

PURE NATURAL STRENGTH FOR COSMETIC PRODUCTS.



THE FIRST LIGNIN-BASED INGREDIENT FOR COSMETIC FORMULATIONS.

From nature's most versatile functional polymer, we have created LignoBase™ – a versatile functional ingredient for sunscreens, body lotions, and creams.

LignoBase is a multifunctional cosmetic ingredient derived from clean, sustainably sourced plants. Its unique polyphenolic molecular structure offers multiple cosmetic benefits, including skin protection, antioxidant activity, and SPF-boosting properties. LignoBase is available in two versions with different natural colors, helping to reduce white cast and simplify color formulation for various skin tones.

Because our particle technology preserves lignin's natural molecular structure, LignoBase remains a high-quality, finely tuned upcycled powder that retains lignin's multifunctional properties, making it ideal for a wide range of cosmetic formulations.

Fully natural, LignoBase is sourced from countries that comply with Nagoya Protocol regulations and from suppliers who use ethically sourced, GMO-free plants.



SPF Booster



Antioxidant



Natural Color



Oil Control



Soft Focus



White cast prevention



LignoBase™ Cool BE25



LignoBase™ Warm WS25

Pioneering the Future of Sustainable Beauty with Lignin

Born from nature's intelligence, lignin has protected plants and trees for millions of years. Uniquely synthesized by each species, this plant-derived polymer offers a spectrum of natural color, defense against UV radiation, oxidative stress, and structural damage.

LignoBase™, created by nature for nature

Unlike some natural ingredients that contribute to deforestation, overharvesting, or require energy-intensive processing, LignoBase is crafted from upcycled lignin using Lignopure's patented particle technology which optimizes lignin's functionality through targeted particle design, embodying the principle of "by nature for nature." LignoBase isn't just natural — *it's sustainable and fully traceable*. We prioritize transparency, ensuring full traceability of biomass origin, culture conditions, processing, and transport.



LignoBase™ Cool BE25

LignoBase™ Warm WS25

| | | |
|------------------------------|---|--|
| INCI | Lignin/Cellulose or Betula Pendula Wood Extract* | Lignin/Cellulose |
| Biomass of Origin | Birch | Wheat Straw and Munj Sweetcane Bagasse |
| Scientific Name | <i>Betula Pendula</i> | <i>Triticum aestivum L. and Saccharum bengalense</i> |
| Appearance | Fine powder | Fine powder |
| Color | Brown, red undertone | Brown, yellow undertone |
| Odor | Neutral to mild woody | Mild woody, aromatic |
| Moisture Content | < 3% | < 3% |
| Particle Size | D50 12.5 µm | D50 12.5 µm |
| pH (10% aq. susp.) | 5 - 7 | 3 - 5 |
| Recommended use level | 1 - 5% 0.5 - 10% 0.1 - 5% | sun care applications color cosmetics antioxidant protection |

*NMPA code available for commercialization in China under request



Natural



Nagoya compliant



Made in Germany



COSMOS APPROVED



NATRUE APPROVED



GMO free



Upcycled biomass



Biodegradable



Reef Safe



FSC Compliant

Benefits

Antioxidant, SPF - Booster, Oil Control, Natural Color, Soft - Focus

Applications

Skin-, Sun-, Body-, Hair-care, Color Cosmetics

Nature's Shield for Broader, More Stable Sun Protection

Enhance sun protection in your formulations and tap into the expanding market for natural personal care with LignoBase.

This innovative, upcycled ingredient acts as a powerful natural SPF booster, improving UV filter efficacy while supporting eco-conscious, sustainable product development.



Boost SPF Naturally and Reduce White Cast

LignoBase synergistically enhances the efficacy of conventional UV filters, while decreasing the undesirable white cast in mineral-based formulations. This enables the formulation of high-protection sunscreens that appeal to a wider range of skin tones.

