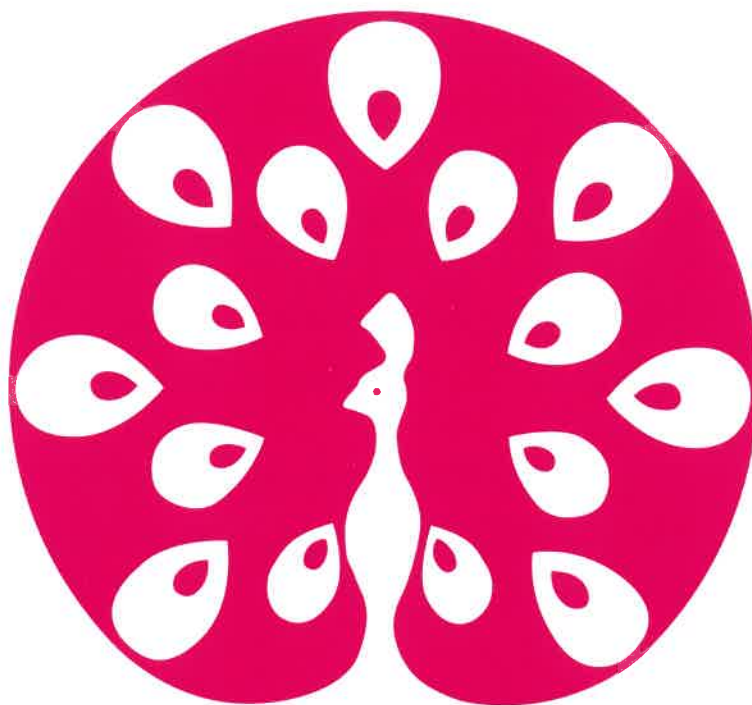


[Black Titanium-Based Pigment]

TilackD®



AKO KASEI CO., LTD.

TilackD®

Ako Kasei Co., Ltd. has produced a variety of high functional products and high value products, based on our philosophy of improving our unique technologies, uniting such technologies and provide useful products conforming to changes in the needs of the market.

“Tilack D” has been newly developed with new production methods (patent under application) uniting our two technologies, the first is inorganic powder producing technology and the second is a ceramic producing technology, which we have been researching for a long time.

The most popular black pigments for cosmetic application at the moment are Carbon Black and Iron Black (Iron Oxide). These are, however, limitation in regard to dispersibility, stability and weatherability in a water base which we took advantage of to improve.

“Tilack D” is superior in those characteristics to Carbon Black and Iron Black. “Tilack D” is also harmless to humans as it is made with Titanium Dioxide, which is a suitable material for cosmetic application. This product is also superior in thermal resistability, acid resistability, alkali resistability and has electrowave absorption ability. So, this material could also be used as raw material of water-based functional paint and electrical parts.

We, therefore, are convinced that this material can satisfy each customer's specific needs by providing unique characteristics to their final products.

PRODUCT CHARACTERISTICS

- 1 Good dispersibility and dispersion stability in hydrophilic solvent.

- 2 Low oil absorption.

- 3 Excellent heat resistance.

- 4 High tinting strength and hiding power.

- 5 High acid resistance and alkali resistance.

- 6 Harmless to humans.

- 7 Capable of controlling electrical conductivity.

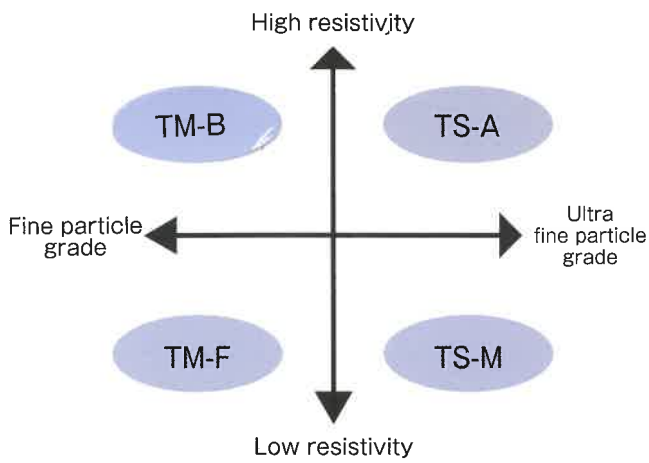
- 8 High absorbance of electromagnetic waves.

