JUST PAINT

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From Mark Golden

Welcome to the 35th edition of our Just Paint newsletter. We have made significant upgrades on JustPaint.org to offer much more rapid updates to our technical resources for artists. Instead of waiting for the semi-annual Just Paint print edition, we now offer monthly articles online. Our annual print edition (also available digitally) will continue to offer significantly more in-depth articles covering our research and activities.

The first article is by Sarah Sands, Senior Technical Specialist. Over the last 8 years, since our acquisition of Williamsburg Handmade Oils, we have conducted our own research as well as consulted with colleagues in art conservation and conservation sciences to gain a better understanding of the role of Zinc White in oil paints. Sarah provides one of the most complete reviews for artists in the complex use of this historic color. This is a must read for oil painters!

Ulysses Jackson, Formulator, has been leading a long-term investigation into the lightfastness of several colors. We have been engaged with the ASTM Committee responsible for the quality standards for artist paints in an effort to update the almost 40-year-old research. Ulysses provides an in-depth look at our 'go to' Hansa Yellow colors, providing new insights into their permanency and introduces our new Benzimidazolone Yellows.

Greg Watson, Material Application Specialist, shares the launch of 7 new Williamsburg Oils – three warm, highly saturated hues, three transparent earth colors and a light color tint.

We are also delighted to share some of the recent happenings at GOLDEN, including a successful Benefit Auction for the Sam and Adele Golden Foundation for the Arts and our continued collaboration with Alliance for Young Artists & Writers for our Scholastic Residency Program.

As always, we welcome your comments! Warmest regards, Mark

Zinc Oxide: *Warnings, Cautions, and Best Practices*

By Sarah Sands

The use of Zinc Oxide in oils has been the focus of a lot of attention lately, especially around its potential to cause an increased rate and degree of embrittlement, cracking, and cleavage of oil paint films. Passionate positions have been staked out on all sides, while various studies have been cited and poured over, seeking confirmation that either all is about to crumble and crack or that the concerns are overblown and mistaken. But of course, there is also a more measured middle path through this sometimes-pitched battle – namely watchful and careful study, erring on the side of caution whenever possible, and most importantly, keeping everything in perspective and not overreacting.

In the pages that follow we will cover our own history and involvement with these issues and share the steps we are taking going forward. We describe the overall concerns with Zinc Oxide, which can be traced back to shortly after its introduction over 150 years ago, as well as some of the reasons why its use has persisted to the present day. We also present best practices for its use and answer some of the most frequent questions. Finally, we touch briefly on some of the past and current research that has convinced us to take these actions at this point in time. A much more in-depth review of the research and concerns about Zinc Oxide is available in an accompanying piece published on our *Just Paint* website, "Zinc Oxide - Reviewing the Research," as well as a more complete "Zinc Oxide: FAQ."

The Problem in Brief

At its most basic, the issue with Zinc Oxide in oils is that it is a highly reactive pigment that forms soaps in contact with free fatty acids found in drying oils, which can cause adhesion problems,

while its unique crystalline structure appears to inhibit or interrupt the full curing of an oil paint film, leaving it weakened and more susceptible to cracking. While the mechanisms involved are just now being understood, the fact that zinc was susceptible to these issues was known since at least the late 19th century (Petit 1907, Church 1890). Why these problems are suddenly more pressing today is partly the subject of this article and touched on later. For now, it's enough to know this general description.

Limits of the Problem in Acrylics, Watercolors

It is important to stress at the outset that the issues of embrittlement and Zinc Oxide are limited solely to oils and alkyds. There is no evidence of similar problems when using zinc in water-based paints, such as acrylics or watercolors, where it forms a stable film. That said, it is not known if using zinc in either of these systems would be safe as an underpainting for oils. It is simply not something that has ever been studied, although we have begun our own long-term testing in this area. Because of that, we do not recommend ever using zinc oxide in any material that will be used directly under oils. This would include not simply water-based paints, but any grounds, substrates, or even composite

materials where Zinc Oxide might be listed as a component, or where it exists as an anti-corrosion coating, such as found on galvanized metal.

GOLDEN's History with Issues of Zinc Oxide and Oils

GOLDEN became increasingly involved in the issues surrounding Zinc Oxide and oil paints once we acquired Williamsburg Handmade Oil Colors in mid-2010. At that time there were still only a handful of modern conservation studies focused on the brittleness of Zinc Oxide, although the topic had been gaining attention after 2007, when a 28-year study by Marion Mecklenburg, Senior Research Scientist at the Smithsonian, began to be publicized and discussed (Mecklenburg 2005, 2007). After consulting with Mecklenburg and other colleagues in the field, it was suggested that reducing the percentage of zinc wherever possible should lower overall risk and increase performance. While there was never evidence of a specific 'safe level' one could use, it was suggested to us and others that 15% was a reasonable target to aim for. This is something we did almost immediately, with the exception, of course, of Zinc White itself. With these new formulations in place, we soon started longer-term, controlled testing, although for oil paints, even initial results can unfortunately take many years to bear fruit and validate our decisions.

