

# Attenuation Grade *Volatile Non-D5* TiO<sub>2</sub> & ZnO Dispersions



There is a current trend in the market to move away from volatile cyclic silicone products, namely **Cyclopentasiloxane**. Kobo is a global leader in pigment dispersions including attenuation grade and pigmentary grade Titanium Dioxide, Zinc Oxide, Iron Oxides, and Organic Pigments. In addition to offering these pigments in cyclic silicones, several **Volatile Non-D5** options are available that have properties that are similar to cyclic silicones.

Based on many years of experience, Kobo has carefully selected carriers and dispersants that mimic the volatility of cyclic silicones. These dispersions continue to provide minimal whitening and protection from UVA/UVB light.

**Kobo also specializes in creating custom dispersion formulations.**



Carrier	INCI Name
CAP/CAQP	Coconut Alkanes
WEIDD	Isododecane, Polyglyceryl-4 Isostearate, Cetyl PEG/PPG-10/1 Dimethicone, Hexyl Laurate
PM9	Isododecane
DM2	Dimethicone (And) Trisiloxane
DIM	Dimethicone (2 Cts.)
DM5	Dimethicone (5 Cts.)
DMTM	Dimethicone (And) Methyl Trimethicone
MTM	Methyl Trimethicone
PM1	Isohexadecane
PT	Phenyl Trimethicone (10cSt)



KSL-365

## W/Si Volatile Non-D5 Smooth Sunscreen Milk



### Part 1

- **MTM3K50XZ4** - Kobo Products: Zinc Oxide (And) Methyl Trimethicone (And) PEG-10 Dimethicone (And) Methicone 27.10%
- **MTM3F40T7** - Kobo Products: Methyl Trimethicone (And) Titanium Dioxide (And) Alumina (And) Hydrogen Dimethicone (And) Lauryl PEG-9 Polydimethylsiloxyethyl Dimethicone 20.00%
- Parsol® MCX - DSM: Ethylhexyl Methoxycinnamate 7.50%
- KF-6017 - Shin-Etsu: PEG-10 Dimethicone 4.00%
- **CXG-1104** - Avantor/Kobo Products: Dimethicone (And) Dimethicone/Vinyl Dimethicone Crosspolymer 3.00%
- Dermol 2014 - Alzo International Inc.: Octyldodecyl Myristate 3.00%
- KSG-710 - Shin-Etsu: Dimethicone (and) Dimethicone/Polyglycerin-3 Crosspolymer 3.00%
- SP-10 - Toray/Kobo Products: Nylon-12 3.00%
- **SunBoost ATB** - Kobo Products: Argania Spinosa Kernel Oil (And) Tocopheryl Acetate (And) Bisabolol 3.00%
- Xiameter® PMX-200 Silicone Fluid 5CS - Dow Coming: Dimethicone 3.00%
- SR1000 - Momentive: Trimethylsiloxysilicate 2.00%

### Part 2

- Deionized Water - Water 10.50%
- Butylene Glycol - Ruger Chemical: Butylene Glycol 5.00%
- Ethanol 24,511-9 - Aldrich Chemical Co.: Ethyl Alcohol 5.00%
- PHENOXYETOL - Clariant: Phenoxyethanol 0.90%

### Manufacturing Procedure

1. Combine Part 1 and homogenize until fully dispersed.
2. Combine Part 2 and mix until homogeneous.
3. Slowly add Part 2 into Part 1 while homogenizing.

### Description

This W/Si Volatile Non-D5 Smooth Sunscreen Milk features **MTM3K50XZ4** and **MTM3F40T7** that mimic the volatility of cyclic silicones. These Sunscreen dispersions provide minimal whitening and highly effective protection throughout the UV region. Kobo's SunBoost ATB is a booster to help increase the SPF/PFA values. CXG-1104 imparts a creamy, gel texture to the product, and SP-10 gives a creamy slip during application.

