



# CATALOG

for cosmetic ingredients

The Gentle Communication Between People and Chemistry  
**Sakai Chemical Industry Co.,Ltd.**



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# Our company launched its business with the manufacture of zinc oxide in 1918.

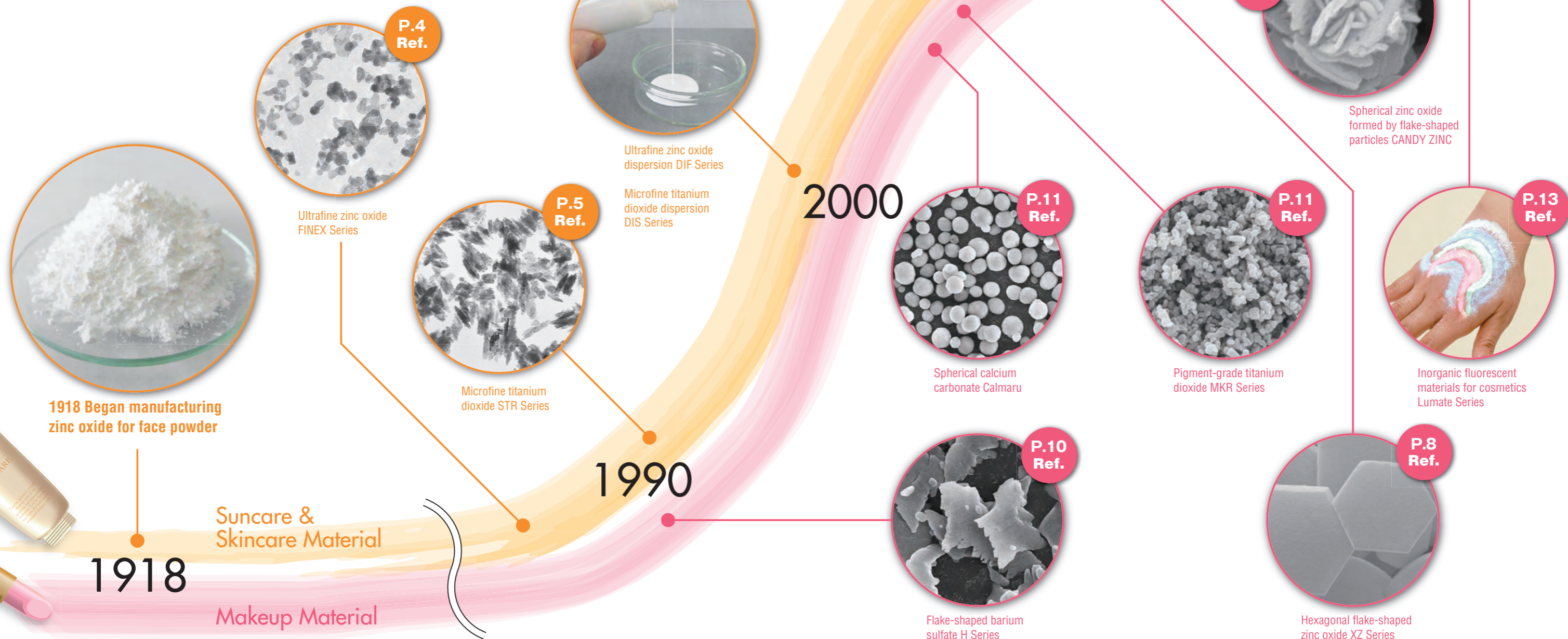
At that time, zinc oxide was employed as a base material for face powders for women and actors. Today, in addition to its use in cosmetics and sunscreens, zinc oxide is used in a wide range of applications, including electronic materials, rubber products, and paints.

In addition to zinc oxide products, Sakai Chemical Industry manufactures a wide variety of characteristic cosmetic ingredients, including titanium dioxide, flake-shaped barium sulfate, and spherical calcium carbonate.

Cosmetic products such as foundations and sunscreens are required to be both extremely delicate and to fulfill specific functions.

Requirements for these products include a smooth and moist texture, a natural-looking finish, and the outstanding ability to screen UV rays.

Sakai Chemical Industry contributes to the realization of beautiful and healthy skin through our unique particle size, particle shape control, and surface treatment technologies.



# Ultrafine zinc oxide FINEX Series <Powder>

Efficient shielding of UVA rays while keeping high transparency.

## Grade List

Characteristics	Grade	Primary particle size (nm)	INCI name	Composition (%)				Quasi-drug
				Zinc oxide	Hydrated silica	Hydrogen dimethicone	Triethoxycaprylylsilane	
Non-coated grade	FINEX-50	20	Zinc oxide	100	—	—	—	Yes (Yes in EU)
	FINEX-30	35		100	—	—	—	
	FINEX-25	60		100	—	—	—	
Standard	NANOFINE-50LP	20	Zinc oxide Hydrogen dimethicone	96	—	4	—	Yes
Passivated grade	FINEX-33W	35	Zinc oxide Hydrated silica	95	5	—	—	Yes
	FINEX-52W-LP2	20	Zinc oxide Hydrated silica	86	10	4	—	Yes
	FINEX-33W-LP2	35	Hydrogen dimethicone	91	5	4	—	
High-transparency grade	FINEX-50S-LP2	20	Zinc oxide	96	—	4	—	Yes
Low-viscosity grade	FINEX-30S-LPT	35	Hydrogen dimethicone	96	—	4	—	
	FINEX-25-LPT	60		97	—	3	—	
Texture-modified grade	FINEX-50-OTS	20	Zinc oxide Triethoxycaprylylsilane	93	—	—	7	No (Yes in EU)

# Microfine titanium dioxide STR Series <Powder>

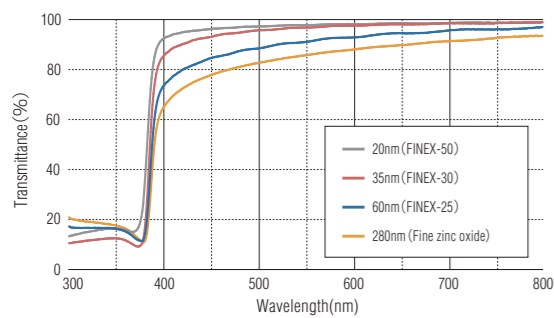
High transparency and efficient UVB shielding; surface activity is controlled by dense surface coating.

