

# Kobo ZnO-100

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

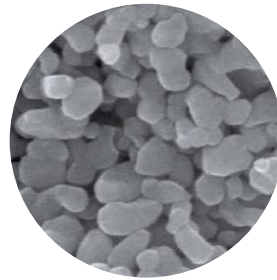


### China Program

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.

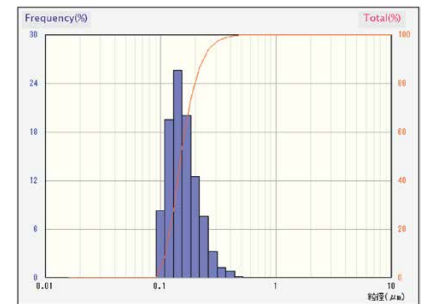
Kobo now offers a unique grade of non-nano Zinc Oxide, named Kobo ZnO-100. This zinc oxide has a primary particle size of about 100-300 nm and a size distribution that is approximately 80 percent above 100nm, when measured by image analysis. Particle sizes of powders and dispersions made with Kobo ZnO-100 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).

KOBO ZNO-100 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.



SEM image of Kobo ZnO-100

### Particle Size Distribution (Image Analysis)



KSL-475E-EU

## Clean Beauty Sunscreen Stick 3-in-1 Prime'n Glow Non-Nano ZnO



#### Part 1

• Dub Zenoat - Stearinerie Dubois: <i>Propanediol dicaprylate</i>	28.10%
• ZnO-C-ASG3J - Kobo Products: <i>Zinc Oxide (And) Stearoyl Glutamic Acid</i>	25.00%
• Emotion Light - Roelmi HPC: <i>Tripelargonin</i>	18.69%
• SunBoost ATB - Kobo Products: <i>Argania Spinosa Kernel Oil (And) Tocopheryl Acetate (And) Bisabolol</i>	4.00%
• Plurol Diisostearique - Gattefosse: <i>Polyglyceryl 3 Diisostearate</i>	2.00%
• Sensiva PA 40 - Schuelke: <i>Phenylpropanol (and) Propanediol (and) Caprylyl Glycol (and) Tocopherol</i>	0.60%

#### Part 2

• Sunflower Wax - Koster Keunen: <i>Helianthus Annus (Sunflower) Seed Wax</i>	3.80%
• Dub PTB - Stearinerie Dubois: <i>Pentaerythrityl Tetrahehenate</i>	3.00%
• Kesterwax K82H - Koster Keunen: <i>C20-40 Alkyl Stearate</i>	2.00%

#### Part 3

• CELLULOBEADS D-10-NPC2 - Kobo Products: <i>Cellulose (And) Hydrogenated Lecithin</i>	5.00%
• MSS-500/N - Kobo Products: <i>Silica</i>	5.00%
• MSS-500/3H - Kobo Products: <i>Silica</i>	1.20%

#### Part 4

• KTZ® ARUBAN CORAL-ASG2 - Kobo Products: <i>Mica (And) Titanium Dioxide (And) Iron Oxides (CI 77491) (And) Stearoyl Glutamic Acid</i>	1.00%
• GCG50TRSG - Kobo Products: <i>Iron Oxides (CI 77491) (And) Caprylic/Capric Triglyceride (And) Polyglyceryl-3 Diisostearate (And) Stearoyl Glutamic Acid</i>	0.40%

- GCG50TYSG - Kobo Products: *Iron Oxides (CI 77492) (And) Caprylic/Capric Triglyceride (And) Polyglyceryl-3 Diisostearate (And) Stearoyl Glutamic Acid* 0.15%
- KTZ® EBONY - Kobo Products: *Iron Oxides (CI 77499) (And) Mica* 0.06%

#### Manufacturing Procedure

1. Prepare Part 1 by dispersing powder ZnO in liquid emollients.
2. Add Part 2, heat to 95°C, add Part 3 followed by Part 4 and mix till homogeneous.
3. Pour into containers at 85°C and leave to cool at RT.

#### Description

This easy-to-use, waterless 3-in-1 sunscreen stick is also a primer with a glow effect, containing mostly vegetal and mineral origin ingredients. The formulation contains ZnO-C-ASG3J, a non-nano Zinc Oxide, hydrophobically modified for easy dispersion in the emollients used, to provide UV protection. It also contains SunBoost ATB for UV protection boosting and skin protecting efficacy. The mineral microspheres MSS-500/N and MSS-500/3H contribute to weightless application and good payoff as well as soft focus effects on the skin. CELLULOBEADS D-10-NPC2, a 10 micron cellulose microsphere with hydrogenated lecithin treatment, which renders it more creamy, contributes softness and creaminess to the stick. The formulation is tinted with GCG50TRSG and GCG50TYSG, transparent iron oxide dispersions and KTZ® EBONY, a black iron oxide coated mica, to significantly reduce whitening caused by large particle size Zinc Oxide. The glow effect is imparted by KTZ® ARUBAN CORAL-ASG2, a special skin color blend.

