Composite Microspheres

USA & Canada Program

A composite material is made from two or more constituent materials with significantly different physical or chemical properties that, when combined, produce a material with characteristics different from the individual components.

There are several possible structures for building a composite microsphere

- A modifier dispersed in a polymer matrix
- A shell covering a core of a different composition
- A mineral platelet covered with small polymer particles.

Kobo Products offers a broad range of these novel Composite Microspheres, to allow formulators to take advantage of their unique structures: improved skin feel and affinity, optical blurring, ease of formulation and/or radiance.

Matrix & Modifier Structure

MSP-TK04, NH-RAS06 are Composite Microspheres with a matrix and a modifier, giving them a higher refractive index than regular PMSQ microspheres. Their composition combined with a textured surface makes them ideal for improved skin feel and optical blurring.

US-450 has small PSMQ particles embedded within the polyurethane matrix at the periphery of the microsphere. It offers HEV protection by attenuating blue light.

Core & Shell Structure

These composites have in common a structure where a shell modifies the physicochemical characteristics of the core material.

SESQ-MH5 has a shell made of silica which renders the PMSQ core hydrophilic and easily dispersible in water. SILCRUSTA MK03 is based on the same principle, with an MMA Crosspolymer core and a PMSQ textured shell.

<table>
<thead>
<tr>
<th>Trade Name</th>
<th>INCI Name</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSP-TK04</td>
<td>Polymethylsilsequioxane (And) Titanium Dioxide</td>
<td>4 µm</td>
</tr>
<tr>
<td>NH-RAS06</td>
<td>Polymethylsilsequioxane (And) Alumina</td>
<td>5 µm</td>
</tr>
<tr>
<td>US-450</td>
<td>HDI/Trimethyl Hexyllactone Crosspolymer (And) Polymethylsilsequioxane</td>
<td>18 µm</td>
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Semi-Spherical Composite Microspheres

UP-611 are composite microspheres, with a PMMA core and a Polyurethane outer shell, showing a unique, semi-spherical shape. Due to their shape and composition they have been shown to adhere better than spherical particles to the skin, improve color intensity when mixed with pigments and act as SPF boosters in sunscreen products.

<table>
<thead>
<tr>
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<th>Size</th>
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<tbody>
<tr>
<td>UP-611</td>
<td>HDI/Trimethyl Hexyllactone Crosspolymer (And) Methyl Methacrylate Crosspolymer</td>
<td>11 µm</td>
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PMMA-Coated Pearls

These products are pearlescent pigments coated with small PMMA particles to limit the specular reflection and create a more natural look. They are used to give radiance and a natural glow to the skin.

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<th>INCI Name</th>
<th>Size</th>
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<tbody>
<tr>
<td>SK-45-R</td>
<td>Polymethyl Methacrylate (And) Mica (And) Titanium Dioxide</td>
<td>25 µm</td>
</tr>
<tr>
<td>HV-GOLD</td>
<td>Synthetic Fluorphlogopite (And) Titanium Dioxide (And) Polyvinyl Alcohol</td>
<td>23 µm</td>
</tr>
<tr>
<td>HV-RED</td>
<td>Polymethyl Methacrylate (And) Tin Oxide (And) Polyvinyl Alcohol</td>
<td></td>
</tr>
<tr>
<td>HV-BLUE</td>
<td>Synthetica Fluorphlogopite</td>
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Technical Literature ref MicroCompoUS-002 - June 2, 2020
KFL-111
Light Cushioned Blurring Primer

Part 1
- Deionized Water - Water 55.70%
- CES-1104 - Nusil/Kobo Products: Dimethicone (And) Water (And) Glycerin (And) Pentylene Glycol (And) Dimethicone/Vinyl Dimethicone Crosspolymer (And) Amodimethicone (And) Carbamer (And) Phenoxyethanol (And) Sodium Hydroxide (And) Disodium Edta 5.00%
- Butylene Glycol - Ruger Chemical: Butylene Glycol 3.00%
- Germaben® II - ISP: Propylene Glycol (And) Diazolidinyl Urea (And) Methylparaben (And) Propylparaben 1.00%
- GS-GT - Kobo Products: Water (And) Camellia Sinensis Leaf Extract (And) Palmitoyl Hydoxypropyltrimonium Amylopectin/Glycerin Crosspolymer (And) Phenoxyethanol (And) Parabens (And) Hydrogenated Lecithin 1.00%
- GS-PPY - Kobo Products: Water (And) Papain (And) Palmitoyl Hydoxypropyltrimonium Amylopectin/Glycerin Crosspolymer (And) Phenoxyethanol (And) Hydrogenated Lecithin (And) Parabens 1.00%
- Methyl Paraben NF - International Sourcing: Methylparaben 0.10%
- Propyl Paraben NF - International Sourcing: Propylparaben 0.10%