## Grade List

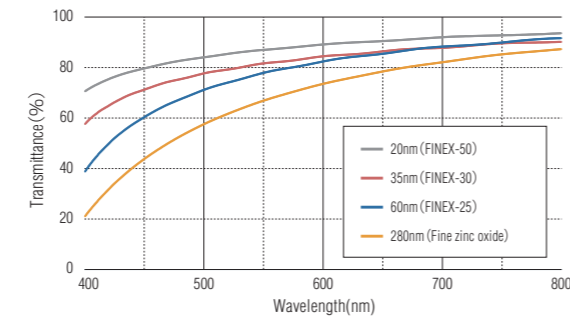
Characteristics	Grade	Primary particle size (nm)	INCI name	Composition (%)					Quasi-drug
				Titanium dioxide	Aluminum hydroxide	Hydrated silica	Hydrogen dimethicone	Triethoxycaprylylsilane	
Non-coated grade	STR-100N	15	Titanium dioxide	100	—	—	—	—	Yes
Standard grade	STR-100A-LP	15	Titanium dioxide Hydrated silica Aluminum hydroxide Hydrogen dimethicone	84	4	8	4	—	Yes
	STR-100C-LP	15	Titanium dioxide Aluminum hydroxide Hydrogen dimethicone	89	7	—	4	—	Yes
	STR-100W-LP	15	Titanium dioxide Hydrated silica Hydrogen dimethicone	75	—	17	8	—	Yes
Fatty acid-treated grade	STR-100C-LF	15	Titanium dioxide Aluminum hydroxide Stearic acid	84	9	—	—	—	Yes (7% Stearic acid)
Texture-modified grade	STR-100W-OTS	15	Titanium dioxide Hydrated silica Triethoxycaprylylsilane	73	—	18	—	9	No
Hydrophilic passivated grade	STR-100W(G)	15	Titanium dioxide Hydrated silica	80	—	20	—	—	Yes
UVA and UVB shielding grade	STR-40-OTS	35	Titanium dioxide Triethoxycaprylylsilane	95	—	—	—	5	No

### Optical characteristics of FINEX Series

#### Total light transmittance



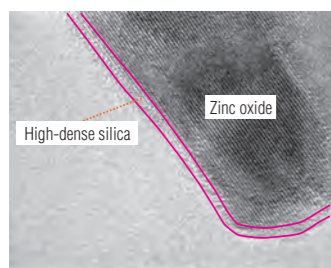
#### Parallel light transmittance



Characteristics vary based on the particle size. FINEX-25 has high UVA shielding performance, and FINEX-50 has high transparency.

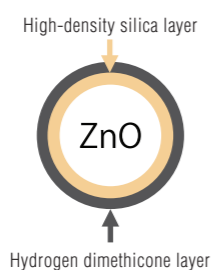
### High-density silica coating (passivated grade)

#### FINEX-52W-LP2 TEM image

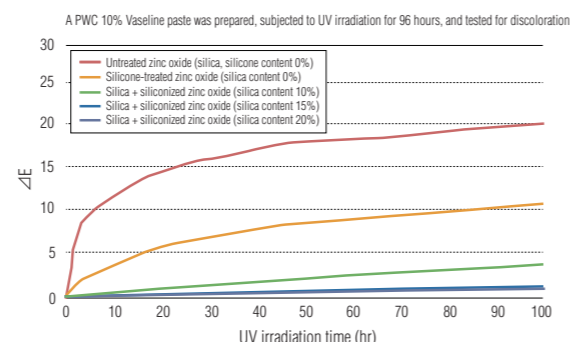


Zinc oxide is densely coated by a silica layer.

#### Image of high density silica coating



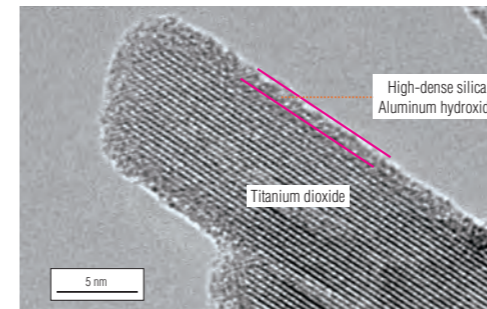
#### Difference in activity due to silica coating (Vaseline discoloration)



We can control photocatalytic activity of zinc oxide by coating with high density silica.

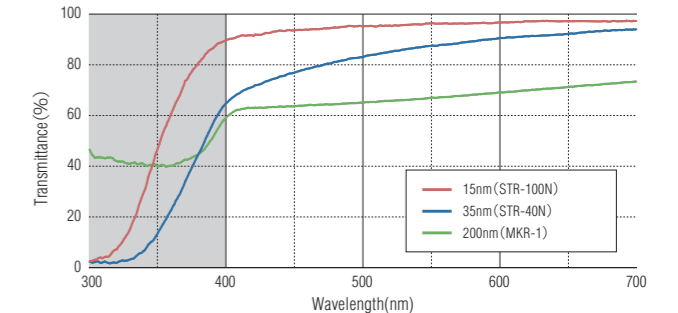
### Electron microscope image and optical characteristics of STR series

#### STR-100A-LP TEM image



Titanium dioxide is densely coated.

#### Optical characteristics of STR series



STR-40 type has high UVA shielding performance, and STR-100 type has high transparency.

### Photochromism of titanium dioxide

Photochromism is a phenomenon in which exposure to light causes a color change in titanium dioxide.

#### Test method

Samples with different W/O formulations were exposed to sunlight for four hours and observed for color changes.



**After exposure**  
STR's dense surface coating realizes greater control in photocatalytic activity in titanium dioxide than that of the competitors' products.