- 9 Excellent laser marking properties.

TilackD GRADE NAME

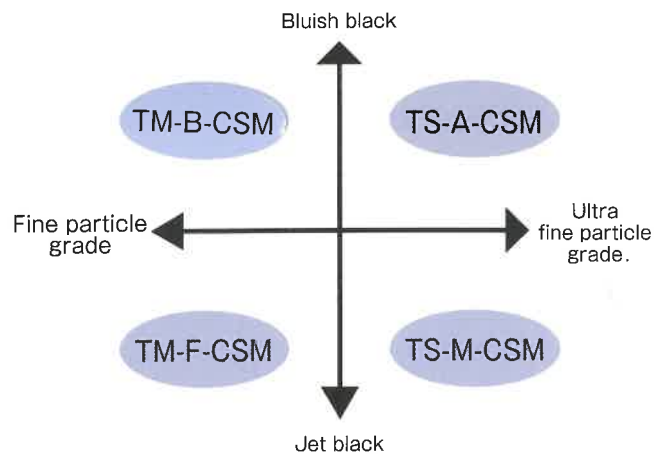
● For industrial use

	Fine particle grade	Ultra fine particle grade
High resistivity	TM-B	TS-A
Low resistivity	TM-F	TS-M



● For cosmetics

	Fine particle grade	Ultra fine particle grade
Bluish black	TM-B-CSM	TS-A-CSM
Jet black	TM-F-CSM	TS-M-CSM



【Powder】



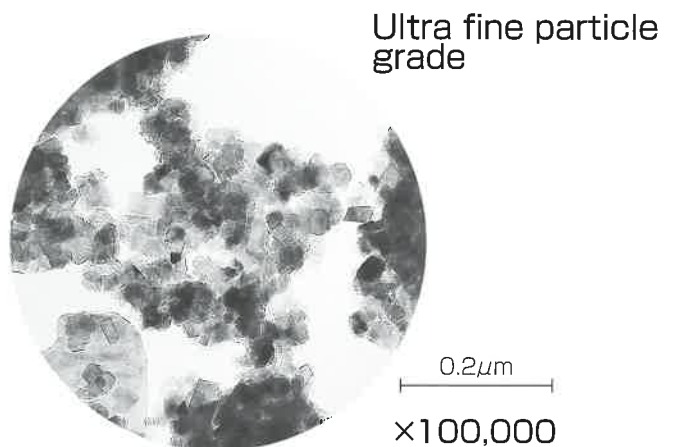
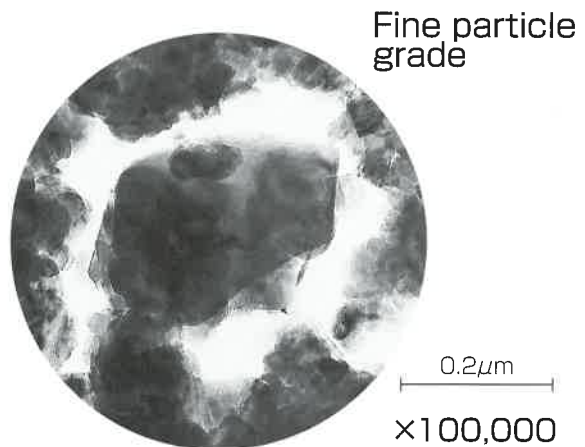
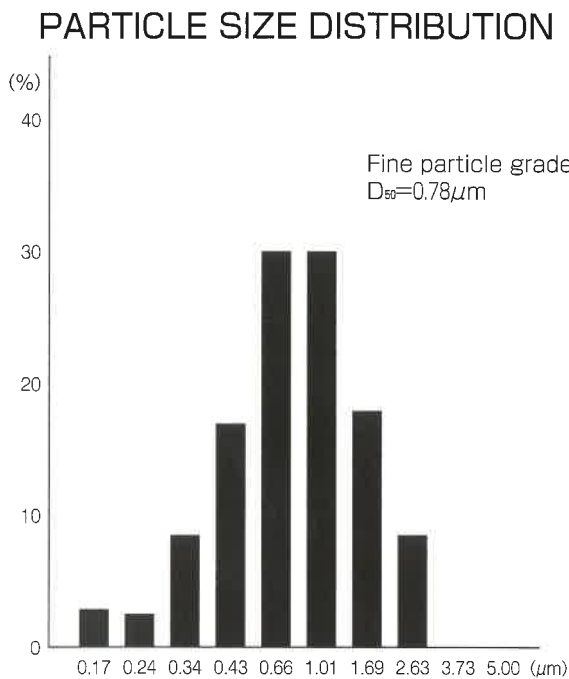
【Outer packaging】