Stable and Broader Protection

LignoBase's radical quenching properties stabilize UV filter systems and help broaden the UV protection spectrum, offering enhanced defense against both UVB and UVA rays, and appealing to high-SPF consumers.

Natural, Sustainable & Powerful

LignoBase's upcycled, plant-based origin resonates with the rapidly growing segment of eco-conscious consumers who actively seek out sustainable and natural alternatives for a bigger market reach.

Scientifically Proven Functionality

To demonstrate LignoBase's boosting properties, LignoBase Cool BE25 variant was incorporated into both a mineral and a chemical base sunscreen at 1%, 3% and 5%. The resulting formulations were subjected to in-vivo SPF determination using a screening panel of 5 human volunteers, following the in-vivo determination of the Sun Protection Factor (SPF) ISO 24444 methodology.

The results demonstrated a significant SPF enhancement across all tested concentrations. This suggests that even with a concentration as low as 1%, LignoBase Cool BE25 offers a substantial improvement in skin protection against sun exposure.

The UVA-PF boosting power of LignoBase Cool BE25 was tested on 13 healthy human subjects using the non-invasive LED HDRS method (ISO 24443). This advanced methodology combines in vitro UVB and in vivo UVA spectral analysis for reliable SPF assessment, confirming a significant 34% UVA-PF boost in a commercial mineral sunscreen with the addition of 3% LignoBase Cool BE25.



SPF Booster



Natural



Upcycled biomass



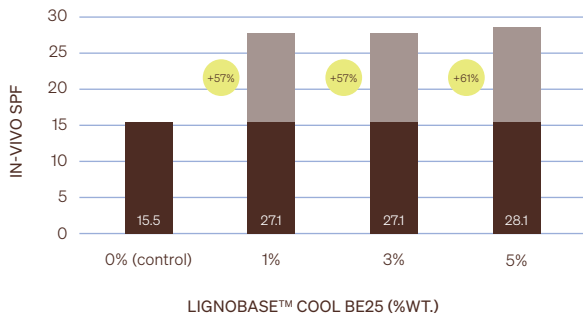
COSMOS APPROVED



NATRUE APPROVED

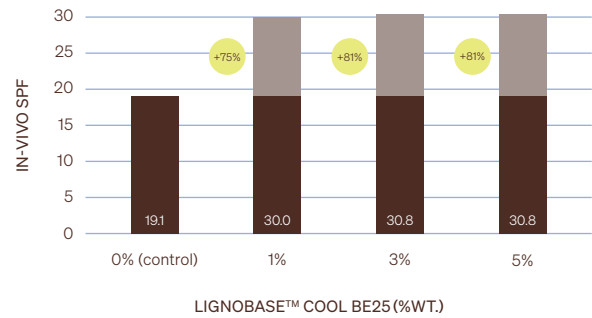


IN-VIVO SPF VALUES OF CHEMICAL SUNSCREEN SPF20



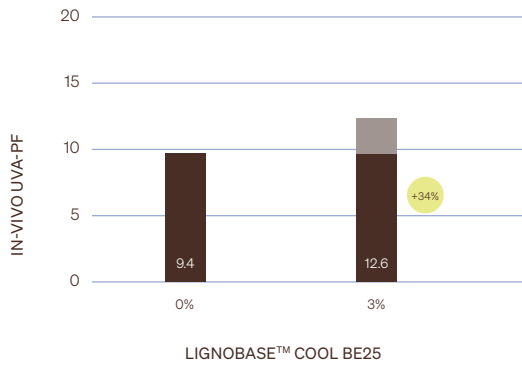
With Commercial Chemical Sunscreen 205-01

