ADVANCE ZINCTEK LTD

ANTARIA an advanced materials world

A NATURAL SOFT FOCUS

White Sapphire Glow

NEW: NEXT GEN WHITE SAPPHIRE - *WITH SPF BOOSTING CAPABILITIES*

THE ULTIMATE MULTIFUNCTIONAL INGREDIENT FOR CUTTING-EDGE SKINCARE, SUN CARE, AND COSMETIC FORMULATION.

- **BOOSTS SPF EFFECTIVNESS** FOR SUPERIOR SUN PROTECTION
- PROVIDES A **SOFT-FOCUS, RADIANT FINISH** THAT ENHANCES PRODUCT PERFORMANCE TO GIVE SKIN A NATURAL AND HEALTHY RADIANCE
- IDEAL FOR USE IN **SUNSCREENS, MOISTURIZERS AND MAKEUP** FORMULATIONS
- DELIVERS **LONG-LASTING WEAR** FOR BEAUTY SOLUTIONS WITH IMPROVED POWDER ADHESION

WHITE SAPPHIRE

White Sapphire, derived from aluminum oxide, is one of nature's most stable and inert materials. It is a free-flowing off-white powder with a hexagonal crystal structure. Aluminum is the third most common element in the Earth's crust, present in soils, clays, minerals, rocks, and even water and food, making human exposure inevitable. However, White Sapphire, being naturally occurring aluminum oxide, is highly resistant to most corrosive environments, including the dynamic environment of the human body.

Due to its electrochemical properties, the positively charged aluminum ions in White Sapphire form tight chemical bonds with oxygen, resulting in minimal dissociation in pH-neutral, aqueous environments. As most living organisms function at or near these pH levels, White Sapphire presents minimal potential for cellular or subcellular interactions and remains relatively inaccessible to biological processes, ensuring its inertness and safety in various applications.

Unlike aluminum metal, it is a thickening agent, absorbent, and exfoliant. Its fine white powder absorbs impurities and excess oil, which delivers an improved application through creating a smoother, creamier, and more spreadable texture in facial cleansers, masks, and other cosmetic formulations.

CHEMICAL COMPOSITION

INCI Name	Composition
Alumina (or Synthetic Sapphire)	Aluminium Oxide >99.0%
Molecular Formula	**CAS No.**
Al_2O_3	1344-28-1

WHITE SAPPHIRE BENEFITS

ENHANCED SPF

Antaria has developed a provisional patent which has proven that our White Sapphire Alusion combined with our ZinClear®XP powder provides a SPF boost in end sunscreen and cosmetic products.

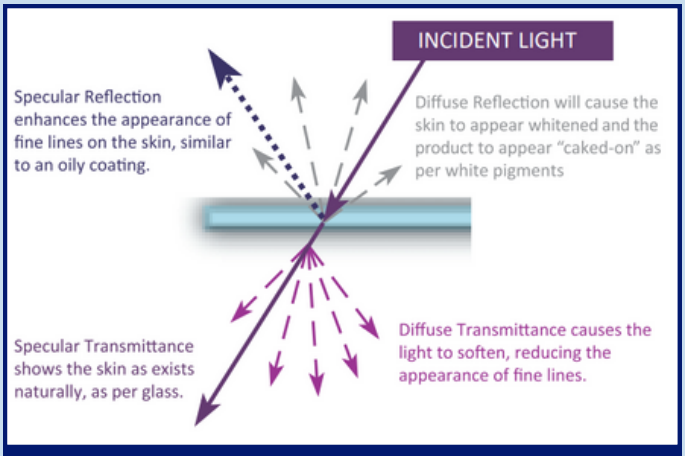
REDUCES SWEATING

A leading dermatologist in Brisbane, Dr Russell Hills, has developed a SPF50+ sunscreen (which includes White Sapphire) that reduces sweating.

