

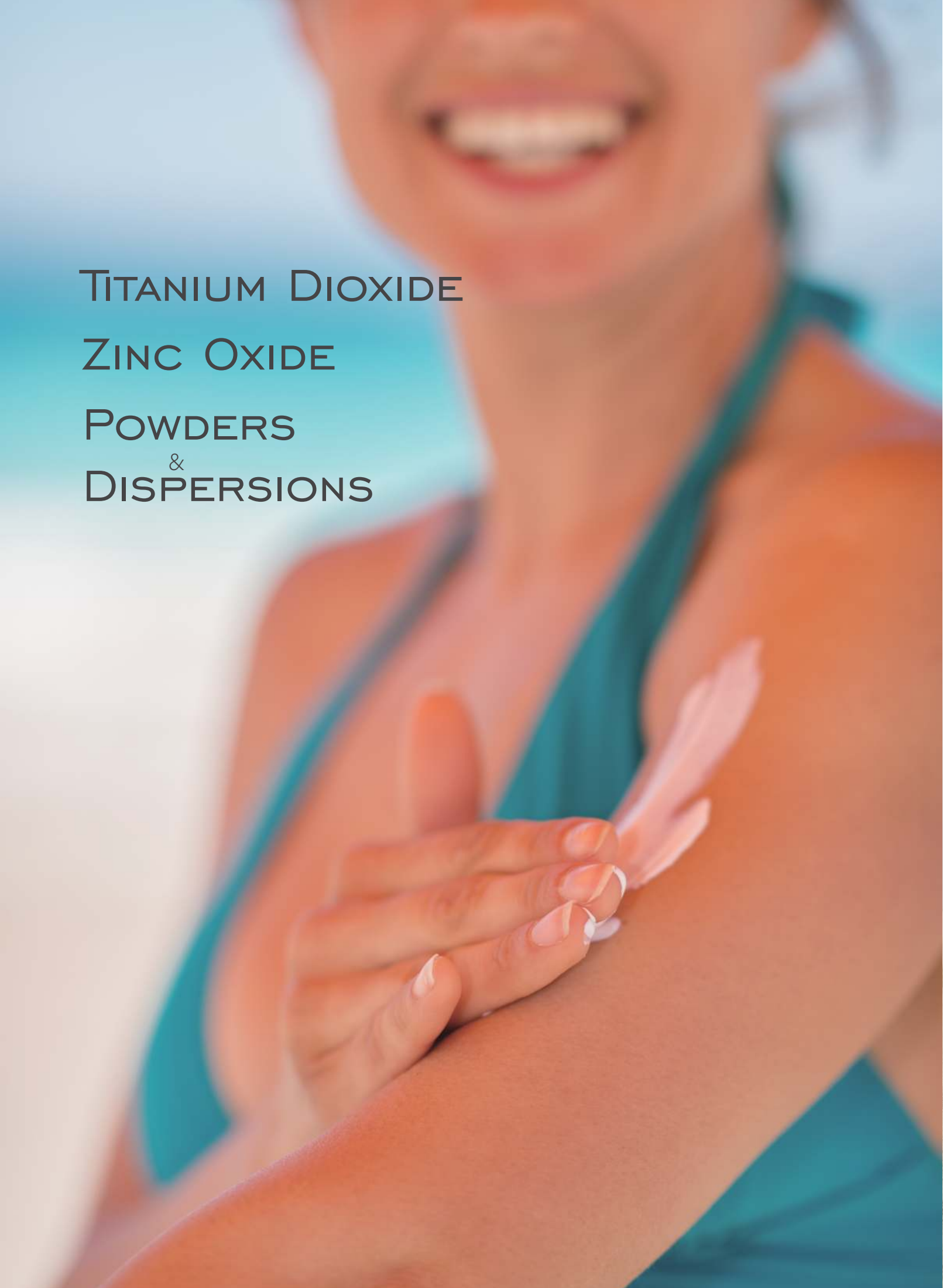
PRODUCT CATALOGUE

PHYSICAL SUNSCREEN INGREDIENTS

A large, glowing orange circle with a white starburst effect in the top-left corner. Inside the circle, the text 'UV' is written in large, white, outlined letters, and 'PROTECTION' is written in smaller, white, outlined letters below it. The background of the circle is filled with a bokeh effect of yellow and white light spots. Three smaller, glowing orange circles are positioned around the main circle: one at the top, one at the bottom-right, and one at the bottom-left.

UV
PROTECTION

Changzhou NaO Technology Co., Ltd.

A close-up photograph of a woman with a bright smile, wearing a teal halter-neck top. She is applying a white sunscreen product to her left arm with her right hand. The background is a soft, out-of-focus light blue and white, suggesting an outdoor setting. The text is overlaid on the left side of the image.

TITANIUM DIOXIDE
ZINC OXIDE
POWDERS
&
DISPERSIONS

Company Profile

Founded in 2013, Changzhou NaO Technology Co., Ltd. is dedicated to research and development of ultra-fine functional materials and their in-situ assembly technology, surface treatment technology, nano dispersion technology, and product manufacturing. With strong technical and R&D support, NaO has developed multiple world-leading products and technologies which can be widely used in the fields of Cosmetics, Special Functional Coatings, Textile Materials, Functional Polymer Materials, etc.

Over the years, NaO has continuously increased investment in R&D and drawing in talents. In 2014, the company established Jiangsu Province postgraduate workstation with Changzhou University. In 2017, NaO got the title of International High-Tech Enterprise. The company currently has 22 R&D personnel, including 6 PhDs and 12 Masters. NaO has already obtained ISO9001 quality management system certification and 53 authorized invention patents till now. The company is committed to creating a digital factory with stable quality, optimal cost, and flexible delivery.