# Ultrafine Zinc Oxide Dispersion DIF Series

## Grade List

Characteristics	Dispersion grade name	Dispersoid (Powder) composition (wt%)	Dispersion medium	Composition						Quasi-drug
				Powder grade	Primary particle size (nm)	ZnO content (%)	surface treatment			
							Hydrated silica	Hydrogen dimethicone	Triethoxycaprylylsilane	
Zinc oxide Water dispersions										
High transparency Good skin feel	DIF-AB-33W	60	Water	FINEX-33W-LP2	35	55	○	○	—	Yes
	DIF-AB-3CS (Prototype)	60		FINEX-30-OTS	35	58	—	—	○	No (Yes in EU)
Zinc oxide D5 dispersions										
Standard	DIF-3ST2	50	Cyclopentasiloxane	FINEX-30S-LPT	35	48	—	○	—	Yes
High transparency High passivity	DIF-AW4	50		FINEX-52W-LP2	20	43	○	○	—	Yes
High UV shielding High passivity	DIF-3W4	60		FINEX-33W-LP2	35	54	○	○	—	Yes
Good skin feel	DIF-5CS	50		FINEX-50-OTS	20	46	—	—	○	No (Yes in EU)
Zinc oxide Ester oil dispersions										
High passivity High concentration	DIF-OP-3W	70	Ethylhexyl palmitate	FINEX-33W-LP2	35	64	○	○	—	Yes
	DIF-TL-3W	70	Isotridecyl isononanoate	FINEX-33W-LP2	35	64	○	○	—	Yes

※Packed in 20 kg plastic bottle (15 kg for DIF-AB-33W and DIF-AB-3CS)

# Microfine Titanium Dioxide Dispersion DIS, GT Series

## Grade List

Characteristics	Dispersion grade name	Dispersoid (Powder) composition (wt%)	Dispersion medium	Composition						Quasi-drug
				Powder grade	Primary particle size (nm)	TiO2 content (%)	surface treatment			
							Hydrated silica	Aluminum hydroxide	Hydrogen dimethicone	
Titanium dioxide Water dispersions										
High SPF Good feel	DIS-AB-10W	50	Water	STR-100W-LP	15	38	○	—	○	Yes
High passivity	GT-10W2	40		STR-100W	15	32	○	—	—	Yes
Titanium dioxide D5 dispersions										
Standard High transparency	DIS-11A	40	Cyclopentasiloxane	STR-100A-LP	15	34	○	○	○	Yes
Titanium dioxide Ester oil dispersions										
High passivity High concentration	DIS-OP-10A	50	Ethylhexyl palmitate	STR-100A-LP	15	42	○	○	○	Yes
	DIS-TL-10A	50	Isotridecyl isononanoate	STR-100A-LP	15	42	○	○	○	Yes

※Packed in 20 kg plastic bottle (15 kg for DIS-AB-10W)

## O/W type gel cream

**Characteristics** -Including the aqueous dispersion AB series, which uses hydrophobic powder, in the water phase achieves high UV shielding in a non-chemical O/W formulation.  
-Increased SPF and water resistance and improved friction compared to the conventional silica-coated powder formulation.

Composition / Formulation No.	[wt%]		
	SSS007	SSS011	SSS099
1 Propylene glycol dicaprate	6.5	10.0	10.0
2 Hydrogenated polyisobutene	11.5	12.0	9.0
3 Dimethicone	1.5	1.5	1.5
4 Behenyl alcohol	0.7	0.7	0.7
5 Sorbitan sesquistearate	0.5	0.5	0.5
6 Glyceryl stearate	0.3	0.3	0.3
7 Sulfonic acid polymer	0.6	0.4	0.5
8 Polysorbate 60	1.0	1.0	1.0
9 Bentonite	0.1	0.1	0.1
10 Crystalline cellulose (2%)	2.5	2.5	2.5
11 1,3-butylene glycol	6.0	4.0	6.0
12 water	48.8	22.0	42.9
13 DIS-AB-10W	20.0 (10)※	20.0 (10)	—
14 DIF-AB-33W	—	25.0 (15)	—
15 DIF-AB-3CS	—	—	25.0 (15)
vivo SPF (n=2)	47.8	56.0	31.3
vivo UVAPF (n=2)	16.9	19.2	20.0

<Creation procedure>  
A. Evenly mix ingredients 1 to 6 and heat to 80°C.  
B. Evenly mix ingredients 7 to 12 and heat to 80°C.  
C. Add A to B and emulsify.  
D. Bring C to 60°C or less and then add 13 to 15 and mix evenly.

## W/O milk

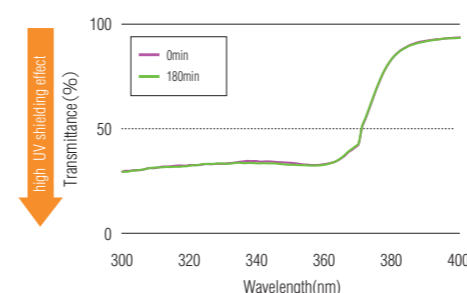
**Characteristics** -Achieves high transparency and high UV shielding non-chemically.  
-Including D5 dispersions allows for non-sticky, refreshing skin feel.

Composition / Formulation No.	※ ( ) Powder concentration [wt%]	
	SSS088	SSS098
1 DIF-AW4	38.0 (19)	—
2 DIF-5CS	—	20.0 (10)
3 DIS-11A	24.0 (9.6)	24.0 (9.6)
4 Neopentylene glycol dicaprate	6.0	6.0
5 Cyclopentasiloxane	3.5	12.3
6 Dimethicone	4.0	4.0
7 PEG-9 Polydimethylsiloxyethyl dimethicone	1.5	1.5
8 Cyclopentasiloxane, Dimethicone crosspolymer	1.0	1.0
9 Polymethylsilsesquioxane	0.5	0.5
10 Sodium citrate	0.2	0.2
11 Sodium chloride	0.5	0.5
12 1,3-butylene glycol	3.0	5.0
13 water	17.8	25.0
vivo SPF (n=2)	59.4	53.0
vivo UVAPF (n=2)	19.2	16.0

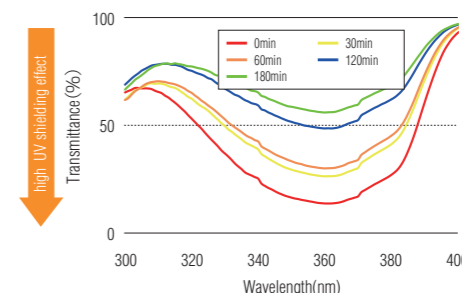
<Creation procedure>  
A. Evenly mix ingredients 1 to 9.  
B. Evenly mix ingredients 10 to 13.  
C. Add B to A and emulsify.

