



# BIOBLANCA-1,3-PDO

## PRODUCT MANUAL

- Sustainable and Consistent Supply
- Preferred for Fragrance-Free Formulas
- COSMOS Approved



# BIOBLANCA

## —1,3-PDO



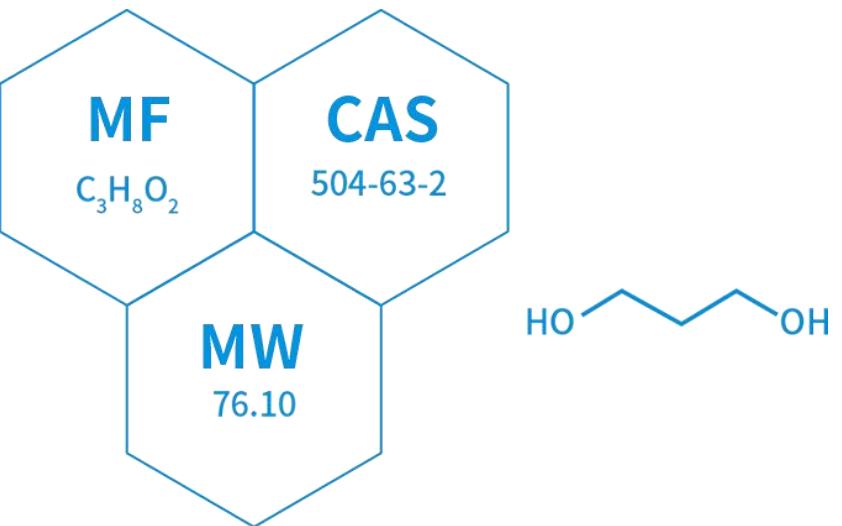
# Product Introduction

## 1,3-丙二醇——BIOBLANCA-1,3-PDO

1,3-Propanediol is a colorless, odorless, hygroscopic viscous liquid, which is a multifunctional polyol moisturizer with preservative-boosting properties.