【Inner packaging】

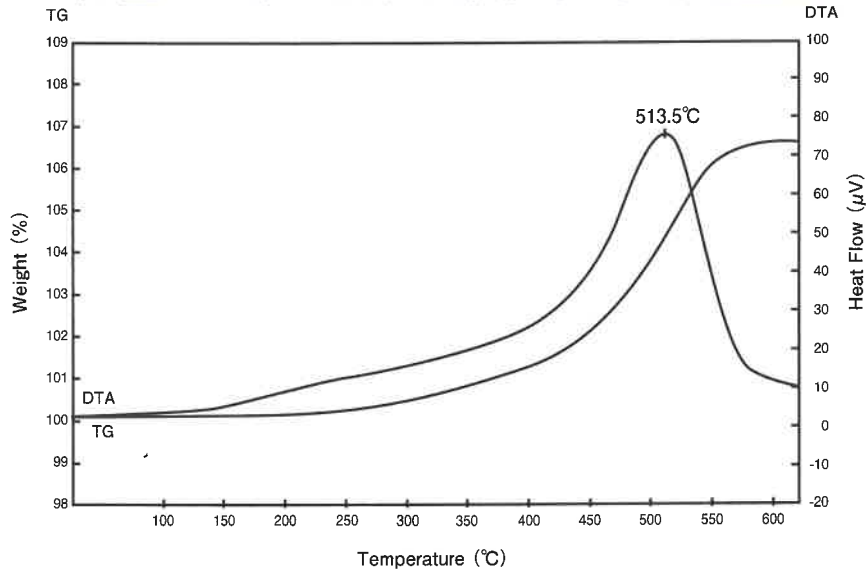
	Fine particle grade	Ultra fine particle grade
Specific gravity	3.9	3.9
Bulk density(g/ml)	0.3~0.4	0.2~0.4
Primary particle size (μm)	0.2~0.4	0.03~0.1
Mean particle size (μm)	0.6~1.5	0.6~2.0
Specific surface area (m^2/g)	20~30	40~60
Color tone	Bluish black~Jet black	Bluish black~Jet black
Blackness (L-value)	13~15	13~18
Surface properties	Hydrophilic	Hydrophilic

Measurement method is the same of properties list.