## Comparison of sunlight resistance of inorganic and organic UV absorbers

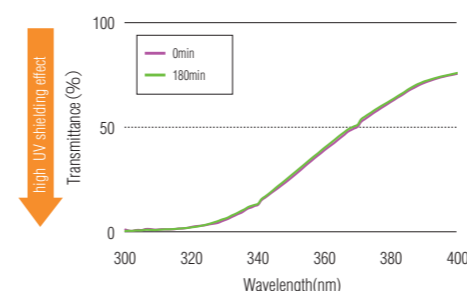
### FINEX-50S-LP2 (ZnO)



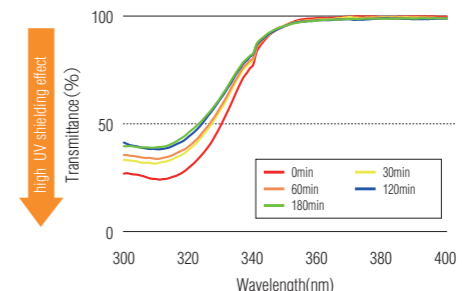
### UVA organic UV absorber



### STR-100A-LP (TiO2)



### UVB organic UV absorber



**Inorganic UV absorbers STR-100A-LP and FINEX-50S-LP2 have better simulated sunlight resistance than organic UV absorbers.**

### Measurement method

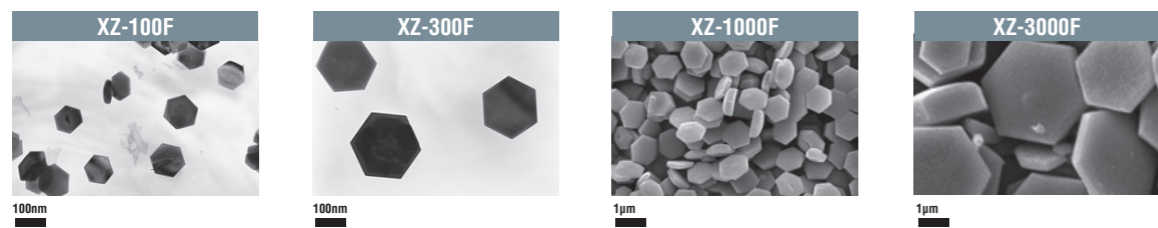
1. FINEX-50S-LP2 and STR-100A-LP were both dispersed and applied to glass slides with a bar coater #6 (13.7 μm when wet).
2. The total light transmittance of the coating film before illumination (0 minutes) was measured with a spectrophotometer.
3. Artificial sunlight was illuminated with a weather meter (255W/m<sup>2</sup>) for 30, 60, 120, and 180 minutes, and the total light transmittance was measured for each.

# Hexagonal Flake-shaped Zinc Oxide XZ Series

## Grade List

Grade	Particle size (nm)	Thickness (nm)	INCI name	Characteristics
XZ-100F-LP	100	30	Zinc oxide Hydrogen dimethicone	High UV shielding effect.
XZ-300F-LP	300	100		Booster effect to increase SPF Can be also used as a white pigment.
XZ-1000F-LP	1000	290		Good skin feel and the ability to produce optimal whiteness enable it to be substituted for pigment-grade titanium dioxide.
XZ-3000F-LP	3000	750		Best skin feel in the series.
XZ-1000F-KR	1000	290	Zinc oxide Stealdimonium hydroxypropyl hydrolysed keratin	Comfortable texture that blends with skin. High near-infrared shielding effect.

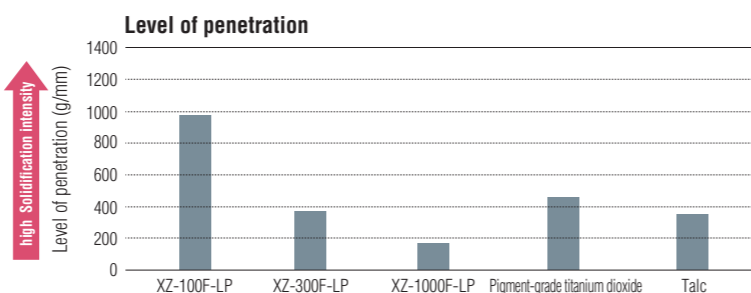
※Non-coated items also included in lineup



**XZ-100F-LP shows a high level of penetration, and also functions as a fixation agent for foundations.**

### Measurement conditions

3 g of powder was placed in a 25-mm diameter ring and pressed at 30 MPa.  
Rheometer: 1 mm diameter, 1 mm penetration speed: 6 cm/min

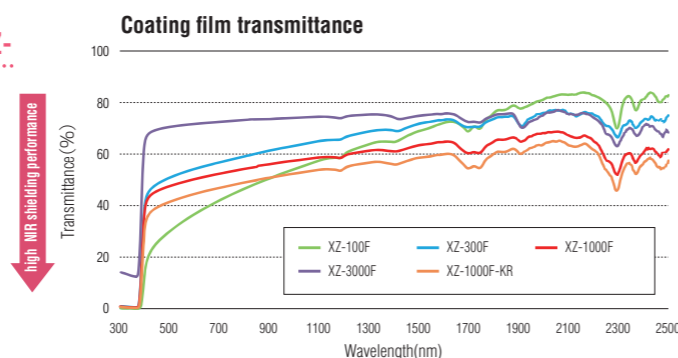


## Near-infrared rays shielding performance of hexagonal flake-shaped zinc oxide

**The hexagonal flake-shaped zinc oxides XZ-1000F and XZ-1000F-KR show high NIR shielding performance.**

### Measurement conditions

Measured coating film at 20 wt% pulled with 1.5 mil applicator

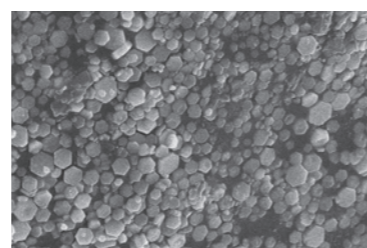


## Application of hexagonal flake-shaped zinc oxide on the skin

**The XZ series shows effective sunblock performance and a good texture due to apply evenly on the skin.**

### Measurement conditions

- Sample was spread on the skin and transferred using carbon tape.
- Transferred sample was observed using SEM.