**Product Name:** BIOBLANCA-1,3-PDO

**INCI :** Propanediol



# Applications

BIOBLANCA-1,3-PDO

## Personal Care Products



## Pharmaceutical Intermediate



## Industrial Chemicals



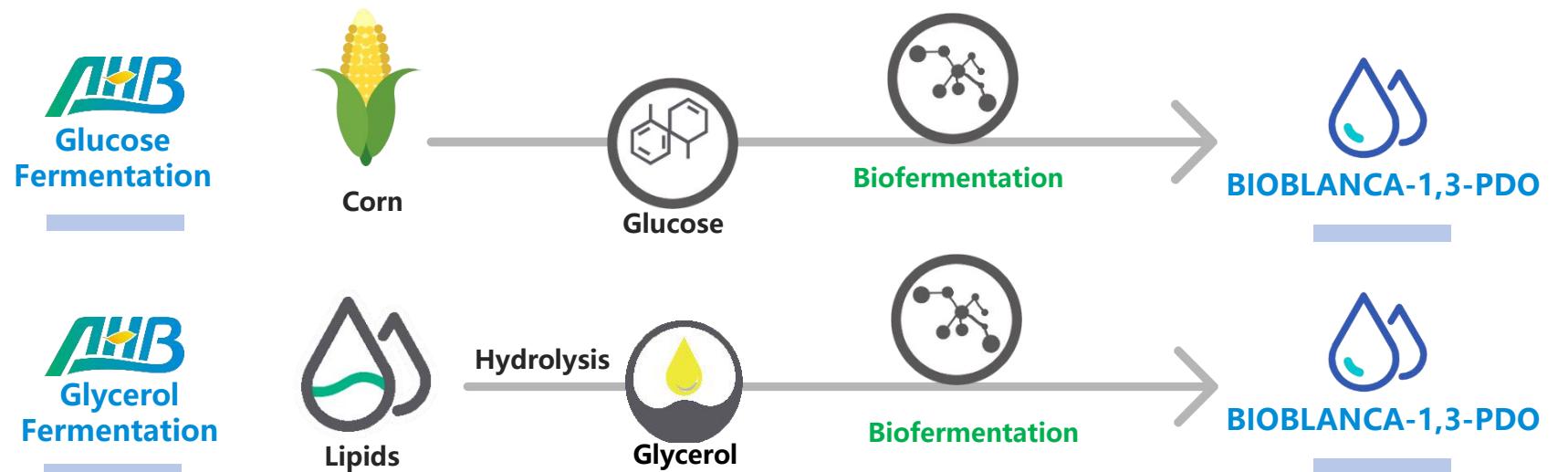
# Product Grades

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Application	Pharmaceutical	Industry	Cosmetics
<b>Product Grades</b>	Polyester Grade	Polyester Grade	Cosmetic Grade
<b>Content(GC), %</b>	≥99.9%	≥99.9%	≥99.9%
<b>Chroma , Hazen</b>	≤5	≤5	≤5



# Production Process



## Our Process

Two Biofermentation Processes

Renewable Raw Materials

100% Bio-based Product

# Product Certification

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# Functions and use of

BIOBLANCA-1,3-PDO

01 **Emollient**

02 **Solvent**

03 **Humectant**

04 **Booster**



05 **Viscosity Enhancer**

06 **Botanical Extraction**

07 **carrier for actives**

# Advantages

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BIOBLANCA-1,3-PDO

01 Solubilizer

02 Carrier for actives

03 Moisturization

04 Sensorial Enhancer

05 Reduced skin Irritation

06 Boost Preservative Efficacy



# Functional Benefits

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## Excellent Solubilizer



● **1,3-Propanediol serves as a key solvent for the delivery of active ingredients in both skincare products and pharmaceuticals.**

○ As a potent solubilizer for sun-blocking agents, it amplifies the efficacy and refines the sensory experience of sunscreen lotions.

Demonstrating excellent solubility, it is particularly effective for fragrances and similar components.

It is also an optimal choice as a solvent in the preparation of botanical extracts.

### References:

- [1] F. Reymer, D. Lutz, A. Rawlings, and B. Gleason. "Optimization of a broad-spectrum SPF 50+ sunscreen lotion containing natural 1, 3-propanediol for enhanced efficacy and improved sensory." Poster presented at the Society of Cosmetic Chemists Annual Meeting, New York, NY, December 2016.
- [2] L. Ortonne, E. Baudouin, M. Schmitz, M. Coiffard, J. Haftek, and C. Rouvrais. "Effect of 1, 3-propanediol and 1, 2-hexanediol on the skin penetration of sun filters." Journal of Cosmetic Science, vol. 59, no. 2, pp. 93-102, 2008
- [3] Yarong Li, Siyu Zhao, Xueping Song, Danyu Cao, Kai Li, Morteza Hassanpour, Zhanying Zhang. (2021) UV-Shielding Performance and Color of Lignin and its Application to Sunscreen.

# Functional Benefits

## Excellent moisturizing properties



### ● Moisturizing Performance VS Petro-based

#### 1,3-Butanediol, 1,2-Propanediol

##### ○ Test Conditions:

A. Skin Moisture Measurement Instrument 825PC\* (Courage+Khazaka)

B. 1,3-Propanediol (5%)

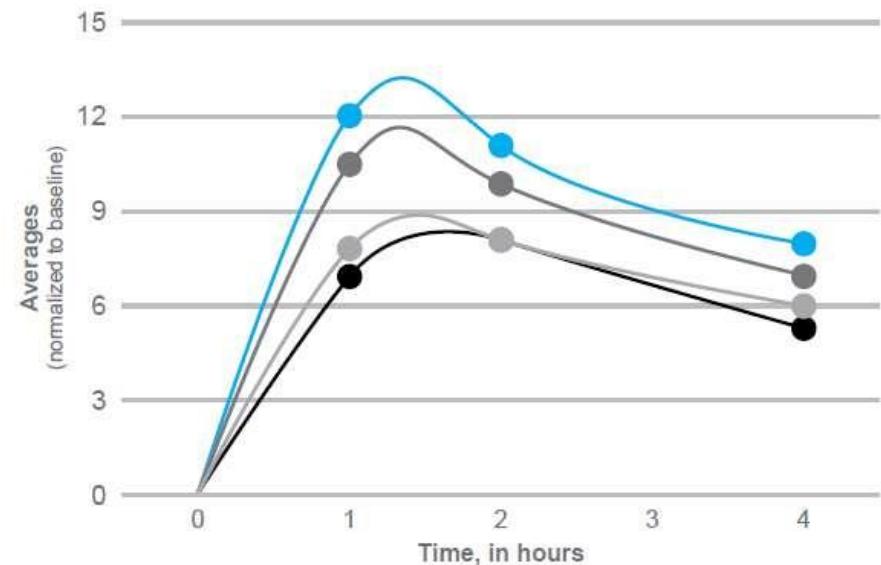
1,2-Propanediol (5%)

