

# **IRIDESIUM**

**Industrial Grade  
Pearlescent Pigments**

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## **Industrial Grade Pearlescent Pigments**

Manufactured from high quality materials to create our diverse range of colours, pearlescent effects and luster.

## **Pigment Series**

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**Silver White  
Interference  
Golden  
Coloured  
Iron  
Multi Colour  
Coloured Crystal  
Antique  
Silky Bronze  
Crystal**

## SILVER WHITE

Catalog Code	Color	Size $\mu\text{m}$	Mesh	Effect	Crystal
IRIDESIUM 100	Silver White	10-60	600	Bright Pearl luster	Anatase
IRIDESIUM 103	Silver White	10-60	600	Bright Pearl luster	Rutile
IRIDESIUM 110	Silver White	<15	1200	Ultra Soft Satin Pearl luster	Anatase
IRIDESIUM 111	Silver White	<15	1200	Ultra Soft Satin pearl luster	Rutile
IRIDESIUM 120	Silver White	5-25	800	Bright Soft Satin Pearl Luster	Anatase
IRIDESIUM 123	Silver White	5-25	800	Bright Soft Satin Pearl Luster	Rutile
IRIDESIUM 151	Silver White	20-80	300	Shiny Pearl Luster	Rutile
IRIDESIUM 153	Silver White	20-100	200	Shiny Pearl luster	Rutile
IRIDESIUM 163	Silver White	20-180	120	Glinting Pearl luster	Anatase
IRIDESIUM 173	Silver White	10-40	600	Bright Pearl Luster	Rutile
IRIDESIUM 183	Silver White	50-500	60	Sparkle Pearl Luster	Anatase
IRIDESIUM 100SW	Silver White	10-60	600	Brilliant White Pearl Luster	Anatase
IRIDESIUM 120SW	Silver White	5-25	800	Soft Satin White Pearl Luster	Anatase
IRIDESIUM 153SW	Super White	20-100	200	Shiny White Pearl Luster	Rutile
IRIDESIUM 163SW	Silver White	20-180	120	Glinting White Pearl Luster	Anatase
IRIDESIUM 123YR*	Silver White	5-25	800	Soft Satin Pearl Luster	Rutile
IRIDESIUM 103YR*	Silver White	10-60	600	Bright Pearl Luster	Rutile

## INTERFERENCE

Catalog Code	Color	Size $\mu\text{m}$	Mesh	Effect	Crystal
IRIDESIUM 205	Interference Gold	10-60	600	Translucent Pearl Luster	Rutile
IRIDESIUM 206	Interference Purple Gold	10-60	600	Translucent Pearl Luster	Rutile
IRIDESIUM 215	Interference Red	10-60	600	Translucent Pearl Luster	Rutile
IRIDESIUM 219	Interference Purple Red	10-60	600	Translucent Pearl Luster	Rutile
IRIDESIUM 225	Interference Blue	10-60	600	Translucent Pearl Luster	Rutile
IRIDESIUM 235	Interference Green	10-60	600	Translucent Pearl Luster	Rutile

## GOLDEN LUSTER

Catalog Code	Color	Size $\mu\text{m}$	Mesh	Effect	Crystal
IRIDESIUM 300	Gold	10-60	600	Bright Metallic Luster	Rutile
IRIDESIUM 302	Golden Yellow	5-25	800	Satin Metallic Luster	Rutile
IRIDESIUM 303	Deep Gold	10-60	600	Bright Metallic Luster	Rutile
IRIDESIUM 308	Bright Gold	10-60	600	Bright Metallic Luster	Rutile
IRIDESIUM 309	Sunny Gold	10-60	600	Bright Metallic Luster	Rutile
IRIDESIUM 323	Gold	5-25	800	Satin Metallic Luster	Rutile
IRIDESIUM 351	Shining Gold	10-100	200	Brilliant Metallic Luster	Rutile
IRIDESIUM 355	Shining Deep Gold	10-100	200	Brilliant Metallic Luster	Rutile

