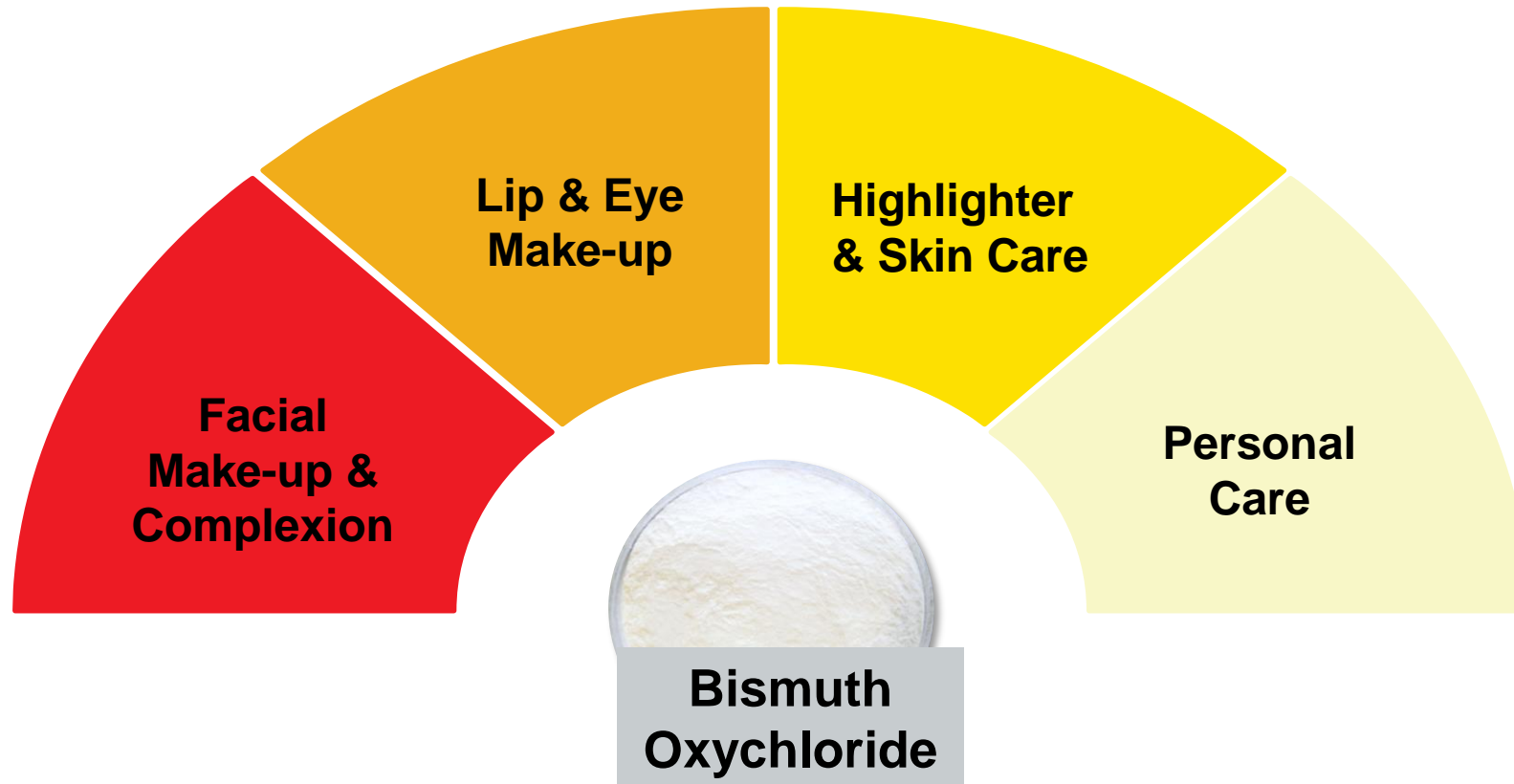




Bismuth Oxychloride in Make-up and Personal Care

Bismuth Oxychloride

A versatile ingredient for make-up & personal care



BCE Toolbox – Bismuth Oxychloride based effects



BiOCl Based Pearl Pigments

Pearl-Glo® Grades

Bismuth oxychloride Powder

Bi-Lite® 20

Bismuth oxychloride crystals deposited on mica platelets



BiOCl Based Absorption Pigments

Chroma- Lite® Colors

Bismuth oxychloride crystals deposited on mica platelets combined with Iron Oxides or Carmine