### Active Ingredients

Zinc Oxide	3.00%
Titanium Dioxide	6.30%
Ethylhexyl Methoxycinnamate	7.50%

### Testing

SPF: in vivo on 3 subjects  
CW: FDA method

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	Product Name	INCI Name	Primary Part. Size nm	Part. Size** nm	Active %	Viscosity
Titanium Dioxide	PM9P50M170*	Titanium Dioxide (And) Isododecane (And) Alumina (And) Hydrogen Dimethicone (And) Polyhydroxystearic Acid	14	110	40	pourable
	CAP50M170*	Titanium Dioxide (And) Coconut Alkanes (And) Alumina (And) Hydrogen Dimethicone (And) Polyhydroxystearic Acid	14	125	39.5	pourable
	DIM2KG40TU9*	Dimethicone (And) Titanium Dioxide (And) Silica (And) PEG-10 Dimethicone (And) Lauryl Polyglyceryl-3 Polydimethylsiloxyethyl Dimethicone (And) Hydrogen Dimethicone	14	148	32	pourable
	PM1P70T7*	Titanium Dioxide (And) Isohexadecane (And) Alumina (And) Hydrogen Dimethicone (And) Polyhydroxystearic Acid	15	120	55	paste
	DM2F40T7*	Dimethicone (And) Trisiloxane (And) Titanium Dioxide (And) Alumina (And) Hydrogen Dimethicone (And) PEG-9 Polydimethylsiloxyethyl Dimethicone	15	125	32	paste
	MTM3F40T7*	Methyl Trimethicone (And) Titanium Dioxide (And) Alumina (And) Hydrogen Dimethicone (And) Lauryl PEG-9 Polydimethylsiloxyethyl Dimethicone	15	128	32	pourable
	New PT1HLP50M160*	Titanium Dioxide (And) Phenyl Trimethicone (And) Hexyl Laurate (And) Stearic Acid (And) Alumina (And) Polyhydroxystearic Acid	15	151	40	pourable
	DM2X45TIS	Titanium Dioxide (And) Trisiloxane (And) Dimethicone (And) PEG/PPG-18/18 Dimethicone (And) Polyglyceryl-6 Polyricinoleate (And) Isostearic Acid (And) Aluminum Hydroxide	15	159	36	paste
	DMTMF40T7*	Titanium Dioxide (And) Dimethicone (And) Methyl Trimethicone (And) PEG-9 Polydimethylsiloxyethyl Dimethicone (And) Alumina (And) Hydrogen Dimethicone	15	163	32	pourable
	WEIDDF45TIS	Titanium Dioxide (And) Isododecane (And) Polyglyceryl-4 Isostearate (And) Cetyl PEG/PPG-10/1 Dimethicone (And) Hexyl Laurate (And) Aluminum Hydroxide (And) Isostearic Acid (And) PEG-9 Polydimethylsiloxyethyl Dimethicone	15	164	36	paste
Zinc Oxide	New CAQP60ZSI*	Zinc Oxide (And) Coconut Alkanes (And) Triethoxycaprylylsilane (And) Polyhydroxystearic Acid (And) Coco-Caprylate/Caprates	20	133	58	pourable
	New PM9QP60ZSI*	Zinc Oxide (And) Isododecane (And) Polyhydroxystearic Acid (And) Triethoxycaprylylsilane	20	145	58	pourable
	New DIM2F66OZSI*	Zinc Oxide (And) Dimethicone (And) Polyglyceryl-3 Polydimethylsiloxyethyl Dimethicone (And) Triethoxycaprylylsilane	20	158	58	pourable
	MTM3K50XZ4	Zinc Oxide (And) Methyl Trimethicone (And) PEG-10 Dimethicone (And) Methicone	20	170	48	pourable
	DM2F50XZ4	Zinc Oxide (And) Dimethicone (And) Trisiloxane (And) Methicone (And) PEG-9 Polydimethylsiloxyethyl Dimethicone	20	171	48	pourable
	New DMTMF50ZSI*	Zinc Oxide (And) Dimethicone (And) PEG-9 Polydimethylsiloxyethyl Dimethicone (And) Triethoxycaprylylsilane	20	180	48	pourable
	DM565HP1*	Zinc Oxide (And) Dimethicone (And) Lauryl PEG-9 Polydimethylsiloxyethyl Dimethicone (And) Triethoxycaprylylsilane	60-100	227	64	paste
	DIM2X65HP1*	Zinc Oxide (And) Dimethicone (And) PEG/PPG-18/18 Dimethicone (And) Triethoxycaprylylsilane (And) Tocopheryl Acetate	60-100	236	62	paste
	WEIDDF65HP1*	Zinc Oxide (And) Isododecane (And) Polyglyceryl-4 Isostearate (And) Cetyl PEG/PPG-10/1 Dimethicone (And) Hexyl Laurate (And) Triethoxycaprylylsilane (And) PEG-9 Polydimethylsiloxyethyl Dimethicone	60-100	236	62	paste
	MTM3K65HP1*	Zinc Oxide (And) Methyl Trimethicone (And) PEG-10 Dimethicone (And) Triethoxycaprylylsilane	60-100	239	64	paste

This table was prepared to assist in formulating with Volatile Non-D5 Dispersions. The information contained herein is believed to be accurate at the time of printing and represent typical values, but should not be used as a substitute for product specification sheets.

\*These ZnO and TiO<sub>2</sub> products comply with the conditions for Zinc Oxide (nano) or for Titanium Dioxide (nano) as set forth in the Annex VI to Regulation (EC) No 1223/2009.

\*\* Size in dispersion: intensity-weighted mean size measured on Dynamic Light Scattering particle sizer

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 or TiO<sub>2</sub> loading and efficacy.
- 2. High Speed™ Dispersions:** These are usually pourable and easy to incorporate into a formulation. They have a narrower particle size distribution, and are highly transparent.

#### Formulation guidelines Zinc Oxide

Estimation of use level for SPF

- |                                  |                       |
|----------------------------------|-----------------------|
| 1. PPS : 20 - 30 nm, PS < 150 nm | 1.0 - 2.0 SPF / ZnO % |
| 2. PPS : > 60 nm, PS > 200 nm    | 0.5 - 1.0 SPF / ZnO % |

#### Formulation guidelines Titanium Dioxide

Estimation of use level for SPF

10 -15 nm TiO<sub>2</sub> Dispersions

1. SPF < 20 : 2.0 - 2.5 SPF / TiO<sub>2</sub> %
2. SPF > 25 : 2.5 - 3.0+ SPF / TiO<sub>2</sub> %