ADE TO TRAVEL
XIRONA® COSMETIC PIGMENTS
WHY XIRONA® PIGMENTS?

- Create multiple color-changing effects for color and care cosmetics with a unique edge
- Iridescent shades made by effects of light
- Add visual depth and 3D effects for holographic color matching
- Up to 4 different attractive shades depending on the viewing angle
- Small amounts render high impact
- Outstanding color-styling flexibility

THE PHYSICS BEHIND INTERFERENCE

Extraordinary effects require a defined coating process. The technological principles apply to all shiny color effects created by pearlescent pigments. The substrate plays an important role by providing a thin, smooth and translucent foundation. It is then coated by a carefully applied layer of metal oxide with a high refractive index. Each layer reflects light in a different way, or only partly allows light to be emitted and this generates the desired color and gloss effect. The actual interference color is dictated by the layer of metal oxide (TiO₂) and the overall effect is determined by the thickness of the layer.

HOW XIRONA® PIGMENTS WORK

- Substrate
- Metal oxide
- Viewing angle

COLOR THAT MOVES YOU

Xirona® pigments suffuse each ounce of texture with multiple halos of changing color to set formulations in motion but also trigger emotions. Varying effects from precious shimmer to daring sparkle scintillate and transition to envelope the skin in appearing and disappearing shifts of light. Create charmingly upbeat effects for cosmetic applications like highlighters, lip glosses, eyeshadows, nail polishes, hair gels, and the like. Elevate your products on social media with Xirona® color travel pigments for unique eye-catching effects, as these jewels are truly #instagrammable!

PRISMATIC CHANGE

Every change brings a new beginning, encouraging your consumers to reinvent themselves, fueling a quest for self-assertion. To assist you in satisfying the demanding beauty addict of tomorrow, we work in close collaboration with renowned trend forecasting agencies. Xirona® color travel pigments are carefully selected to pave the way for experimental minds from the lab to the makeup cabinet.

Mix and match these highly versatile ingredients to achieve desired looks known as holographic effects, colorless colors, or three-dimensional illusions.

VOYAGE OF IRIDESCENCE

XIRONA® COSMETIC PIGMENTS

Experience our Xirona® color travel pigments, a metamorphic palette of ever-changing colors! Inspired by nature’s wonderful designs, we mimic the multichromatic surface of floating bubbles, the interlacing shimmer of sea shells and enchanting moon stones. Add unique edge to your color and care products with a selection of prismatic shades that go beyond the nuances of the rainbow. These shifting hues of iridescence are based on a special layer-substrate technology resulting in transitional interference or absorption colors. Highly stable and versatile, these gems conjure up eye-catching effects with up to 4 colors in one!
COLOR TRAVEL ENABLED BY TECHNOLOGY

The Xirona® color travel range demands a more specialized coating technology compared to single layer pigments that solely reveal one interference color.

The process requires enveloping the substrate in several layers of metal oxides to generate up to three colors in one. The substrate’s components consist of thin and even platelets of mica, silica, or calcium aluminum borosilicate coated with layers of TiO2 and SiO2.

The ingenious surface coating technique is combined with a precise flake quality that performs with its own dedicated interference color. The final outcome is a multi-shaded color travel effect.

Other pigments with a size distribution between 20 and 200µm display a high sparkle effect.

ADVANTAGES:
Xirona® pigments are globally approved and can be used for all types of cosmetic applications in skin care and color cosmetics. They are very stable and disperse well in oil-, water- and solvent-based systems.

INTERFERENCE PIGMENTS
ADDITIVE COLOR MIXING

Interference pigments with a white body color follow the additive color model. The observed color is a physical effect of light and thus depending on the light source and the viewing angle. The primary colors are red, green, and blue.

A blend of complementary colors like interference yellow (gold) and interference blue results in white (silver). Combining all three primary colors results in white.

Subtractive color mixing: Yellow + blue = green

Additive color mixing: Yellow + blue = white

COLOR MIXING RULES

Achieving desirable eye-catching results with interference pigments requires color-matching experience. The following two aspects demonstrate some basic approaches:

1. CONSIDER COLOR-MIXING RULES FOR SUBTRACTIVE AND ADDITIVE COLOR MIXING

ABSORPTION PIGMENTS

SUBTRACTIVE COLOR MIXING

The subtractive color-mixing rule comes into play when working with absorption (body-colored) colorants. The primary colors are yellow, red and blue. The blend of blue and yellow for example results in green. The appearance of the color is the result of the reflected and absorbed parts of the electromagnetic spectrum. All three colors together produce black.

2. ADD CONTRASTING BACKGROUND COLOR

All interference pigments with a white powder color need a background shade to display the interference effect. The interference color is hardly visible in white or transparent formulations. A contrasting background color, however, accentuates the interference shade. Create a color travel experience with up to four colors in one formulation! Pick a Xirona® pigment with three shades and combine it with a darker background color for a multichromatic experience.