“Quality, Service and Reputation” are the principle of our enterprise culture. “Reality, Innovation and Excellence” are our purpose. In the future, NaO aims to the research and innovation of functional powders, committed to becoming an internationally industry leader.

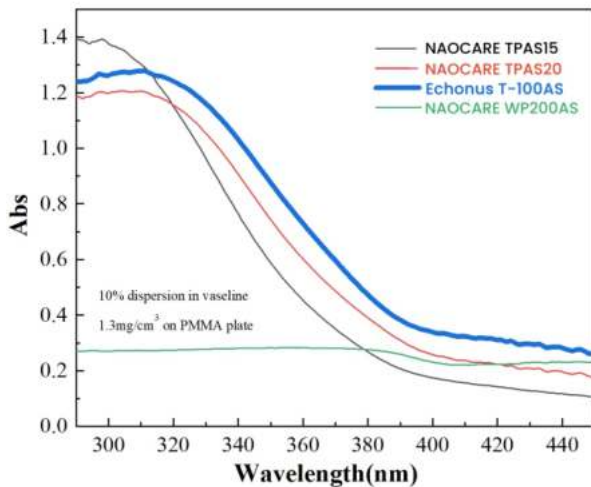
We are very confident to be your long term business partner on the basis of mutual benefit in line of functional powders.



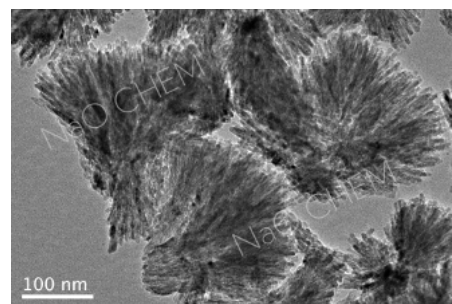
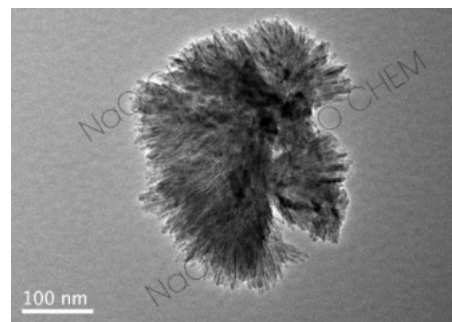
everyday
Sun
care

With the upgrading of UV protection concepts, people need more comprehensive sun protection to resist various injuries such as ultraviolet, infrared, and visible light. However, the particle size distribution of physical UV filter will have a certain impact on the protective effect.

NaO's Echonus™ TiO₂ is a new Non-Nano physical UV filter. Using exclusive patented technology, let needle shaped Rutile TiO₂ grown outward along the crystal nucleus under the action of a morphology controller, and transformed into urchin-like, bundle like, cluster like, and arborization. This not only strictly complies with EU standards, but also provides excellent UV protection performance!



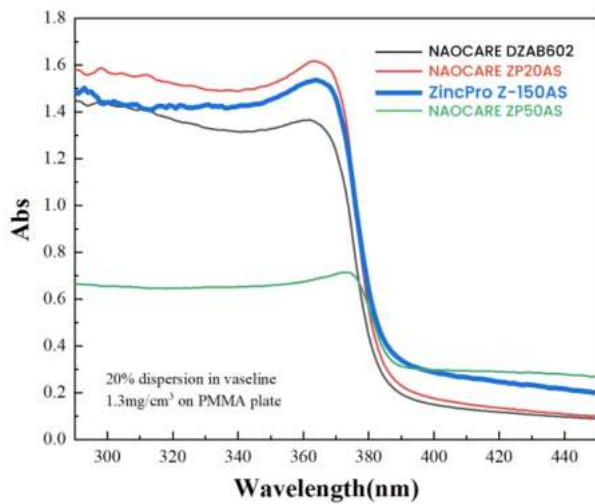
UV/Visible Abs Curves of **Echonus™ T-100AS**



Echonus™ Non-Nano TiO₂ (TEM image)

Product Code	INCI Name	TiO ₂ Content	Surface Property	Particle Size
Echonus™ T-100	Titanium Dioxide Silica	80%-90%	Hydrophilic	>100nm
Echonus™ T-100AS	Titanium Dioxide Silica Triethoxycaprylylsilane	77%-87%	Hydrophobic	
Echonus™ T-100SA	Titanium Dioxide Aluminum Hydroxide Stearic Acid	77%-87%		
Echonus™ T-100ASG	Titanium Dioxide Aluminum Hydroxide Sodium Stearoyl Glutamate	77%-87%		

ZincPro™ is a new type of physical UV filter that, under the action of a template, directionally arranges and sinters Nano Zinc Oxide into a platy structure. The platy structure Non-Nano Zinc Oxide is easier to spread and disperse on the skin, and has higher SPF and PA values compared to Nano Zinc Oxide. NaO provide various surface treatment to meet clients different formulation requirements.