## COLOURED

Catalog Code	Color	Size $\mu\text{m}$	Mesh	Effect	Crystal
IRIDESIUM 400	Standard Blue	10-60	600	Soft Pearl Luster	Rutile
IRIDESIUM 405	Interference Gold	10-60	600	Soft Pearl Luster	Rutile
IRIDESIUM 425	Interference Red	10-60	600	Soft Pearl Luster	Rutile
IRIDESIUM 419	Interference Purple	10-60	600	Soft Pearl Luster	Rutile
IRIDESIUM 4005	Olive Green	10-60	600	Soft Pearl Luster	Rutile
IRIDESIUM 4015	Coffee Brown	10-60	600	Soft Pearl Luster	Rutile
IRIDESIUM 4025	Chestnut Brown	10-60	600	Soft Pearl Luster	Rutile
IRIDESIUM 4035	Palm Leaf Green	10-60	600	Soft Pearl Luster	Rutile
IRIDESIUM 4045	Rose	10-60	600	Soft Pearl Luster	Rutile
IRIDESIUM 4055	Grape Purple	10-60	600	Soft Pearl Luster	Rutile

## IRON

Catalog Code	Color	Size $\mu\text{m}$	Mesh	Effect	Crystal
IRIDESIUM 500	Antique Copper	10-60	600	Bright Metallic Luster	-
IRIDESIUM 502	Antique Copper	10-60	600	Bright Metallic Luster	-
IRIDESIUM 504	Wine Red	10-60	600	Bright Metallic Luster	-
IRIDESIUM 505	Purple Red	10-60	600	Bright Metallic Luster	-
IRIDESIUM 507	Iron Green	10-60	600	Bright Metallic Luster	-
IRIDESIUM 508	Coffee	10-60	600	Bright Metallic Luster	-
IRIDESIUM 520	Antique Copper	5-25	800	Satin Bright Metallic Luster	-
IRIDESIUM 522	Red Brown	5-25	800	Satin Bright Metallic Luster	-
IRIDESIUM 524	Wine Red	5-25	800	Satin Bright Metallic Luster	-
IRIDESIUM 530	Antique Copper	10-100	800	Brilliant Metallic Luster	-
IRIDESIUM 532	Red Brown	10-100	200	Brilliant Metallic Luster	-
IRIDESIUM 534	Wine Red	10-100	200	Brilliant Metallic Luster	-

## MULTI COLOUR

Catalog Code	Color	Size $\mu\text{m}$	Mesh	Effect	Crystal
IRIDESIUM 630	Yellow Red	10-60	600	Color-Shifts - Yellow to Red	Rutile
IRIDESIUM 632	Orange Purple	10-60	600	Color-Shifts - Orange to Purple	Rutile
IRIDESIUM 634	Orange Blue	10-60	600	Color-Shifts - Orange to Blue	Rutile
IRIDESIUM 636	Green Yellow	10-60	600	Color-Shifts - Green to yellow	Rutile
IRIDESIUM 650	Blue Green	10-60	600	Color-Shifts - Blue to Green	Rutile
IRIDESIUM 654	Orange Green	10-60	600	Color-Shifts - Orange to Green	Rutile
IRIDESIUM 656	Gold Green	10-60	600	Color-Shifts - Gold to Green	Rutile
IRIDESIUM 658	Blue Orange	10-60	600	Color-Shifts - Blue to Orange	Rutile
IRIDESIUM 661	Yellow Green	10-60	600	Color-Shifts - Yellow to Green	Rutile
IRIDESIUM 662	Red Yellow	10-60	600	Color-Shifts - Red to Yellow	Rutile
IRIDESIUM 663	Purple Yellow	10-60	600	Color-Shifts - Gold to green	Rutile
IRIDESIUM 665	Purple Green	10-60	600	Color-Shifts - Purple to Green	Rutile
IRIDESIUM 670	Gold Red	10-60	600	Color-Shifts - Gold to Red	Rutile
IRIDESIUM 672	Purple Red	10-60	600	Color-Shifts - Purple to Red	Rutile
IRIDESIUM 674	Blue Red	10-60	600	Color-Shifts - Blue to Red	Rutile
IRIDESIUM 676	Green Red	10-60	600	Color-Shifts - Green to Red	Rutile
IRIDESIUM 680	Gold Purple	10-60	600	Color-Shifts - Gold to Purple	Rutile
IRIDESIUM 682	Red Purple	10-60	600	Color-Shifts - Red to Purple	Rutile
IRIDESIUM 684	Blue Purple	10-60	600	Color-Shifts - Blue to Purple	Rutile
IRIDESIUM 686	Green Purple	10-60	600	Color-Shifts - Green to Purple	Rutile
IRIDESIUM 690	Gold Blue	10-60	600	Color-Shifts - Gold to Blue	Rutile
IRIDESIUM 692	Red Blue	10-60	600	Color-Shifts - Red to Blue	Rutile
IRIDESIUM 694	Purple Blue	10-60	600	Color-Shifts - Purple to Blue	Rutile
IRIDESIUM 696	Green Blue	10-60	600	Color-Shifts - Green to Blue	Rutile