1,3-Butanediol (5%):

##### ○ Results:

**1,3-Propanediol demonstrates superior moisturizing effects compared to 1,2-Propanediol and 1,3-Butanediol.**

### Skin Moisture Test



Blue: 1,3-Propanediol Grey: 1,3-Butanediol Light Grey: 1,2-Propanediol Black: Blank

#### References:

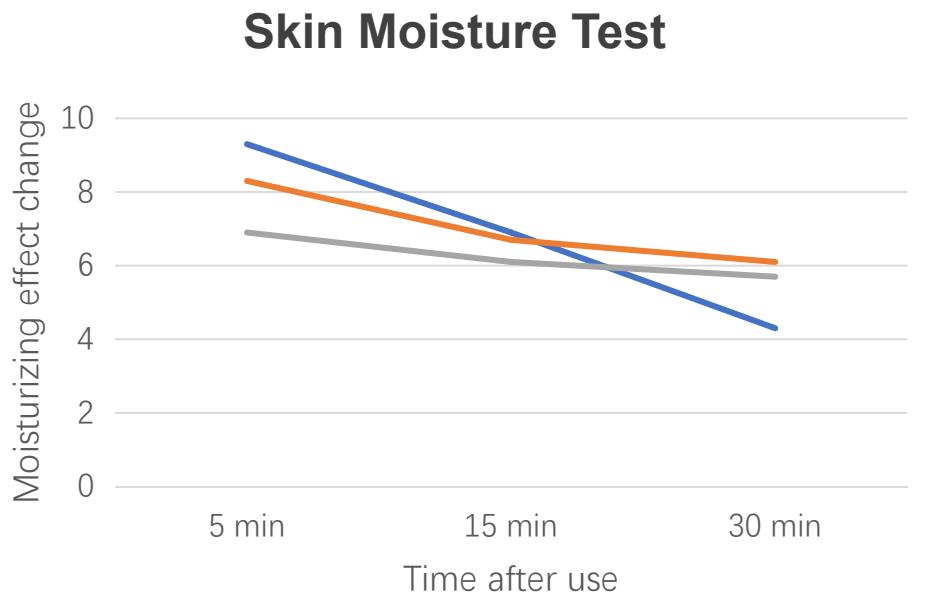
- [1] Miller, R., Ghosh, R., & Bae, I. Y. (2014). Evaluation of bio-based 1, 3-propanediol as a 100% natural glycol replacement. *Cosmetics & Toiletries*, 129(11), 46-52.
- [2] Belcher, Leigh A, Carl Frank Muska. Evaluating 1 , 3-Propanediol for Potential Skin Effects. 2010

# Functional Benefits

## Sensorial Enhancer

### Moisturizing Performance vs Glycerin

- **Test conditions:**
  - A. Skin moisture meter (ASA-M2);
  - B. 1,3-Propanediol (10%) 1,3-Propanediol (5%) + Glycerol (5%) Glycerol (10%)
- **Results:**
  - A. 1,3-Propanediol has better moisturizing effect than glycerin at the initial stage of use;**
  - B. 1,3-Propanediol mixed with glycerin can improve the moisturizing effect of glycerin and reduce the viscous skin feeling of glycerin.**



Blue: 1,3-Propanediol 10% Red: 1,3-Propanediol 5%+Glycerol 5% Grey: Glycerol 10%

References:  
[1] Miller, Robert Warren and Joseph W. Desalvo. Natural glycol replacement for hair and skin care. 2010.

