prepared using the formulations shown in the table, and their UV protection efficacy was evaluated using the SPF/PA measurement system from JASCO Corporation. Each powder foundation sample was mixed with petrolatum prior to testing. As shown in the figure below, replacing conventional mica powder with UP-10 resulted in enhanced SPF and PA values in actual formulations.

No.	Component	amount (weight%)	
		Sample	Comparison
1	UP-10	20.0	
2	Mica with same size as UP-10(Y-1800)	25.5	45.5
3	Spherical Silica	4.9	4.9
4	Titanium Dioxide	4.5	4.5
5	Born Nitride	4.9	4.9
6	Talc	8.9	8.9
7	Fine Titanium Dioxide treated with Silicone	15.2	15.2
8	Fine Zinc Oxide treated with Silicone	3.0	3.0
9	Iron dioxide(CI77492) Treated with Triethoxycaprylylsilane	1.2	1.2
10	Iron dioxide(CI77491) Treated with Triethoxycaprylylsilane	0.4	0.4
11	Iron dioxide(CI77499) Treated with Triethoxycaprylylsilane	0.1	0.1
12	Ethylhexyl Methoxycinnamate	6.1	6.1
13	Squalane	5.3	5.3
Total		100.0	100.0



(Conclusion)

As demonstrated above, we have newly discovered the UV-shielding properties of natural mica powder. While these studies focused on evaluating the actual effects in cosmetic formulations, the results suggest not only potential improvements in SPF and PA values, but also enhanced light resistance in industrial products such as plastics.