## ZnO-C
### A Unique Non-Nano Zinc Oxide for Sunscreen Applications

Inorganic UV filters have been manufactured during the past forty years for use in sunscreen products. They are often preferred over organic UV filters because of their physical and chemical stability, as well as their non-irritating properties. In order to optimize the protection against UV light, and to minimize the scattering of visible light, zinc oxide with particle sizes less than 100nm, or “nanoparticles,” have become increasingly popular. However, recent concerns surrounding “nanoparticles” safety have challenged pigment producers to develop grades with a mean particle size over 100nm, while maintaining adequate performance.

Kobo now offers a unique grade of non-nano Zinc Oxide, named ZnO-C. This zinc oxide has a primary particle size of about 265 nm and size distribution that is entirely above 100 nm, when measured by image analysis. Particle sizes of powders and dispersions made with ZnO-C are greater than 100nm when measured by light scattering sizing, 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).

ZnO-C is available as a powder, surface-treated to improve its dispersibility and compatibility with cosmetic media, and as dispersions in esters, silicones or water to further increase performance. It allows formulators to develop sunscreen products with high UV protection and cosmetic acceptability without nanoparticles.

### Manufacturing Procedure
1. Pre-mix Part 2 and add to Part 1. Heat to 80°C.
2. Pre-mix Part 3 and mix until homogeneous using a propeller. 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 propeller mixing.
4. Homogenize at 7000 rpm for 5 minutes.
5. Add Part 5 and cool to room temperature while mixing.

### Description
This natural sunscreen features Kobo’s Cosmos approved products GC70MZCJ-G, non-nano ZnO dispersion, and TTO-NJE8, non-nano treated TiO2. This combination offers high UV protection. SunBoost ATB Natural is a proprietary ratio of anti-oxidant, anti-irritant and anti-inflammatory agents that can boost UV protection. MSS-500W is a silica microsphere, that reduces tackiness and improves application feel.

### Active Ingredients
- Titanium Dioxide 11.40%
- Zinc Oxide 16.10%

### Technical Literature ref NonNanoZnO-001 - February 21, 2020

---

### Part 1
- Deionized Water Water 18.95%
- Sodium Chloride - Fischer: Sodium Chloride 1.50%

### Part 2
- Glycerin - Interchimie: Glycerin 4.00%
- Keltofl® CG - CP Kelco: Xanthan Gum 0.25%

### Part 3
- Tegosoft® CT - Eponik: Caprylic/Capric Triglycerides 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%

### Part 4
- Dehymuls® PGPH - 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%
- Lipex® Shea Tris - AAK: Shea Butter 1.00%
- Olivem® 900 - Hallstar: Sorbitan Olivate 1.00%

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

---

### KSL-376A-EU
### Natural Non-Nano Sunscreen

- Deionized Water Water 18.95%
- Sodium Chloride - Fischer: Sodium Chloride 1.50%

### Part 2
- Glycerin - Interchimie: Glycerin 4.00%
- Keltofl® CG - CP Kelco: Xanthan Gum 0.25%

### Part 3
- Tegosoft® CT - Eponik: Caprylic/Capric Triglycerides 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%

### Part 4
- Dehymuls® PGPH - 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%
- Lipex® Shea Tris - AAK: Shea Butter 1.00%
- Olivem® 900 - Hallstar: Sorbitan Olivate 1.00%

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

---

### Technical Literature ref NonNanoZnO-001 - February 21, 2020

---

### Kobo Products
### USA - New Jersey
+1 (908) 757-0033

### BRASIL - São Paulo
+55 (11) 5062-0634

### UK - Abingdon
+44 7913 636 673

### FRANCE - Labege
+33 (0)5-62-88-77-40

---

www.koboproducts.com
## Powders

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Surface Treatment</th>
<th>Properties</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZnO-C</td>
<td>None</td>
<td>Hydrophilic</td>
</tr>
<tr>
<td>ZnO-C-I2</td>
<td>Isopropyl Titanium Trisostearate</td>
<td>Lipophlic</td>
</tr>
<tr>
<td>ZnO-C-NJE3</td>
<td>Jojoba Esters</td>
<td>Hydrophilic</td>
</tr>
<tr>
<td>ZnO-C-NOE4</td>
<td>Natural Olive Esters</td>
<td>Hydrophilic</td>
</tr>
<tr>
<td>ZnO-C-DMC2</td>
<td>Hydrogen Dimethicone</td>
<td>Hydrophilic</td>
</tr>
<tr>
<td>ZnO-C-DS4</td>
<td>Dimethicone</td>
<td>Hydrophilic</td>
</tr>
<tr>
<td>ZnO-C-ASG3J</td>
<td>Stearoyl Glutamic Acid</td>
<td>Hydrophilic</td>
</tr>
</tbody>
</table>