UV/Visible Abs Curves of **ZincPro™ Z-150AS**



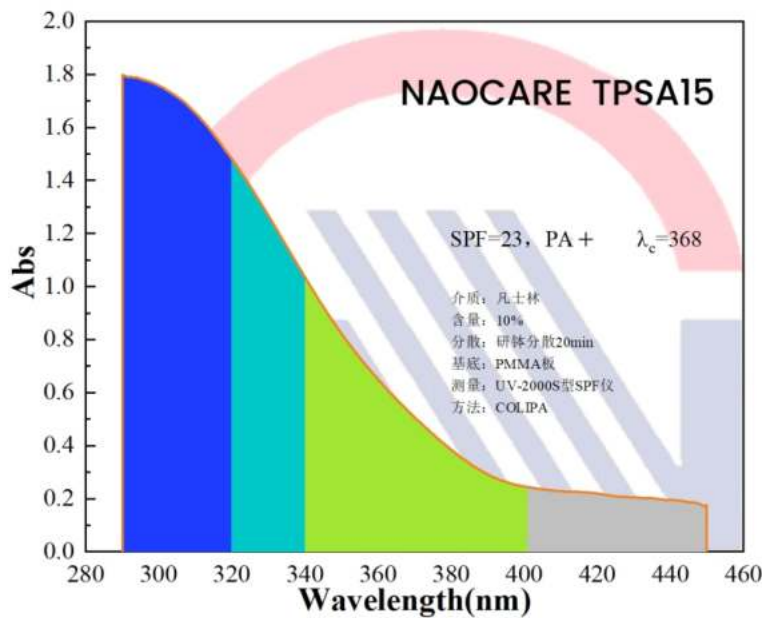
ZincPro™ Non-Nano ZnO (TEM image)

Product Code	INCI Name	ZnO Content	Surface Property	Particle Size
ZincPro™ Z-150	Zinc Oxide Silica	93%-97%	Hydrophilic	>100nm
ZincPro™ Z-150DM	Zinc Oxide Dimethicone		Hydrophobic	
ZincPro™ Z-150AS	Zinc Oxide Triethoxycaprylylsilane			
ZincPro™ Z-150IA	Zinc Oxide Isostearic Acid			
ZincPro™ Z-150HD	Zinc Oxide Hydrogen Dimethicone			

Titanium Dioxide is the most widely used inorganic UV filter in global cosmetic formulations, and is one of the key components of sunscreen cosmetics with high SPF.

Titanium Dioxide has strong photocatalytic activity and requires inorganic or organic surface treatment. Using Nano Titanium Dioxide as the core, a barrier is established between the nano particles and the surrounding medium through different surface treatment, reducing contact with the active ingredients in the formula and enhancing its photostability.

NaO provide inorganic coatings such as Aluminum Oxide, Aluminum Hydroxide, Silica, as well as various organic surface treatments. Diversified coating technologies can adapt powders to various formulation systems and can be customized according to needs.



SPF= 23, PA+, $\lambda_c= 368$

Agent: Vaseline

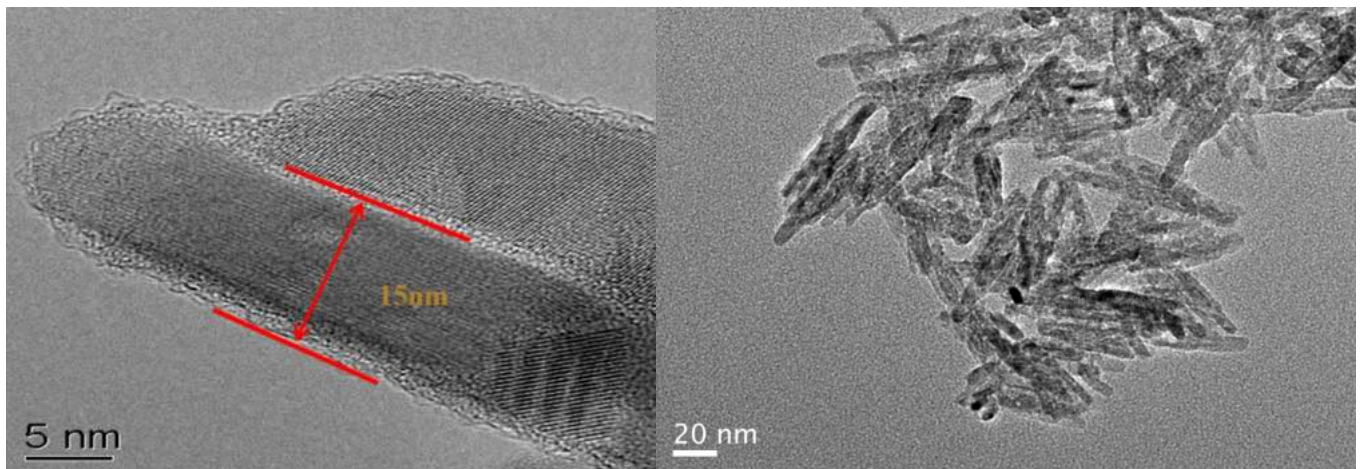
TiO₂ Content: 10%

Disperse in an agate mortar for 20 minutes

Base: PMMA board

Measurement: UV-2000S SPF instrument

Method: COLIPA



Nano TiO₂ (TEM image)