A Cautious Step Forward

As mentioned earlier, the core issues of brittleness and cracking involving Zinc Oxide had been well-known since the 19th century. So, in themselves those aspects were not particularly new, and research confirming them not particularly alarming. However, it had long been assumed by most painters and researchers that small additions were not only safe but could also play a desirable and beneficial role; a position that even today enjoys a broad and dedicated following. Indeed, even Mecklenburg, who is often seen as raising the awareness around the issues of zinc, stated that 'it makes some sense to add some zinc oxide pigment to the titanium dioxide in an effort to give the mixture some strength' (2005, p.18). With this backdrop, any new research or sudden change in recommendations would have to overcome the resistance of almost 150 years of practice supported by a wealth of empirical evidence. It was and remains a very high bar to overcome, and we believe one should approach overturning any longstanding practice with great caution. That said, after carefully weighing a lot of evidence over the last 7 years, we have decided to remove nearly all Zinc Oxide from our line of Williamsburg Oils. While this represents a significant change, we believe it is the right choice. Below we describe the specific changes you will see.

Removal of Zinc Oxide from All Color Blends

Starting February 2018, we have removed Zinc Oxide (PW 4) from all color blends, replacing it with Titanium Dioxide (PW 6) and carefully reformulated each one to match the originals as closely as possible. The one exception is Zinc Buff Yellowish, which could not be matched to our satisfaction and will sadly be discontinued. Although nearly all these colors, since 2010, had contained 15% or less of Zinc Oxide, the new zinc-free versions will be safer to use in a wider range of applications, while keeping the changes in their color, feel and handling to a minimum. (Table 1)

Zinc White and Titanium-Zinc White

While our color blends were one thing, Zinc and Titanium-Zinc White presented altogether different issues. Both continue to be significant and important colors for a lot of artists who have used them carefully and often without incident for many decades. In addition, zinc possesses unique properties that are not easily replaced. Because of that, during this period when research is still ongoing and often inconclusive, we felt it was more important to educate artists about the known risks of using Zinc Oxide than to remove it completely from our offerings. This situation is not unlike other art materials, such as rabbit skin glue or Alizarin Crimson, which have been used for even longer periods of time despite being linked to equally well-known problems.

While we are currently committed to making Zinc and Titanium-Zinc White available to artists, we will be selling them only in 150 ml tubes. In addition, we will discontinue completely our Silver White and SF Silver White (linseed and safflower versions of a lead white – zinc oxide blend), as well as the safflower-based SF Titanium-Zinc. By greatly limiting the number of products containing zinc, as well as the sizes they come in, we hope to reduce the casual or inadvertent use of Zinc Oxide while still making it available to those who truly want it and understand the risks involved.

New Zinc-Free Versions Available
Persian Rose
Naples Yellow
Titan Buff (formerly Zinc Buff)
Brilliant Yellow Pale
Naples Yellow Reddish
Jaune Brilliant
Canton Rose
Montserrat Orange
Provence Violet Reddish
Provence Violet Bluish
King's Blue
Sevres Blue
Turquoise
Sold in 150 ml Size Only
Titanium-Zinc White
Zinc White
Being Discontinued
Zinc Buff Yellowish
Silver White
SF Titanium-Zinc White
SF Silver White

Table 1 – List of colors being reformulated, discontinued, or limited in offerings due to Zinc Oxide change.

New Labels

The 150 ml tubes of Zinc White and Titanium-Zinc White will showcase a new warning on the front and back of the label stating clearly that "Zinc Oxide is linked to embrittlement and cleaving of oil paint." (Image 1) By placing the warning prominently on the front, in multiple languages, we hope it will be a highly visible and clear statement that can raise artists' awareness of zinc issues. We will also encourage people to go to our website for more information about best practices and a complete FAQ section.

Image 1: New Zinc White Label on 150 ml tubes

Testing and Research

Current conservation literature is too large to be fully summarized here. References to some of the major papers are included in the bibliography at the end, while our online article, "Zinc Oxide - Reviewing the Research," offers a more complete review of recent studies at JustPaint.org.

Although some conservation articles written between 2000-2007 mention Zinc Oxide, most were concerned with metallic soaps in general and their ability to form mobile aggregates or surface efflorescence, with lead soaps being decidedly the main focus. The major exception to this was a number of articles written by Marion Mecklenburg during this timeframe on the changing mechanical properties of various oil paints, with Zinc Oxide consistently highlighted as an example of an extremely brittle film that could cause structural problems (2005, 2007). This embrittlement could develop in as little as three years, and was found even when zinc was blended with other pigments. Along with cracking, Mecklenburg also showed that layers with substantial amounts of zinc were in danger of delamination from acrylic grounds. By 2010 this work began to be built on by other researches (Maor, Rogala, Osmond) and the original findings, which had focused on controlled lab samples, started to find frequent and powerful confirmation in case studies on specific works as well as broader surveys of museum collections focused around paintings from the mid-20th century. Repeatedly researchers found strong correlation between the use of Zinc Oxide and decades later, areas of flaking, cracking, and peeling paint. Running in parallel with this widening interest in the conservation community, the research eventually found a widening audience among artists, discussion forums, and manufacturers (O'Hanlon 2007).