Gemtone® Radiant Nude

is a luminous effect pigment composed of natural mica, iron oxides, and bismuth oxychloride

Make-up and complexion

Benefits of Bismuth Oxychloride in make-up and complexion products



Can be used in applications to achieve different skin tone shades-light to dark while providing discrete radiance.



Opacifying effect without ashy appearance on skin

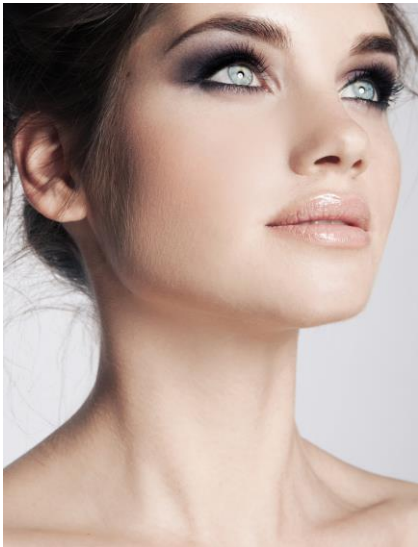


Enhances the tactile properties and long-wear properties of cosmetic formulations



Excellent flow and compressibility
Color Index number is available

Pearl-Glo® Performance Minerals



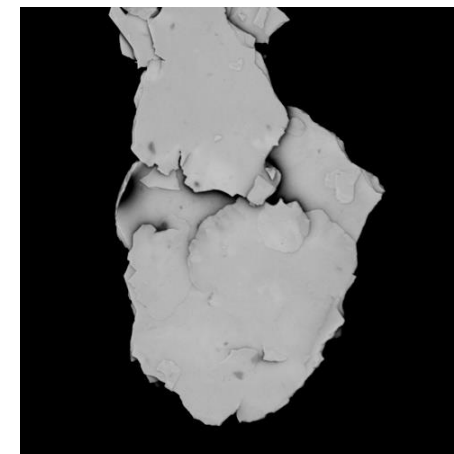
- Bismuth Oxychloride based performance minerals, aid in:
 - Low oil absorption
 - Compressibility of powder applications
 - Creating a soft texture
 - Enhanced skin adhesion
 - Excellent flowability due to fine particle size
 - Excellent covering power
- UVR and M are resistant to the graying effects of UV light without the addition of UV light absorber

Pearl-Glo®	INCI	Particle Size Range (µm)
Pearl-Glo® SF	Bismuth Oxychloride	3-8
Pearl-Glo® M		4-10
Pearl-Glo® UVR		6- 15

Bi-Lite® 20 - Performance Minerals

Bi-Lite® 20 is bismuth oxychloride crystals deposited on mica platelets

- ✓ These high-value composite pigments combine the performance benefits of both materials to give better transparency and less density than bismuth oxychloride alone.
- ✓ It enhances the tactile properties and long-wear properties of cosmetic formulations.



Bi-Lite® 20

Product Name	INCI	Particle Size Range (µm)
Bi-Lite® 20	Mica (and) Bismuth Oxychloride	15 -25