IN-VIVO SPF VALUES OF MINERAL SUNSCREEN SPF20



With Commercial Mineral Sunscreen 220-02

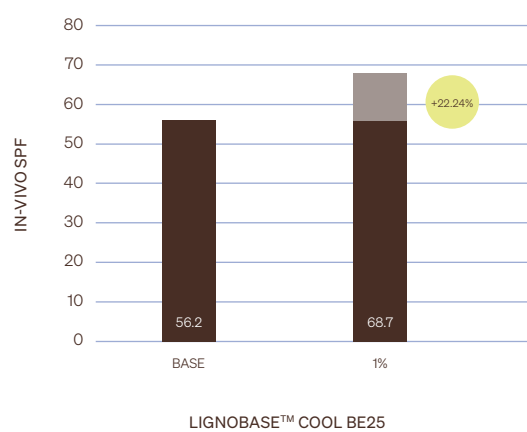
UVA-PF OF COMMERCIAL CHEMICAL-MINERAL SUNSCREEN IN HUMAN SUBJECTS



HUMAN DETERMINATION OF SPF (LED HDRS METHOD)

With Commercial Chemical-Mineral Sunscreen 241-00

IN-VIVO SPF VALUES OF CHEMICAL SUNSCREEN SPF50

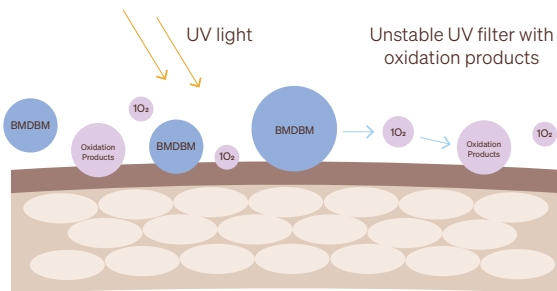


With Chemical Sunscreen 401-00

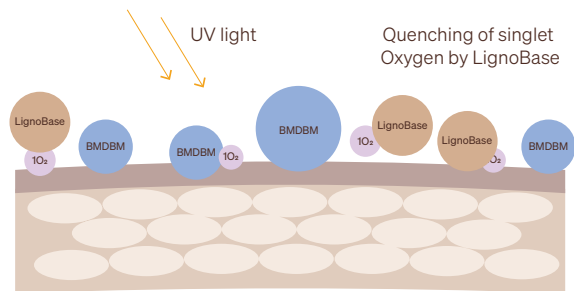
The Upcycled Ingredient for Clean Sun Protection

LignoBase is the first non-nano lignin-based ingredient designed for cosmetics, featuring an unparalleled lignin concentration to maximize its natural benefits. Sustainably sourced from ethically grown plants and processed with proprietary technology, each variant retains its unique polyphenolic structure. This natural shield enhances SPF in mineral and chemical formulations across color cosmetics, skincare, haircare, and sun care. By leveraging a unique molecular interaction, LignoBase boosts SPF and broadens UV protection for superior sunscreen performance.

UV FILTER STABILIZATION

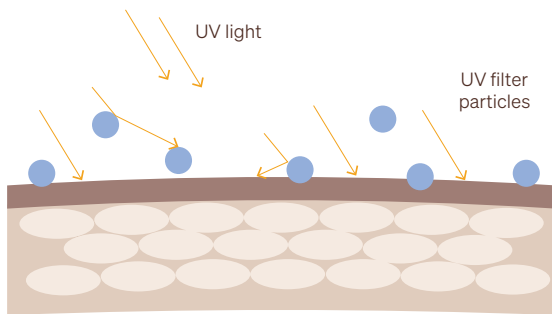


Oxidation products are harmful for the skin. Can cause skin aging, dehydration, etc.

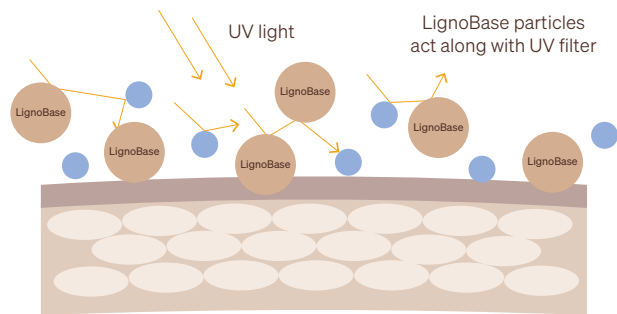


Stabilization of UV filter via quenching. Stable UV filter leads to SPF boosting.

