

Balanced UV Protection

The UV Balance concept was developed in order to ensure protection of the skin from both UVB and UVA rays. This concept suggests that for every 3 units of UVB protection there is also 1 unit of UVA protection being provided in an SPF product. When working with inorganic sunscreen ingredients such as micronized Titanium Dioxide or Zinc Oxide it is important to find the right combination of particle sizes in order to yield the 3:1 ratio for protection. In order to achieve these results, KOBO has developed both UV Balance Powders and Dispersions, as well as recommended use levels for specific combinations of dispersions.

For Sunscreens

While formulating with inorganic sunscreen ingredients, it is difficult to achieve a high SPF and UV Balanced Formula. TiO₂ is often too whitening while ZnO is not an efficient UVB agent. By combining TiO₂ and ZnO of correct particle sizes, balanced UV protection can be achieved. A combination of very fine ZnO and large ZnO can also give high SPF and provide UV Balanced Protection. The following dispersion combinations are recommended:

Combination of TiO₂ and ZnO for Balanced UV protection

For Oil Phase

	TNP50T7	TiO ₂ %	TNP65MZS	ZnO%
SPF 30 (KSL-043E)	13	5.0	20	12.0
SPF 20	8.6	3.3	15	9.0
SPF 15	6.5	2.5	11.5	7.0
	IN65S4	TiO ₂ %	INH73MZ	ZnO%
SPF 30 (KSL-024E)	11.3	6.0	17	12.0
SPF 20	8	4.25	12	8.5
SPF 15	6	3.2	9	6.35

For Silicone Phase

	CM3K40T4	TiO ₂ %	CM3K50XZ4	ZnO%
SPF 30	22	7.0	25	12.0
SPF 20	15.6	5.0	19	9.0
SPF 15	12.5	4.0	14.6	7.0

Combination of ZnO for Balanced UV protection

	INH73MZ	ZnO%
SPF 15 (KSL-016)	22	16.0

	CM3K50XZ4	ZnO%
SPF 15	32	15.0

	TNP65MZS	ZnO%
SPF 15	25	15.0

UV Balance Sunscreen featuring TNP50T7 and TNP65MZS

Formula KSL-143E

Part 1

- Deionized Water 39.02%
- Aculyn™ 44 - Rohm & Haas: PEG-150/Decyl Alcohol/SMDI Copolymer 3.00%
- Sodium Chloride - Morton Salt: Sodium Chloride 0.56%
- Allantoin - RITA Corp: Allantoin 0.20%

Part 2

- **TNP65MZS** - Kobo Products: Zinc Oxide (And) C12-15 Alkyl Benzoate (And) Polyhydroxystearic Acid (And) Triethoxycaprylylsilane 19.81%
- **TNP50T7** - Kobo Products: C12-15 Alkyl Benzoate (And) Titanium Dioxide (And) Alumina (And) Polyhydroxystearic Acid (And) Methicone 13.00%
- Finsolv TN - Finetex: C12-15 Alkyl Benzoate 8.00%
- Hallbrite BHB - C.P. Hall Company: Butyloctyl Salicylate 3.00%
- ABIL® Wax 9801 - Evonik: Cetyl Dimethicone 3.00%
- Arlancel P135 - Croda: PEG-30 Dipolyhydroxystearate 2.50%
- ABIL® WE 09 - Evonik: Polyglyceryl-4 Isostearate (And) Cetyl PEG/PPG-10/1 Dimethicone (And) Hexyl Laurate 2.50%
- Floraesters® 15 - Floratech: Jojoba Esters 2.10%
- Shea Butter - RITA Corp.: Shea Butter 1.00%
- **LUCENTITE SAN-P** - Kobo Products: Quaternium-18 Hectorite 1.00%
- Argan Oil - Centerchem, Inc.: Argan Oil 1.00%
- Methyl Paraben NF - International Sourcing: Methylparaben 0.15%

- Propylene Carbonate - Propylene Carbonate 0.10%
- Propyl Paraben NF - International Sourcing: Propylparaben 0.06%

Manufacturing Procedure

1. In a double jacketed stainless steel tank equipped with a lightening type mixer, along with side sweep action, mix ingredients in Part 1 in the order listed.
2. Heat Part 1 to 75°C.
3. In a second double jacketed stainless steel tank equipped with a lightening type mixer, heat Part 2 to 75°C.
4. Add Part 1 to Part 2 very slowly with mixing using a lightening type mixer.
5. Cool emulsion further to 33°C with sweep action mixing.