TiO₂

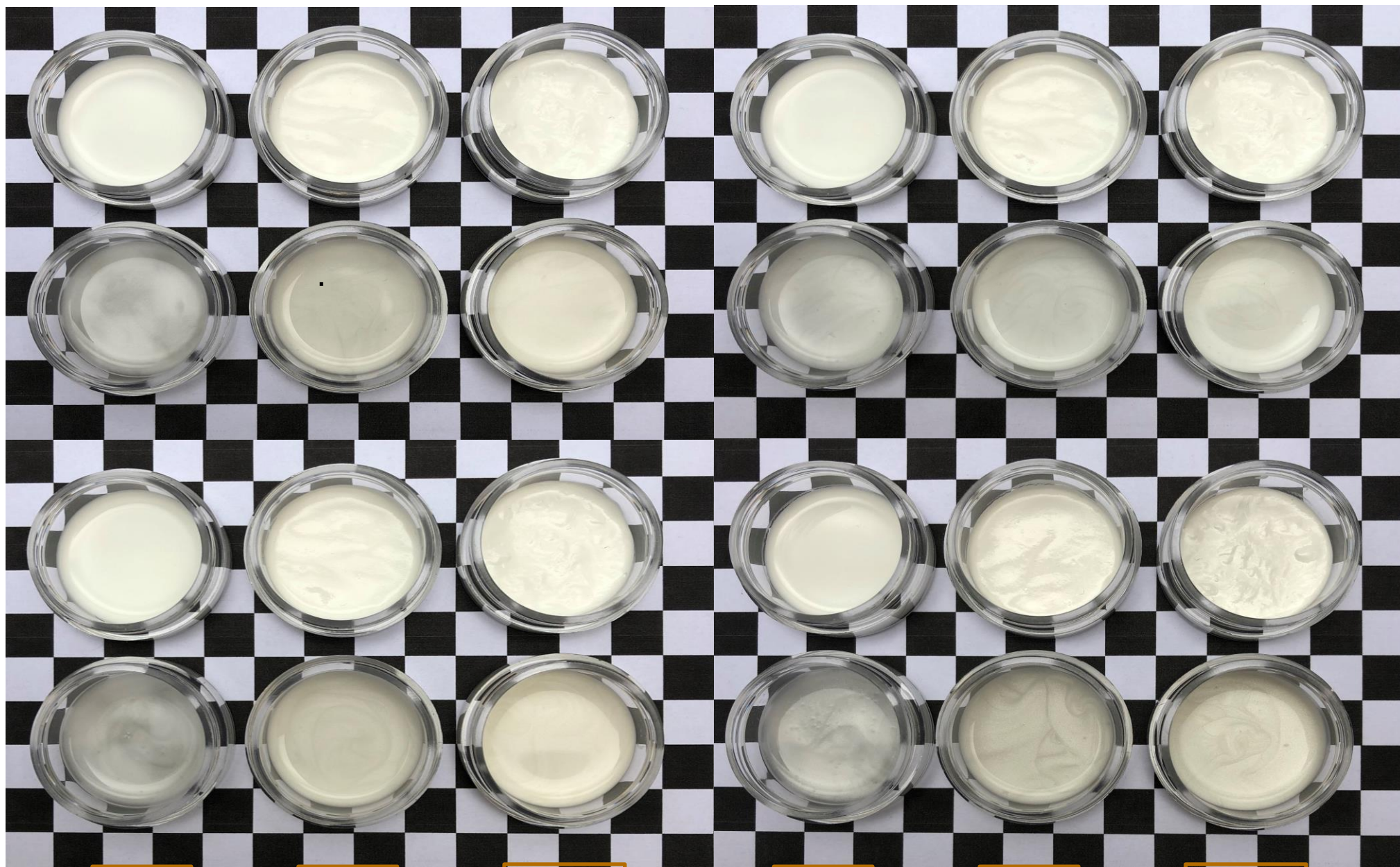
Pearl Glo M

TiO₂

Pearl Glo UVR

Pearl Glo SF

Bi-Lite 20



1%

5%

10%

1%

5%

10%

Color measurement data Bismuth Oxychloride

Color data on drawdown with Byk Mac (over black 15°)