UV LIGHT SCATTERING

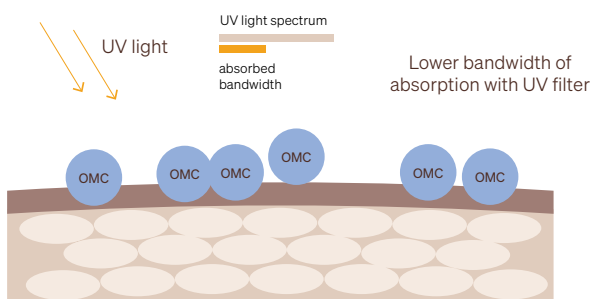


Low light scattering results in higher UV light contact with skin

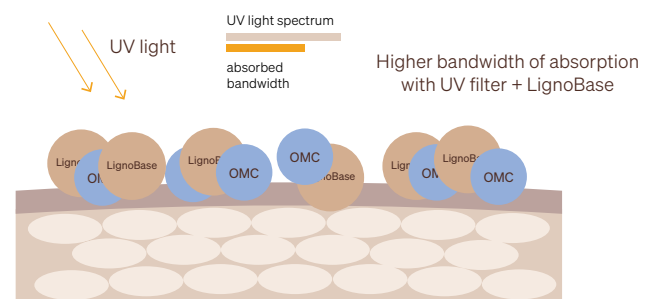


High light scattering results in lower UV light contact with skin

SYNERGETIC EFFECT



Sunscreens with ingredients like Octyl methoxycinnamate acting alone



Stacking of aromatic rings in OMC and LignoBase creates a synergistic effect, increasing the bandwidth of UV absorption

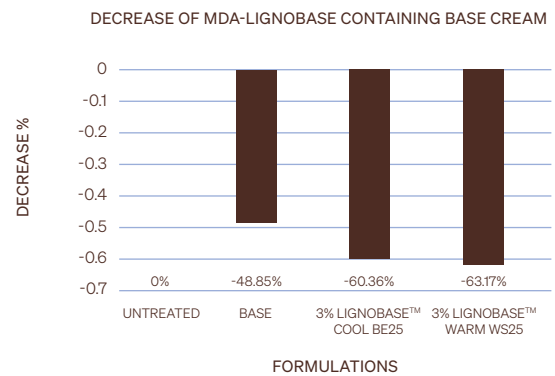


**Sustainable Skin Defense
at the Cellular Level**

Enhance your skincare line with LignoBase, the upcycled powerful antioxidant ingredient to combat a key marker of skin aging at the cellular level.

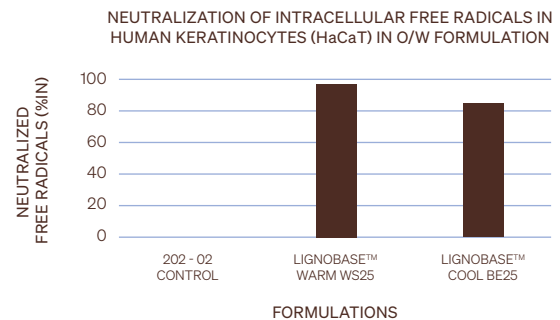
Proven MDA Reduction

A study on human skin explants demonstrated that topical application of LignoBase significantly decreased Malondialdehyde (MDA) – a byproduct of lipid peroxidation that damages collagen and elastin – by up to 63.17%, a remarkable 15% improvement over the base formulation. By effectively reducing MDA, LignoBase helps preserve skin's structural integrity, combats premature aging, and minimizes potential DNA damage.