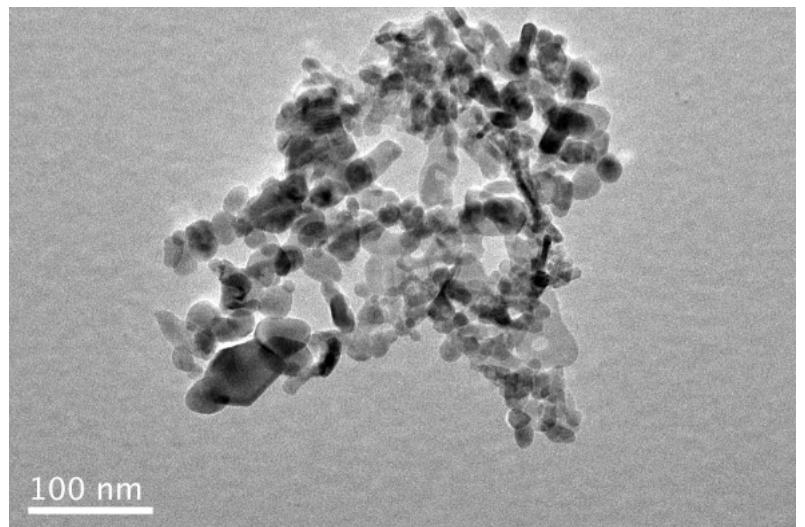
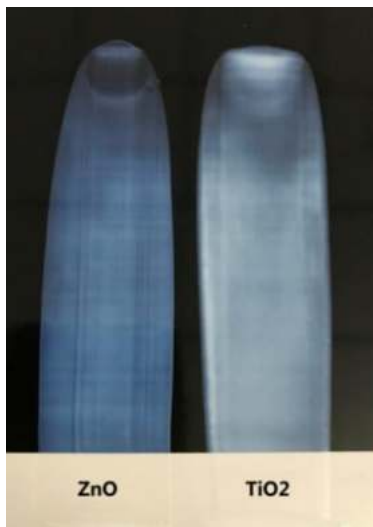


Nano Titanium Dioxide Powders

Product Code	INCI Name	TiO ₂ Content	Surface Property	Particle Size (nm)
Silica Treated				
NAOCARE™ TP15	Titanium Dioxide Silica Aluminum Hydroxide	80%-90%	Hydrophilic	15
NAOCARE™ T2001				20
NAOCARE™ TP20	Titanium Dioxide, Silica	85%-90%		20
NAOCARE™ TP45				45
Dimethicone Treated				
NAOCARE™ TPDM15	Titanium Dioxide Silica Aluminum Hydroxide Dimethicone	73%-83%	Hydrophobic	15
NAOCARE™ TPDM20	Titanium Dioxide, Silica Dimethicone	80%-90%		20
NAOCARE™ TPDM45				45
Triethoxycaprylylsilane Treated				
NAOCARE™ TPAS15	Titanium Dioxide Silica Aluminum Hydroxide Triethoxycaprylylsilane	73%-83%	Hydrophobic	15
NAOCARE™ T2002		75%-85%		20
NAOCARE™ TPAS20	Titanium Dioxide, Silica Triethoxycaprylylsilane	80%-90%		20
NAOCARE™ TPAS45				45
Lauroyl Lysine Wet Processing				
NAOCARE™ TPLL15	Titanium Dioxide Aluminum Hydroxide Lauroyl Lysine	73%-83%	Hydrophobic	15
NAOCARE™ TPLL20		75%-85%		20
NAOCARE™ TPLL45				45
Stearic Acid Treated				
NAOCARE™ TPSA15	Titanium Dioxide Aluminum Hydroxide Stearic Acid	73%-83%	Hydrophobic	15
NAOCARE™ TPSA20		75%-85%		20
NAOCARE™ TPSA45				45
Sodium Stearoyl Glutamate Treated				
NAOCARE™ TPSG15	Titanium Dioxide Aluminum Hydroxide Sodium Stearoyl Glutamate	73%-83%	Hydrophobic	15
NAOCARE™ TPSG20		75%-85%		20
NAOCARE™ TPSG45				45
Isostearic Acid Treated				
NAOCARE™ TPIA15	Titanium Dioxide Aluminum Hydroxide Isostearic Acid	73%-83%	Hydrophobic	15
NAOCARE™ TPIA20		75%-85%		20
NAOCARE™ TPIA45				45
Hydrogen Dimethicone Treated				
NAOCARE™ TPHD15	Titanium Dioxide, Silica Aluminum Hydroxide Hydrogen Dimethicone	73%-83%	Hydrophobic	15
NAOCARE™ TPHD20	Titanium Dioxide, Silica Hydrogen Dimethicone	80%-90%		20
NAOCARE™ TPHD45				45

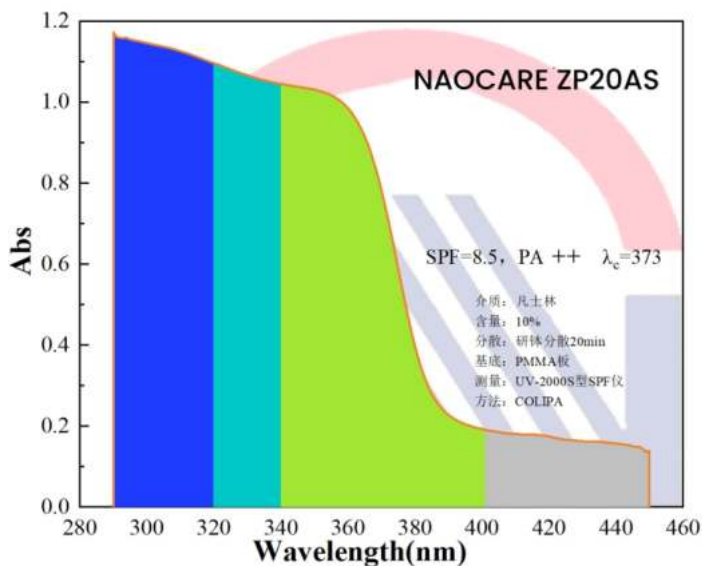
Zinc Oxide is a typical broad-spectrum inorganic UV shielding agent, the critical wavelengths can reach around 370nm. Compared to Titanium Dioxide, Zinc Oxide has better transparency and skin feel, which can reduce the influence of inorganic sunscreen agents on the formula and reduce false whitening phenomenon.

