

Formulation guidelines for formulating effect pigments in lipstick and lip gloss applications

For lipstick and lip gloss applications, the choice of effect pigments comprises the pearlescent pigment range as well as the metallic pigment range. The use of both pigment ranges and their optical properties are described as follows:

Pearlescent Pigments: Effect versus particle size

Different coloring effects can be achieved with the right choice of effect pigments depending on their particle size. Small particles (< 25 µm) create silky and satin effects and will opacify the mass. They enhance the hiding power of formulations and provide good coverage as well. Larger sized particles (20-150 µm/20-250 µm) create high luster effects, either sparkling or dazzling, combined with very high brilliance and transparency.

Table 1: Effect versus particle size

Particle Size	Effect	Silver and subtle shimmer effects	Gold to redbrown effects
1 – 15 µm 5 – 25 µm	Silk effects	PRESTIGE® Soft Silver PRESTIGE® Silk Silver PRESTIGE® Silk Interference Pigments	PRESTIGE® Soft Bronze PRESTIGE® Soft Copper PRESTIGE® Soft Fire-red PRESTIGE® Soft Beige
10 – 50 µm	Strong pearl effects	PRESTIGE® Silver PRESTIGE® Interference Pigments	PRESTIGE® Bronze PRESTIGE® Copper PRESTIGE® Lemon Gold PRESTIGE® Summer Gold PRESTIGE® Autumn Gold
15 – 70 µm	Bright effects	PRESTIGE® Bright Silver PRESTIGE® Bright Interference	PRESTIGE® Bright Bronze PRESTIGE® Bright Copper PRESTIGE® Bright Fire-red PRESTIGE® Bright Lemon Gold PRESTIGE® Bright Summer Gold PRESTIGE® Bright Autumn Gold
20 – 150 µm	Sparkling effects	PRESTIGE® Sparkling Silver PRESTIGE® Sparkling Interference	PRESTIGE® Sparkling Lemon Gold PRESTIGE® Sparkling Pure Gold
20 – 250 µm	Dazzling effects	PRESTIGE® Dazzling Silver	PRESTIGE® Dazzling Red Gold

Combinations with other raw materials

All recommended effect pigments show excellent compatibility with other cosmetic raw materials including all other pigments and dyes for use in lipstick/lip gloss formulations.

Adding color to lipstick/lip gloss products

Next to standard colorants, also colored pearlescent pigments can be used to provide color to lipstick formulas. In contrast to iron oxides, they will not only color the product but also provide a subtle shine.

Table 2: PRESTIGE® Colored Pigments

<i>Particle Size</i>	<i>Product</i>	<i>Color tone</i>
10 – 50 µm	PRESTIGE® Ruby	Red
10 – 50 µm	PRESTIGE® Sapphire	Blue
10 – 50 µm	PRESTIGE® Emerald	Green
10 – 50 µm	PRESTIGE® Amethyst	Lilac

Procedure

A few basic rules need to be considered in formulations containing effect pigments.

General rules:

- **Avoid grinding and milling of effect pigments:** If the mechanical stress to the pigments is too high, the pigment particles might break or the metal oxide layer might be removed from the mica platelets, resulting in loss of lustre or change in shade. The effect pigments always disperse very well without any grinding due to their large particle size and the virtual absence of agglomeration. They can be added to the powder system while stirring after milling of the organic/inorganic pigments and before the binder is added.
- **Consider color mixing rules:** Absorption pigments mix subtractively, because the visible color is the non-absorbed portion of light. A mixture of yellow and blue is green – a mixture of all colors is black. Interference pigments mix additively, because the visible color is the reflected portion of light. A mixture of complementary colors like yellow and blue is white – a mixture of all colors is white.

Table 2: Recommended pigmentation in lipstick/lip gloss:

<i>Finished Product</i>	<i>Level of use:</i>
Lipstick	12 – 20 %
Lip balm	3 – 5 %
Lip gloss, transparent	3 – 5 %
Lip lacquer	10 – 15 %

For all applications applies the same rule: PRESTIGE® Soft range and PRESTIGE® Silk range are used to create pearly shine and achieve high coverage. The PRESTIGE® Bright range and PRESTIGE® Sparkling range is used for high brilliance and transparency.