## COLOURED CRYSTAL

Catalog Code	Color	Size $\mu\text{m}$	Mesh	Effect	Crystal
IRIDESIUM 4301	Bright Yellow	10-60	600	Soft Pearl Luster	Rutile
IRIDESIUM 4302	Bronze	10-60	600	Soft Pearl Luster	Rutile
IRIDESIUM 4321	Red	10-60	600	Soft Pearl Luster	Rutile
IRIDESIUM 4322	Deep Red	10-60	600	Soft Pearl Luster	Rutile
IRIDESIUM 4341	Purple	10-60	600	Soft Pearl Luster	Rutile
IRIDESIUM 4342	Deep Purple	10-60	600	Soft Pearl Luster	Rutile
IRIDESIUM 4361	Light Blue	10-60	600	Soft Pearl Luster	Rutile
IRIDESIUM 4362	Blue	10-60	600	Soft Pearl Luster	Rutile
IRIDESIUM 4363	Deep Blue	10-60	600	Soft Pearl Luster	Rutile
IRIDESIUM 4381	Light Green	10-60	600	Soft Pearl Luster	Rutile
IRIDESIUM 4382	Green	10-60	600	Soft Pearl Luster	Rutile
IRIDESIUM 4383	Deep Green	10-60	600	Soft Pearl Luster	Rutile

## ANTIQUÉ

Catalog Code	Color	Size $\mu\text{m}$	Mesh	Effect	Crystal
IRIDESIUM 4201	Intense Dark Grey	10-60	600	Soft Black Pearl Luster	Anatase
IRIDESIUM 4202	Medium Black	10-60	600	Soft Black Pearl Luster	Anatase
IRIDESIUM 4203	Black	10-60	600	Soft Black Pearl Luster	Anatase
IRIDESIUM 4204	Intense Black	10-60	600	Soft Black Pearl Luster	Anatase
IRIDESIUM 4205	Silver Grey	10-60	600	Soft Silver Pearl Luster	Anatase
IRIDESIUM 4211	Intense Satin Black	5-25	800	Soft Black Pearl Luster	Anatase

## SILKY BRONZE

Catalog Code	Color	Size $\mu\text{m}$	Mesh	Effect	Crystal
IRIDESIUM 4501	Satin Copper	5-25	800	Silky Metallic luster	Rutile
IRIDESIUM 4521	Copper Gold	5-25	800	Silky Metallic luster	Rutile
IRIDESIUM 4541	Light Satin Copper	5-25	800	Silky Metallic luster	Rutile
IRIDESIUM 4542	Medium Satin Bronze	5-25	800	Silky Metallic luster	Rutile
IRIDESIUM 4543	Deep Satin Bronze	5-25	800	Silky Metallic luster	Rutile
IRIDESIUM 4511	Bright Bronze	10-60	600	Satin Metallic luster	Rutile
IRIDESIUM 4512	Copper	10-60	600	Satin Metallic luster	Rutile
IRIDESIUM 4561	Light Copper	10-60	600	Satin Metallic luster	Rutile
IRIDESIUM 4581	Deep Bronze	10-60	600	Satin Metallic luster	Rutile