%	Sample	L*	a*	b*	C*	h
1%	TiO ₂	62.24	-1.23	-3.91	4.10	252.50
	Pearl Glo M	46.93	-0.13	-1.81	1.81	285.81
	Pearl Glo UVR	42.96	0.01	-2.06	2.06	270.19
	Pearl Glo SF	56.25	-0.39	-2.13	2.17	259.67
	Bi-Lite 20	48.53	-0.1	-1.47	1.48	266.27
5%	TiO ₂	84.79	-1.99	-4.44	4.86	254.83
	Pearl Glo M	74.38	-0.81	-3.25	3.35	256.04
	Pearl Glo UVR	77.20	-0.83	-4.23	4.31	258.95
	Pearl Glo SF	85.75	-0.73	-1.93	2.06	249.17
	Bi-Lite 20	84.58	-0.84	-2.31	2.45	250.06
10%	TiO ₂	86.37	-2.00	-3.59	4.11	240.91
	Pearl Glo M	80.80	-0.94	-3.23	3.37	253.75
	Pearl Glo UVR	89.35	-0.98	-4.17	4.28	256.82
	Pearl Glo SF	96.12	-0.83	-1.84	2.01	245.65
	Bi-Lite 20	98.61	-0.83	-1.19	1.45	235.02

- In terms of white color all used products are close together
- With increased concentration the differences are less noticable
- Bismuth is more yellow and slightly more green in color

Bismuth Oxychloride as opacifier in Make-up and Complexion

- All Pearl-Glo[®] grades provide acceptable results in opacity. The opacity is a function of particle size

Sample	Opacity 1%	Opacity 5%	Opacity 10%
TiO ₂	46.6%	82.4%	90.5%
Pearl Glo M	18.9%	39.7%	55.7%
Pearl Glo UVR	15.6%	39.8%	57.3%
Pearl Glo SF	30.9%	58.1%	73.5%
Bi-Lite 20	13.8%	33.9%	51.4%

- Balance opacity performance and UV-stability

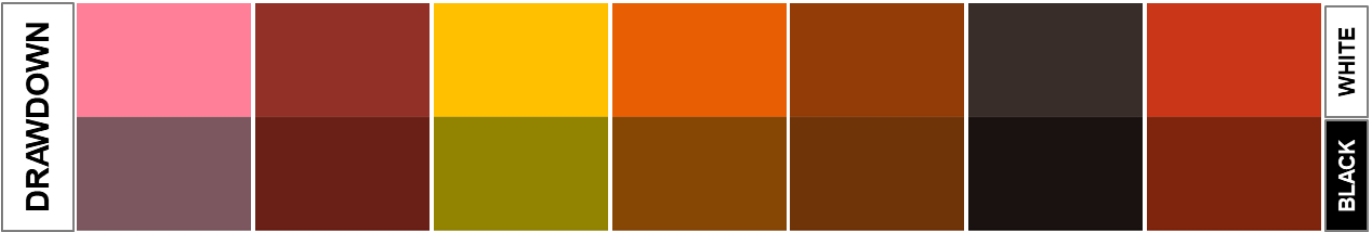
→ **Pearl-Glo[®] M** is the preferred candidate as this is light stabilized and has the smallest Particle size distribution.

Chroma-Lite® Colors

- Absorption-type effect pigments that combines bismuth crystals deposited on natural mica platelets with colorants.
- Rich colors delivering slight shine, silky after feel as well as good skin adhesion and warm luminosity to the skin.



Chroma-Lite®	INCI	Particle Size Range (µm)	Effect
Magenta CL4505	Mica (and) Bismuth Oxychloride (and) Carmine	15 - 25	Velvety (Absorption)
Mauve CL4511	Mica (and) Bismuth Oxychloride (and) Iron Oxides		
Yellow CL4502			
Bronze CL4499			
Brown CL4509			
Black CL4498			
Red CL4506			



Gemtone® Radiant Nude - Skin Tone Radiance



- **Gemtone® Radiant Nude** is a luminous effect pigment composed of natural mica, iron oxides, and bismuth oxychloride.
- Provides radiance without whitening out the skin or creating an “ashy” complexion
- Ideal in applications for all skin tone shade ranges
- Due to the BiOCl composition, it delivers an enhanced texture and aids in adhesion to the skin
- Readily and easily disperses into cosmetic vehicles without excessive shear

Product	INCI	Particle Size Range (µm)	Effect
Gemtone® Radiant Nude G016	Bismuth Oxychloride (and) Mica (and) Iron Oxides	5 - 22	Velvety (Absorption)

Wonderful Tan – Bismuth only- Prototype SC-FR-13-017-A012

PRODUCT OVERVIEW

The appeal of a good glow is nearly universal. Apply this wonderful tan serum to add some warmth to your complexion for a natural sun-kissed look.

