【Technical Data】	YAMAGUCHI MICA CO., LTD.				
Title	Proposal for Talc Substitutes －Amodimethicone-Treated Mica Blend Powder－				
Category	Cosmetics	By	H. Asano	Date	Sep.23.2025

(Summary) Recently, we have received many requests for natural mica as a talc substitute. Therefore, we experimented with blending various mica and additives, as well as surface treatments, with consideration for smoothness, moldability, gloss suppression, and price. As a result, we were able to make the mica containing fine powders more similar to the characteristics of talc by adding inorganic substances such as silicates and calcium carbonate, and metal soaps. Furthermore, by treating these blended powders with amodimethicone, it was possible to further approximate the feel of talc. This report proposes “amodimethicone-treated mica blend powder” as a talc substitute ingredient developed based on these facts.

(Key Words) Natural Mica, Silicates, Calcium Carbonate, Metal Soaps, Smoothness, Moldability, Gloss Suppression, Price

(Introduction)

Talc is characterized by its smoothness and ease of crumbling due to the weak bonds between its layers. For these reasons, it is widely used in cosmetics due to its pleasant feel on the skin, high moldability, and low cost. On the other hand, natural mica is a plate-like powder that cleaved easily and feels hard. Mica also has a glossy finish compared to the matte finish of talc. As mentioned above, the properties of talc and natural mica are significantly different, but recently we have received many requests for natural mica as a talc substitute. Therefore, we experimented with blending various mica and additives, as well as surface treatments, with consideration for smoothness, moldability, gloss suppression, and price.

(Implemented Activities)

1. Selection from Our Own Mica

To enhance moldability and suppress gloss, micronization of mica is necessary. However, the micronization also increases squeakiness and roughness. Keeping these facts in mind and considering cost, we attempted to select and blend our own mica.

2. Additive Search

It is difficult to achieve a texture similar to that of talc simply by grinding, classifying, or blending natural mica. Therefore, we first searched for additives to enhance smoothness and moldability, focusing on organic substances such as starch and inorganic fine powders.

3. Surface Treatment

We investigated treatments such as amodimethicone treatment and metal soap treatment, which are expected to improve smoothness and moldability.

4. Evaluation

① Untreated talc is often used in point makeup products. Therefore, we improved the texture by blending mica and additives without surface treatment. The evaluation was carried out by pressing the mixture into an aluminum pan without a binder and observing the initial state and the change in state under wet condition.

② For samples showing good results in ①, we mainly applied amodimethicone treatment. Next, the pressing state was observed in the same way as in ①, and the drop strength was compared with that of talc.

(Results)

1. Selection of our own mica

Taking into consideration moldability and gloss suppression, we selected several types of our own mica containing fine powder.

2. Additive Screening

We collected and examined additives with the following functions: those that suppress squeakiness and roughness caused by fine particles, and those that fill the gaps between plate-like mica particles while crumbling during compression molding.

Organic materials: corn starch, rice starch, aluminum starch octenylsuccinate, magnesium stearate, aluminum stearate, zinc stearate.

Inorganic materials: finely powdered sericite, aluminum silicate, magnesium silicate, calcium carbonate.

These were blended with the selected mica, and the pressed molded products were subjected to moisture absorption tests in a desiccator. Typical results are shown below.

corn starch　　rice starch　　aluminum starch octenylsuccinate　　calcium carbonate/ magnesium stearate

As shown in the figure above, starches are extremely smooth, but under wet conditions, the pressed molded products indicated a pronounced tendency to expand. In contrast, silicates and calcium carbonate have excellent moldability and stability, although they have squeakiness and roughness. Furthermore, adding metal soaps proved effective in enhancing the usability and moldability of their blends. Therefore, we determined that inorganic substances such as silicates and calcium carbonate are suitable as additives for mica to enhance moldability, and that metal soaps are effective for improving the smoothness.

3. Mica Blend for enhanced usability

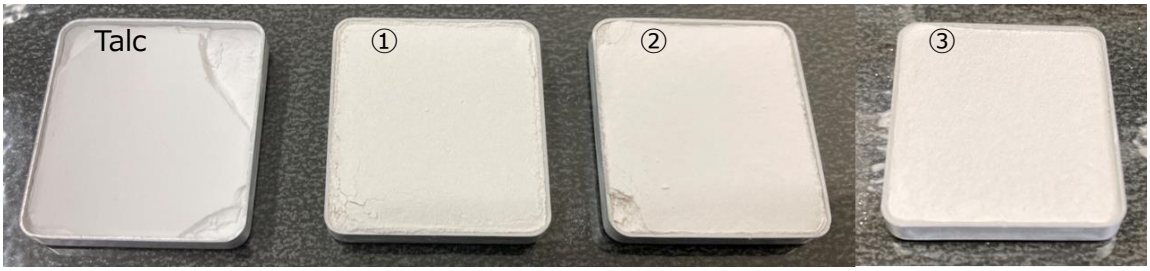
Using mica containing fine powder to improve formability or suppress gloss results in squeakiness and reduced smoothness. To solve this problem, we considered blending our own main mica without fine powder to reduce roughness, while also taking price into consideration. As results, although it did not improve to the same usability as talc, blending our main mica product enables adjustment of smoothness during application.

4. Development of Talc Substitutes by Surface Treatment

Based on the results of mica selection, blending, and additive exploration described above, we investigated amodimethicone treatment to further improve feel and enhance moldability. Regarding metal soap treatment, we concluded that incorporating metal soap as an additive into cosmetic formulations is more cost-effective than surface treatment.

We performed amodimethicone treatment on various powder combinations. The figure below shows the results of the drop test conducted.

Drop Test(n=3) Aluminiun Pan: 28mm×25.5mm×4mmH



Talc: crack

①(Mica Mixture/CaCO3 with 3% amodimethicone): rising up, crack

②(Mica Mixture/CaCO3 with 5% amodimethicone): crack

③(Mica Mixture with 5% amodimethicone): rising up

	Talc		①	②	③
Pressing Condision	2.5g 7MPa	3.5g 7MPa	2.5g 7.5MPa	2.5g 7.5MPa	2.5g 7.5MPa
Drop Resistance	3.3	2.0	0.7	2.3	1.0

Treatment with 3% amodimethicone tended to result in slightly inferior drop strength, but the feel was smooth. Treatment with 5% amodimethicone yielded comparable drop strength, and the cracking pattern was similar to that of talc, rather than a rising pattern. Even in formulations without calcium carbonate, the amodimethicone treatment showed a certain degree of drop strength.

(Conclusion)

Considering the demand for talc alternatives, we evaluated proposals using our mica. As a result, we found that adding inorganic substances such as silicates and light calcium carbonate, and metal soaps to untreated mica worked well. Based on these findings, we have successfully developed a cost-effective talc substitute material, “Amodimethicone-treated Mica Blend Powder,” by blending various types of our micas and applying amodimethicone treatment. These talc substitutes offer a smooth feel, excellent moldability, reduced gloss, and other usability benefits at a lower price.