As we mentioned, our own research did not get underway until late 2010, with our entry into oil paint manufacturing, and has focused primarily on the testing of our paints applied to canvas, drawdown cards, polyester film, and primed aluminum panels. Tests have included the simple flexing and bending of the cards by hand to more controlled mandrel testing, where paint applied to different surfaces can be bent over a dowel or cone to provide a reading of flexibility. (Images 2-4) Like other researchers, we found that the vast majority of the zinc-containing paints became measurably more brittle as they aged, but exceptions did pop up, so invariably more time and more variations in how the paints are formulated and applied will be needed. Overall, seven years is an extremely short period of time for a study like this, and we expect that the degree of brittleness will continue to increase with time.

In the end, even as provisional as they are, the results from our own tests, as well as the growing conservation literature on zinc, have been compelling enough for us to

Image 2: All samples are 6 mil drawdowns from 2010-2011. Flake (top left) and Silver White (bottom left) are on aluminum panels bent over a cone. Titanium (top right) and Titanium-Zinc White (bottom right) are on polyester film bent over different diameters of dowels and rolled edges. Flake White showed no cracking, while Silver White, made with Lead and Zinc, showed extreme brittleness. Titanium White, which is zinc free, remained flexible even when bent over 1/8", while Titanium-Zinc cracked easily at 1".

Image 3: All samples are 6 mil drawdowns from 2010 on polyester film and bent over different diameters. Cadmium Red Light (top left), made without zinc, remained extremely flexible and could be easily bent over a 1/8" diameter rolled edge. In contrast, Zinc Buff (top right) started to crack at 1", King's Blue (bottom left) at 5/8", and Naples Yellow Reddish (bottom right) easily snapped in half at 3/4". Both of these blends had zinc in them.

Image 4: All samples are 6 mil drawdowns from 2011 on primed aluminum cards bent over a cone. Red Ochre (top left), a natural iron oxide, remained very flexible. By contrast, Zinc Buff Yellowish (top right) showed substantial cracking and signs of delamination. Sevres Blue (bottom left), made with zinc oxide, showed fine parallel cracks that remained anchored to the ground, while Jaune Brilliant (bottom right), also made with zinc, showed extreme cracks and complete adhesion failure.

feel that Zinc Oxide should be removed from the majority of our paints, and that artists should be better informed about the risk of using paints containing zinc.

How Exactly Does Zinc Oxide Cause the Cracking?

The actual mechanisms which cause zinc to form a brittle paint and have a high risk of cracking or delamination, are still a subject of research but a broad picture starts to emerge. Most oil paints, as they cure, form an intricate web of intermingled, crosslinked chains of fatty acids. However, the particular crystalline structure of Zinc Oxide is believed to interfere with this process. Its stiff and plate-like layers are densely packed and appear to entrap unsaturated free fatty acids, preventing them from oxidization and crosslinking. They are essentially cut off from connecting to the rest of the polymer network. Because of this, the film remains structurally fragile, with hard and brittle formations only weakly linked to each other. This makes the zinc-bearing paints very prone to cracking, as well as intralayer cleavage, where a single layer of paint splits in two, as opposed to separating from another layer below it.

Finally, Zinc Oxide is also an extremely reactive pigment that rapidly creates metallic soaps from the fatty acids found in drying oils; a process known as saponification. The dangers from these soaps are two-fold. They can form agglomerates or pustules that interfere with the appearance of a painting by becoming mobile and breaking through to the surface. In this they are not unlike lead soaps, which have shown similar issues, albeit over a longer period of time. More importantly, these soaps seem to display a preference to accumulate at the interfaces between layers of paint, or between the paint and ground, and therefore linked to instances of delamination and peeling. (Osmond, Rogalla)

The Benefits of Zinc Oxide – Past and Present

While many of the problems with Zinc Oxide were known from the beginning, it still gained popularity for a variety of reasons that are important to keep in mind as the issues with zinc have always involved a wrestling between pros and cons, benefits and risks. Below we touch on the traits most commonly cited in the literature.

Pros

Harder Paint Films

Zinc White was often added to other colors to help provide a harder, less marrable surface, especially in paints that created notoriously soft films, like Titanium White, or which were particularly vulnerable to weathering outdoors. We see this mentioned repeatedly in the commercial literature and highlighted by the manufacturers of zinc oxide at the time. And this use continues to this day.

Ease of Milling and Pigment Dispersion

The reactive, soap-forming nature of zinc allows for easier and more efficient dispersing and wetting of pigments, especially ones that might otherwise be difficult to mill. Because of this, whenever Zinc Oxide is removed from a blend, or the percentage greatly reduced, it will usually require additional milling and effort to achieve the same color development. In the past, zinc stearates were commonly used as a dispersing agent for commercial and fine art paints.

Less Yellowing

Zinc Oxide greatly decreases the amount of yellowing associated with other white pigments, such as lead or titanium white, both in terms of the permanent yellowing that occurs with aging, as well as the more temporary phenomenon of dark yellowing. This property is still utilized by paint manufacturers and is certainly one of the reasons – along with film hardening – that the combination of titanium with a small percentage of zinc white is among the most popular blends.

Other Benefits in Commercial Paints

A number of other benefits were primarily important to the commercial house paint industry and had little to do with artists' oil colors per se. These included its ability to act as a mildewcide, to stabilize house paints being sold in cans, as well as provide washability, scrub resistance, and both moisture and UV protection. With the broad use of Zinc Oxide in commercial paints through at least the 1950s, it was only a matter of time before many of these products would be used by artists interested in industrial materials or simply seeking cheaper alternatives in larger, convenient sizes. So the two fields are not completely separate, and a lot of current conservation and art materials research builds upon the initial research literature generated by the commercial coatings industry.