Description

Elegant W/O sunscreen that uses Kobo's Titanium Dioxide Dispersion, TNP50T7, and Kobo's Zinc Oxide Dispersion, TNP65MZS. The proportion of Titanium Dioxide to Zinc Oxide provides a 3:1 ratio of SPF to PFA while still being transparent on the skin.

Active Ingredient(s) :	
Titanium Dioxide	5.10%
Zinc Oxide	12.20%

in vivo SPF 32
in vitro SPF 29
PFA 11

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Balanced UV Protection

For Color Cosmetics

UV Balance Powder 100 consists of various primary particle sized hydrophobic TiO₂. When formulated correctly, this product offers good coverage on the skin while providing a 3:1 ratio.

UV Balance Pressed Powder

Formula KPP-014A

Part 1

- **TALC N/MM3** - Kobo Products: *Talc (And) Magnesium Myristate* 53.66%
- **UV BALANCE POWDER 100** - Kobo Products: *Titanium Dioxide (And) Alumina (And) Hydrogen Dimethicone* 17.29%
- **MICA S/MM3** - Kobo Products: *Mica (And) Magnesium Myristate* 16.00%
- **ZINC MYRISTATE** - Kobo Products: *Zinc Myristate* 2.50%
- **BYO-12** - Kobo Products: *Iron Oxides (C.I. 77492) (And) Isopropyl Titanium Triisostearate* 1.75%
- **BRO-12** - Kobo Products: *Iron Oxides (C.I. 77491) (And) Isopropyl Titanium Triisostearate* 0.40%
- **BBO-12** - Kobo Products: *Iron Oxides (C.I. 77499) (And) Isopropyl Titanium Triisostearate* 0.20%
- Methyl Paraben NF - International Sourcing: *Methylparaben* 0.10%
- Propyl Paraben NF - International Sourcing: *Propylparaben* 0.10%

Part 2

- Lexol® PG-865 - Inolex Chemical Co.: *Propylene Glycol Dicaprylate/Dicaprate* 2.80%
- **SF96-20** - Momentive/Kobo Products: *Dimethicone* 2.40%
- **SF96-350** - Momentive/Kobo Products: *Dimethicone* 2.40%
- **SS4267** - Momentive/Kobo Products: *Dimethicone (And) Trimethylsiloxysilicate* 0.40%

UV Balance FAS60UVP100 dispersion consists of UV Balance Powder 100 dispersed in a silicone system. It offers excellent opacity and coverage on the skin while providing a 3:1 ratio.

UV Balance Foundation

Formula KLF-042C

Part 1

- **SF1528** - Momentive/Kobo Products: *Cyclopentasiloxane (And) PEG/PPG-20/15 Dimethicone* 12.00%
- LEXOL® PG-865 - Inolex Chemical Company: *Propylene Glycol Dicaprylate/Dicaprate* 2.50%
- Salacos 99 - Ikeda Corporation: *Isononyl Isononanoate* 2.50%
- **SS4230** - Momentive/Kobo Products: *Cyclopentasiloxane (And) Trimethylsiloxysilicate* 2.50%
- **LUCENTITE SAN-P** - Kobo Products: *Quaternium-18 Hectorite* 2.00%
- **SF1555** - Momentive/Kobo Products: *Bis-Phenylpropyl Dimethicone* 0.75%