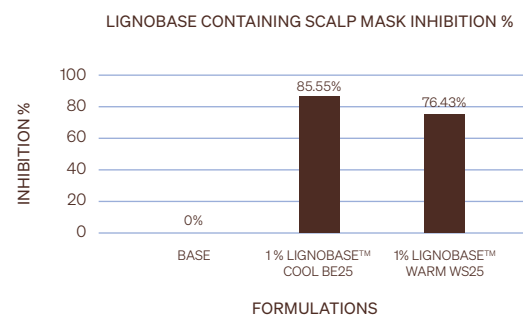
Powerful ROS Neutralization

Further confirming LignoBase's antioxidant activity at the cellular level, tests on human keratinocytes (HaCaT) showed that the addition of 5% Lignopure Base to a regular O/W cream neutralized 70-98% of intracellular Reactive Oxygen Species (ROS), including superoxide anion (O₂^{•-}) and hydroxyl radical (OH[•]), generated by photoinduction.



Revitalizing Antioxidant Power in Scalp Masks

Harnessing the potent antioxidant properties of lignin, LignoBase demonstrated its exceptional antioxidant capacity in developing high-performance detoxifying scalp masks. Following a DPPH radical scavenging test, the incorporation of 1% LignoBase Cool BE25 enhanced the scalp mask's antioxidant activity to 85.55%, while 1% LignoBase Warm WS25 increased it to 76.43%, highlighting LignoBase's superior antioxidative capabilities.



Unlock the Power of a Natural Antioxidant and Formula Stabilizer

Harnessing lignin's natural potent polyphenolic structure and multiple proton-donating groups for skin and hair benefit, LignoBase is a powerful sustainable antioxidant ready to enhance your personal care. It effectively scavenges free radicals, shielding skin cells from damaging oxidative stress. Beyond skin protection, this innovative ingredient acts as a natural stabilizing system, preserving the efficacy of other actives and preventing the oxidation of sensitive formulation components.

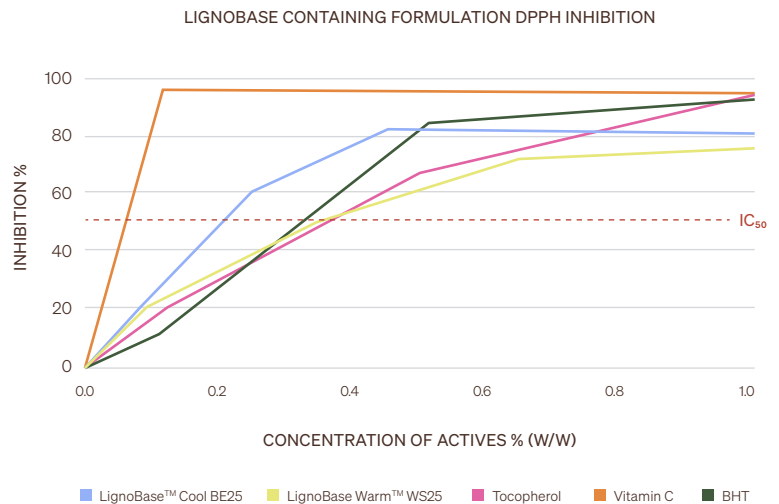


Antioxidant Evaluation

The antioxidant capacity of LignoBase was evaluated in a base cream at varying concentrations and compared to commercial antioxidants (tocopherol, vitamin C, BHT), with solubility-adjusted results.

IC₅₀, the concentration required to neutralize 50% of DPPH free radicals, indicates antioxidant strength—a lower IC₅₀ reflects higher efficacy. Both LignoBase variants showed IC₅₀ values around 0.25%, comparable to tocopherol and BHT. Notably, LignoBase Cool BE25 exhibited a better IC₅₀ than both tocopherol and BHT, demonstrating superior antioxidant capacity.

While Vitamin C exhibits a lower IC₅₀, LignoBase's robust nature constitutes a significant advantage. LignoBase maintains its efficacy without requiring additional stabilizers, offering formulators a reliable, natural, and sustainable antioxidant solution for diverse market applications.