In-Between

Transparency

While the greater transparency of zinc was sometimes seen as a problem, especially in commercial applications where opacity and coverage were critical, it was also a trait that many artists prized as it allowed for cleaner, less chalky tints. It could also be used to modify the extreme opacity of Titanium to create a more general mixing white.

Slow Drying

Whether drying slowly is listed as a benefit or fault depends a lot on what one wants. But certainly for some artists its extended open time was helpful and sought after as a way to facilitate wet into wet blending and allow for more extended painting sessions. However, in commercial paints this trait was seen as an issue, while for artists it could make layering much more complicated.

Cons

Brittle Paint Films

While creating a harder surface was included as one of the benefits, that trait is also inexorably linked to its main weakness: the production of very brittle paint films. Of all the whites, Zinc Oxide is the least flexible and the most prone to cracking and delamination. Those failures can occur from internal stresses within a painting, as well as external ones caused by bending, flexing, stretching, vibration, shocks, or large changes in environmental conditions.

The most common way to represent a paint's flexibility is through stress/strain curves, where the percentage of stretching, or strain, is plotted along the x-axis, and the force required to cause that movement along the y-axis. The absolute minimum amount of strain an artist material should be able to accommodate is generally placed at a half percent (.5%). As you can see in the following diagram, Zinc Oxide fails to even reach that percentage. Titanium White, it should be noted, is only marginally better, while lead white is clearly the most flexible of the options. (Figure 1)

Reactivity and Metal Soaps

As described earlier elsewhere, Zinc Oxide is very reactive and will quickly form metallic soaps from free fatty acids found in oil paints. These soaps appear to accumulate at the interfaces between one paint film and another, or between the paint and the ground, where it can cause issues with adhesion. In addition, over the long term, zinc soaps can also form mobile aggregates that migrate to the upper layer, causing ruptures and unsightly blemishes.

Best Practices

Coming up with a set of Best Practices is difficult on several fronts. First, it is impossible to predict what any one painting will do, especially given our current understanding and the complexity of the issues involved. Secondly, current conservation research has not identified a safe level of zinc, or reached consensus on all the factors that might lessen or increase the risk of cracking and delamination. So what remains is undeniably broad and general.

To limit problems linked to the use of Zinc Oxide, we would recommend the following:

- Use zinc sparingly and only when needed.
- Do not use it in underpaintings or lower layers.
- Keep applications thin. Do not apply thickly.
- Avoid stretching, bending, or flexing of the surface.
- Limit shipping whenever possible due to the potential for vibration, sudden shocks from dropping, or extreme changes in environmental conditions.
- Protect the paintings from anything pressing from the rear by using a backing board. Likewise, when shipping or moving, protect the front by use of a travel frame or shipping collar.
- Maintain the painting in as stable an environment as possible, following similar ranges recommended for museums and galleries of 16-25°C (60-77°F) and 40-60% RH.
- Work on an inflexible support. Ideally, one that is unresponsive to humidity and temperature, such as aluminum composite panel.

Overview

Removal of Zinc Oxide from 13 color blends, as well as the discontinuation of 4 others, is a big change and not something we have undertaken lightly. While the problems associated with zinc have been known for more than a hundred years, researchers are only now fully understanding the risks, even with levels of zinc that were once thought to be safe. For many painters this may raise a new level of concern about artwork they have done and paints they have purchased. We understand that and try to address both of those questions in "Selected FAQ". (page 6) At the same time, we are not ready to abandon Zinc Oxide as it provides benefits not easily replaced and the research is still ongoing and critical questions remain unanswered. Because of that, we will continue to offer both our Zinc and Titanium-Zinc Whites in larger tubes, but with new warning labels stating clearly that Zinc Oxide has been linked to cracking and the cleavage of paint films. We are taking this last step because we strongly believe that painters should be fully informed about the risks of using zinc while still being allowed the option to use it on their own. In the future we will know more – whether there are safe levels of zinc, or at least safer ways to use it.

Until then, we will continue to follow the research and conduct our own studies and make that information available to you. In the meantime, if you have questions or concerns, please contact us at help@goldenpaints.com or by calling 607-847-6154 / 800-959-6543.