The original particle size of Zinc Oxide is about 20nm (TEM), which has a low oil absorption value and specific surface area. It can increase its wettability and dispersibility while ensuring broad-spectrum UV shielding. Therefore, it also has unique advantages in preparing dispersions. Zinc Oxide has higher solid content and lower viscosity which making it convenient for formulators to study and use.



The transparency of ZnO is better than TiO₂

Nano ZnO (TEM image)



SPF= 8.5, PA++, $\lambda_c= 373$

Agent: Vaseline

ZnO Content: 10%

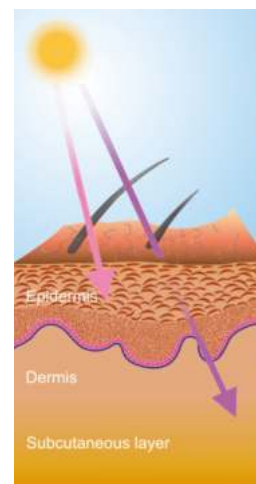
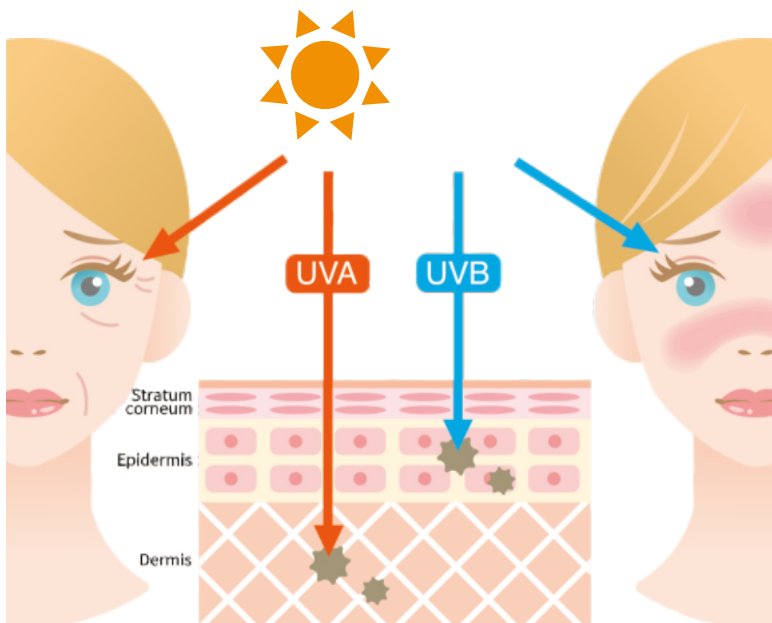
Disperse in an agate mortar for 20 minutes

Base: PMMA board

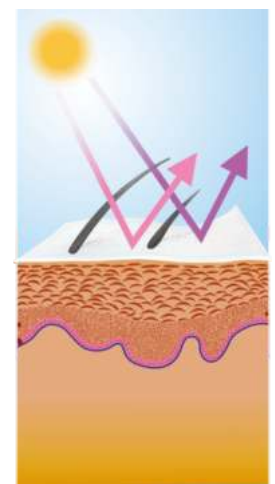
Measurement: UV-2000S SPF instrument

Method: COLIPA

Product Code	INCI Name	ZnO Content	Surface Property	Particle Size(nm)
Silica Treated				
NAOCARE™ ZP50	Zinc Oxide Silica	93-97%	Hydrophilic	50
NAOCARE™ ZP20				20
Triethoxycaprylsilane Treated				
NAOCARE™ ZP50AS	Zinc Oxide Silica Triethoxycaprylsilane	80-90%	Hydrophobic	50
NAOCARE™ ZP20AS	Zinc oxide Triethoxycaprylsilane	93-97%		20
Hydrogen Dimethicone Treated				
NAOCARE™ ZP50HD	Zinc Oxide Silica Hydrogen Dimethicone	80-90%	Hydrophobic	50
NAOCARE™ ZP20HD	Zinc Oxide Hydrogen Dimethicone	93-97%		20
Isostearic Acid Treated				
NAOCARE™ ZP50IA	Zinc Oxide Isostearic Acid	85-95%	Hydrophobic	50
NAOCARE™ ZP20IA				20



Skin without protection
 ● UVA RAYS
 (Causes skin aging and wrinkles)



Physical sunscreen protection
 ● UVB RAYS
 (Causes sunburn and skin cancer)



Titanium Dioxide and Zinc Oxide Compound Powders & Dispersions

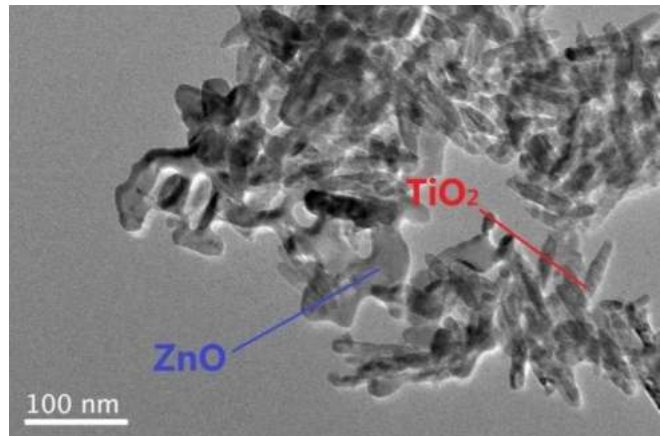
Titanium Dioxide and Zinc Oxide are a type of regulatory sunscreen with high safety and stability, but each has its own advantages and disadvantages:

Titanium Dioxide is a typical UVB sunscreen that can provide excellent SPF performance, but its photocatalytic activity is strong. If the surface passivation treatment is not good, it will have adverse effects on the formula, and the refractive index of dioxide is high, which can easily cause formula whitening and cause unnatural adverse experiences.