FEATURED EFFECT PIGMENT

Chroma Lite Colors come in rich colors and deliver slight shine, a silky after feel as well as good skin adhesion and warm luminosity to the skin.



Wonderful Tan – Bismuth only- Prototyp SC-FR-13-017-A012

Phase	Ingredients	INCI	% by weight	Function
A	Water, demin.	Aqua	64.42	
	Chroma-Lite® Brown CL4509	Mica, Bismuth Oxychloride, Iron Oxides	1.80	Effect pigment
	Chroma-Lite® Yellow CL4502	Mica, Bismuth Oxychloride, Iron Oxides	0.60	Effect pigment
	Chroma-Lite® Black CL4498	Mica, Bismuth Oxychloride, Iron Oxides	0.18	Effect pigment
	Cloisonné® Sparkle Bronze 250J	Mica, Iron Oxides	1.00	Effect pigment
	Preservative		qs	Preservative
B	Glycerin	Glycerin	5.00	Humectant
	Rheocare® XGN	Xanthan Gum	0.10	Rheology modifier
C	Emulgade® PL 68/50	Cetearyl Glucoside, Cetearyl Alcohol	3.00	Emulsifier (O/W)
	Eumulgin® Prisma	Disodium Cetearyl Sulfosuccinate	0.20	Emulsifier (O/W)
	Cosmedia® SP	Sodium Polyacrylate	0.50	Rheology modifier
	Lanette® 22	Behenyl Alcohol	1.00	Consistency agent
	Cetiol® Sensoft	Propylheptyl Caprylate	10.00	Emollient
	Cetiol® C 5C	Coco-Caprylate/Caprate	7.00	Emollient
	Cetiol® OE	Dicaprylyl Ether	3.00	Emollient
D	Lipofructyl™ Argan LS 9779	Argania Spinosa Kernel Oil	2.00	Active ingredient
	Fragrance	Parfum	0.20	Fragrance

Lip and Eye Make-up

Benefits of Bismuth Oxychloride in Lips and Eye Make-up



Can be used in applications to achieve colors from pastel tones to vibrant shades

Transparency of Bismuth Oxychloride allows for flexibility in shade adjustment. Color will go lighter, but will not get ashy at the same time

Provides silky sheen

Enhances the tactile properties and long-wear properties of cosmetic formulations

Excellent flow and compressibility
Color Index number is available

TiO₂

Pearl Glo M

Pearl Glo UVR

Pearl Glo SF

Bi-Lite 20

1%

5%

10%

1%

5%

10%



Bismuth Oxychloride for shade adjustment in Lips and Eye Make-up

- The addition of Bismuth will keep L on the same level. Therefore, the addition of Bismuth for shade adjustment will not create an grey and ashy appearance on skin.
- The usage of Titanium Dioxide will decrease L and chroma and therefore appearance of product will turn more pastel but also more grey at the same time

	Sample	L*			C*		
		1%	5%	10%	1%	5%	10%
0,1% Red 7	TiO ₂	57.74	64.08	69.18	48.82	38.11	30.97
	Pearl Glo SF	57.81	57.63	54.95	43.91	40.15	35.15
	Pearl Glo M	56.78	55.56	57.61	49.24	49.00	44.52
	Pearl Glo UVR	56.84	56.02	57.15	47.15	45.64	42.26
	Bi-Lite 20	55.40	55.42	54.04	48.60	43.81	42.30

* Color data on drawdown with Byk Mac (over white 45°)

Bismuth Oxychloride for shade adjustment in Lips and Eye Make-up

- Adding TiO₂ will create a less red color and more blue. Pinker
- The addition of bismuth will not create pink but more yellow

