**TiO₂ Powders**  
For Sunscreen Applications

Because of its high refractive index, Titanium dioxide (TiO₂) is commonly used as a pigment. It is also an effective UV filter when the primary particle size is under 100 nm. Titanium Dioxide is ideal for formulating mild or hypoallergenic sun care products with UVA/UVB protection for babies and children, and consumers with sensitive skin. Its physical and chemical stability differentiates this filter from organic UV absorbers.

To improve stability, dispersion in formulas and performance as a UV filter, TiO₂ is available treated with various inorganic and organic compounds. While Aluminum Hydroxide and Alumina are common inorganic treatments, Silica treated TiO₂ are also available. Most Kobo TiO₂ powders are “Non-Nano” as measured according to the last Nano Guidance from Cosmetics Europe (Interpretation of the Definition of the Term “Nanomaterial” according to the EU Cosmetic Regulation 1223/2009, May 24, 2019).

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**KLF-263**  
W/O Natural Non-Nano BB Cream

**Part 1**  
- Deionized Water - Water: 12.15%
- Sodium Chloride - Morton Salt: Sodium Chloride: 1.50%

**Part 2**  
- Glycerin U.S.P. Natural 96% - Vopak: Glycerin: 4.00%
- Keltrol® CG - CP Kelco: Xanthan Gum: 0.25%

**Part 3**  
- Pelemol® CCT - Phoenix Chemicals: Caprylic/Capric Triglyceride: 25.00%
- GC70MZCJ-G - Kobo Products: Zinc Oxide (And) Caprylic/Capric Triglyceride (And) Jojoba Esters (And) Glyceryl Behenate/Eicosadioate: 24.00%
- TTO-NJE8 - Kobo Products: Titanium Dioxide (And) Alumina (And) Jojoba Esters: 15.00%
- OD75CJE - Kobo Products: Titanium Dioxide (And) Octyldecanolate (And) Jojoba Esters (And) Trihydroxystearin: 5.80%
- OD55YJE - Kobo Products: Iron Oxides (CI 77491) (And) Octyldecanolate (And) Jojoba Esters (And) Trihydroxystearin: 0.80%
- OD75RJE - Kobo Products: Iron Oxides (CI 77499) (And) Octyldecanolate (And) Jojoba Esters (And) Trihydroxystearin: 0.15%
- OD75BJE - Kobo Products: Iron Oxides (CI 77492) (And) Octyldecanolate (And) Jojoba Esters (And) Trihydroxystearin: 0.05%

**Part 4**  
- Dehydrol® PGP - BASF: Polyglyceryl-2 Dipolyhydroxystearate: 4.00%
- SunBoost ATB Natural - Kobo Products: Argania Spinosa Kernel Oil (And) Tocopheryl Acetate (And) Bisabolol: 3.00%
- MSS-500W - Kobo Products: Silica: 2.00%
- Cegesoft® SB - BASF: Butyrospermum Parkii (Shea) Butter: 1.00%
- Olivem® 900 - The HallStar Company: Sorbitan Olivate: 1.00%

**Part 5**  
- AE Preserve® PCG - AE Chemie: Phenethylalcohol (And) Caprylylhydroxamic Acid (And) Glycerin: 0.30%

**Manufacturing Procedure**
1. Add Part 2 (pre-mix first) to Part 1. Heat to 80°C.
2. Add Part 4 to Part 3 and mix while heating to 80°C.
3. Add Parts 1 and 2 to Parts 3 and 4 slowly, while mixing with propeller.
4. Homogenize at 7000 rpm for 5 minutes.
5. Air cool batch under homomixer to 40°C.
6. Add Part 5 and cool to room temperature with continuous mixing.

**Description**
This Natural BB (Beauty Balm) Cream formula is an elegant light weight moisturizer featuring Kobo’s Cosmos-approved products. The combination of GC70MZCJ-G, non-nano ZnO dispersion, and TTO-NJE8, non-nano treated TiO₂ offers high UVA and UVB protection. Kobo’s natural Pigmentary dispersions in Octyldodecanol contain the same Jojoba Ester pigment treatment. They provide light coverage for dark spots and skin discolorations. SunBoost ATB Natural is a proprietary ratio of anti-oxidant, anti-irritant and anti-inflammatory agents that helps to boost sun protection. MSS-500W is a silica microsphere, that reduces tackiness and provides non-greasy feel.

