Effect pigments are nowadays widely used in colour care applications, as they provide a touch of lustre and sparkle in make-up products. However, they can also give additional performance benefits in other personal care products such as skin care and body cleansing products, and enable the creation of modern beauty care products with fascinating new looks.

Unlike conventional colourants and dyes, effect pigments interact with light to create fascinating visual effects. Thanks to precisely-controlled coating of the films based on titanium dioxide over pearly, transparent substrates such as mica, iridescent/interference pigments separate the white light into its component parts and produce dual colours, obtaining one colour via reflection and one colour via transmission. This results in iridescence. Additional layers of coating with a low refractive index (e.g., SiO$_2$) create further reflective interfaces, which cause the colour-varying effects in colour-changing pigments. When viewed from different angles, the beautiful and aesthetically pleasing colour effects create interesting visual transformations. Optional addition of absorption colourants or pigments to the composition creates a combination of absorption and interference effects. The resulting colour effect pigments add colour to the bulk of the formulation and give it a variety of fascinating lustres.

**Different types of effect pigments**

The structure of an visual effect pigment is usually composed of a substrate, which is a high-aspect particle that displays high specular reflectivity and little scattering. It is usually coated with interference layers made from one or several materials, such as TiO$_2$, iron oxides, colourants, etc.

Different types of effect pigments can be created depending on the relative composition of the layers. The combination of a highly refractive metal oxide layer, e.g., made from titanium dioxide, and transparent substrates such as mica results in pearlescent pigments that produce bright, pearly effects. Thanks to precisely-controlled coating of the films based on titanium dioxide over pearly, transparent substrates such as mica, iridescent/interference pigments separate the white light into its component parts and produce dual colours, obtaining one colour via reflection and one colour via transmission. This results in iridescence. Additional layers of coating with a low refractive index (e.g., SiO$_2$) create further reflective interfaces, which cause the colour-varying effects in colour-changing pigments. When viewed from different angles, the beautiful and aesthetically pleasing colour effects create interesting visual transformations. Optional addition of absorption colourants or pigments to the composition creates a combination of absorption and interference effects. The resulting colour effect pigments add colour to the bulk of the formulation and give it a variety of fascinating lustres.

**Maximum design flexibility**

BASF has developed a broad range of effect pigments and specialty minerals for cosmetic, beauty care and personal care products. The pigment portfolio offers an extensive variety of white pigments, a full range of colours and iridescent pearls and natural-looking, vibrant, shiny and metallic shades. Effect pigments based on natural mica, such as the Timica, Flamenco and Cloisonne ranges give cosmetics and personal care products shimmering effects, both as white pigments in a variety of lustres and as colour pigments in a range of metallic and earth tones. Timica interference colours, for instance, use thin, precisely controlled...
What are pigments?

A pigment is a material that changes the colour of light. Pigments reflect or transmit colours when they interact with incident light, and have many uses:

- to give colour to objects
- to distinguish between brands
- to produce security inks, pharmaceuticals and other applications.

From cosmetics to cars, and newspapers to spaceships: these colourants are used in almost every product we buy.

Films of titanium dioxide on mica to separate white light into its component parts and produce dual colours, obtaining one colour via reflection and one colour via transmission, resulting in iridescence. The different interference colours are obtained by increasing the thickness of the TiO₂ layer covering the mica surface.

Effect pigments composed of a synthetic mica substrate with the INCI name Synthetic Fluorphlogopite have a titanium dioxide coating and create a very bright, clean colour as a result of the transparency of the substrate. Synthetic mica pigments such as Chicone are ideal for use in cosmetic and personal care products where high purity and a clean, high chroma effect is desired.

Borosilicate-based pigments such as those from the Reflects and Reflects Dimensions ranges provide a spectrum of optical effects that have an extraordinary visual impact and add great visual depth and dimensionality. New levels of chroma, colour purity, brightness, transparency and reflectivity are achieved using the new borosilicate substrate (sodium calcium borosilicate). The effects are especially noticeable in transparent formulations such as gels or clear sticks.

Colour-changing pigments such as those from the MultiReflections and Reflects MultiDimensions ranges give cosmetics a vibrant vividness by changing colour as the angle of the viewer shifts. The colour travels within adjacent colour spaces, creating beautiful and aesthetically pleasing visual transformations by harnessing an innovative technology called Bi-Quadrant CPV. Low refractive index SiO₂ provides colour travel and two additional interfaces for reflection. High refractive index TiO₂ provides reflectivity and dictates the hue at normal light incidence according to the thickness of each layer. Whether based on mica or borosilicate substrates, these multi-dimensional effect materials enable distinctive colour travel effects in both colour cosmetics and beauty care products. Reflects MultiDimensions represent the latest advance in borosilicate pigment technology.

All these pigments can be used on their own or in conjunction with one another to create new colour spaces and/or effects. Depending on their size, the pigment yields a range of effects, such as varying degrees of lustre and coverage in cosmetics and personal care applications. To obtain satin matt effects with best coverage the average particle size should be around 6 µm, for silky pearl effects with good coverage ~25, for shimmering effects with less coverage ~50 and for sparkling effects with no coverage ~100 µm.

High performance for fascinating effects

Effect pigments can also add further performance benefits to many personal care products, such as skin care and body wash products. Even-toned, fresh-looking skin, for example, is a result of a well-balanced, inner skin structure. Adding pearlescent and iridescent effect pigments to skin care products can also help skin look healthy and radiant. These pigments help to visibly refine the skin tone and mask imperfections such as red or yellow spots, while giving the product itself a satin, matt beige or even white glow, depending on the type of pigment used, making them especially suitable for use in daily facial creams and colour correction creams such as a Skin Perfector BB Cream SPF 25 and a Digital Pink Expert Serum.

A touch of elegance can be added to daily skin care creams using white interference pigments. They add a satiny, silk-like shimmer to the cream and thereby provide a touch of luxury to the formulation. Tanned skin is often synonymous with healthy, beautiful skin. Special-effect pigments are an excellent choice for use in products that give the skin a freshly sun-tanned appearance.

Body wash and hair care formulations can be infused with natural mica-based pigments such as those from the Timica range to provide a lustrous shine and shimmering swirls, and enable the creation of colourful, bright, and more intriguing, cost-efficient products such as a Gold Creamy Care Shampoo.

Our personal care business draws its inspiration for innovation from real life – by making consumers’ wants and needs an essential starting point for the continuous development of new products and concepts. With its combination of market empathy and scientific excellence, including in-depth expertise in technology and research, we aim to develop high-performance concepts and ingredients that help our customers meet the functional and also the emotional needs of consumers. With our wide range of effect pigments and formulation expertise, we support manufacturers with the creation of modern cosmetic, beauty care and personal care products with fascinating looks.

* The formulations mentioned can be found on the Internet – see Internet panel

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More information can be found on the website www.health-and-beauty.com

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Special effect pigments – new looks for body care lines

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