	Sample	a*			b*		
%		1%	5%	10%	1%	5%	10%
0,1% Red 7	TiO ₂	47.86	37.78	30.89	9.60	4.96	2.19
	Pearl Glo SF	43.41	39.60	34.82	6.65	6.60	4.87
	Pearl Glo M	48.49	47.84	43.47	8.57	10.59	9.58
	Pearl Glo UVR	46.58	44.79	41.48	7.31	10.43	10.70
	Bi-Lite 20	47.84	43.00	41.33	8.52	8.39	9.00

*Color data on drawdown with Byk Mac (over white 45°)

- Light stability and performance need to be balanced
- **Pearl-Glo® M** is the preferred candidate as this is light stabilized and has the smallest Particle size distribution.

Highlighter and Skin Care

Benefits of Bismuth Oxychloride for Highlighters and Skin Care



Can be used in highlighters and Skin Care to add discrete radiance and immediate effect without ashy appearance



Opacifying effects and adds a fresh and healthy glow to the skin



Enhances the tactile properties and long-wear properties of cosmetic formulations



Excellent flow and compressibility
Color Index number is available

Pore-Less Radiance Primer

Bismuth only- Prototype

CC-FR-17-004-J22

PRODUCT OVERVIEW

This soft-radiance primer instantly brightens and bronzes lighter skin tones, while providing an immediate radiance to medium and dark skin tones. Oil-free and lightweight, it delivers a silky-smooth texture to the face, minimizing the appearance of pores and helps to make the skin look bright, radiant and awake.

FEATURED EFFECT PIGMENTS

Gemtone® Radiant Nude G016 brightens and bronzes light skin tones, while providing an instant radiance to medium and darker skin tones.

Bi-Lite® 20 provides a silky touch and a subtle radiance to the skin.



Pore-Less Radiance Primer

Bismuth only-Prototype

CC-FR-17-004-J22

Phase	Ingredients	INCI	% by weight	Function
A	KSG-016F (Shin Etsu Chemical)	Dimethicone, Dimethicone/ Vinyl Dimethicone Crosspolymer	51.85	Skin feel modifier
	KSG-42 A (Shin Etsu Chemical)	Isododecane, Vinyl Dimethicone/Lauryl Dimethicone Crosspolymer	22.00	Skin feel modifier
	KSG-15 (Shin Etsu Chemical)	Cyclopentasiloxane, Dimethicone/ Vinyl Dimethicone Crosspolymer	1.50	Skin feel modifier
	Myritol® 312	Caprylic/Capric Triglyceride	2.00	Emollient
	Cetiol® Ultimate	Undecane, Tridecane	2.00	Emollient
B	Sepimat P (Seppic)	Polymethyl Methacrylate	15.50	Filler
C	Bi-Lite® 20 BL 1070	Mica, Bismuth Oxychloride	2.50	Effect pigment
	Gemtone® Radiant Nude G016	Bismuth Oxychloride, Mica, Iron Oxides	0.50	Effect pigment
D	Hyaluronic Filling Spheres™ C00309	Ethylhexyl Palmitate, Silica Dimethyl Silylate, Butylene Glycol, Pentylene Glycol, Sodium Hyaluronate	2.00	Active ingredient
	Perfume	Parfum	0.15	Fragrance

Fresh Fluid Bismuth only- Prototype

CC-FR-17-047-A09

PRODUCT OVERVIEW

A cool and refreshing take on the everyday primer. Prep and enhance your natural beauty instantly with this calming serum.

FEATURED EFFECT PIGMENT

Pearl-Glo® M PG 1098 provides the optimal radiance to the skin. It adds a silky and light touch to the formulation and enhances skin adhesion.