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**Active Ingredients**
- Zinc Oxide: 16.18%
- Titanium Dioxide: 11.51%

**Testing**
- SPF: in vivo on 5 subjects
- UVA-PF: in vivo on 3 subjects
- CW: FDA method
<table>
<thead>
<tr>
<th>Product Name</th>
<th>INCI Name</th>
<th>Active %</th>
<th>Primary Part. Size (nm)</th>
<th>EU Compliance</th>
</tr>
</thead>
<tbody>
<tr>
<td>A10-TIO2-SA-ASG8</td>
<td>Titanium Dioxide (And) Aluminum Hydroxide (And) Stearoyl Glutamic Acid (And) Hydrated Silica</td>
<td>75</td>
<td>10</td>
<td>Compliant</td>
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<tr>
<td>A10-TIO2-SA-NJE14</td>
<td>Titanium Dioxide (And) Aluminum Hydroxide (And) Hydrated Silica (And) Jojoba Esters</td>
<td>70</td>
<td>10</td>
<td>Compliant</td>
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<tr>
<td>A15-TIO2-SX-D56</td>
<td>Titanium Dioxide (And) Silica (And) Dimethicone</td>
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<td>15</td>
<td>Compliant</td>
</tr>
<tr>
<td>A15-TIO2-ST-NOE8</td>
<td>Titanium Dioxide (And) Hydrogenated Olive Oil Stearyl Esters (And) Aluminum Hydroxide</td>
<td>92</td>
<td>15</td>
<td>-</td>
</tr>
<tr>
<td>A15-TIO2-SX-NJE8</td>
<td>Titanium Dioxide (And) Silica (And) Jojoba Esters</td>
<td>74</td>
<td>15</td>
<td>Compliant</td>
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<tr>
<td>A15-TIO2-ST-SA8</td>
<td>Titanium Dioxide (And) Aluminum Hydroxide (And) Stearic Acid</td>
<td>80</td>
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<tr>
<td>JTTO-MS7</td>
<td>Titanium Dioxide (And) Alumina (And) Hydrogen Dimethicone</td>
<td>79</td>
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<tr>
<td>TTO-MS4</td>
<td>Titanium Dioxide (And) Alumina (And) Hydrogen Dimethicone</td>
<td>81</td>
<td>15</td>
<td>Compliant</td>
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<tr>
<td>TTO-NJE8</td>
<td>Titanium Dioxide (And) Alumina (And) Jojoba Esters</td>
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<td>15</td>
<td>Compliant</td>
</tr>
<tr>
<td>TTO-TTB7</td>
<td>Titanium Dioxide (And) Alumina (And) Isopropyl Titanium Triisostearate (And) Triethoxysilylpropyl Polydimethylsiloxyethyl Dimethicone</td>
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<td>15</td>
<td>-</td>
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<tr>
<td>TTO-SIM14</td>
<td>Titanium Dioxide (And) Alumina (And) Hydrogen Dimethicone (And) Triethoxysilylethyl Polymethylsiloxane</td>
<td>73</td>
<td>15</td>
<td>-</td>
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<tr>
<td>MT-500B-NJE5</td>
<td>Titanium Dioxide (And) Jojoba Esters</td>
<td>93</td>
<td>35</td>
<td>Compliant</td>
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<tr>
<td>A35-TIO2-MDS6</td>
<td>Titanium Dioxide (And) Hydrogen Dimethicone (And) Dimethicone</td>
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<td>Compliant</td>
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<tr>
<td>TIO2 STT-65S-I3</td>
<td>Titanium Dioxide (And) Isopropyl Titanium Triisostearate</td>
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<tr>
<td>MT-600B-MS7</td>
<td>Titanium Dioxide (And) Hydrogen Dimethicone</td>
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<td>50</td>
<td>Compliant</td>
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<tr>
<td>MT-600B-11SS*</td>
<td>Titanium Dioxide (And) Triethoxycaprylylsilane</td>
<td>95</td>
<td>50</td>
<td>-</td>
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</table>

* This TiO₂ Powder was found to be a nanomaterial when tested by light scattering method

This table was prepared to assist in formulating with Titanium Dioxide Powders. The information contained herein is believed to be accurate at the time of printing and represents typical values, but should not be used as a substitute for product specification sheets. The Non-Nano Powders listed in this flyer have been tested by light scattering method, according to the Cosmetics Europe Nano Guidance Package; Part II: Interpretation of the Definition of the Term “nanomaterial” according to the EU Cosmetic Regulation 1223/2009, published on May 24, 2019. We are also listing the primary particle size - PPS (nm) - for comparison purposes.

EU Compliance: These TiO₂ comply with the conditions for Titanium Dioxide (nano) as set forth in the Annex VI to Regulation (EC) No 1223/2009.

We recommend that customers make their own assessment when using particle size data for the purpose of identifying nanomaterials in their finished formulations.

Please contact our team at techservice@koboproductsinc.com for additional information on this subject.