## Crystal

Catalog Code	Color	Size $\mu\text{m}$	Mesh	Effect	Crystal
IRIDESIUM 7211	Silver Grey	10-60	600	Pearl luster	Rutile
IRIDESIUM 7234	Silver Grey	5-25	800	Satin Pearl Luster	Rutile
IRIDESIUM 7317	Yellow	10-60	600	Pearl luster	Rutile
IRIDESIUM 7326	Ruby	10-60	600	Pearl luster	Rutile
IRIDESIUM 7330	Violet	10-60	600	Pearl luster	Rutile
IRIDESIUM 7336	Sapphire	10-60	600	Pearl luster	Rutile
IRIDESIUM 7346	Emerald	10-60	600	Pearl luster	Rutile

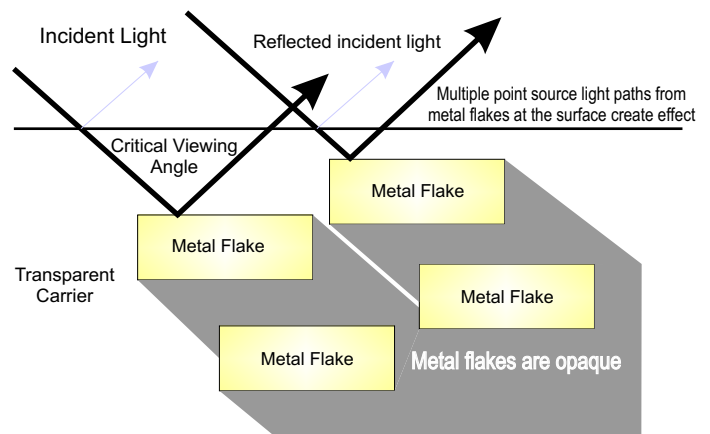
# Pearlescent Pigments are different from metal flakes

Before pearlescent pigments the only way to impart a metallic luster into plastics or coatings was to use very fine thin metal flakes so light striking them is reflected from multiple point sources creating a metallic sheen. Metal flakes are opaque sheen effect is caused *only* from the platelets found at the surface of the coating.

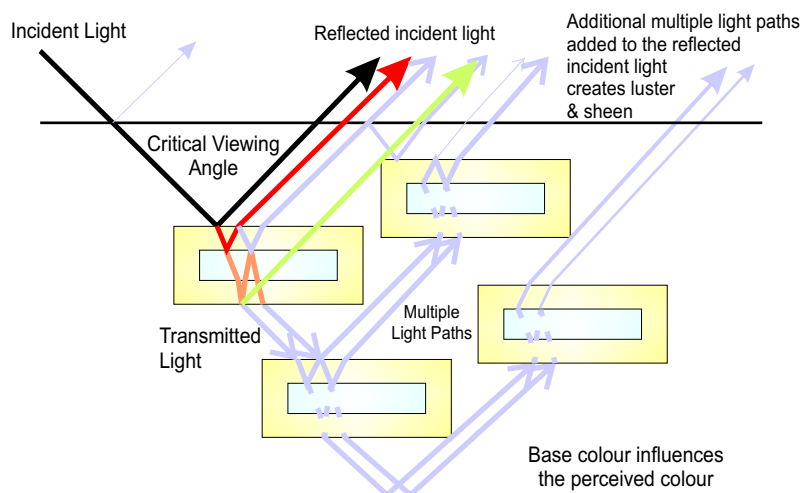
Similar to metal flake pearlescent pigments are also made of very thin flakes (platelets) of *transparent* MICA which has been clad with *transparent* metallic oxides. Pearlescent pigments develop their colour from the interaction of light refraction.

When used in a transparent or semi-transparent coating light penetrates *through* the pearlescent pigments interacting with neighboring platelets causing additional multiple point source reflections and colours not possible with metal flakes.