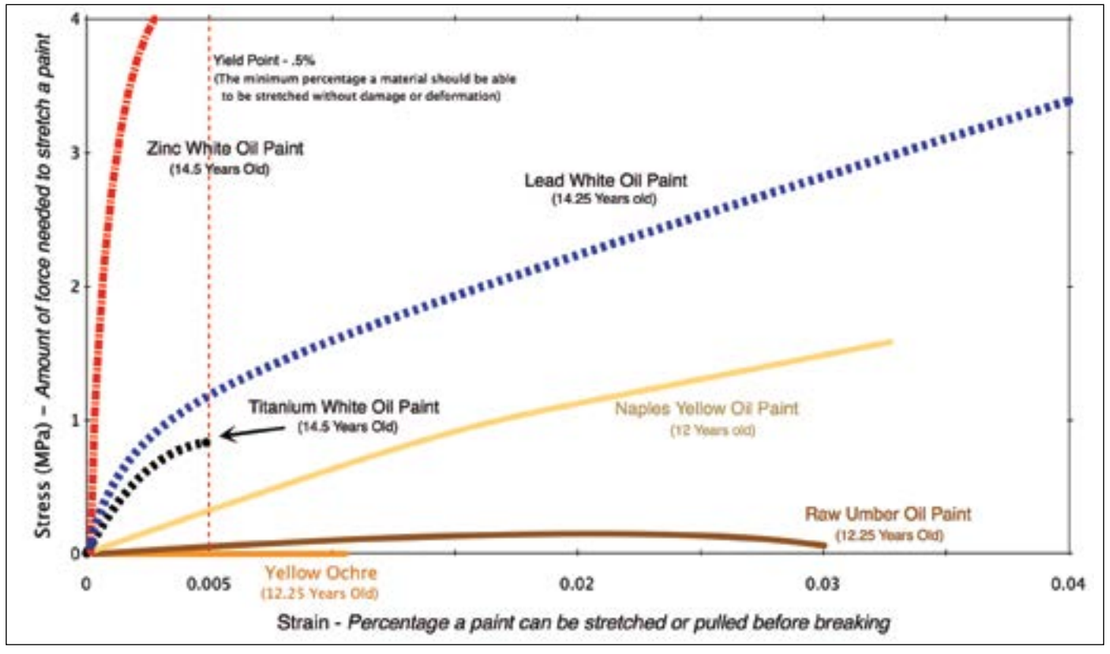

Figure 1 – Brittleness of Zinc White compared to Titanium White, Lead White, and other oil colors. Data adapted from testing done by Marion Mecklenburg, Senior Research Scientist, Smithsonian Institute, Washington DC.

Selected FAQ

I used Williamsburg paints containing Zinc Oxide in my painting. What is going to happen to it? What about works in galleries and collections?

There is really no way to predict what might happen to any particular painting. There are simply too many variables. Keep in mind that the majority of paintings containing some level of zinc still appear to be fine, and there might be any number of factors beyond simply using Zinc Oxide that could greatly lessen or increase the risk. The best thing to do at this point is to keep it in a stable environment and try to avoid any flexing, stress, or keying out of the painting. Never roll the painting and try to limit any shipping, where the piece will be exposed to vibration and shocks. Anyone who currently owns or deals with oil paintings containing Zinc Oxide should handle them with extra care and monitor them closely for any signs of cracking or cleaving. If signs of these appear, a conservator should be consulted about possible treatments.

What should I do with any Williamsburg paints I own that contain zinc?

We are happy to exchange any of our paints containing Zinc Oxide for one of our new zinc-free formulations or for any other color of similar value.

How do I tell if there is zinc in my paints?

We list all the pigments for each of our paints on the label. This practice is followed by most manufacturers but is not a legal requirement. If you have any questions about any of your paints, we recommend contacting the manufacturer of that brand for more information.

What other white can I use that is most similar to zinc?

In terms of translucency, the best options are Flake White (made with basic lead carbonate) or our Safflower Porcelain White (made with PW5, lithopone). Neither of these, however, will lessen yellowing nor appear as cool in temperature – properties unique to Zinc White.

What percentage of Zinc Oxide is in your current Titanium-Zinc White?

While there is currently no acknowledged safe level of zinc in conservation literature, we have continued to reduce the percentage to a minimum and still achieve the benefits of adding Zinc Oxide to Titanium White – namely less yellowing and a harder, less tacky surface. Starting in February 2018 that percentage has been set at 2% by weight and we will continue to make further adjustments as needed based on testing and research.

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Williamsburg Welcomes 7 New Colors

By Greg Watson

Williamsburg Handmade Oil Colors is excited to introduce seven new colors to its line-up: three warm, highly saturated hues, three transparent earth colors and a light color tint. Bismuth Vanadate Yellow, Pyrrole Orange, Pyrrole Red, Nickel Azo Yellow, Transparent Yellow Iron Oxide, Transparent Red Iron Oxide and Titan Buff all have ASTM lightfastness ratings of 1, which is considered Excellent. With the exception of Titan Buff which is a blended color, the other six are all single pigment, synthetic, modern colors that have been offered in our QoR® Watercolor and GOLDEN Acrylic lines for many years. Bismuth Vanadate Yellow, Pyrrole Red and Pyrrole Orange are all dense, opaque colors that offer an alternative to Cadmiums, as well as being more durable than our Permanent Yellows and Fanchon Red. The Transparent Yellow and Red Iron Oxides are made from the same pigments we use to produce Stil De Grain and Brown Pink respectively but are milled to a very fine, smooth consistency. These tightly milled versions have been available as special edition colors since 2015, but due to increased demand, are now available as standard colors. Nickel Azo Yellow offers a unique color quality with a dramatic shift between earthy brown masstone to luminous yellow undertone and tints. Lastly, Titan Buff replaces Zinc Buff as a slightly pinkish cream color, convenient for warm tints and bright neutrals.