SOFT-FOCUS PROPERTIES

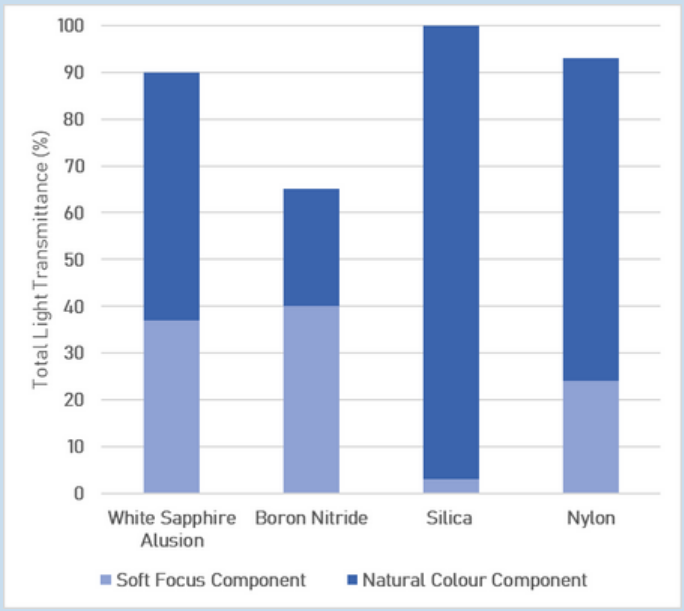
Soft-focus cosmetics aim to reduce the appearance of fine lines by ensuring that light is highly diffused. Fine lines are hidden, whilst remaining highly transparent and hence showing natural skin tones. Light can interact with a material in several ways as shown. Soft-focus materials reduce the reflected components of light, which show lines and whiten the skin, and increase the diffuse component of transmitted light softening fine lines. White Sapphire enhances the diffusion of light whilst remaining highly transparent, giving a superior more natural look.

White Sapphire Alusion's light reflecting properties, when combined with zinc oxide, create an enhanced SPF boost in end sunscreen formulations. This combination enhances the effectiveness of UV protection, creating a smoother, more refined finish when supporting the natural defence against harmful rays.



Soft-focus materials aim to minimize total reflection as well as maximize diffuse transmittance and total transmittance.

As can be seen by the transmittance measurements, White Sapphire has superior combination of diffuse and total transmittance giving a more natural looking soft-focus effect.



APPLICATIONS

WHITE SAPPHIRE CAN BE USED IN A VARIETY OF COSMETIC APPLICATIONS. COMMON USES INCLUDE:

- Sunscreen.
- Lip and Eye Pencils.
- Eye Shadows.
- Face Powders / Blush.
- Foundations and Concealers.
- Lipstick.
- Skin Care.
- Bath and Body Products.
- Beauty Products.
- Nail Enamels.
- Antacid to relieve heartburn, sour stomach, and acid indigestion.
- Acne treatment and the removal of hard skin.
- Abrasive medium for Microdermabrasion.
- Opacifier.
- Drying Agent.
- Viscosity controlling agent.
- Colour additive
  (FDA exemption from certification).
- Colour additive in form of Aluminum Lakes for drug and cosmetic use: FD&C Blue #1 Aluminum Lake, FD&C Red #40 Aluminum Lake, FD&C Yellow #5 Aluminum Lake
- Articulating surfaces in joint replacements.
- Bone Spacers.
- Dental Restoration, Orthopedic Implants.

FORMULATION

TYPICAL RANGES OF WHITE SAPPHIRE POWDER USED IN COSMETIC FORMULATIONS:

Face and body powder	2-10%
Eye shadow/blushes	2-10%
Lipstick	1-10%
Lip and eye pencils	2-55%
Concealers/foundations	1-5%
Nail enamels	1-2%
Skin care lotion/creams	2-10%
Sunscreens	2-10%

ANO WHITE SAPPHIRE IS **NON-NANO AND SAFE**

The White Sapphire used in our cosmetics is Aluminium Oxide, which isn't a salt of aluminium. Aluminium salts will dissolve in water producing Aluminium ions whereas Aluminium oxide is stable and won't dissolve in water or oil.

The current research at the time suggests that aluminium salts don't pose a health threat [12], though there is still negative press about aluminium resulting in the wide range of aluminium salt free products available. Aluminium oxide doesn't pose a health risk even in larger concentrations because of its inactivity. All types of aluminium are poorly absorbed by the body, increasing its safety, and non-nano aluminium oxide is likely not absorbed through the skin [13].

White Sapphire is EcoCert approved since 2018 by MERCK under its RonaFlair White Sapphire.

White Sapphire is EcoCert COSMOS Version 4 certified.

STORAGE & HANDLING

Good ventilation is advised when handling the powder. Store in a cool, dry place. Consult the SDS for additional handling or safety information.

SHELF LIFE

White Sapphire has a shelf-life stability of 5 years when stored under standard conditions (above 5°C and below 30°C).

STRONG **ADHESION**

USING MULTIPLE SUBSTRATES AND TESTING METHODS ON AVERAGE WHITE SAPPHIRE ADHERED:

- 19% more than Boron Nitride
- 29% more than Talc
- 44% more than Nylon
- 64% more than Silica

ECONOMIC **USES**

White Sapphire has been extensively used in refractory applications, steel production, wear-resistant ceramic parts, paint additives, chromatography, integrated circuits, paper coatings, pigments and reinforced fibers for polymer- and metal-based composites. For decades it has been used in drugs, cosmetics, foods, biomaterials and bio ceramics. White Sapphire is listed in the British Pharmacopia as dried Aluminium Hydroxide (Hydrated Aluminium Oxide) which contains 47 – 60% of Al_2O_3 [2]. The U.S. Food and Drug Administration (FDA) has listed White Sapphire (dried aluminium hydroxide) with 'not less than 50%' Al_2O_3 as a color additive that is exempt from certification [3].