# Functional Benefits

## Reduced skin Irritation

### ● Irritant VS 1,2-Propanediol (Petroleum Based)

#### ○ Test conditions:

- A, 207 test receptors;
- B, 1,3-propanediol (25%, 50%, 75%),  
1,2-propanediol (25%, 50%, 75%)  
Blank (25%, 50%, 75%)

#### ○ Result:

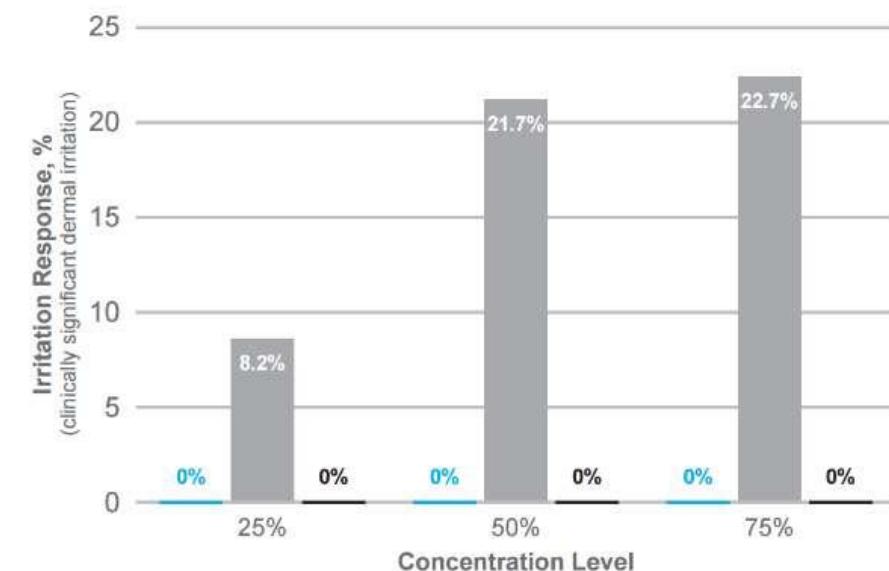
**1,3-Propanediol did not show significant irritation at 75% concentration.**

#### ○ Numerous studies have shown that:

**1,3-Propanediol has not been found to cause significant irritation in irritation tests, and no abnormalities such as sensitization have been observed even at very high concentrations.**



**Skin patch test**



Blue:1,3-Propanediol Grey: 1,2-Propanediol Black: blank

#### References:

- [1] Miller, R., Ghosh, R., & Bae, I. Y. (2014). Evaluation of bio-based 1, 3-propanediol as a 100% natural glycol replacement. *Cosmetics & Toiletries*, 129(11), 46-52.
- [2] Miller, Robert Warren, Joseph W. Desalvo. (2010). Natural glycol replacement for hair and skin care.
- [3] Belcher, Leigh A. Carl Frank Muska. (2010). Evaluating 1 , 3-Propanediol for Potential Skin Effects.

# Functional Benefits

## Boost Preservative Efficacy



- **Studies show 1,3-Propanediol, combined with preservatives like Phenoxyethanol, boosts antimicrobial activity. This enhances product shelf life and long-term quality.**
- Krause and Schmitz tested seven different preservatives in skin lotions containing 1,3-propanediol at 50% of the recommended use level. The preservatives tested were phenoxyethanol, ethylhexylglycerin, octanediol, dehydroacetic acid/paraben, benzyl alcohol, sodium benzoate, and potassium sorbate.
- **1,3-Propanediol enhances the potency of preservatives, making them effective at lower concentrations. It also exhibits its own antimicrobial activity against certain microbes.**

**It's recommended as a natural alternative to boost the preservation of cosmetic formulas.**

### References:

- [1]Jeong, Dae H., et al. "Enhancement of antimicrobial efficacy by combination of preservatives in cosmetic products." *Journal of cosmetic science* 61.1 (2010): 33-41.
- [2]Krause, Max, and Michaela Schmitz. "Zemea® propanediol as natural and effective alternative for the enhancement of preservation efficacy." *SÖFW-Journal* 142.11 (2016): 24-28.
- [3]Singh, T., et al. "Synergistic preservation effect of 1, 3-propanediol and preservatives in cosmetics and personal care products." *International Journal of Chemical and Analytical Science* 6.2 (2015): 113-117.
- [4]Song, Doyeon, et al. "Evaluation of 1, 3-propanediol as an antimicrobial agent to improve the preservation efficacy of parabens in cosmetic emulsions." *Journal of cosmetic science* 63.5 (2012): 329-340.