Bismuth Vanadate Yellow:

Bismuth Vanadate (PY 184) came into use as a pigment in the mid-1980's. This synthetic, inorganic color is a bright, cool to middle temperature yellow. It occupies a color space between Cadmium Lemon / Cadmium Yellow Light and Permanent Lemon / Permanent Yellow Light. The opacity and density of this color is closer to Cadmiums, making even our Permanent Yellows feel very translucent in comparison. This is a knockout color that will truly expand one's gamut when making greens. Additions of the smallest amounts of Phthalo Blue will create sprightly spring-time greens while Ultramarine Blue will yield more muted earth greens. Bismuth Vanadate is a wonderful addition to the palette for keying up colors in need of warmth and density. (Series 7)

Pyrrole Red:

Diketopyrrole-pyrrole (PR 254). Pyrroles are synthetic organic pigments and like Bismuth Vanadate, were introduced in the 1980's. They are highly resistant to fading and have proven their salt in the automobile industry. In our line, Pyrrole Red finds its color space between Fanchon Red, Cadmium Red Medium and Cadmium Red Deep. As mentioned, it is a dense, opaque paint that feels very much like the Cadmium Reds with similar tinting strength, but mixes to a cleaner pink. This could be an important alternative to anyone wanting to avoid cadmiums because of concerns with heavy metals. Compared to Fanchon, Pyrrole Red is more opaque and lightfast, a bit darker in masstone and tints to a cooler pink. Overall it is a deep middle red that becomes warmer when made into a wash and cooler when tinted with Titanium White. (Series 4)

Pyrrole Orange:

Diketopyrrole-pyrrole (PO 73) belongs to the same chemical family as Pyrrole Red and has a very similar feel and working qualities. It is more lightfast than our current Permanent Orange, more vivid and a touch more opaque. Like its red cousin, Pyrrole Orange provides a non-Cadmium alternative to Cadmium Orange or Cadmium Red Light. (Series 7)

Nickel Azo Yellow:

Nickel Complex Azomethine (PY 150) is a chemical cousin to Williamsburg's Green Gold, which is a Copper Complex of Azomethine. Like Green Gold, Nickel Azo Yellow has a similarly dynamic color quality. A difficult color to pin down, its almost angle-dependent masstone seems to shift from slight greenish brown to a nut-like orangish-tan. This color is strikingly different in masstone from the undertone and tint. When scraped thin it is an absolutely stunning brilliant yellow which can be scumbled onto the surface without the additions of medium, as a chromatic golden veil or used in glazes to saturate and warm up an

underpainting. When added to white it turns to a unique mustard yellow, similar to the colonial yellows used on houses and primitive furnishings. Cooler than any other transparent yellow, including Cobalt Yellow and Transparent Yellow Iron Oxide. (Series 6)

Transparent Red Iron Oxide:

Synthetic Iron Oxide (PR 101). Transparent Red Iron Oxide is the smooth version of our Brown Pink. In masstone it is reminiscent of dark chocolate or layers of aged varnish. This color contains a fiery glow throughout. The undertone is deep like oxblood or rust – a luminous red revealed when scraped or used in glazes. Tinting with white yields a variety of oranges and pinks. Mixes beautifully with Ultramarine Blue to make everything from neutral grays to flesh tones. Central to landscape and portrait painters. This color is brighter and cleaner than natural iron oxides. (Series 4)

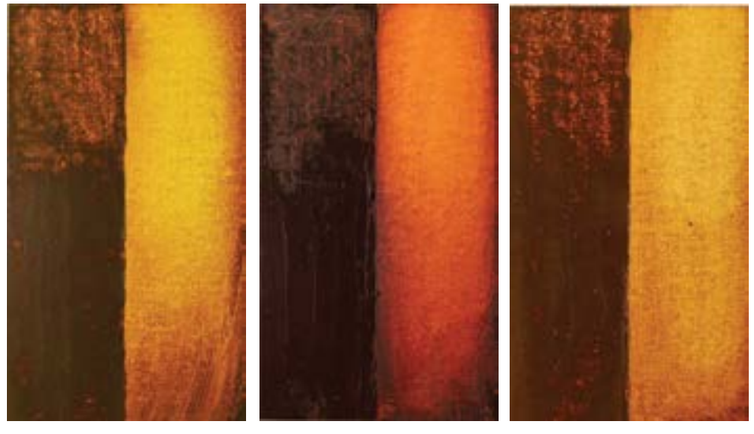
Transparent Yellow Iron Oxide:

Synthetic Hydrated Iron Oxide (PY 42) is the very fine, smooth version of our Stil De Grain. This color space is a cornerstone for painters doing landscape and portraiture since it provides a stronger, cleaner tint than equivalent hues such as Raw Sienna or some Yellow Ochres. The masstone of Transparent Yellow Iron Oxide is the color of a French style, brown leather club chair – a luminous brown with a hint of orange in the undertone. It is the glowing transparency of this color that differentiates this iron oxide from the more muted and opaque synthetic Mars or natural earths. Scraped thin, the undertone is like a stained glass version of Raw Sienna and when tinted with Titanium White, it brightens through warm caramels into pinkish creams. (Series 4)

Titan Buff:

Titanium Dioxide, Synthetic Hydrated Iron Oxide, Synthetic Iron Oxide (PW 6, PY 42, PR 101). With the removal of zinc oxide from all the Williamsburg blends, this color has been reformulated and renamed. Previously called Zinc Buff, this very pale, pinkish cream color is now made with Titanium White as the only white in the mixture. It still has the bright warmth of its predecessor and is a go to color for tinting without the cool, chalkiness of straight Titanium. It is perfect to use on its own, or for mixing light mass and highlights as they appear in warm light. (Series 1)

With ever changing availability and new developments in pigment manufacture and conservation, Williamsburg seeks to use every opportunity to improve our line and offer a full range of colors that are lightfast and stable, as well as useful. It is our hope that these new additions will provide entry into some hard to mix color spaces and greater opportunity for transparent and opaque application. We hope you enjoy these new colors! We look forward to hearing your feedback.