XZ-1000F applied to the skin

# Spherical Zinc Oxide Formed by Flake-shaped Particles CANDY ZINC

## Grade List

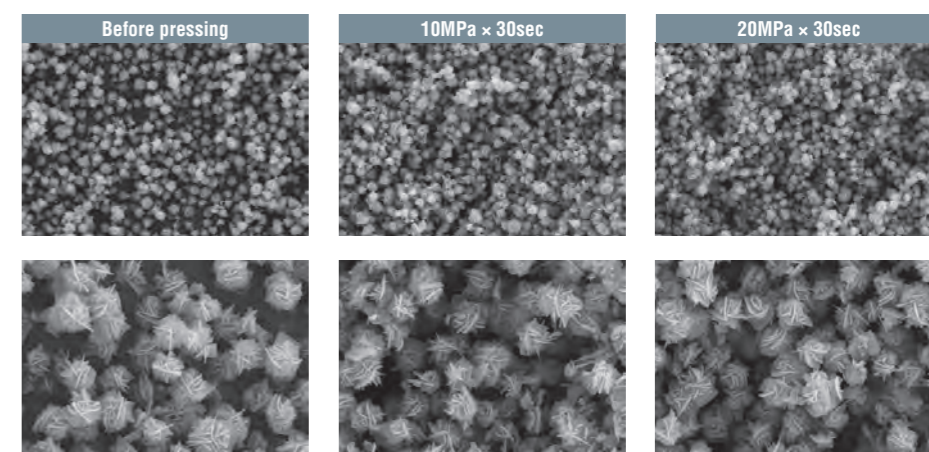
Grade	Particle size (nm)	INCI name	Characteristics
CANDY ZINC 1000	1000	Zinc oxide Polysorbate 80	Has a good skin feel while also offering high ultraviolet shielding and sebum absorption effect.

## Pressure resistance test

**CANDY ZINC particles keep their shape even after pressing at 20 MPa.**

### Measurement conditions

2 g of test samples were placed in a 35 mm diameter ring and compacted.



## Sebum absorption of CANDY ZINC

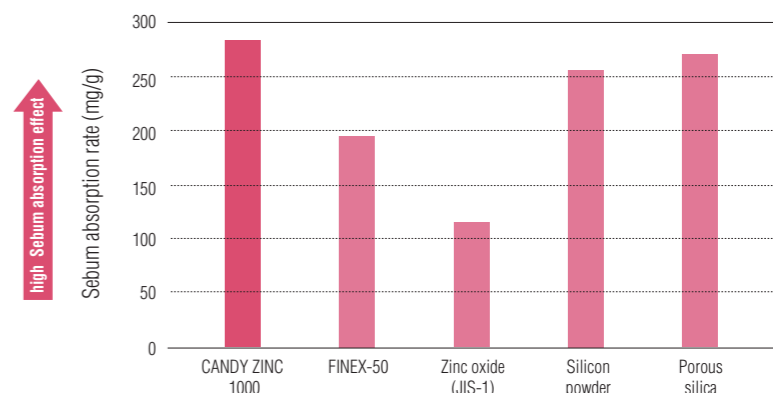
**CANDY ZINC has a high sebum absorption effect.**

### Test sample

Test sample	Particle size (μm)
CANDY ZINC 1000	1
FINEX-50	0.02
Zinc oxide (JIS-1)	0.5-0.8
Silicon powder	6-10
Porous silica	2

### Mixing ratio of artificial sebum and test samples

Artificial sebum	Mixing ratio
Test sample	5%
Oleic acid	5%
Squalene	10%
Olive oil	10%
Isopropyl alcohol	70%



### Measurement method

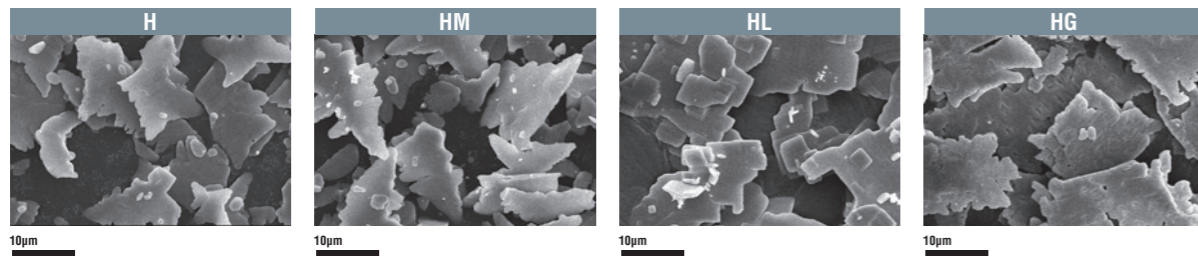
- Artificial sebum was mixed with test samples in centrifuge tubes, in the ratios shown above.
- After being left to stand for 30 minutes, the mixtures were centrifugally separated, and the separated solvents were collected.
- The solvents were measured using FT-IR to enable calculation of the peak area of 2945-2875 cm<sup>-1</sup> (C-H symmetric stretch vibration) derived from sebum.
- Calibration curves were formulated in order to calculate the sebum absorption rate.

# Flake-shaped barium sulfate H Series

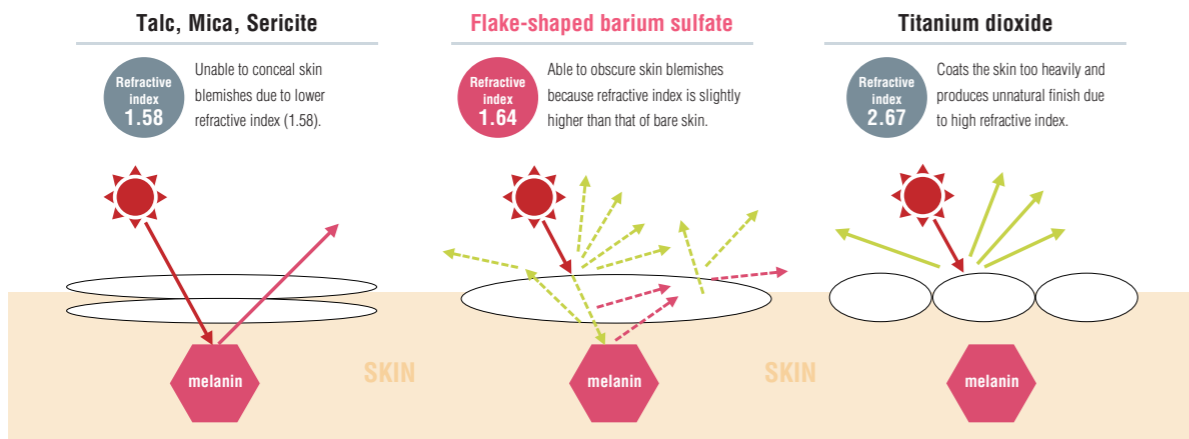
## Grade List

Grade	Particle size(μm)	INCI name	Characteristics
H	7	Barium sulfate	Offers matte finish.
HM	10		Good balance of matte and luster finish.
HL	15		Offers more luster than HM.
HG	20		The grade with the most shiny luster finish.
H-LFM	7	Barium sulfate Magnesium myristate	Matte finish with good smoothness.
HG-LFP	20	Barium sulfate Magnesium hydroxide Palmitic acid	Luster finish with good smoothness.