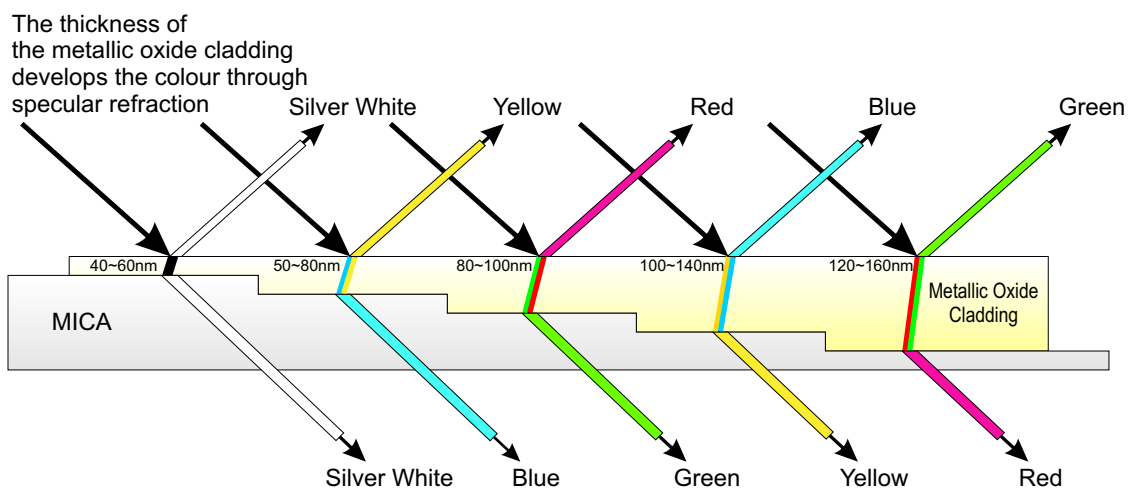
Pearlescent pigments develop colour through interference between light rays reflecting at specular angles from the top and bottom surfaces of the metal-oxide layer. By varying the coating thickness, these colors can be gold, red, blue, or green (see below). The pigments lose color intensity as viewing angle shifts to non-specular angles. In addition, a second color is transmitted through the pigment platelet that is complementary to the reflected one.



## Metal Flakes



## Pearlescent Pigments



Metallic Oxide Cladding Thickness and resultant colour:  
Silver White 40-60nm, Yellow 50-80nm, Red 80-100nm, Blue 100-140nm, Green 120-160nm

# Using Pearlescent Pigments

A better understanding of how pearlescent pigments differ from other conventional pigments can help the end-user achieve the desired effect and sidestep common problems in their formulations, mixing, and processing. Pearlescent pigments are somewhat more complex to use than other conventional colorants.

The most widely used pearlescent pigments consist of mica platelets clad with titanium dioxide or iron oxide to give silver white and coloured effects. Pearlescent pigments typically are colourless as the colour they develop is from interference of light rays reflecting at specular angles from the top to bottom surfaces of the many metal oxide layers – in addition the use of dyes may be incorporated within the pearlescent pigment structure to develop more colours or effects. Pearlescent pigments lose colour intensity as viewing angle shifts to non-specular angles. In addition to the reflected primary colour a complementary second colour (or transmission colour) is transmitted through the pigment platelet.

Interference pearlescent pigments on a white base the weaker transmission colour is reflected back through the coating and supplements the stronger reflection colour. Against a dark background, the transmission colour is absorbed and only the interference pearlescent pigment's reflection colour is seen.

Light reflected from pearlescent platelets that are essentially parallel to each other at different levels in the coating creates a sense of depth and lustre. The best pearl lustre, brightness, and colour intensity occurs with platelets that are 10 to 40 µm in size while larger platelets of 50 to 150 µm confer sparkle and glitter.

## Pearlescent Pigments in Plastic

Pearlescent pigments can be used in nearly all thermoplastics and most processes. Their effects are most intense in transparent resins like PS, PP, PE, PVC, acrylic, styrene-block copolymers, and silicone.

It is also possible to attain pearlescence and lustre in polymers having little or no transparency as with nylon 6, ABS, and HIPS but only with higher pigment loadings. Pearlescent pigments combined with dark absorption pigments in opaque polymers can yield a strong reflection colour and produce pearlescent effects of great richness and depth.

Highly filled plastics are not good candidates for pearlescent pigments because opaque fillers scatter light, eliminating the pearlescent effect. Most users limit fillers to less than 1% in systems containing pearl pigments.