Masstone and undertone applications of transparent colors. The paint on the left was applied in full thickness with a palette knife and then scraped to the canvas at the top of the strip. The right side was applied thinly with a brush and then wiped away to show the undertone of the transparent color. Nickel Azo Yellow (left) is a complicated, wide ranging color with a greenish brown masstone with a hint of glowing red beneath the brushstroke. The undertone transitions from an earth orange to a chromatic, almost astringent, brilliant yellow. Transparent Red Iron Oxide (center) is a deep transparent red brown with a fiery red glow. The undertone ranges from glowing earth red to blazing orange. Transparent Yellow Iron Oxide, (right) by contrast, is much warmer, yellowish brown. It is a transparent chestnut brown with a slight reddish bias in the masstone and a clean earth yellow undertone.

Always Striving for the Best

The Introduction of Benzimidazolone Yellow Medium (PY154) & Benzimidazolone Yellow Light (PY175)

By Ulysses Jackson

Golden Artist Colors is a company that has a very clear goal of making the best artist paints possible! In a time when so many companies see how far they can reduce quality before a consumer notices, GOLDEN continues to resist this trend and make improvements wherever possible regardless of cost. Artists and conservators place their trust in our materials because of our reputation and we take that trust very seriously! To remain at the forefront of our field, in the Lab at GOLDEN we constantly conduct tests and perform research projects to try to further improve the materials we produce by looking at features like stronger tint strength, brighter masstone, improved artist experience, or even striving to create something completely new for the marketplace.

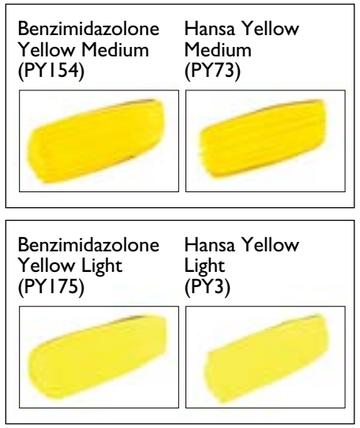
In production there are various ways we monitor our quality, starting with a detailed incoming raw material analysis protocol, all the way through to ongoing re-checks of retained samples for long term shelf stability. Additionally, in Research and Development we bend paint, freeze paint, heat paint, peel paint, scratch paint, scrub paint, soak paint, stain paint, stretch paint, and give paint "suntans". The last of which, for the purposes of this article is what we will focus on most.

On an ongoing basis we subject cured paint films to both actual and simulated sunlight through glass to verify the lightfastness of colors. So it was a surprise to us that in recent testing we started to see results from our old friends Hansa Yellow Medium (PY73) and Hansa Yellow Light (PY3), which were unexpected and sparked a desire to understand what may be going on. Our testing also led us to develop some additional improved options in the same color space for the artist.

As the author knows that our readers fall into two general camps - those who love detailed data and those who simply want to paint, we thought it appropriate to summarize the article that follows before it starts.

Summary

While GOLDEN educates artists about these new colors, Benzimidazolone Yellow Medium (PY154) and Benzimidazolone Yellow Light (PY175), we will continue to sell Hansa Yellow Light (PY3) and Hansa Yellow Medium (PY3) as they have a wide following, and are unique in their qualities: tinting for Hansa Yellow Medium and the Masstone for Hansa Yellow Light. However, as it is our belief to give our consumers the most accurate information possible we will change the lightfastness rating on the label to the word "Fair" in order to reflect the test results we observed.



It is also very important to remember that accelerated ageing is just that and if given a lower energy input over a longer time, such as a display in one's house, Hansa Yellow Medium PY73 and Hansa Yellow Light PY3 may not show the same degree of change. Unfortunately, as there is rarely an unexposed control or detailed notes on mix ratios, we are unable to look back and test this in a methodical way. What we can say, is older paintings we have reviewed on display containing various Hansa Yellows still look yellow. Artists have been using these colorants a long time and commonly due to yellow being a weaker tinting material overall, it is incorporated in mixes at larger quantities which would further reduce the risk of dramatic change. That said, should an artist feel concerned with the continued use of the two Hansa colors PY73/PY3 mentioned in this article and want to have their material replaced, simply contact a Materials and Application Specialist at GOLDEN and we would be more than happy to assist.

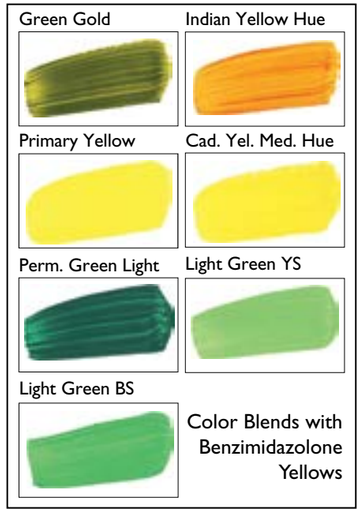
Before we get into the nitty-gritty of the testing and why we are changing color blends, let's first introduce these two new colors next to their coloristic cousins (left).