## SEM image



## Optical characteristics of flake-shaped barium sulfate

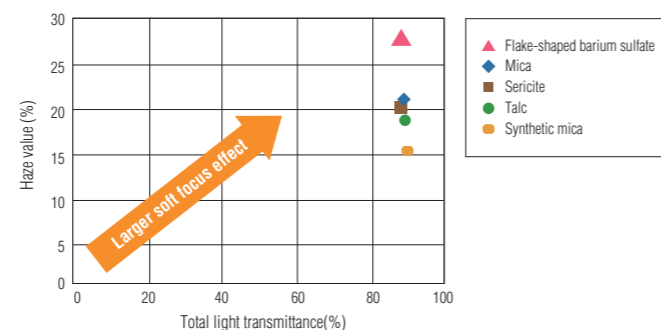


## Comparative data of flake-shaped barium sulfate and other materials

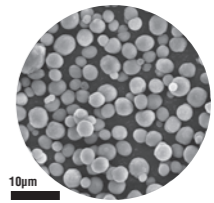
The soft focus effect of flake-shaped barium sulfate is higher than with other materials.

### Measurement conditions

0.2 g of sample + 0.8 g of silicone (PWC = 20 wt%) were dispersed twice with 25 turns at 100 pounds in a Hoover muller, applied to a glass plate with a 1 mil applicator, and measured in a haze meter.



# Spherical Calcium Carbonate Calmaru



## Grade List

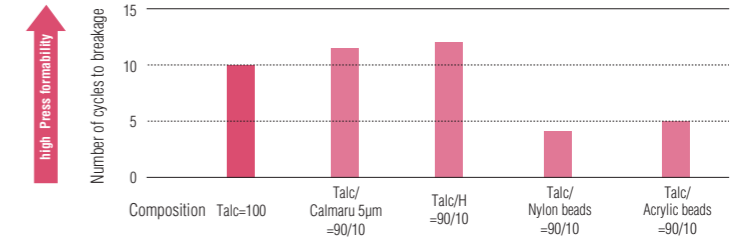
Grade	Particle size (μm)	INCI name	Characteristics
SCS-M5	5	Calcium carbonate Sodium metaphosphate	Offers both excellent soft focus effect and a high level of press moldability.

## Drop test of molded compound

By blending Calmaru and Flake-shaped barium sulfate H, press formability is improved.

### Measurement conditions

Samples (10 g) were placed in a vessel and molded by pressing at 2 MPa for 30 sec. The molded compounds were dropped from a height of 10 cm, and the number of cycles until breakage was recorded.

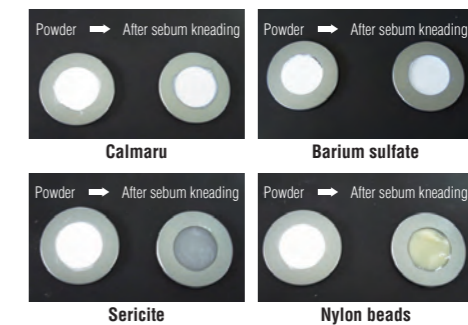


## Soft focus effect of Calmaru after sebum absorption

Even after moistening with sebum, Calmaru does not change color and keeps its soft focus effect.

### Measurement conditions

Artificial sebum (0.9 g) was mixed with test materials (1.2 g), and the powder was checked for color change. The artificial sebum was produced by mixing oleic acid, squalane, and olive oil in a ratio of 1:2:2.



The change in the soft focus effect of the extender pigment was examined using oleic acid, one of the major components of sebum.

# Pigment-grade Titanium Dioxide MKR Series

## Grade List

Grade	Particle size (nm)	INCI name	Characteristics
MKR-1	200	Titanium dioxide Hydrogen dimethicone	Hydrophilic. Aluminum-free. Can be used in water-based formulations.
MKR-1S	200		Hydrophobic. Aluminum-free. Reduced photocatalytic activity in comparison to competitors' products.

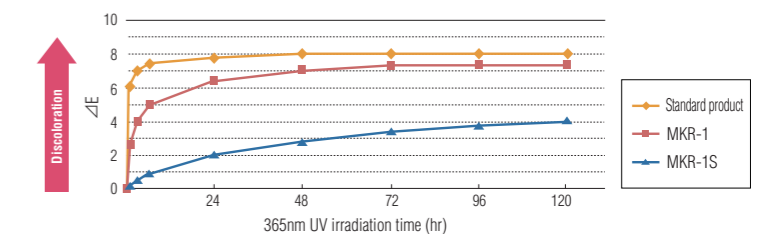
Conforms to E171.

## Vaseline Discoloration Test

MKR Series shows reduced photocatalytic activity compared to standard products.

### Measurement conditions

Vaseline pastes containing 10% powder were formulated. L, a, and b values were measured following UV irradiation, and ΔE was calculated.





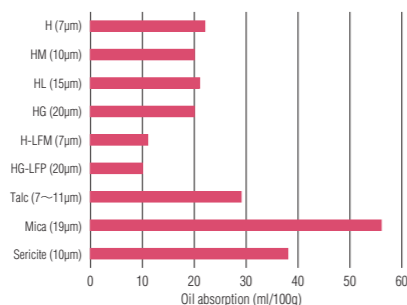
## Comparison Data of Performance of Base Makeup Products

## Amount of oil absorbed by various powders

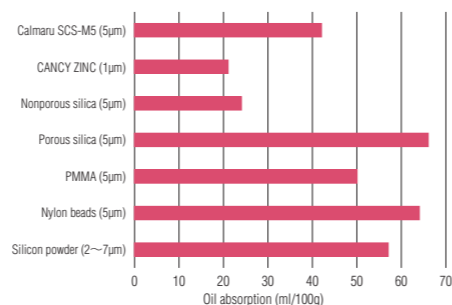
## Measurement method

0.5 g of a sample was measured out and IPM was dripped onto it while mixing the sample with a spatula to measure the amount of oil absorbed.