Market Benefits

In today's market, consumers demand more than just effective personal care, they look for natural, sustainable solutions backed by science.

Stand Out

Feature LignoBase, a unique, scientifically validated, and upcycled antioxidant, to differentiate your product line.

Deliver Natural High-Performance

Meet consumer demand for effective and natural formulations with stable antioxidants.

Lead the Clean Beauty Movement

Align with the growing preference for plant-based and upcycled ingredients.



Experience Soft Focus Powered by Nature

The pursuit of a youthful, radiant complexion drives consumer desire for soft focus. This visual effect gently blurs imperfections, smoothing skin tone and diminishing the visibility of fine lines, wrinkles, and pores for a healthy skin effect.



Benefits for Cosmetic Brands

Consumer Appeal

Meets the growing demand for products that address concerns like aged-appearance and uneven skin tone.

Differentiation

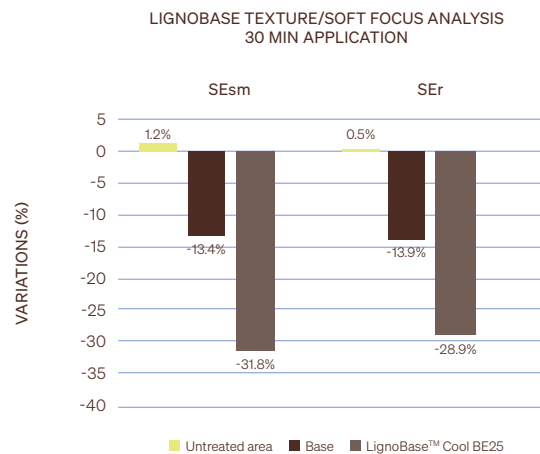
Provides a unique selling point and a more luxurious feel and look for cosmetic formulations while leveraging natural ingredients.

Soft Focus Analysis

This experiment aimed to evaluate the effect on skin appearance and texture capabilities of LignoBase containing formulations by measuring skin smoothness (SEsm) and roughness (SEr) parameters in 10 healthy participants.

SEsm reflects the average width and depth of wrinkles, while SEr indicates the average roughness of the skin profile. Concurrent reductions in both parameters suggest that LignoBase enhances the formulation's spreadability, resulting in a visibly smoother and more uniform skin surface.

Notably, these results indicate that LignoBase containing formulations achieved more than double the reduction in both SEsm and SEr parameters compared to the base formulation.



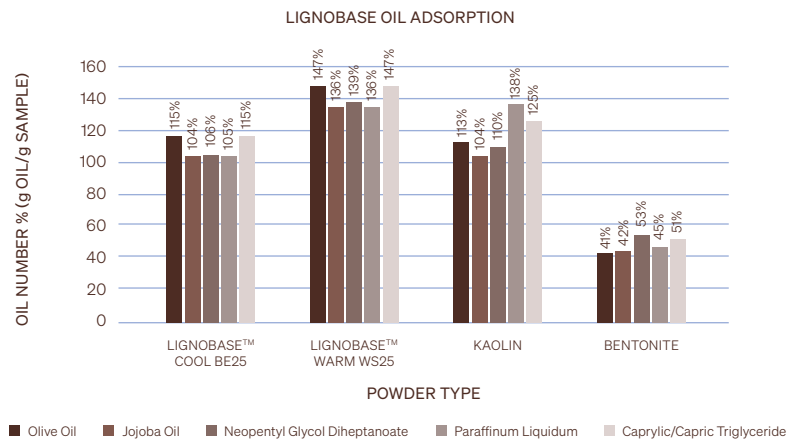
Balance and Beauty in One Upcycled Powerhouse for Oil Control

Unsightly shine is a key consumer concern. By utilizing a sustainable ingredient that naturally controls sebum and excess oil, brands can significantly enhance their appeal to eco-conscious consumers demanding effective mattifying solutions.