Fresh Fluid

Bismuth only- Prototype

CC-FR-17-047-A09

Phase	Ingredients	INCI	% by weight	Function
A	Water, demin.	Aqua	79.15	
	Glycerin	Glycerin	2.00	Humectant
	Preservative		qs	Preservative
B	Rheocare® C Plus	Carbomer	0.20	Rheology modifier
C	Eumulgin® VL 75	Lauryl Glucoside, Polyglyceryl-2 Dipolyhydroxystearate, Glycerin	2.00	Emulsifier (O/W)
	Lanette® O	Cetearyl Alcohol	1.00	Consistency agent
	Myritol® 331	Cocoglycerides	3.00	Emollient
	Cetiol® 868	Ethylhexyl Stearate	3.00	Emollient
	Cetiol® CC	Dicaprylyl Carbonate	4.00	Emollient
D	Cosmedia® Ace	Sodium Polyacrylate, Dicaprylyl Carbonate, Polyglyceryl-3 Caprate	1.00	Rheology modifier
E	Pearl-Glo® M PG1098	Bismuth Oxychloride	1.00	Effect pigment
F	PatchH2O™ A00297	Aqua, Glycerin, Glyceryl Polyacrylate, Trehalose, Urea, Serine, Pentylene Glycol, Algin, Caprylyl Glycol, Sodium Hyaluronate, Pullulan, Disodium Phosphate, Potassium Phosphate	3.00	Active ingredient
	Perfume	Parfum	0.65	Fragrance

Peel Off Mask

Golden Bronze- Prototype

CC-FR-18-051-A13

PRODUCT OVERVIEW

Paint, peel, post, repeat. Metallics are not just for makeup anymore: Recharge your skin and complexion with the Golden Bronze metallic Peel-Off Mask. Reveal refreshed and hydrated skin that you will want to share.

FEATURED EFFECT PIGMENT

Bi-Lite® 20 bismuth oxychloride crystals deposited on mica platelets. It adds a subtle sheen to the formulation.

Cloisonné® Satin Bronze 250M is a small particle size bronze metallic effect pigment that is created by coating iron oxide on natural mica.



Peel Off Mask

Golden Bronze-Prototype

CC-FR-18-051-A13

Phase	Ingredients	INCI	% by weight	Function
A	Water, demin.	Aqua	54.20	
	Luviset® One	Acrylates/Methacrylamide Copolymer	5.00	Rheology modifier
	D-Panthenol Care	Panthenol	1.00	Active ingredient
	Preservative		qs	Preservative
B	Rheocare® XGN	Xanthan Gum	0.30	Rheology modifier
	Glycerin	Glycerin	1.00	Humectant
C	Selvol Ultalux FP	Polyvinyl Alcohol	12.00	Film forming agent
D	Luviskol® K 90 Solution	PVP	5.00	Film forming agent
	Ethanol 96%	Alcohol	20.00	Solvent
E	Bi-Lite® 20 BL 1070	Mica, Bismuth Oxychloride	0.90	Effect pigment
	Cloisonné® Satin Bronze 250M	Mica, Iron Oxides	0.40	Effect pigment
F	Perfume	Parfum	0.20	Fragrance
	Sodium Hydroxide (25% solution)	Sodium Hydroxide	qs	pH Adjustment

Personal care

Benefits of Bismuth Oxychloride in cleansing applications



Can be used as opacifier and pearlizer effect for cleansing applications.
(Shampoo, Body Wash and Hand Soaps)



Excellent flow and easy to use



Clean white color and low heavy metals

Pearl Shampoo- Bi-Lite 20- Prototype CC-FR-20-042-C03

PRODUCT OVERVIEW

A COSMOS NATURAL shampoo formulation with clear appearance to let the used effect pigment stand out and make your marketing story sparkle

FEATURED EFFECT PIGMENT

Bi-Lite® 20 provides a satiny pearl effect to the formulation without the use of TiO_2