## Flake-shaped powder



## Spherical powder

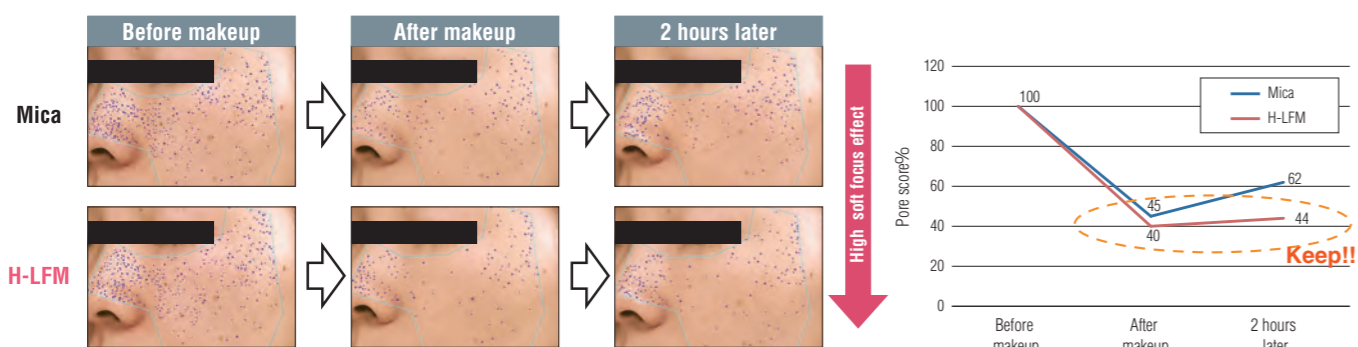


## Improvement of long lasting effect by flake-shaped barium sulfate/H-LFM

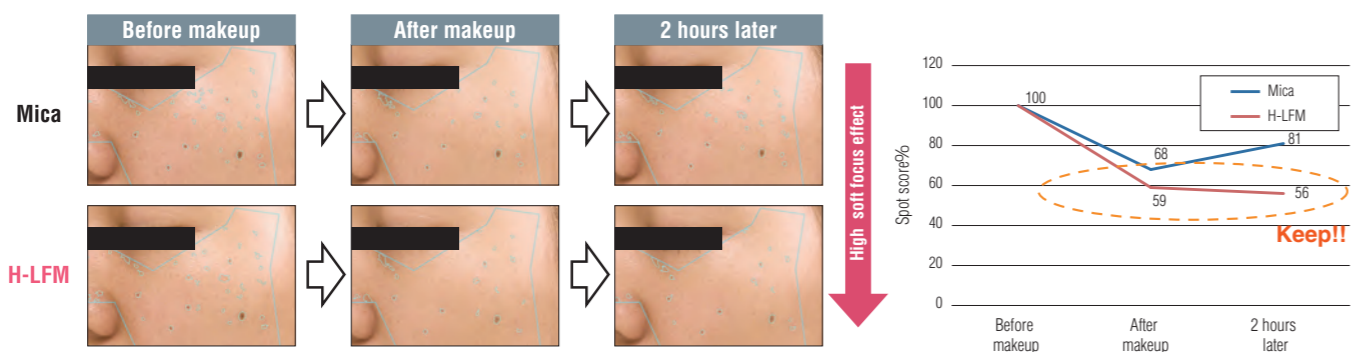
## Evaluation method

After washing the face, lotion and milk were used to condition the skin and left to be absorbed by the skin for 15 minutes, following which a powder foundation was applied in appropriate amounts and the number of spots and pores was measured using a skin measurement device, VISIA.

## Pore



## Spot



Flake-shaped barium sulfate was confirmed to have a soft focus effect higher than that of mica, and a long make-up effect.

## Cosmetic Inorganic Fluorescent Materials Lumate® Series

## Characteristics

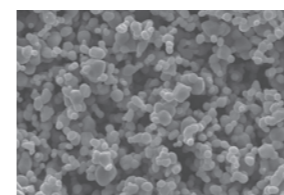
- Absorbs harmful UV rays, transforming them to visible light to shine.
- Composed of elements used in cosmetic materials.
- Green (Lumate® G) corrects reddish hues, red (Lumate® R) gives skin a healthy look, and blue (Lumate® B) gives it a translucent look.
- Various shining colors including white can be produced by combining the three Lumate products.

## Change in powder color before and during UV irradiation

## Lumate® G

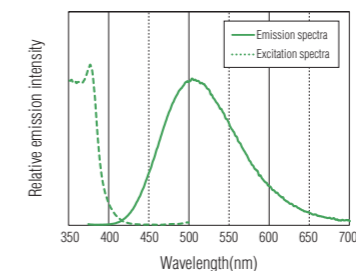
INCI name : Zinc oxide

## SEM image

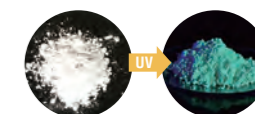
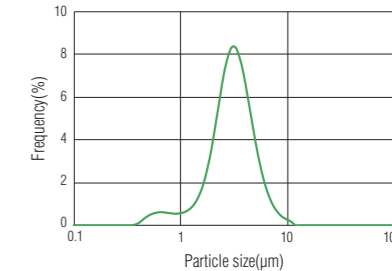


1μm

## Emission / excitation spectra



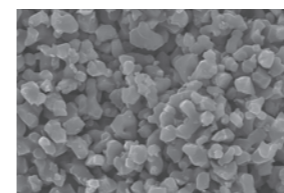
## Particle size distribution



## Lumate® R

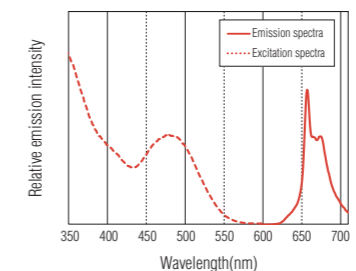
INCI name : Magnesium / Manganese / Titanium Oxide

