COLORS & EFFECTS

Biju®
Mearlite®
Pearl-Glo®
Bi-Lite®
Chroma-Lite®

Bismuth Oxychloride Pigments for Color Cosmetics and Personal Care Products

Technical Information

November 2016

BASF
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Bismuth Oxychloride Product Grades

Bismuth oxychloride pigments have long been valued as effect enhancers in cosmetic and personal care products. Visually they impart a range of lusters, from a satiny look to a metallic sheen. They also give products a smooth silky feel, excellent skin adhesion, covering power, and exceptional compressibility and binding properties. Grades vary according to particle size, bulk density, luster, and ultraviolet resistance.

BASF's broad selection of bismuth oxychloride pigments ensures compatibility with many different cosmetics and personal care formulations. These include:

- Pearl-Glo SF has excellent flowability and dispersability providing exceptional covering power, skin adhesion, compressibility, and an extremely fine particle size.
- Pearl-Glo UVR is a highly lustrous pigment with excellent covering power, skin adhesion, and compressibility. Pearl-Glo UVR is unique among bismuth oxychloride type pearls in being extremely resistant to the graying effect of UV light without the addition of UV absorbers.
- Pearl-Glo M is a lustrous pigment with excellent covering power, skin adhesion, and compressibility in a UV resistant form. It is similar to Pearl-Glo UVR, but with higher covering power and a smaller particle size
- Dry grade Mearlite LBU adds a medium amount of luster in lipsticks, blushes, and eye shadow to provide a soft, smooth look.
- Biju Ultra UFC is made of uniform and highly lustrous bismuth oxychloride crystals. Biju Ultra platelets are square in shape and generate a brighter, more brilliant luster to provide a unique combination of sheen and opacity. Biju Ultra UFC can be used to prepare concentrates for lipophilic products such as lipstick and eye shadow, and hydrophilic products such as foundation, lotions, and other personal care products.

Dry Bismuth Oxychloride Grades – Typical Properties

GRADE*	LUSTER TYPE/OPACITY	PARTICLE SIZE RANGE** (µm)	DENSITY (Kg/L)	APPROX. BULK DENSITY*** (g/in^3)
Pearl-Glo UVR	Medium/Fair†	Avg. 6–15µm 97% less than 105µm	7.7	5 - 9
Pearl-Glo M	Medium/Fair†	Avg. 4–10µm 100% less than 74µm	7.7	6 - 10
Pearl-Glo SF	Medium/Good†	Avg. 3–8µm 100% less than 74µm	7.7	10
Mearlite LBU	Medium/Good††	5–40µm	7.7	14
Biju Ultra UFC	Very High/Excellent†		7.7	

† Luster type and opacity (coverage) were evaluated using drawdowns of lacquer dispersions at 3% pigment concentration
†† Luster type and opacity (coverage) were evaluated on skin
* Please refer to individual product specification sheets for certifiable product specifications
** The particle size results will vary depending on the light scattering instrument used. The values listed (as % by weight) are the results using a Malvern Mastersizer
*** Determined by Scott viscometer

Bismuth Oxychloride/Mica Products

Bi-Lite and Chroma-Lite Colors contain 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. The mica substrate improves crystal strength, so less pearlescence is lost as cosmetic products are processed.

- Bi-Lite 20 is wettable in water or oil and has less than half the density of conventional bismuth oxychloride pigments. It is well suited for heavy emulsions and gels.

- In the case of the Chroma-Lite grades, colorants are thoroughly dispersed on the surface of the substrate. These minimize the grinding and dispersion problems often associated with traditional absorption color pigments. When formulating with Chroma-Lite grades, high shear mixing should be avoided to prevent colorant degradation. Each color can be used alone, in combination with each other, or mixed with our other lines of effect enhancing pigments.