#### Active Ingredient

Zinc Oxide	24.25%
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#### Testing

SPF: in vivo on 5 subjects  
UVA-PF: in vitro method  
CW: FDA method

**KOBO**

USA  
New Jersey

BRASIL  
São Paulo

UK  
Abingdon

FRANCE  
Labege

ASIA PACIFIC  
Tokyo

## Powders

Product Name	Surface Treatment	Properties
KOBO ZNO-100	None	Hydrophilic
ZnO-C-12	Isopropyl Titanium Triisostearate	Lipophilic
ZnO-C-NJE3	Joboa Esters	Hydrophobic
ZnO-C-NOE4	Natural Olive Esters	Hydrophobic
ZnO-C-DMC2	Hydrogen Dimethicone	Hydrophobic
ZnO-C-DS4	Dimethicone	Hydrophobic
ZnO-C-ASG3J	Stearoyl Glutamic Acid	Hydrophobic

US 20180235855A1, WO 2007048057A3  
Zinc Oxide Powder Blends, Their Production And Use

US 9949904B2  
Method of Formulating Zinc Oxide Powder Blends for Balanced UVA/UVB Attenuation

US 20110150792, WO 2010068687, CN102246014B  
Zinc Oxide Aqueous and Non-Aqueous Dispersions

US 8623386B2, WO 2009126859  
Natural ester, wax or oil treated pigment, process for production thereof, and cosmetic made therewith

## Dispersions

Carrier	Product Name	INCI Name	Active %	Viscosity
Natural Esters/Oils	GC70MZCJ-G	Zinc Oxide (And) Caprylic/Capric Triglyceride (And) Jojoba Esters (And) Glyceryl Behenate/Eicosadioate	67	Paste
	GC70MZCSG	Zinc Oxide (And) Caprylic/Capric Triglyceride (And) Stearoyl Glutamic Acid (And) Glyceryl Behenate/Eicosadioate	68	Paste
	JOSP80MZCOE	Zinc Oxide (And) Simmondsia Chinensis (Jojoba) Seed Oil (And) Polyhydroxystearic Acid (And) Hydrogenated Olive Oil Stearyl Esters	76	Paste
	JOP80MZCJ	Zinc Oxide (And) Simmondsia Chinensis (Jojoba) Seed Oil (And) Polyhydroxystearic Acid (And) Jojoba Esters	77	Paste
Silicones	CMX80MZCM	Zinc Oxide (And) Cyclopentasiloxane (And) Dimethicone (And) PEG/PPG-18/18 Dimethicone (And) Hydrogen Dimethicone	78	Paste
UV Boosters	HBP75MZCM	Zinc Oxide (And) Butyloctyl Salicylate (And) Polyhydroxystearic Acid (And) Hydrogen Dimethicone (And) Glyceryl Behenate/Eicosadioate	73	Paste
	TNSS75MZCM	Zinc Oxide (And) Ethylhexyl Methoxycrylene (And) C12-15 Alkyl Benzoate (And) Polyhydroxystearic Acid (And) Hydrogen Dimethicone	73	Paste
Volatile Non-D5	DIM2FH75MZCM	Zinc Oxide (And) Dimethicone (And) Isononyl Isononanoate (And) Polyglyceryl-6 Polyricinoleate (And) PEG-10 Dimethicone (And) Hydrogen Dimethicone	73	Pourable
	DIM2X75MZCM	Zinc Oxide (And) Dimethicone (And) PEG/PPG-18/18 Dimethicone (And) Hydrogen Dimethicone	73	Pourable
	MTMX80MZCM	Zinc Oxide (And) Methyl Trimethicone (And) Dimethicone (And) PEG/PPG-18/18 Dimethicone (And) Hydrogen Dimethicone	78	Paste
Aqueous	GLW70MZC	Zinc Oxide (And) Water (And) Glycerin (And) Sodium Polyacrylate (And) Cellulose Gum	70	Paste



Raw materials approved by COSMOS

This chart was prepared to assist formulators using KOBO ZNO-100 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.

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.

Please contact our team at [techservice@koboproductsinc.com](mailto:techservice@koboproductsinc.com) for additional information on this subject.

**KOBO**

Non-Nano Zinc Oxide

[www.koboproducts.com](http://www.koboproducts.com)