# Functional Benefits

## Excellent Consumer Experience

### Skincare Consumer Perception Study

#### Test Conditions:

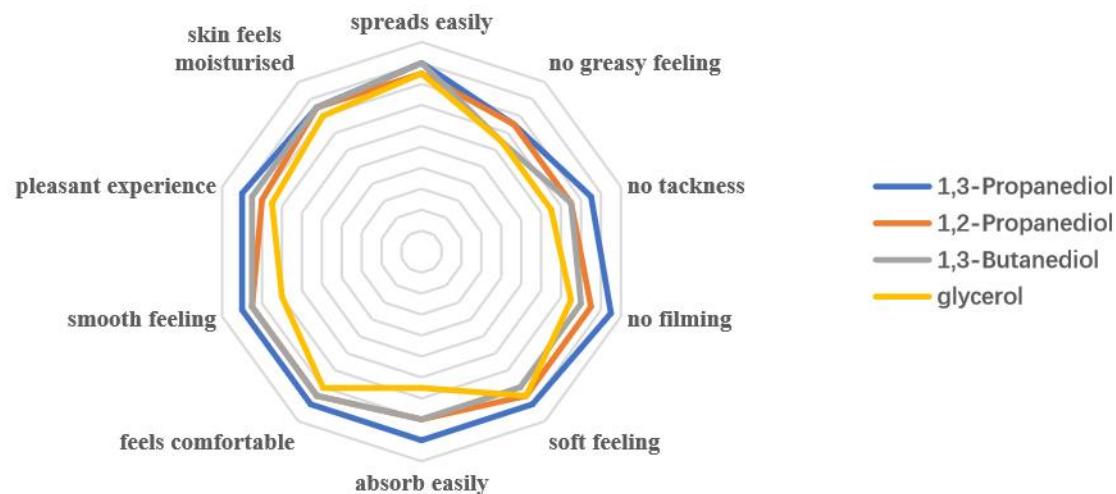
- A. Skincare Lotion;
- B. 1,3-Propanediol (5%), 1,2-Propanediol (5%), 1,3-Butanediol (5%), Glycerin (5%)

#### Results:

**Skincare lotions formulated with 1,3-Propanediol received higher consumer perception. In some formulations, propanediol also effectively reduces the viscosity of high-concentration glycerin.**



### Consumer Skin Efficacy Test



#### References:

[1] Miller, Robert Warren and Joseph W. Desalvo. Natural glycol replacement for hair and skin care. 2010.

# Personal Care Applications

BIOBLANCA-1,3-PDO

Facial Cleanser



Shampoos



Moisturizing Spray



Essence



Lip Stick



Shower Cream



# Recommended Formulation

BIOBLANCA-1,3-PDO

## Daily Moisturizer

Description: Immediate and deep hydration helps eliminate visible fine lines and even tone. It is nonirritating with a combination of super moisturizing combo of AHB's super-moisturizing AHB propanediol and AHB panthenol to sooth the dry skin.

ID	Ingredient	wt./wt. %	Function	Supplier
A	Water	0.722	Solvent	
A	Carbopol	0.0035	Thickener	
A	Glycerin	0.05	Humectant	
A	Niacinamide	0.02	Even tone agent	
A	AHB Malic acid	0.005	pH adjust, humectant	AHB
A	<b>AHB Propanediol</b>	<b>3.000</b>	<b>Humectant</b>	<b>AHB</b>
B	Dimethicone	0.0125	Emollient	
B	Isopropyl Palmitate	0.03	Emollient	
B	Distearyl Dimonium Chloride	0.05	Conditioner	
B	Caprylic/Capric Triglyceride	0.03	Emollient	
B	Potassium cetyl phosphate	0.02	Emulsifier	
B	Cetearyl Alcohol Ceteareth-20	0.03	Emollient, Emulsifier/Solubilizer	
C	Triethanolamine	q.s	pH adjustment	
D	Sodium hyaluronate	0.001	Super hydrator	
D	Benzyl Alcohol	0.006	Preservative	
	Total	1		

### Preparation Procedures

1. Heat A and B separately to 80°C with stirring
2. Add B to A with propeller stirring until uniform
3. Cool down to RT and adjust pH with C
4. Add D into A/B/C while homogenizing until uniform

## Multi-vitamin Hydrating Facial Serum

Description: This light and luxurious serum with panthenol and Vit E is excellent for sensitive skin, morning or night. Apply to face to enjoy its hydrating effects.