WHITE SAPPHIRE IS A **MINERAL INGREDIENT**

(CAS Number 1344-28-1)

White Sapphire is a mineral ingredient sourced from naturally occurring alumina (aluminum oxide). As a naturally occurring ingredient, it aligns with clean beauty trends, where consumers value environmentally friendly products. Being a thickening agent and abrasive, White Sapphire works well as an exfoliator or to improve a formulas texture [14]. It is also used for its absorbing properties and its waterproof nature. It also functions as an anti-caking and absorbing agent. It is found in many make-up products such as blush, powder foundation, lipstick and facial cleanser [15]. White Sapphire can help to remove excess oil from the skin which unclog pores for a smoother feeling on the skin [14]. White Sapphire provides a soft-touch focus, leaving the skin with a smooth, matte appearance without a greasy feel. This works well within cosmetics by enhancing the performance of products like foundations and finishing powders [15].

EXPOSURE ASSESSMENT & **HEALTH CONSIDERATIONS**

Most estimates of human toxicity are based on animal studies. Toxicity is an inbuilt property of a material, similar to its physical constants. It is the ability of a chemical substance to cause an undesirable effect in a biological system. Because of the insolubility and thus relative biological inactivity of White Sapphire (aluminium oxide) experimental toxicology results are not readily available [1,4,5,6,7]. Other more soluble aluminium compounds that do not commonly occur in nature have been extensively studied [1,5,6,7].

The average human intake of aluminum is about 25 mg/day, mainly from food and water, with additional intake from pharmaceuticals, such as antacids, ranging from 10 to 5,000 mg/day. No reports of dietary aluminum toxicity in healthy individuals exist in current scientific literature. Toxicological data indicate low acute oral toxicity for White Sapphire Powder, with an LD value greater than 5,000 mg/kg in rats. However, no specific data on acute inhalation toxicity is available.

Studies have shown that White Sapphire Powder does not irritate the skin or eyes (based on animal testing), nor does it exhibit carcinogenic activity. It is not classified as a specific target organ toxicant for single or repeated exposure. Acute aluminum toxicity is unlikely due to limited absorption from oral intake. Skin absorption is also minimal, with an average adult absorbing approximately 15 micrograms of the 5 mg/day of aluminum encountered from the environment. To date, no studies on skin absorption in animals are available.

There are no systematic studies on the pulmonary absorption of White Sapphire Powder, and no LC data has been identified for inhalation. Aluminum compounds are generally considered non-mutagenic and non-carcinogenic, based on a range of assay methods.

Ecological data for White Sapphire Powder is limited, with no available information on toxicity, bioaccumulation, or persistence. However, when handled and used responsibly, no environmental problems are expected.

OUR PRODUCTS

PRODUCT	PACKAGE DIMENSIONS
White Sapphire Glow	20kg Boxes 18 Boxes to 1 Pallet (360kg)
ZinClear®XP50 Sunflower White Sapphire Alusion Dispersion	20kg Boxes 18 Boxes to 1 Pallet (360kg)
ZinClear®XP57 Coconut White Sapphire Alusion Dispersion	20kg Boxes 18 Boxes to 1 Pallet (360kg)

PRODUCTION **CAPACITY**

- ANO can manufacture in excess of 50mt per annum.

LOGISTICS

- ANO stocks White Sapphire in both our Dallas, USA and Netherlands warehouses for distributors to access.

WHITE SAPPHIRE: TECHNICAL SPECIFICATION & PROPERTIES

Test Name	Specification
Crystal	Hexagonal (X-Ray Diffraction)
Appearance	White powder (Visual)
Whiteness Index	>85.0 (CIE Index - UV - Vis)
Odor	None
Loss on Drying (%)	<0.5 (3 hours at 160C)
pH Value	9.0-11.0
Mean Particle Size (µm)	4.0-12.0 (Dynamic Light Scattering (DLS))
Al_2O_3 (%)	≥ 97
Cd (ppm)	≤ 1 (ICP-MS/ ICP-OES)
As (ppm)	≤1 (ICP-MS/ ICP-OES)
Pb (ppm)	≤8 (ICP-MS/ ICP-OES)
Hg (ppm)	≤1 (ICP-MS/ ICP-OES)
Surface Area (m^2/g)	4-7.5
Tap Density (g/cm^3)	0.5-0.7
Oil Absorption (g/100g)	50-100
Coefficient of Friction	0.25-0.35
Purity	Meets FDA specifications for heavy metals impurities (Pb, As, Hg) in Food and drug colour additives

*Actual Properties may vary. Numbers represent typical data and will vary within ranges established for a particular grade.

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