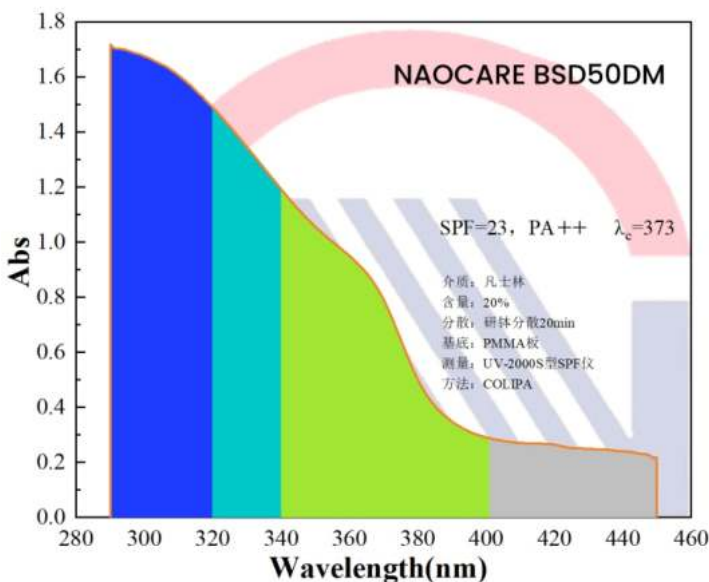
Zinc Oxide is a broad-spectrum UV shielding agent, with a critical wavelengths up to 372nm, high transparency, and good photostability. However, the sun protection efficiency of Zinc Oxide is relatively low, and it is difficult to achieve the desired SPF index when added alone. Therefore, NAO CARE™ TiO₂ and ZnO Compounded material has emerged. It has an efficient full band blocking effect on ultraviolet rays and high transparency in the visible light band, overcoming the photocatalytic activity and transparency issues of dioxide. Compared with chemical sunscreens, it has higher photostability and safety for the human body and environment, especially suitable for sensitive skin use.



Regular dispersion VS TZ series dispersion



Coprecipitation of TiO₂ and ZnO



SPF= 23, PA++, $\lambda_c= 373$

Agent: Vaseline

ZnO Content: 10%

Disperse in an agate mortar for 20 minutes

Base: PMMA board

Measurement: UV-2000S SPF instrument

Method: COLIPA



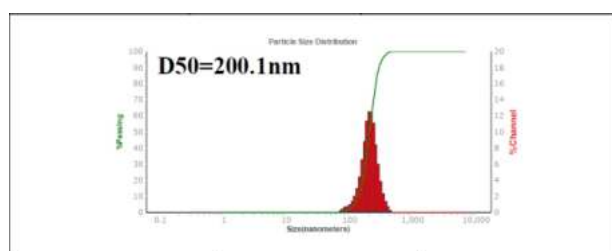
Titanium Dioxide and Zinc Oxide Compound Powders & Dispersions

Product Code	INCI Name	Active Content	Particle Size(nm)
TiO ₂ and ZnO Compound Powders			
NAOCARE™ BS11AS	Titanium Dioxide Zinc Oxide	≥ 93%	20-50
NAOCARE™ BS12AS	Triethoxycaprylylsilane		
NAOCARE™ BS11IA	Titanium Dioxide Zinc Oxide	≥ 88%	
NAOCARE™ BS12IA	Isostearic Acid		
Product Code	INCI Name	Solid Content	Viscosity/mPa · s
TiO ₂ and ZnO Compound Dispersions			
NAOCARE™ BSD50CP	Cyclopentasiloxane Titanium Dioxide Zinc Oxide PEG-10 Polydimethylsiloxane Triethoxycaprylylsilane	≥45%	1000-4000
NAOCARE™ BSD50DEC	Diethylhexyl Carbonate Titanium Dioxide Zinc Oxide Polyhydroxystearic Acid Triethoxycaprylylsilane	≥45%	200-2000
NAOCARE™ BSD50DM	Titanium Dioxide Zinc Oxide Triethoxycaprylylsilane Dimethicone PEG-10 Polydimethylsiloxane	≥45%	1000-4000
NAOCARE™ BSD50AB	Titanium Dioxide Zinc Oxide Triethoxycaprylylsilane C12-15 Alkylbenzoate Polyhydroxystearic Acid	≥45%	500-3000
NAOCARE™ BSD65IDD	Titanium Dioxide Zinc Oxide Triethoxycaprylylsilane Isododecane Polyhydroxystearic Acid	≥60%	1000-4000

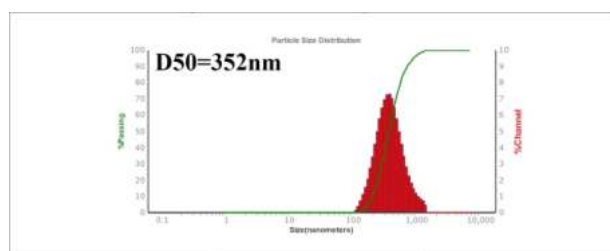
ANTI
UV 

The use of inorganic sunscreen agents in the form of dispersion is one of the preferred methods for clients.