Pearlescent pigments can be used in many thermosetting plastics, including unsaturated polyester, acrylic, urethane, and epoxy as well as cast polyester cultured marble and onyx components for countertops, floors, furniture, and fireplace elements. Pearlescent pigments can also be added to cast acrylic sheet and alloyed or blended materials such as rubber-toughened polycarbonate, nylon/ABS, and PC/ABS.

## Compounding Pearlescent Pigments in plastics

Pearlescent pigments can be master batched containing 25% pearlescent pigments (up to 50%) in most resins by drum tumbling or mixing in twin-shell, ribbon, or high-speed blenders. Pearlescent pigments are never ground or subjected to extended cycles or heavy shear because these can shear off the metal oxide cladding and damage the platelets. Banbury-type or continuous mixers are most often used to create pearlescent master batches, although two-roll mills, calendars, vertical intensive mixers, and double planetary mixers are also suitable as long as you avoid excessive shear. Pearlescent pigments are usually incorporated in powdered polymers such as PVC and PE by simple blending. Blending usually begins with organic pigments, followed by inorganic pigments, and lastly the pearlescent pigments.

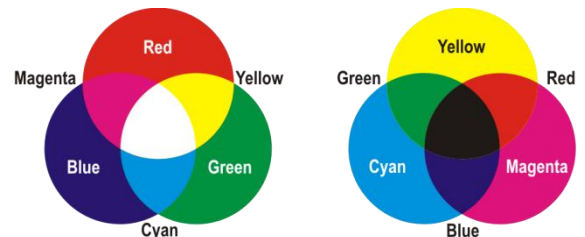
When pearlescent pigments are used with pelletised polymers, the difference in size between the pellets and the pearlescent pigments may cause separation after blending. Compounders usually use shorter blending times with pellets pre-blended with mineral oil so they are slightly tacky than with powders as the pellets can damage the pearlescent pigment platelets. For some compounders who wish to avoid preblending and potential separation problems do so by feeding pearlescent pigments into the molten polymer through a downstream feeder.

Dispersion aids include low-molecular-weight polyethylene waxes and calcium or magnesium stearate. Moulders often add 1% LMW-PE wax to polyolefins and mix for 20-30 min. With PS they typically use only about 0.1% of a dispersion aid.

Injection moulders who dry blend usually follow a three step process. 1/ Blend powdered resin and mineral oil for 10 minutes. 2/ All colorants, except pearlescent pigments with a dispersing aid are added and blended for 10 more minutes. 3/ Pearlescent pigments are then added and blended for another 20 minutes.

## Mixing Colours

Combining pearlescent pigments colours together and with conventional colorants is as much art as it is science due to how they interact. Colour mixing falls into two categories: Additive and Subtractive. In additive colour mixing such as with light (RGB = Red, Green, Blue) complementary colours mix and form white. In subtractive colour mixing such as with printing (CYM = Cyan, Yellow, Magenta) complementary colours mix to form black or grey.



Additive Colour Mixing

Subtractive Colour Mixing

## Additive Colour Mixing

The three primary colours of light for additive colour mixing are blue, green, and red combined to reproduce the range of visible colours. Additive Colour Mixing works by adding different colours of light on top of each other so the more light that is mixed the brighter the result. Mixing all primary colours equally is WHITE thereby subtracting each colour one by one BLACK is eventually the result.

## Subtractive Colour Mixing

The three primary pigment colours for subtractive colour mixing are Yellow, Magenta, and Cyan combined to reproduce the range of visible colours. Subtractive Colour Mixing involves mixing the reflected colours from pigments. A pigment's colour is the colour not absorbed but reflected. The more pigments that are added the darker the result. Mixing all primary colours equally is BLACK, thereby subtracting each colour one by one WHITE is eventually the result.

## Mixing Interference Pearlescent Pigments

The interference colours formed by pearlescent pigments must be treated as additive colours. Combining absorption and interference colours can create a variety of single- or dual-color effects. The presence of an absorption pigment used with interference pearlescent pigments produces intense specular reflection colors that give way to the color of the absorption pigment at non-specular angles. There is also a transmission color that combines the effects of the two pigments. Experimentation is suggested before use.

# IRIDESIUM

## Industrial Grade Pearlescent Pigments



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CHINA 223800

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