Oil Adsorption

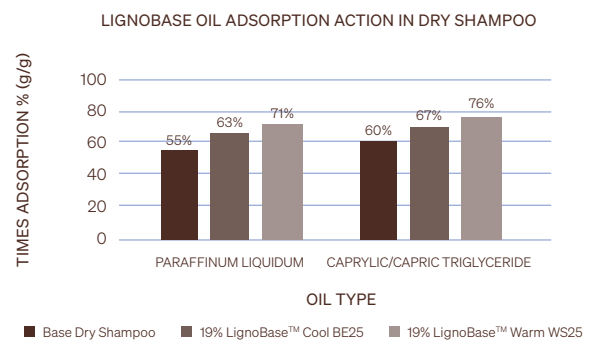
LignoBase boasts hydrophobic functional groups alongside an optimized particle size and surface area, endowing it with exceptional oil control and mattifying properties. LignoBase's oil adsorption capacity was quantified (oil number) and compared to kaolin and bentonite using a standardized method (DIN-ISO-787/5) with various oils. Notably, LignoBase showed a stronger affinity for skin-relevant lipids like triglycerides and wax esters compared to kaolin, which favored mineral oil.



Dry Shampoo Application

To assess LignoBase's ability to boost dry shampoo sebum control performance, we evaluated its impact on oil adsorption compared to a standard formulation.

Our results showed that LignoBase can enhance the oil adsorption of the base dry shampoo by as much as 16%. This improved oil adsorption in LignoBase containing dry shampoos highlights its potential to deliver a naturally superior product experience with enhanced sebum control, antioxidant and antipollution benefits and the potential for added SPF protection.



Multifunctional Power with Effortless Color Beauty Formulations

Unlock a new realm of formulation possibilities and expand your brand's appeal with LignoBase, the naturally derived ingredient with functional properties and a subtle brown hue that simplifies color cosmetics and multifunctional skin- and sun-care formulations.

By integrating LignoBase into your personal care products, you can create innovative, high-performing, and clean beauty products for consumers seeking both efficacy, and sustainable, streamlined solutions. Its unique brown hue becomes an asset, simplifying the creation of natural-looking skin tones while its multifunctionality offers significant formulation advantages.



Streamline Formulations with Multifunctionality

LignoBase acts as an antioxidant, SPF booster, soft focus, and oil control agent – all in one sustainable ingredient. This versatility allows you to reduce the number of ingredients in your formulations, simplifying production and appealing to consumers seeking multifunctional and minimal but effective products.






Naturally Enhance and Simplify Color Cosmetics

LignoBase's inherent brown color offers a unique advantage in color cosmetics. Its sheer color capacity means it's easily covered by pigments, providing a natural base that can contribute to the overall shade and depth of your foundations, concealers, and tinted moisturizers. This brown hue can simplify the often complex process of achieving natural-looking skin, red, brown and many more tones, reducing the need for numerous color-adjusting pigments.






Tap into the Natural and Sustainable Demand

As an upcycled, plant-based ingredient, LignoBase resonates strongly with environmentally conscious consumers who prioritize natural and sustainable beauty choices. Highlight this unique selling point to attract a growing and loyal customer base.

LignoBase™ Cool BE25 Family

| | |
|--|--|
|  3% LB Cool | |
|  3% LB Cool + 0.1% Yellow |  3% LB Cool + 0.5% Yellow |
|  3% LB Cool + 0.1% Red |  3% LB Cool + 0.5% Red |

LignoBase™ Warm WS25 Family

| | |
|--|--|
|  3% LB Warm | |
|  3% LB Warm + 0.1% Yellow |  3% LB Warm + 0.5% Yellow |
|  3% LB Warm + 0.1% Red |  3% LB Warm + 0.5% Red |

*Color may vary due to natural differences in raw ingredient batches



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Lignopure

PIONEERING LIGNIN-BASED SOLUTIONS