ID	Ingredient	wt./wt.	Function	Supplier
A	Water	78%	Solvent	
A	Acrylates/C10-30 Alkyl acrylate	0.50%	Polymer	
B	Ethanol	10%	Solvent	
B	<b>AHB Propanediol</b>	<b>10%</b>	<b>Humectant</b>	<b>AHB</b>
B	Tocopheryl acetate	0.10%	Active	
7	Niacinamide	0.30%	Active	
	AHB D-Panthenol	0.50%	Active	AHB
8	AHB Malic acid	0.30%	pH adjuster	AHB
	Total	100%		

### Preparation Procedures

1. Premix A propeller stirring until uniform clear gel
2. Premix B, then add to A with propeller stirring until uniform
3. Add C, D and E to A/B with propeller stirring until uniform

# Recommended Formulation

BIOBLANCA-1,3-PDO

## Natural Moisturizing Mask

Description: This natural facial mask formula may help to hydrate, soothe, and protect the skin, while also absorbing excess oil and impurities for a refreshed and revitalized appearance

ID	Ingredient	% wt/wt	Function	Supplier
A	Aloe vera powder	0.2%	Soothes and moisturizes	
A	Xathan Gum	0.5%	Thickener	
A	Water	37.8%	Solvent	
B	Kaolin clay	50.0%	Absorbs excess oil and impurities	
B	AHB Propanediol	5.0%	Humectant, helps to hydrate	AHB
B	Honey	5.0%	Antibacterial and moisturizing	
B	Vitamin E oil	0.5%	Antioxidant	

### Procedures:

1. In a clean contain, mix together A until forming a uniform gel
2. Add B to A while mixing until uniform paste

## Cosmetic Lipid Stick

Description: The 1,3 propanediol in this formula acts as a humectant, helping to attract and retain moisture on the lip to give fullness.

ID	Ingredient	wt./wt. %	Function	Supplier
A	Castor oil	20.0%		
A	Beeswax	<b>20.0%</b>		
A	Shear butter	20.0%		
A	Cocoa butter	20.0%		
B	Jojoba oil	<b>15.5%</b>		
B	Vitamin E	<b>0.5%</b>		
C	1-3 propanediol	3.5%	Solvent, humectant	AHB
D	Mica (for color)	0.5%		
	<b>Total</b>	<b>100.0%</b>		

### Instructions:

1. Melt together A in a double boiler.
2. Add B to A and stir well.
3. Gradually add in C to B/A and stir until well combined.
4. Add in D (mica powder) to achieve the desired color (variable), and stir until the color is evenly distributed.
5. Pour the mixture into lipstick molds or a clean container, and let it cool and harden.

# Recommended Formulation

BIOBLANCA-1,3-PDO

## Antiaging Brightening Cream

Description: Brightening your skin with a soft, even tone and texture skin

ID	Ingredient	wt./wt.	Function	Supplier
A	Water	26%	Solvent	
B	Magnesium sulfate	30%	Solvent	
B	AHB Propanediol	20%	Humectant	AHB
B	Coated Titanium oxide	2.00%	OTC monograph active	
B	Tocopheryl acetate	0.10%	Active	
C	Water	20.00%	Solvent	
C	Acrylates/C10-30 Alkyl acrylate	0.50%	Polymer	
D	AHB D-Panthenol	0.50%	Active	AHB
D	Niacinamide	0.30%	Active	
D	AHB Malic acid	0.50%	pH adjuster	AHB
E	Sorbitan Oleate Decylglucoside cross polymer	5%	Moisturizing	
	Total	100%		

### Preparation Procedures

1. Premix B then add to A with propeller stirring
2. Premix C, then add to A/B with propeller stirring until uniform
3. Add D and E to A/B/C with propeller stirring until uniform

## Acne Treatment Gel

Description: Acne treatment facial lotion fights visible blemish with maximum salicylic acid. It is nonirritating with an AHB's super-moisturizing AHB propanediol to soothe the inflamed skin. Malic and Salicylic acid combo exfoliates the skin to reclogging the pores for pore minimizing effects.