Pearl Shampoo

Bi-Lite 20 - Prototype

CC-FR-20-042-C03

Phase	Ingredients	INCI	% by weight	Function
A	Water, demin.	Aqua	71.10	
	Preservative		qs	Preservative
B	Glycerin	Glycerin	3.00	Humectant
	Rheocare® XGN	Xanthan Gum	0.80	Rheology modifier
C	Plantacare® 2000 UP	Decyl Glucoside	13.00	Surfactant
	Plantapon® ACG 50	Sodium Cocoyl Glutamate	10.00	Surfactant
	Lamesoft® PO 65	Coco-Glucoside, Glyceryl Oleate	2.00	Conditioning agent
	Bi-Lite® 20 BL 1070	Mica, Bismuth Oxychloride	0.10	Effect pigment
D	Citric Acid (50% solution)	Citric Acid	qs	pH Adjustment

Procedures

Wonderful Tan – Bismuth only- Prototype SC-FR-13-017-A012

1. Heat phases A and C at 80°C.
2. Introduce phase B and stir during 5 minutes.
3. Introduce phase C in phase A+B and stir for 10 min with high sheer
4. Cool down to room temperature and finally add phase D.

Peel Off Mask Golden Bronze- Prototype CC-FR-18-051-A13

1. Prepare phase A and mix
2. Weigh and mix phase B in a little cup.
3. Heat phase A to 85°C minimum and add phase B into phase A while medium speed mixing
4. Add phase C into phase A+B while medium speed mixing
5. Cool down at room temperature then add phases D, E and F.

Pore-Less Radiance Primer Bismuth only- Prototype CC-FR-17-004-J22

1. Mix phase A under stirring until homogenous
2. Add phase B
3. Then add phase C and D

Pearl Shampoo- Prototype CC-FR-20-042-C03

1. Prepare phase A and B separately.
2. Add phase B in A under stirring until have an homogeneous solution.
3. Prepare phase C and add it to A+B under gentle stirring (without vortex) to avoid bubbles.
4. Add phase D and adjust the pH with phase

Fresh Fluid Bismuth only- Prototype CC-FR-17-047-A09

1. Introduce phase B in phase A and allow swelling for 2 or 3 hours without stirring.
2. Heat phases A+B and C at 75-80°C.
3. Add phase C in phase A+B with low stirring for 10 minutes.
4. Add phase D in phase A+B+C under gentle stirring.
5. Cool down at room temperature and add the ingredients of phase E and F one by one.
6. Finally homogenize during 10 minutes.

Disclaimer

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Back up

Back up

Bismuth Oxychloride in Make-up and Personal Care

Methods

■ Products

- SunPURO Titanium Dioxide C47-5001 (Sun Chemical): *Titanium Dioxide*
- Pearl Glo M PG1098, Pearl Glo UVR PG1086 & Pearl Glo SF PG1099 : *Bismuth Oxychloride*
- Bi-Lite 20: *Mica and Bismuth Oxychloride*
- SunCROMA D&C Red 7 Ca Lake C19-011 (Sun Chemical): *CI 15850*

■ Process

- 1%. 5%. 10% in aqueous liner base
- For EP: 30 min under magnetic stirring in liner base
- For TiO₂ and Red 7 : Grind with tricylinder device 3 to 6 times in liner base + 1 hour under magnetic stirring

■ Measurement

- Byk Mac
- Gloss meter BYK
- Drawdown applicator: 152.4µm

■ Opacity

- $\text{Opacity} = \frac{L^*_{45^\circ \text{ over black}}}{L^*_{45^\circ \text{ over white}}} * 100\%$

Bismuth Oxychloride in Make-up and Personal Care

Liner base formula

Phase	Ingredients	INCI	%
A	Water	<i>Aqua</i>	35.21
	D Panthenol USP	<i>Panthenol</i>	0.53
	Rheocare XGN	<i>Xanthan gum</i>	0.43
	Euxyl 90/10	<i>Phenoxyethanol (and) Ethylhexylglycerin</i>	1.06
B	Luviset Clear AT3	<i>VP/ methacrylamide/ Vinyl Imidazole Copolymer</i>	25.53
C	Hispagel 200	<i>Glycerin (and) glyceryl polyacrylate</i>	5.32
	Water	<i>Aqua</i>	31.91

■ **Opacity = 5.9%**

Gloss		
20°	60°	85°
51.3	85.6	94.0