Bismuth Oxychloride/Mica Pigment Grades – Typical Properties

GRADE*	COMPOSITION	PARTICLE SIZE RANGE** (µm)	DENSITY (Kg/L)	APPROX. BULK DENSITY*** (g/in^3)
Bi-Lite 20	Mica, BiOCl	Average 15-25 µm	3.8	2.0 – 5.0
Chroma-Lite Black CL4498	Mica, BiOCl, Iron Oxides	Average 15-25 µm	3.5	4.5 – 6.5
Chroma-Lite Bronze CL4499	Mica, BiOCl, Iron Oxides	Average 15-25 µm	3.5	4.0 – 5.5
Chroma-Lite Yellow CL4502	Mica, BiOCl, Iron Oxides	Average 15-25 µm	3.5	3.5 – 5.5
Chroma-Lite Magenta CL4505	Mica, BiOCl, Carmine	Average 15-25 µm	3.5	3.5 – 5.5
Chroma-Lite Red CL4506	Mica, BiOCl, Iron Oxides	Average 15-25 µm	3.5	4.0 – 6.0
Chroma-Lite Brown CL4509	Mica, BiOCl, Iron Oxides	Average 15-25 µm	3.5	4.0 – 6.0
Chroma-Lite Mauve CL4511	Mica, BiOCl, Iron Oxides	Average 15-25 µm	3.5	3.5 – 7.0

* Please refer to individual product specification sheets for certifiable product specifications
** The particle size results will vary depending on the light scattering instrument used. The values listed (as % by weight) are the results using a Malvern Mastersizer
*** Determined by Scott viscometer

Applications

Formulating Guidelines

Bismuth oxychloride pigments generally need up to 0.3% of a UV absorber to prevent darkening on exposure to light. The actual amount of light stabilizer needed depends on the presence of colorants and other ingredients that have some UV resistance. Such components often provide enough protection to eliminate the need for stabilization.

Biju Ultra pigments have a relatively high specific gravity, so formulations should contain some thixotropic agent to prevent settling.

Chroma-Lite Magenta contains carmine and should not be heated above 120°C and may be susceptible to fading over time upon exposure to light. If this grade is added to products packaged in transparent containers, the packaging material should contain UV absorbers to extend product shelf life.

Since regulations change over time, we recommend that appropriate use of each colorant be confirmed against each region's current cosmetic regulations.

Physical and Chemical Properties

Solubility

Bismuth oxychloride is inorganic and therefore insoluble in water.

pH

The pH of these products is measured by adding 4 grams of the pigment into 96 mL of water. This value can be found on the specification sheet.

Chroma-Lite grades are not wettable in water and therefore cannot be measured for pH.

Specifications

For product specifications, refer to the respective specification sheet (separate document) for each bismuth oxychloride product.

The color additive components in the products identified in this data sheet meet the applicable FDA (21 CFR Part 73), EU Cosmetic Regulation EC/1223/2009 (Annex IV, including EC-231-2012 requirements), Japan MHW, Korean Cosmetics Colorants Standard, and China's Cosmetic Safety and Technical Standard (2015 version) specifications and purity requirements.

Microbial status for bismuth oxychloride products:

Total aerobic bacteria	100 CFU/g max.
Yeast & mold	100 CFU/g max.
Gram-negative bacteria	absent in 10g
E. coli	absent in 10g
Pseudomonas aeruginosa	absent in 10g
Staphylococcus aureus	absent in 10g

Storage

All of the bismuth oxychloride products listed in this document have a storage stability of 5 years from date of manufacture, provided that they are stored in unopened original containers, protected from light, and under normal conditions of temperature and humidity.

Safety Data Sheet

A Safety Data Sheet for each bismuth oxychloride pigment is available.

Further Product Ranges

Bi-Lite® Bismuth Oxychloride/Mica Pigments
Cellini® Colors
Chione™ Pigments
Chroma-Lite® Colors
Cloisonné® Colors
Duocrome® Iridescent Colors
Flamenco® Pearlescent and Iridescent Pigments
Gemtone® Colors
Mearlite® and Biju® Ultra Bismuth Oxychloride Pigments
Mearlmica® Specialty Performance Mica
MultiReflections™ Iridescent Pigments
Pearl-Glo® Bismuth Oxychloride Pigments

Reflecks™ Pearlescent and Iridescent Pigments and Colors
Reflecks™ Dimensions Pearlescent and Iridescent Pigments and Colors
Reflecks™ MultiDimensions Color Changing Pigments
Timica® Luster Pigments

Appendix – Product Compositions

Table 1: Bismuth Oxychloride – Dry Grade Pigments

Colorant	By Weight	CI No.	CAS No.	EINECS No.
Pearl-Glo UVR - INCI Name: Bismuth Oxychloride				
Bismuth Oxychloride	> 98 %	77163	7787-59-9	232-122-7
Pearl-Glo M - INCI Name: Bismuth Oxychloride				
Bismuth Oxychloride	> 98 %	77163	7787-59-9	232-122-7
Pearl-Glo SF - INCI Name: Bismuth Oxychloride				
Bismuth Oxychloride	> 98 %	77163	7787-59-9	232-122-7
Mearlite LBU - INCI Name: Bismuth Oxychloride				
Bismuth Oxychloride	> 99.5 %	77163	7787-59-9	232-122-7
Biju Ultra UFC - INCI Name: Bismuth Oxychloride				
Bismuth Oxychloride	> 98 %	77163	7787-59-9	232-122-7