Regulatory limitations

No limitations for pearlescent pigments in lipstick/lip gloss application in EU/Japan. PRESTIGE® Sapphire, PRESTIGE® Emerald, PRESTIGE® Amethyst and PRESTIGE® Obsidian contain ferric ferrocyanide, which is not permitted for lip products in the USA.

Metallic Pigments: Effect versus particle size

Different metallic effects can be achieved with the right choice of effect pigments depending on their particle size. Smaller particles (5-50 µm) create brilliant effects with very high coverage. Larger sized particles create high luster (15-70 µm) or sparkle effects (20-95 µm) with characteristic metallic shine.

Table 1: Effect versus particle size

Particle Size	Effect	Gold Effects	Silver Effects	Copper Effects
5 – 50 µm	Brilliant effects	VISIONAIRE® Natural Gold VISIONAIRE® Olive Gold VISIONAIRE® Sunflower Gold VISIONAIRE® Maize Gold VISIONAIRE® Honey VISIONAIRE® Amber	VISIONAIRE® Silver Sea	VISIONAIRE® Cinnamon VISIONAIRE® Lava
15 – 70 µm	Bright effects	VISIONAIRE® Bright Natural Gold VISIONAIRE® Bright Sunflower Gold VISIONAIRE® Bright Honey VISIONAIRE® Bright Champagne	VISIONAIRE® Bright Silver Sea	VISIONAIRE® Bright Cinnamon
20 – 95 µm	Sparkling effects		VISIONAIRE® Sparkling Silver Sea	

Adding color to powder products

All recommended effect pigments can be mixed with any other pigment such as pearlescent pigments, iron oxides and dyes for use in lipstick/lip gloss formulations. Especially the combination of metallic and pearlescent pigment can lead to surprising and unimagined brilliant color shades. Next to standard colorants, also colored metallic pigments can be used to provide color to lipstick/lip gloss formulas. In contrast to iron oxides, they will not only color the product but also provide a metallic brilliance.

Table 2: Visionaire® Colored Pigments

Particle Size	Product	Area of use
15 – 70 µm	VISIONAIRE® Bright Red 7	Lips/Eyes/Face

Formulation remarks

Although metallic pigments show excellent compatibility with cosmetic raw materials used in lipstick/lip gloss formulations, some guidelines should be considered:

VISIONAIRE® Bright Champagne and VISIONAIRE® Silver Sea should only be used in anhydrous systems. For VISIONAIRE® copper effect pigments, water-free systems are recommended as well as the addition of antioxidants especially in combination with vegetable oils.

Procedure

A few basic rules need to be considered in formulations containing metallic effect pigments.

General rules:

- **Avoid grinding and milling of effect pigments:** If the mechanical stress to the pigments is too high, the pigment particles might break or the SiO₂ layer might be removed from the pigment surface, resulting in loss of brilliance. The effect pigments always disperse very well without any grinding due to their large particle size and the virtual absence of agglomeration. They can be added to the powder system while stirring after milling of the organic/inorganic pigments and before the binder is added.
- **Consider color mixing rules:** Metallic pigments behave like absorption pigments, they mix subtractively, because the visible color is the non-absorbed portion of light. A mixture of yellow and blue is green – a mixture of all colors is black.

Table 2: Recommended pigmentation in lipstick/lip gloss:

<i>Finished Product</i>	<i>Level of use:</i>
Lipstick	10 – 17 %
Lip gloss, transparent	0.5 – 2 %
Lip lacquer	2 – 13 %

For all applications applies the same rule: VISIONAIRE® pigments with particle sizes of 5-50 µm and 15-70 µm provide metallic shine and high coverage. Therefore according to the desired effect, the use level of metallic pigments could be significantly lower than the use level of pearlescent pigments.

Regulatory limitations

No limitations for aluminum and bronze/copper pigments in Europe and Japan.
 Aluminum pigments are not permitted for use in lip/oral applications in USA.
 VISIONAIRE® Bright Red 7 is not permitted for eyes/lips/face in USA due to presence of Red 7.

For further questions, please ask your ECKART contact:

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