TIPS AND TRICKS

General formulation recommendation:
Combinations with all types of colorants like dyes, inorganic, organic and pearlescent pigments are possible. For background colors 2, 5, or 10-15% of absorption colorants are suitable. Please note: Using a high pigment amount in combination with a color travel pigment may lower the final interference color shift effect.

A transparent, concave or vaulted shape packaging is beneficial to visualize the color travel effect nicely.

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The particle sizes, that vary between 5 and 50µm, result in a satiny or metallic sheen. Other pigments with a size distribution between 20 and 200µm display a high sparkle effect.

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A transparent, concave or vaulted shape packaging is beneficial to visualize the color travel effect nicely.
Xirona® Caribbean Blue: The pigment displays celestial shades of gold, silver-green and blue. Based on silica flakes, the white powder-colored pigment features a particle size from 5 to 50μm for an appealing smooth shimmer. Formulation Advice: To highlight the interference color effects of the pigment, we recommend combining Xirona® Caribbean Blue with colorants that are not part of its own color circle (see illustration). These could be red, orange, yellow, gold, copper and/or a hint of black (for example Colorona® Mica Black) to darken the background.

Xirona® Golden Sky: Xirona® Golden Sky reminds us of the golden rays of the sun that emanate among a clear blue sky. This pigment displays an attractive shimmering effect under a perpendicular view, changing to silver and green-blue under oblique viewing conditions. The pigment consists of silica platelets and has a particle size distribution from 5 to 50μm. Formulation Advice: Interesting shades may be developed by combining Xirona® Golden Sky with background colors like violet, red, orange, copper, dark gold and/or Colorona® Mica Black.

Xirona® Magic Mauve: Mauve, a delicately feminine shade found in flower beds or vintage elements. We enveloped this color in multiple layers of colorful shimmer. Xirona® Magic Mauve displays a lilac-red interference effect under a perpendicular view. The pigment's color changes from lilac-red to silver to green-blue, depending on the viewing angle. Formulation Advice: Highlight the attractive color travel and shimmering effect by applying a dark blue, red or gray background color. This pigment adds at least three iridescent shades in one for unique beauty products that create a sensual look.

Xirona® Nordic Sunset: When the warm shades of the sun set upon the cold tints of snowy mountains, it creates a truly amazing palette of colors. Within Xirona® Nordic Sunset's white powdery substance lies cool shades of silver-green, silver-red and green-gold. The pigment is based on silica flakes with a particle size distribution of 20 to 200μm. Formulation Advice: Deep background colors like red, violet, blue or black can complement Xirona® Nordic Sunset for an appealing harmony of colors. The pigment's silvery, lustrous effect is highly suitable for personal care products.

Xirona® Moonlight Sparks: Xirona® Moonlight Sparks combines two innovative technologies in one: A sophisticated color travel effect from metallic gold to subtle silver in combination with incredible sparkle. This white powder colored pigment is based on calcium aluminum borosilicate platelets with a particle size distribution of 5 to 50μm. Formulation Advice: Create a lunar experience with brilliant silvery-golden glitter to spark your consumer’s interest. Xirona® Moonlight Sparks is highly versatile and pairs well with all shades, whether it’s deep gold, copper, red, violet, blue or green. There are no limits to your creativity! Highlight the base color of your cosmetic formulations with sparkling “on top” effects.

Xirona® Kiwi Rose: Xirona® Kiwi Rose displays a perfect harmony between golden-brown hues of kiwi shells and striking fresh green of the fruit itself. Flashes of peachy red give it an exotic kick. The pigment is based on silica flakes with a particle size distribution of 5 to 50μm for an appealing shimmering effect. The color changes from green to silver to peach, depending on the viewing angle. Formulation Advice: Attractive optical effects can be achieved in combination with colorants that are not part of its own color circle. Contrasting background colors such as dark green, blue, violet, dark red, brown and/or a hint of black (for example Colorona® Mica Black) are recommended.
**XIRONA® VOlCANIC SPARKS**

Based on calcium aluminum borosilicate platelets, Xirona® Volcanic Sparks displays a firework of gold, red and copper lights. Combined with other sparkling pigments, the special color travel effect and its white powder color become visually eruptive.

**Formulation Advice:**

The transparency of this sparkling pigment is unique. It does not morph with other pigments to result in a new shade, as it creates more of a sparkling "top layer" effect. Blend the color travel pigment with various shades and contrasting background colors. Set highlights by using violet, blue, turquoise, green or black (e.g. Colorona® Mica Black).

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**XIRONA® VOlCANIC FIRE**

Xirona® Volcanic Fire displays tiny smooth embers of red, copper, and gold shimmer that give your formulation a warm finish. The white powder is based on mica with a particle size distribution of 10 to 60µm.

**Formulation Advice:**

We recommend combining Xirona® Volcanic Fire with strong background colors like brown, violet, blue or green to highlight the special color travel effect. Achieve dazzling effects by combining the pigment with small amounts of contrasting dark shades like red or black.