Table 2: Bismuth Oxychloride – Dry Grade Pigments

Colorant	By Weight	CI No.	CAS No.	EINECS No.
Bi-Lite 20 - INCI Name: Mica (and) Bismuth Oxychloride				
Mica	55 – 63 %	77019	12001-26-2	310-127-6
Bismuth Oxychloride	37 – 45 %	77163	7787-59-9	232-122-7
Chroma-Lite Black CL4498 - INCI Name: Mica (and) Bismuth Oxychloride (and) Iron Oxides				
Mica	42 – 49 %	77019	12001-26-2	310-127-6
Bismuth Oxychloride	28 – 35 %	77163	7787-59-9	232-122-7
Black Iron Oxide	15 – 25 %	77499	1317-61-9	215-277-5
Red Iron Oxide	1 – 5 %	77491	1332-37-2	215-277-5
Chroma-Lite Bronze CL4499 - INCI Name: Mica (and) Bismuth Oxychloride (and) Iron Oxides				
Mica	41 – 47 %	77019	12001-26-2	310-127-6
Bismuth Oxychloride	27 – 33 %	77163	7787-59-9	232-122-7
Yellow Iron Oxide	10 – 20 %	77492	51274-00-1	257-098-5
Red Iron Oxide	1 – 6 %	77491	1332-37-2	215-277-5
Chroma-Lite Yellow CL4502 - INCI Name: Mica (and) Bismuth Oxychloride (and) Iron Oxides				
Mica	42 – 48 %	77019	12001-26-2	310-127-6
Bismuth Oxychloride	29 – 35 %	77163	7787-59-9	232-122-7
Yellow Iron Oxide	20 – 26 %	77492	51274-00-1	257-098-5

Colorant	By Weight	CI No.	CAS No.	EINECS No.
Chroma-Lite Magenta CL4505 - INCI Name: Mica (and) Bismuth Oxychloride (and) Carmine				
Mica	51 – 58 %	77019	12001-26-2	310-127-6
Bismuth Oxychloride	34 – 41 %	77163	7787-59-9	232-122-7
Carmine	2– 8 %	75470	1390-65-4	215-724-4
Chroma-Lite Red CL4506 - INCI Name: Mica (and) Bismuth Oxychloride (and) Iron Oxides				
Mica	40 – 49 %	77019	12001-26-2	310-127-6
Bismuth Oxychloride	27 – 35 %	77163	7787-59-9	232-122-7
Red Iron Oxide	22 – 28 %	77491	1332-37-2	215-570-8
Chroma-Lite Brown CL4509 - INCI Name: Mica (and) Bismuth Oxychloride (and) Iron Oxides				
Mica	37 – 42 %	77019	12001-26-2	310-127-6
Bismuth Oxychloride	25 – 30 %	77163	7787-59-9	232-122-7
Red Iron Oxide	5 – 15 %	77491	1332-37-2	215-570-8
Yellow Iron Oxide	2 – 10 %	77492	51274-00-1	257-098-5
Black Iron Oxide	1 – 8 %	77499	1317-61-9	215-277-5
Chroma-Lite Mauve CL4511 - INCI Name: Mica (and) Bismuth Oxychloride (and) Iron Oxides				
Mica	41 – 47 %	77019	12001-26-2	310-127-6
Bismuth Oxychloride	27 – 33 %	77163	7787-59-9	232-122-7
Red Iron Oxide	20 – 26 %	77491	1332-37-2	215-570-8

Product Range

Product	PRD-No.
Biju Ultra UFC	30301556
Bi-Lite 20 BL1070	30322174
Chroma-Lite Black CL4498	30322182
Chroma-Lite Bronze CL4499	30322183
Chroma-Lite Brown CL4509	30322184
Chroma-Lite Magenta CL4505	30322188
Chroma-Lite Mauve CL4511	30322189
Chroma-Lite Red CL4506	30322191
Chroma-Lite Yellow CL4502	30322193
Mearlite LBU	30302415
Pearl-Glo M PG1098	30322521
Pearl-Glo SF PG1099	30322522
Pearl-Glo SF UVR PG1060	30322523

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