Dispersion can not only control the aggregation particle size of sunscreen agents to achieve excellent sunscreen effects, but also greatly reduce equipment investment and factory dust pollution for manufacturers, making it convenient, fast, and easy to control. Under the action of Oxidation ball mill machine and dispersion agent, the agglomerated particle size of the powder can be controlled in an ideal state. The agglomerated particle size is ensured to be above 100nm, reducing the potential harm of nano materials to the skin. The particle size distribution is made narrower as much as possible to achieve more ideal dispersion and sun protection effects.



Powders particle size distribution



Dispersions particle size distribution

Product Code	INCI Name	Solid Content	Viscosity/mPa · s
Regular SERIES			
NAOCARE™ DT4515	Titanium Dioxide, Aluminum Hydroxide Stearic Acid, Polyglycerol-10 Laurate Phenoxyethanol, Water	≥40%	200-2000
NAOCARE™ DTDM501	Titanium Dioxide, Aluminum Hydroxide Dimethicone, Stearic Acid Polyglyceryl-3polydimethylsiloxylethyl Dimethicone	≥45%	1000-3000
NAOCARE™ DTCP451	Titanium Dioxide, Aluminum Hydroxide Stearic Acid, Cyclopentasiloxane PEG-10 Polydimethylsiloxane	≥40%	2000-8000
NAOCARE™ DTAB501	Titanium Dioxide, Aluminum Hydroxide Isostearic Acid, C12-15 Alkylbenzoate Polyhydroxystearic Acid	≥45%	1000-5000
NAOCARE™ DTIDD601	Titanium Dioxide, Aluminum Hydroxide Stearic Acid, IP clean LX Polyhydroxystearic Acid	≥55%	500-3000
NAOCARE™ DTDM502	Titanium Dioxide, Silica, Dimethicone PEG-9 Polydimethylsiloxylethyl Dimethicone Polyglyceryl-3polydimethylsiloxylethyl Dimethicone	≥45%	1000-3000
NAOCARE™ DTCP502	Titanium Dioxide, Silica, Dimethicone Cyclopentasiloxane PEG-10 Polydimethylsiloxane	≥45%	1000-3000
NAOCARE™ DTAB502	Titanium Dioxide, Aluminum Hydroxide Stearic Acid, C12-15 Alkylbenzoate Polyhydroxystearic Acid	≥45%	2000-8000
NAOCARE™ DZDM602	Zinc Oxide, Triethoxycaprylylsilane Dimethicone, PEG-10 Polydimethylsiloxane	≥55%	500-5000
NAOCARE™ DZCP602	Zinc Oxide, Triethoxycaprylylsilane Cyclopentasiloxane PEG-10 Polydimethylsiloxane	≥55%	500-5000
NAOCARE™ DZAB602	Zinc Oxide, Triethoxycaprylylsilane C12-15 Alkylbenzoate, Polyhydroxystearic Acid	≥55%	500-5000

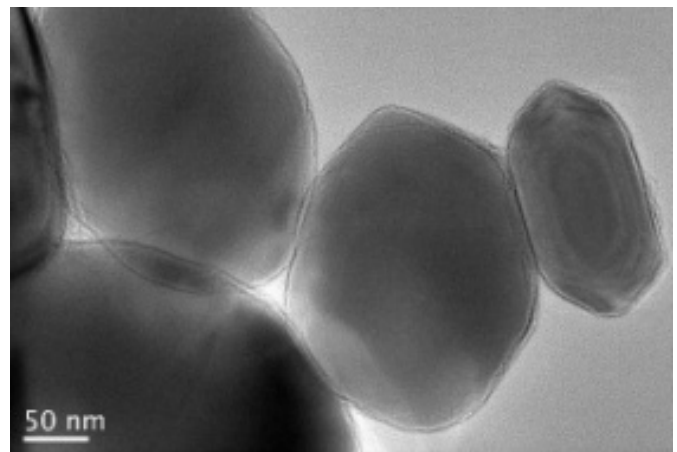
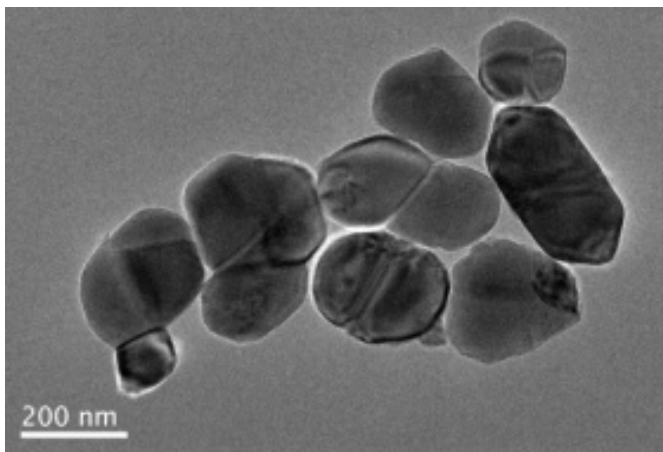
Product Code	INCI Name	Solid Content	Viscosity/mPa · s
Other Dispersions			
NAOCARE™ MD502	Methylene Bis-benzotriazolyl Tetramethylbutylphenol, Decyl Glucoside Xantham Gum, Butylene Glycol, Water	≥50%	1000-8000
NAOCARE™ MD501	Methylene Bis-benzotriazolyl Tetramethylbutylphenol Decyl Glucoside, Xanthan Gum Propylene Glycol, Water	≥50%	5000-20000
NAOCARE™ MTD50	Methylene Bis-benzotriazolyl Tetramethylbutylphenol Titanium Dioxide, Decyl Glucoside Xantham Gum, Butylene Glycol, Water	≥50%	200-2000
NAOCARE™ DZOMC	Ethylhexyl Methoxycinnamate Zinc Oxide, Isostearic Acid Polyhydroxystearic Acid	≥50%	3000-6000
Customized SERIES			
NAOCARE™ TZ-COS-4142	Titanium Dioxide, Zinc Oxide Aluminum Hydroxide, Stearic Acid Triethoxycaprylylsilane Isopropyl Palmitate Polyhydroxystearic Acid	≥41%	50-300
NAOCARE™ TZ-JH-6011	Titanium Dioxide, Zinc oxide Triethoxycaprylylsilane, CC, GTCC Polyhydroxystearic Acid	≥60%	2000-4000
NAOCARE™ TZ-XY-6012	Titanium Dioxide, Zinc Oxide Triethoxycaprylylsilane Octapronediol Diheptylate Polyhydroxystearic Acid	≥60%	2000-5000
NAOCARE™ NZD-BHB-60	Zinc Oxide, Triethoxycaprylylsilane Butyl Octanol Salicylate Polyhydroxystearic Acid	≥60%	1000-3000
NAOCARE™ NZD-NDH-65	Zinc Oxide, Triethoxycaprylylsilane Octapronediol Diheptylate Polyhydroxystearic Acid	≥65%	1000-3000
NAOCARE™ NTD-JH-60	Titanium Dioxide, Aluminum Hydroxide Isostearic Acid, Dioctyl Carbonate Caprylic Acid/Capric Acid Triglycerides Polyhydroxystearic Acid	≥50%	2000-5000