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**XIRONA® LE ROUGE**

Xirona® Le Rouge is a body colored pigment with a deep red shade wrapped up in pearlescence. The deep shade of crimson changes to orange-red depending on the viewing angle. The pigment is based on silica flakes and has a particle size distribution of 5 to 50µm.

**Formulation Advice:**

Combinations with clear red or bluish-red colorants intensify the vibrant red tone. The addition of interference red, blue, or violet effect pigments result in highly stable red shades. Xirona® Le Rouge allows formulating various red, orange and pink shades. This pigment is highly versatile and can be combined with all kinds of interference pigments. Additionally, it can function as a background color for the rest of its Xirona® kinsmen.

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**TECHNICAL DATA AT A GLANCE**

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Product No.</th>
<th>Particle Size (microns)</th>
<th>D-50 (microns)</th>
<th>TiO₂</th>
<th>SiO₂</th>
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<tr>
<td>Xirona® Caribbean Blue</td>
<td>117165</td>
<td>10.0 - 60.0</td>
<td>21.0 - 27.0</td>
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<td>SnO₂, White powder with color travel (turquoise/blue/violet)</td>
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<td>Xirona® Magic Mauve</td>
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<td>16.0 - 22.0</td>
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<td>x</td>
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<tr>
<td>Xirona® Nordic Sunset</td>
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<td>16.0 - 23.0</td>
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<td>x</td>
<td>SnO₂, White powder with color travel (silver-green/silver-red/green-gold)</td>
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<td>Xirona® Moonlight Sparks</td>
<td>117746</td>
<td>20.0 - 200.0</td>
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<td>Ca-Al Borosilicate, SnO₂, Silver-white powder with golden sparkle effect</td>
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<tr>
<td>Xirona® Kiwi Rose</td>
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<td>SnO₂, White powder with color travel (green/silver/peach)</td>
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<td>117736</td>
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<td>Ca-Al Borosilicate, SnO₂, White powder with color travel (red/copper/gold)</td>
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<td>Xirona® Volcanic Fire</td>
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<td>Xirona® Le Rouge</td>
<td>117728</td>
<td>5.0 - 50.0</td>
<td>16.0 - 22.0</td>
<td>x</td>
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<td>Fe₂O₃, Red powder with discreet color travel (red/orange-red)</td>
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</tbody>
</table>
FEATURES AT A GLANCE

Benefits:
• Outstanding color travel effects for trendsetting cosmetic formulations
• High pigment stability
• Endless styling flexibility for eye-catching shades with up to 4 shades in one product
• Metallic shine with irresistible multi-color or sparkle effects
• Ideal for creating holographic appearances and pearlescent color depth

WHY MERCK COSMETICS?

When you choose Merck’s products, not only do you receive a tremendous product, but you also gain access to the resources of the world’s oldest chemical and pharmaceutical company. Merck offers unparalleled global expertise and resources to its clients, from international regulato-
ry and applicational support and extensive R&D knowledge to consulting services for clients anywhere in the world.
• Development of trendsetting pigments
• Formulation advice for a broad range of issues
• Guidance on satisfying market trends
• Information on how to enrich your color cosmetic products with our active ingredients, for beauty that works inside and out

Do not miss your chance to work with an experienced global partner! Use the best we have to offer for your own outstanding products.

Purchasing our products means gaining access to our knowledge.

OUR PORTFOLIO AT A GLANCE

Take a peek at our latest tool, Colors-4Beauty. Our digital color card invites you to take a ride along our rainbow of endless shades and blends. Receive prismatic insights of all our pigments in just one click! Save your favorite effects and be up to date on our latest additions.

The app is now available for Apple and Android.
ORDERING INFORMATION

<table>
<thead>
<tr>
<th>NAME</th>
<th>INCI</th>
<th>PACKAGE SIZE</th>
<th>ITEM NO.:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Xirona® Caribbean Blue</td>
<td>Mica, CI 77891 (Titanium Dioxide), Silica, Tin Oxide</td>
<td>50g, 1kg, 20kg</td>
<td>117165</td>
</tr>
<tr>
<td>Xirona® Golden Sky</td>
<td>Silica, CI 77891 (Titanium Dioxide), Tin Oxide</td>
<td>50g, 1kg, 20kg</td>
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</tr>
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</tr>
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<td>117112</td>
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<td>Xirona® Moonlight Sparks</td>
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<td>117116</td>
</tr>
<tr>
<td>Xirona® Le Rouge</td>
<td>CI 77491 (Iron Oxides), Silica</td>
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<td>Xirona® Volcanic Fire</td>
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<tr>
<td>Xirona® Volcanic Sparks</td>
<td>Calcium Aluminum Borosilicate, CI 77891 (Titanium Dioxide), Silica, Tin Oxide</td>
<td>50g, 1kg, 20kg</td>
<td>117736</td>
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For more information, please contact: cosmetic@merckgroup.com

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