## SEM image

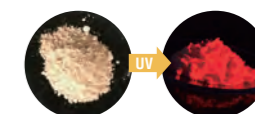
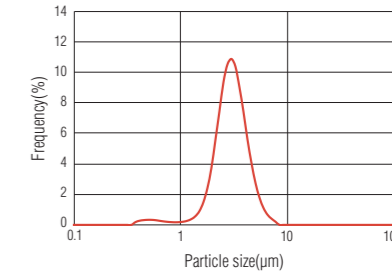


1μm

## Emission / excitation spectra



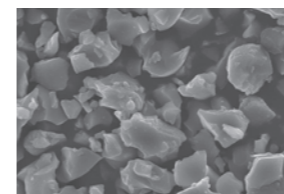
## Particle size distribution



## Lumate® B

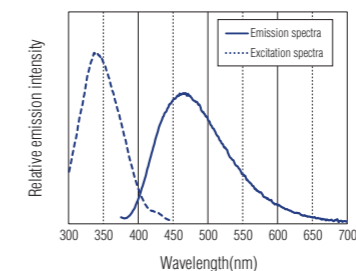
INCI name : Calcium Cerium Phosphate

## SEM image

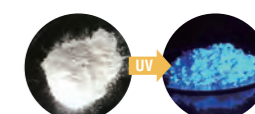
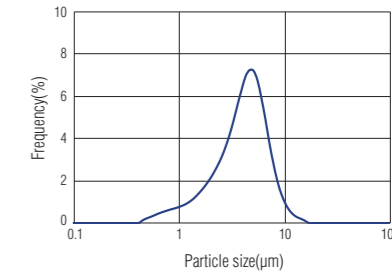


1μm

## Emission / excitation spectra



## Particle size distribution



## Corporate profile

### Corporate profile (As of October 1, 2018)

<b>Company name</b>	Sakai Chemical Industry Co., Ltd.
<b>Head office</b>	5-2 Ebisuji-ma-cho, Sakai-ku, Sakai, Osaka 590-8502 JAPAN
<b>Tel</b>	+81-72-223-4111
<b>Founded</b>	June 25, 1918
<b>Established</b>	February 25, 1932
<b>Capital</b>	21.8 billion yen
<b>Stock</b>	Listed on the First Section of the Tokyo Stock Exchange
<b>URL</b>	<a href="http://www.sakai-chem.co.jp">http://www.sakai-chem.co.jp</a>
<b>E-mail</b>	<a href="mailto:sales-t@sakai-chem.co.jp">sales-t@sakai-chem.co.jp</a>

### Other products

<b>Inorganic material products</b>	Industrial use: Zinc oxide, zinc dust, barium sulfate, high-purity calcium carbonate, barium carbonate, strontium salts, rutile titanium dioxide, anatase titanium dioxide, etc.
<b>Plastic additive products</b>	Metallic soaps, PVC stabilizers (calcium-zinc-based, etc.), flame retardants, ultraviolet absorbers, etc.
<b>Electronic material products</b>	Barium titanate, fuel cell materials, etc.
<b>Catalyst products</b>	De-Nox (nitrogen oxide) catalysts, dioxin decomposition catalysts, Ozone/VOC treatment catalysts, reduced nickel catalysts, polyester polymerization catalysts, photocatalysts, copper-based catalysts, catalyst supports for automotive use, etc.

### Group companies

<b>Sakai Trading Co., Ltd.</b>	Import/export and sales of chemical industrial products, synthetic plastic, electronic materials, and the like
<b>Kaigen Pharma Co., Ltd.</b>	Manufacture and sales of pharmaceuticals, quasi-pharmaceuticals, health food products, and medical devices
<b>Resino Color Industry Co., Ltd.</b>	Manufacture and sale of various dispersions including pigments, coloring agents, and functional inks
<b>Nippon Color Ind. Co., Ltd.</b>	Commissioned production of various chemical products, etc.
<b>Sakai Chemical (vietnam) Co., Ltd</b>	Manufacture and sale of plastic additives
<b>Katayama Seiyakusyo Co., Ltd.</b>	Manufacture of pharmaceutical (new drugs) bulk drugs and intermediates
<b>SC Organic Chemical Co., Ltd.</b>	Manufacture and sale of plastic materials, pharmaceutical intermediates, lubricating oil materials, and water treatment agents
<b>Kyodo Chemical Co., Ltd.</b>	Manufacture and sale of additives for plastics
<b>Osaki Industry Co., Ltd.</b>	Manufacture and sale of chemical industrial products, road display materials, electronic materials, and the like
<b>Joban Kasei Co., Ltd.</b>	Manufacture and sale of chemical industrial products

## Network



Head Office



Sakai Manufacturing Site



Matsubara Factory (Cosmetic Ingredients Works)



Onahama Manufacturing Site



Tokyo Branch



### [Locations]

#### Sakai Chemical Industry Co., Ltd.

<b>Head Office</b>	〒590-8502	5-2 Ebisuji-ma-cho, Sakai-ku, Sakai, Osaka	TEL +81-72-223-4111
<b>Tokyo Branch</b>	〒101-0032	2F XYMAX Iwamoto-cho Building, 2-3-3, Iwamoto-cho, Chiyoda-ku, Tokyo	TEL +81-3-5823-3721
<b>Sakai Manufacturing Site</b>	〒590-0985	5-1 Ebisuji-ma-cho, Sakai-ku, Sakai, Osaka	TEL +81-72-223-4115
<b>Semboku Factory</b>	〒595-0075	1-18 Rinkai-cho, Izumiotsu, Osaka	TEL +81-725-33-3881
<b>Onahama Manufacturing Site</b>	〒971-8183	110 Tajuku, Shimogawa, Izumimachi, Iwaki, Fukushima	TEL +81-246-56-5111
<b>Matsubara Factory</b>	〒971-8183	110 Tajuku, Shimogawa, Izumimachi, Iwaki, Fukushima	TEL +81-246-56-5111
<b>Yumoto Factory</b>	〒972-8313	1-1 Sawame, Joban Iwagaokamachi, Iwaki, Fukushima	TEL +81-246-43-4301
<b>Otsurugi Factory</b>	〒971-8183	382 Otsurugi, Shimogawa, Izumimachi, Iwaki, Fukushima	TEL +81-246-56-6610
<b>Corporate Research Laboratories</b>	〒590-0985	5-1 Ebisuji-ma-cho, Sakai-ku, Sakai, Osaka	TEL +81-72-223-4117