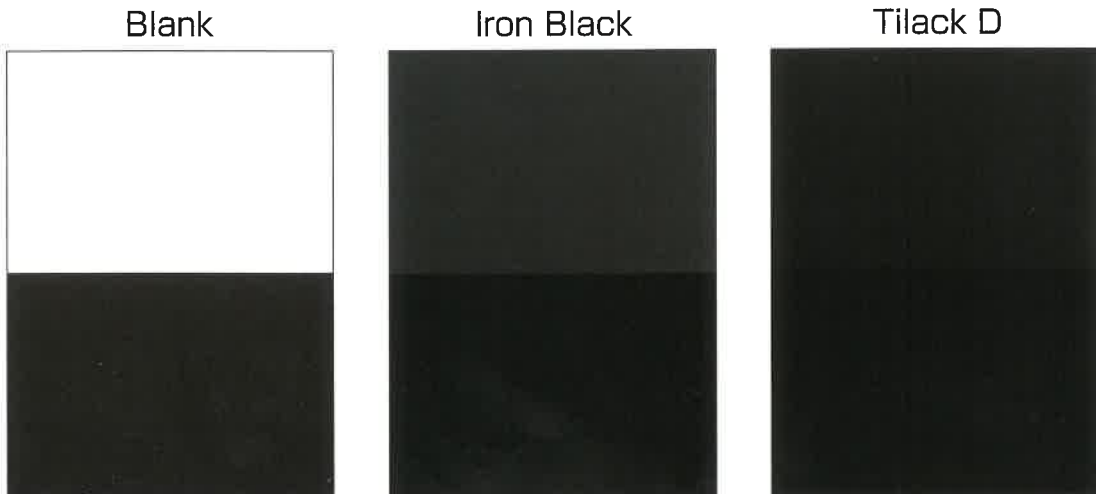


TEM PHOTOGRAPHS

RESULT OF THERMAL ANALYSIS



RESULT OF HIDING POWER TEST



Resin : cellulose nitrate
Concentration of pigment : 10PHR

OFFICIAL STANDARD LIST

STANDARD NAME	STANDARD NUMBER (NAME)
The Japanese Cosmetic Ingredients Codex 1993	550090 (Titanium/Titanium Dioxide)
CAS No.	51745-87-0
EINECS No.	257-372-4
COLOUR INDEX	77890 (C.I.Pigment Black 35)
CTFA* FILE No.	1364 (Titanium/Titanium Dioxide)

*"Tilack D" is mentioned on P224, P715 of INTERNATIONAL BUYERS' GUIDE 1996.

PROPERTIES

	Tilack D	Carbon black	Iron black
Specific gravity	3.9	1.8	5.0
Bulk density(g/ml)	0.2~0.5	0.3~0.5	0.8~1.3
Primary particle size(μm) ^{*1}	0.03~0.5	0.01~0.5	0.2~1.0
Mean particle size(μm) ^{*2}	0.6~1.5	12.8	2.1
Surface properties	Hydrophilic	Hydrophobic	Hydrophilic
Color tone	Bluish black~Jet black	Black	Black
Blackness(L-value) ^{*3}	9~20	8~14	17
Specific surface area(m^2/g) ^{*4}	5~60	90~460	70
Oil absorption(ml/100g)	15~60	450~900	20~30
Heat resistance temperature($^{\circ}\text{C}$)	400	380	150
pH ^{*5}	4~9	2~10	6~8
Electric resistance($\Omega\cdot\text{cm}$) ^{*6}	$10^{-1}\sim 10^7$	$10^{-2}\sim 10^0$	$10^4\sim 10^5$
Tinting strength(L-value) ^{*7}	61	52	72

*1 : Primary particle size was measured by scanning electron microscopy.

*2 : Measured by Laser diffraction scattering method. [unused dispersing agent]

*3 : Measured with color difference meter. [Lab]

*4 : Measured by BET method.

*5 : 10wt% solution in water.

*6 : Measure of Compressed powder (1t/cm³).

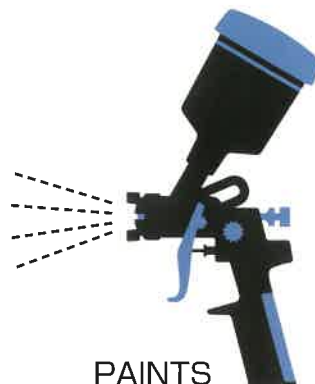
*7 : It was measured by same method as *3 that add 5wt% of each black pigments to Titanium Dioxide.



COSMETICS



ELECTRICAL PARTS



PAINTS