ID	Ingredient	wt./wt.	Function	Supplier
A	Water	26%	Solvent	
B	Ethanol	30%	Solvent	
B	AHB Propanediol	20%	Humectant	AHB
B	Salicylic acid	2.00%	OTC monograph active	
B	Tocopheryl acetate	0.10%	Active	
C	Water	20.00%	Solvent	
C	Acrylates/C10-30 Alkyl acrylate	0.50%	Polymer	
D	AHB D-Panthenol	0.50%	Active	AHB
D	Niacinamide	0.30%	Active	
D	AHB Malic acid	0.50%	pH adjuster	AHB
E	Sorbitan Oleate Decylglucoside cross polymer	5%	Moisturizing	
	Total	100%		

### Preparation Procedures

1. Premix B then add to A with propeller stirring
2. Premix C, then add to A/B with propeller stirring until uniform
3. Add D and E to A/B/C with propeller stirring until uniform

# Recommended Formulation

BIOBLANCA-1,3-PDO

## Clarifying Mask

Description: A creamy mask is created for oily skin. Apply a generous layer of the mask on skin and leave on for several minutes until dry, then gently massage in a circular motion to remove off the film, rinse as necessary. It exfoliates the dead skin cells and reveal a matte, radiant, and healthy skin.

ID	Ingredient	wt/wt	Function	Supplier
A	Water	59%	Solvent	
<b>A</b>	<b>AHB Propanediol</b>	<b>4%</b>	<b>Humectant</b>	<b>AHB</b>
A	Glycerin	5%	Humectant	
A	Xanthan gum	1%	Solvent	
B	Kaolin	28%	Sebum absorber	
C	Tocopheryl acetate	0.10%	Active	
C	Olive oil	0.50%	Active	
C	AHB D-Patenol	0.50%	Active	AHB
C	AHB Malic acid	0.20%	pH adjuster	AHB
C	Fragrance	0.15%	Fragrance	
D	AHB Propanediol	1.00%	Solubilizer	AHB
D	Menthol	0.15%	Cooling sensa	
E	Phenoxyethanol	0.60%	Preservative	
	Total	100%		

## Mineral Sunscreen-SPF 50

Description: A light weight mineral sunscreen with a SPF50. It is easy to apply.

ID	Ingredient	wt/wt	Function	Supplier
A	Caprylic/Capric Triglyceride	11%	Humectant	
A	Dextrin Isosterate, Caprylic acid/Capric Triglyceride	1.00%	Solvent	
A	Ethyl Olivate	2.50%	pH adjuster	
A	Coco-caprylate	3.00%	Anti-oxidant	
B	Zinc Oxide	24.00%	Lightens dark spots	
B	Titanium Dioxide	4.00%	Sunscreen	
B	C13-16 Isoalkane (formerly C13-16 Isoparaffin) (and) Heptyl Undecylenate	3%	Wet agent	
B	Stearic acid	0.30%	Wetting agent	
C	Jojoba esters	5.00%	Solvent	
C	Sorbitan Olivate	1.00%	Active	
<b>D</b>	<b>AHB Propanediol</b>	<b>3.00%</b>	<b>even tone</b>	<b>AHB</b>
D	Water	41%	Solvent	
E	Sodium chloride	1.00%	Salt	
F	Phenoxyethanol Ethylhexylglycerin	1.00%	Preservative	

# Recommended Formulation

BIOBLANCA-1,3-PDO

## Even Tone Essence

Description: An essence evens out and brightens skin tone, lightens darkened areas, and can help with the appearance of scars.

ID	Ingredient	wt/wt	Function	Supplier
A	Water	94.15%	Solvent	
A	Glycerin	5.00%	Humectant	
A	AHB D-Pathenol	0.50%	Active	AHB
A	Citric acid	0.25%	Active	
A	AHB $\alpha$ -arbutin	1.00%	Dark mark fading	AHB
<b>B</b>	<b>AHB Propanediol</b>	<b>5.00%</b>	<b>Humectant</b>	<b>AHB</b>
B	Xanthan gum	0.10%	Solvent	
B	Tocopheryl acetate	0.10%	Active	
C	Sodium Hyaluronate	0.15%	Sebum absorber	
D	AHB Malic acid	0.50%	pH adjuster	AHB
E	Sodium hydroxide		pH adjuster	
	Total	106.75%		

# BIOBLANCA — 1,3-PDO

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