


【Technical Data】		YAMAGUCHI MICA CO., LTD.																																																																																						
Title	Effect of UV-Shielding Mica UP-10 in Formulation System ① – Powder Foundation –																																																																																							
Category	Cosmetics	By	H. Asano	Date	June.4.2025																																																																																			
<p>(Summary) The new mica brand “Ultraviolet Shielding Mica UP Series” was introduced in a technical data document dated May 8, 2025. In this report, to verify its effectiveness in formulation, we measured SPF and PFA values using an SPF analyzer in addition to spectrophotometric analysis. As a result, the SPF and PFA values were enhanced by replacing ordinary mica with the UP Series, even in powder foundations.</p> <p>(Key Words) Muscovite, mica, UV Shielding, SPF analyzer</p>																																																																																								
<p>(Introduction)</p> <p>In promoting the performance of the UV-shielding mica UP series, we evaluated the transmittance of the raw powder using UV-visible spectrophotometer (V-770, Jasco), and the SPF and PA of the powder foundation using a spectroscopic measurement System for analysis of sunscreen SPF/PA (Jasco).</p> <p>In this report, we further present the results of the evaluation with the SPF analyzer.</p> <p>(Implemented Activities)</p> <p>1. Preparations of powder foundations</p> <p>Powder foundations were prepared according to below formulations.</p>																																																																																								
<table><tr><th rowspan="2">No.</th><th rowspan="2">Component</th><th colspan="3">amount (weight%)</th></tr><tr><th>Formula1</th><th>Formula2</th><th>Comparison</th></tr><tr><td>1</td><td>UP-10</td><td>45.5</td><td>20</td><td></td></tr><tr><td>2</td><td>Mica with same size as UP-10 (Y-1800)</td><td>0</td><td>25.5</td><td>45.5</td></tr><tr><td>3</td><td>Spherical Silica</td><td>4.8</td><td>4.8</td><td>4.8</td></tr><tr><td>4</td><td>Titanium Dioxide</td><td>4.5</td><td>4.5</td><td>4.5</td></tr><tr><td>5</td><td>Born Nitride</td><td>4.8</td><td>4.8</td><td>4.8</td></tr><tr><td>6</td><td>Talc</td><td>8.9</td><td>8.9</td><td>8.9</td></tr><tr><td>7</td><td>Fine Titanium Dioxide treated with Silicone</td><td>15.1</td><td>15.1</td><td>15.1</td></tr><tr><td>8</td><td>Fine Zinc Oxide treated with Silicone</td><td>3</td><td>3</td><td>3</td></tr><tr><td>9</td><td>Iron dioxide(CI77492) Treated with Triethoxycaprylylsilane</td><td>1.1</td><td>1.1</td><td>1.1</td></tr><tr><td>10</td><td>Iron dioxide(CI77491) Treated with Triethoxycaprylylsilane</td><td>0.3</td><td>0.3</td><td>0.3</td></tr><tr><td>11</td><td>Iron dioxide(CI77499) Treated with Triethoxycaprylylsilane</td><td>0.1</td><td>0.1</td><td>0.1</td></tr><tr><td>12</td><td>Magnesium Stearate</td><td>0.5</td><td>0.5</td><td>0.5</td></tr><tr><td>13</td><td>Ethylhexyl Methoxycinnamate</td><td>6.1</td><td>6.1</td><td>6.1</td></tr><tr><td>14</td><td>Squalane</td><td>5.3</td><td>5.3</td><td>5.3</td></tr><tr><td colspan="2">Total</td><td>100</td><td>100</td><td>100</td></tr></table>						No.	Component	amount (weight%)			Formula1	Formula2	Comparison	1	UP-10	45.5	20		2	Mica with same size as UP-10 (Y-1800)	0	25.5	45.5	3	Spherical Silica	4.8	4.8	4.8	4	Titanium Dioxide	4.5	4.5	4.5	5	Born Nitride	4.8	4.8	4.8	6	Talc	8.9	8.9	8.9	7	Fine Titanium Dioxide treated with Silicone	15.1	15.1	15.1	8	Fine Zinc Oxide treated with Silicone	3	3	3	9	Iron dioxide(CI77492) Treated with Triethoxycaprylylsilane	1.1	1.1	1.1	10	Iron dioxide(CI77491) Treated with Triethoxycaprylylsilane	0.3	0.3	0.3	11	Iron dioxide(CI77499) Treated with Triethoxycaprylylsilane	0.1	0.1	0.1	12	Magnesium Stearate	0.5	0.5	0.5	13	Ethylhexyl Methoxycinnamate	6.1	6.1	6.1	14	Squalane	5.3	5.3	5.3	Total		100	100	100
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<div><p>SPF analyzer “Labsphere UV-2000S”</p></div>																																																																																								
<p>2. Measurements of SPF and PFA</p> <p>0.005g of Vaseline was evenly applied to a PMMA plate using fingertips for 90 to 120 seconds, followed by the application of 0.023g of powder foundation in the same manner. Then, at least 15 minutes after application, the SPF and PFA were measured using the Labsphere UV-2000S SPF analyzer with at least 4 measurement samples at 5 locations on each plate.</p>																																																																																								
<p>(Results)</p> <div><p>With 20% replacement, SPF is +4-6, PFA is +1</p><p>With 45.5% replacement, SPF is +12, PFA is +2.5</p></div> <table><tr><td></td><td>SPF</td><td>PFA</td></tr><tr><td>Formula1</td><td>34</td><td>10.94</td></tr><tr><td>Formula2</td><td>26</td><td>9.09</td></tr><tr><td>Comparison</td><td>22</td><td>8.18</td></tr></table>							SPF	PFA	Formula1	34	10.94	Formula2	26	9.09	Comparison	22	8.18																																																																							
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<p>(Conclusion)</p> <p>The results confirmed that using UP-10 in actual powder foundation formulations enhanced both SPF and PFA values. We recommend replacing the extender pigments with the UP series in order to increase UV protection capacity.</p>																																																																																								