Part 2

- Ethyl Alcohol E1028 - VWR Scientific Products: *Ethyl Alcohol* 1.00%

Part 3

- **UV BALANCE FAS60UVP100** - Kobo Products: *Titanium Dioxide (And) Cyclopentasiloxane (And) PEG/PPG-18/18 Dimethicone (And) Alumina (And) Hydrogen Dimethicone* 17.50%
- **SF1202** - Momentive / Kobo Products: *Cyclopentasiloxane* 7.03%
- **FAS50EYSI** - Kobo Products: *Iron Oxides (C.I. 77492) (And) Cyclopentasiloxane (And) PEG/PPG-18/18 Dimethicone (And) Triethoxycaprylylsilane* 4.00%
- **FAS70USI** - Kobo Products: *Titanium Dioxide (And) Cyclopentasiloxane (And) PEG/PPG-18/18 Dimethicone (And) Triethoxycaprylylsilane* 2.00%
- **FAS55ERSI** - Kobo Products: *Iron Oxides (C.I. 77491) (And) Cyclopentasiloxane (And) PEG/PPG-18/18 Dimethicone (And) Triethoxycaprylylsilane* 0.80%
- **FAS60EBSI** - Kobo Products: *Iron Oxides (C.I. 77499) (And) Cyclopentasiloxane (And) PEG/PPG-18/18 Dimethicone (And) Triethoxycaprylylsilane* 0.27%

Manufacturing Procedure

1. Micropulverize Part 1 until color is fully developed.
2. Spray Part 2 to Part 1.
3. Blend well and micropulverize.
4. Press at 300 psi.

Description

This pressed powder formulation contains UV Balance Powder 100 to achieve an Estimated SPF 15 and an Estimated PFA 6. Kobo's Surface-Treated Pigments and Powders provide an excellent application on the skin. Talc N/MM3 and Mica S/MM3 are Magnesium Myristate-Treated and give a creamy feel and texture. Zinc Myristate is used as a dry binder. The ITT-Treated Pigments help adherence on the skin and dispersability. SF96-20 and SF96-350 are used as binders and SS4267 is used to add wear and adherence.

Active Ingredient(s):
Titanium Dioxide 15.28%

in vivo SPF 15
PFA 5

Part 4

- *Deionized Water* 37.50%
- Butylene Glycol - Ruger Chemical Co., Inc.: *Butylene Glycol* 3.50%
- Glycerin U.S.P. Natural 96% - Univar USA Inc.: *Glycerin* 1.25%
- GERMABEN® II - ISP: *Propylene Glycol (And) Diazolidinyl Urea (And) Methylparaben (And) Propylparaben* 1.00%
- Sodium Chloride - Morton Salt: *Sodium Chloride* 0.90%
- Jeecide CAP-5 - Jeen International: *Phenoxyethanol (And) Caprylyl Glycol (And) Potassium Sorbate (And) Water (And) Hexylene Glycol* 0.50%
- TWEEN 20 - Croda: *Polysorbate 20* 0.50%

Manufacturing Procedure

1. Homogenize all ingredients of Part 1 until fully dispersed. Homogenize at least 20 minutes at 3000 RPM.
2. Add Part 2 to dispersed Part 1 at room temperature. Homogenize for 15 minutes.
3. Add Part 3 to dispersed Part 1 and Part 2 at room temperature and homogenize until dispersed.
4. Add Part 4 ingredients together in separate tank and slowly add to Parts 1, 2 and 3 with homogenization.

Description

This UV Balance, sheer foundation has excellent slip and playtime. UV Balance FAS60UVP100, Kobo's Titanium Dioxide Dispersion, helps provide a 3:1 ratio of SPF to PFA. The FAS Dispersions of Iron Oxides give color consistency and ease of manufacturing. SF1528 is an excellent W/O emulsifier and SS4230 helps give wear. SF1202 gives playtime during application while SF1555 helps with feel in application.

Active Ingredient(s):
Titanium Dioxide 9.27%

Trade Name	INCI Name	Product Type
UV BALANCE POWDER 100	Titanium Dioxide (And) Alumina (And) Hydrogen Dimethicone	Powder
UV BALANCE POWDER 100-NJE8	Titanium Dioxide (And) Alumina (And) Jojoba Esters	Powder
UV BALANCE FAS60UVP100	Titanium Dioxide (And) Cyclopentasiloxane (And) PEG/PPG-18/18 Dimethicone (And) Alumina (And) Hydrogen Dimethicone	Dispersion

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