Part 2
- Protachem™ CTG - Protameen: Caprylic/Capric Triglyceride 11.00%
- EA-209 - Kobo Products: Ethylene/Acrylic Acid Copolymer 5.50%
- SESQ-MH5 - N+M/Kobo Products: Polymethylsil sesquioxane (And) Silica 5.00%
- SALACOS® 99 - Ikeda: Isononyl Isononanoate 4.00%
- Abil® Care XL 80 - Evonik: Bis-PEG/PPG-20/5 PEG/PPG-20/5 Dimethicone (And) Methoxy PEG/PPG-25/4 Dimethicone (And) Caprylic/Capric Triglyceride 3.00%
- BPD-500W - Kobo Products: HDI/Trimethyl Hexyl lactone Crosspolymer (And) Silica 3.00%

Manufacturing Procedure
2. Premix Part 2 and add to Part 1 under homogenization.
3. Add Part 3 and homogenize.

Description
This light-on-the-skin, cushion primer features Kobo’s Glycospheres Gs-PPY and Gs-GT. Active ingredients, papain and green tea polyphenols, are released from the systems to both protect the skin and replenish it. Nusil’s CES-1104 is an encapsulated elastomer gel that can be added to the water phase or post emulsification. Upon application the encapsulated CES materials break and offer an initial refreshing feel that is followed by a velvety silicone after feel. Hydrophilic Silicone Resin, SESQ-MH5, offers a smooth application with good payoff and soft focus effect. Microspheres, BPD-500W and EA-209 create a natural blurring effect that minimizes the look of lines and wrinkles and illuminates the skin.

KPP-069I
Pressed Powder with SILCRUSTA MK03

Part 1
- SERICITE GMS-4C - Kobo Products: Mica 70.48%
- SILCRUSTA MK03 - Nikko Rica/Kobo Products: Methyl Methacrylate Crosspolymer (And) Polymethylsil sesquioxane 10.00%
- BTD-1152 - Kobo Products: Titanium Dioxide (And) Triethoxycaprylylsilane 7.00%
- ZINC MYRISTATE - Kobo Products: Zinc Myristate 2.00%
- BYO-1152 - Kobo Products: Iron Oxides (CI 77492) (And) Triethoxycaprylylsilane 1.00%
- BRO-1152 - Kobo Products: Iron Oxides (CI 77491) (And) Triethoxycaprylylsilane 0.86%
- BOO-1152 - Kobo Products: Iron Oxides (CI 77499) (And) Triethoxycaprylylsilane 0.46%
- Methyl Paraben NF - International Sourcing: Methylparaben 0.10%
- Propyl Paraben NF - International Sourcing: Propylparaben 0.10%

Part 2
- Lexol® PG-865 - Inolex Chemical Company: Propylene Glycol Dicaprylate/Dicaprate 2.50%
- Xiameter® PMX-200 Silicone Fluid 20CS - Dow Coming: Dimethicone 2.50%
- Xiameter® PMX-200 Silicone Fluid 350 CS - Dow Coming: Dimethicone 2.00%
- SS4267 - Momentive: Dimethicone (And) Trimethylsiloxysilicate 1.00%
- Liposorb® O - Lipo Chemicals: Sorbitan Oleate 1.00%
- Sepigel™ 305 - ChemUnion/Seppic: Polycryliclamide (And) C13-14 Isoparaffin (And) Laureth-7 0.80%

Manufacturing Procedure
1. Micropulverize Part 1 until color is fully developed.
3. Blend well.
4. Press at 500 psi.

Description
Part of a formula series that shows how important Microspheres are to pressed powder formulas. Each type and size of Microsphere gives the formula a different feel. This pressed powder formula contains Kobo’s SILCRUSTA MK03, Methyl Methacrylate Crosspolymer Microsphere, used for optical enhancing to accentuate the skin with a natural appearance while hiding imperfections such as fine lines and wrinkles. SERICITE GMS-4C is added to give a glide-on application. Kobo’s 11S treatment helps to provide this pressed powder with adhesion to the skin and gives the formula a creamy feel. ZINC MYRISTATE also contributes to great feel and adherence on the skin.