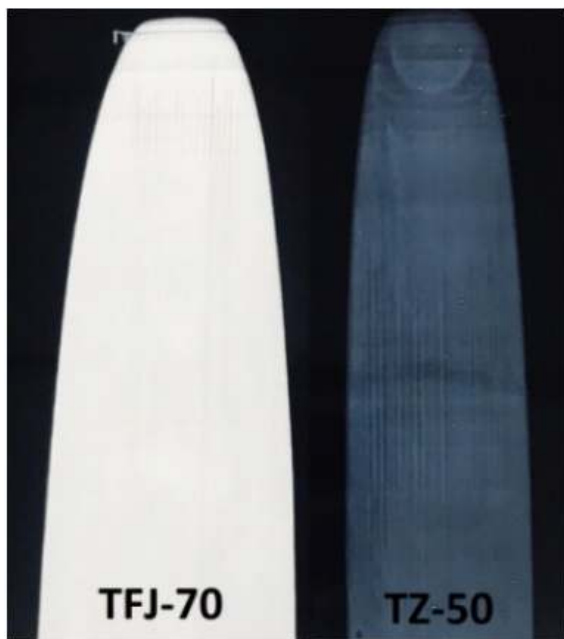


Physical Whitening Titanium Dioxide Powders

Perfluorooctyltriethoxysilane is a new type of surface treatment agent. The Titanium Dioxide powder treated with this surface treatment agent has a very small surface tension (about 20-25 mN/m), resulting in a macroscopic structure with strong skin adhesion, strong hydrophobicity (water surface tension is 72.8 mN/m), and certain oleophobic properties (liquid oil surface tension is generally 40-50 mN/m), which can demonstrate water and sweat resistance in the formula, Improve the makeup holding effect of the product.



Coated TiO₂ (TEM image)





Physical Whitening Titanium Dioxide Powders

Product Code	INCI Name	Active Content	Surface Property	Particle Size(nm)
Self Dispersing Water Based Titanium Dioxide Powder				
NAOCARE™ WP200	Titanium Dioxide Silica	≥80%	Hydrophilic	200-250
Triethoxycaprylsilane Treated				
NAOCARE™ WP150AS	Titanium Dioxide, Silica Triethoxycaprylsilane	≥75%	Hydrophobic	200-250
NAOCARE™ WP200AS	Titanium Dioxide, Alumina Triethoxycaprylsilane	≥92%		200-250
NAOCARE™ WP300AS	Titanium Dioxide Triethoxycaprylsilane	≥93%		250-300
PAEs Treated				
NAOCARE™ WP200TT	Titanium Dioxide Alumina Isopropyl Titanium Triisostearate	≥90%	Hydrophobic	200-250
Hydrogenated Lecithin Treated				
NAOCARE™ WP200HL	Titanium Dioxide Alumina Hydrogenated Lecithin	≥92%	Hydrophobic	200-250
Perfluorooctyl Triethoxysilane Treated				
NAOCARE™ WP200SF	Titanium Dioxide Alumina Perfluorooctyl Triethoxysilane	≥89%	Hydrophobic	200-250
Hydrogen Dimethicone Treated				
NAOCARE™ WP200HD	Titanium Dioxide Alumina Hydrogen Dimethicone	≥90%	Hydrophobic	200-250
Amino Acid Wet Processing				
NAOCARE™ WP200SG	Titanium Dioxide Alumina Hydrogen Dimethicone	≥90%	Hydrophobic	200-250

FUNCTIONAL MATERIALS MANUFACTURING EXPERT

Changzhou NaO Technology Co., Ltd.

📍 D-704, Tianrun Tech Manison, Wujin District, Changzhou, Jiangsu, China 213100

☎ + 86 (519) 81887346

✉ www.NaOchem.com

🌐 info@NaOchem.com