## Dispersions

<table>
<thead>
<tr>
<th>Carrier</th>
<th>Product Name</th>
<th>INCI Name</th>
<th>Active %</th>
<th>Viscosity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Natural Esters/Oils</td>
<td>GC70MZCJ-G</td>
<td>Zinc Oxide (And) Caprylyc/Capric Triglyceride (And) Jojoba Esters (And) Glyceryl Behenate/Eicosadiol</td>
<td>67</td>
<td>Paste</td>
</tr>
<tr>
<td></td>
<td>GC70MZC5G</td>
<td>Zinc Oxide (And) Caprylyc/Capric Triglyceride (And) Stearoyl Glutamic Acid (And) Glyceryl Behenate/Eicosadiol</td>
<td>68</td>
<td>Paste</td>
</tr>
<tr>
<td></td>
<td>JOP80MZCJ</td>
<td>Zinc Oxide (And) Simmondsia Chinensis (Jojoba) Seed Oil (And) Polyhydroxystearic Acid (And) Jojoba Esters</td>
<td>77</td>
<td>Paste</td>
</tr>
<tr>
<td>Silicones</td>
<td>CMX80MZCM</td>
<td>Zinc Oxide (And) Cyclopentasiloxane (And) Dimethicone (And) PEG/PPG-18/18 Dimethicone (And) Hydrogen Dimethicone</td>
<td>78</td>
<td>Paste</td>
</tr>
<tr>
<td>HBP75MZCM</td>
<td>Zinc Oxide (And) Butyloctyl Salicylate (And) Polyhydroxystearic Acid (And) Hydrogen Dimethicone (And) Glyceryl Behenate/Eicosadiol</td>
<td>73</td>
<td>Paste</td>
<td></td>
</tr>
<tr>
<td>TNS57MZCM</td>
<td>Zinc Oxide (And) Ethylhexyl Methoxyxylene (And) C12-15 Alkyl Benzoate (And) Polyhydroxystearic Acid (And) Hydrogen Dimethicone</td>
<td>73</td>
<td>Paste</td>
<td></td>
</tr>
<tr>
<td>UV Boosters</td>
<td>DIM2FH75MZCM</td>
<td>Zinc Oxide (And) Dimethicone (And) Isononyl Isononanoate (And) Polyglyceryl-6 Polyrxcinolate (And) PEG-10 Dimethicone (And) Hydrogen Dimethicone</td>
<td>73</td>
<td>Pourable</td>
</tr>
<tr>
<td></td>
<td>MTMX80MZCM</td>
<td>Zinc Oxide (And) Methyl Trimethicone (And) Dimethicone (And) Hydrogen Dimethicone (And) PEG/PPG-18/18 Dimethicone (And) Hydrogen Dimethicone</td>
<td>78</td>
<td>Paste</td>
</tr>
<tr>
<td>Aqueous</td>
<td>GLW70MZC</td>
<td>Zinc Oxide (And) Water (And) Glycerin (And) Sodium Polycrylate (And) Cellulose Gum</td>
<td>70</td>
<td>Paste</td>
</tr>
</tbody>
</table>

### Raw material approved by Ecocert in accordance with the Cosmos Standard
- C

### Raw material approved by Ecocert in accordance with the Cosmos and Ecocert Standards
- CE

### Raw material approved by Ecocert in accordance with the Cosmos Standards (w/ petrochemical)
- CP

---

This chart was prepared to assist formulators using ZnO-C Powders and Dispersions. 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 and Dispersions 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 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.

---

Our dispersions are often divided into two general categories:

1. **High Solids® Dispersions**: These are usually in paste form and have a high active ZnO loading and efficacy.
2. **High Speed™ Dispersions**: These are usually pourable and easy to incorporate into a formulation.