Reproducing images of paint, digitally or in CMYK ink, inherently reduces any subtle differences that would be observed in use, but one can still see that Benzimidazolone Yellow Medium (PY154) offers a very similar masstone to Hansa Yellow Medium (PY73) as well as coloristically similar tints. However, it is moderately weaker in tint strength and does not offer the dye-like brightness of Hansa Yellow Medium (PY73) in glazes.

Benzimidazolone Yellow Light (PY175) is very similar to Hansa Yellow Light (PY3) for color overall with the main difference being noticed in the masstone, where Hansa Yellow Light (PY3) is a very clean green bias hue right out of the tube, and Benzimidazolone Yellow Light (PY175) requires the slightest touch of Titanium White (PW6) to bring out its greener qualities.

One may ask themselves, "GOLDEN, why the super hard to pronounce, tongue-twister names? Enjoy the challenge to fit long words on the label?" Well, we also asked ourselves those questions and tried a lot of shortened versions, but in the end we feel the only way to correctly describe the chemical structures[1] and differentiate these colors from other yellows is to give the full names. But like many of the other colors where GOLDEN provides the full chemical names, it does not mean that you, the artist, have to say them. Around the shop various nicknames have already been tossed around. Some gaining in popularity are Benz Yellow, Benzi Yellow, and Bedazzle Yellow. If and when artists come up with their own variations, we would love to hear them!

With the introduction of Benzimidazolone Yellow Medium (PY154) and Benzimidazolone Yellow Light (PY175), we also gained the ability to reformulate the following 7 blends to include Benzimidazolone Yellow Light (PY175) for improved lightfastness. Artists who are used to these colors can

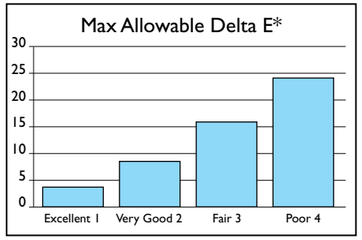


see that even though the components shifted a little, the masstone and tint are very close to the previous version of the same name.

The updated color blends basically look the same and the two Benzimidazolone Yellows look a lot like the existing Hansa Yellow Light and Medium colors so why go through all the effort to change? This is where being a scientific and data driven company comes into play, and what follows relates to a larger issue of testing for lightfastness.

It is expected, by the artist, that when they paint something it will look very similar for future generations if kept in gallery lit conditions[2] (fairly low lux). Unfortunately, as a manufacturer we do not have the luxury (pun intended) of a hundred years to develop and release new materials, so we impart accelerated ageing conditions to highlight potential weaknesses. This testing is done based on the longstanding ASTM test method D4303 where paint samples are subjected to natural daylight under glass in Arizona or Florida during specific months of the year (October to May) until they receive enough energy required to reach a measured value of 1260mj/m^2. Separately, samples are placed for exposure in a Xenon arc light chamber with a glass filter until 510kJ/(M^2·nm) is reached. Xenon chambers are very fast and can be run year round. Often it is necessary to initially rely on a Xenon data set and then follow up with exterior testing under glass in order to confirm our findings. As Sarah Sands relays in her www.justpaint.org article, Lightfastness Testing at Golden Artist Colors , "This specific level of exposure was originally chosen by ASTM because it gave results that corresponded to the degree of fading seen in various pigments, such as Alizarin Crimson and Rose Madder, found in historical paintings going back over a century."[3]

A very important detail in relation to ASTM D4303 is that it is not explicitly required in the standard to do formulation specific testing, as there is a list of accepted Lightfastness ratings for previously submitted pigments within specific mediums. This means if a supplier is using a pigment that is accepted into the standard they only have to look up the ASTM rating for the pigment's chemistry in question and list that rating on the tube. This may lead to issues over time because the majority of pigments were submitted to the ASTM standard many years ago and some pigments may have changed for the better or worse since. These changes could be due to shifts in manufacturing and processing practices at the level of a pigment suppler, in which they may be trying to increase tint or looking to decrease processing times.



Graph 1 – Representation of change allowed from an unexposed control for ASTM lightfastness levels

ASTM 1 ASTM 2

Lightfastness ranges are based on the total measured change from an unexposed standard. This is referred to as Delta E* and follows the maximum differences listed in Graph 1 (above). When applied to material packaging and literature one would see it listed in one of the following ways: ASTM Lightfastness followed by a number, as sun symbol with a number (as shown above)[5], or

Blue wool zone	Photo unexposed left, exposed right	DE* [4]	ASTM Lightfastness equivalent
8		.93	1 (DE* 0-4) Excellent (low to middle of range change)
7		3.40	1 (DE* 0-4) Excellent (far end of range approaching a LF 2 rating) (DE* 4-8)
6		8.72	3 (DE* 8-16) Fair
5		18.82	4 (DE* 16-24) Poor
4		18.64	4 (DE* 16-24) Poor
3		50.32	5 (DE* 24 and up) Very Poor
2		51.12	5 (DE* 24 and up) Very Poor
1		70.63	5 (DE* 24 and up) Very Poor

Figure 1 – Blue Wool Standard before and after Xenon exposure.

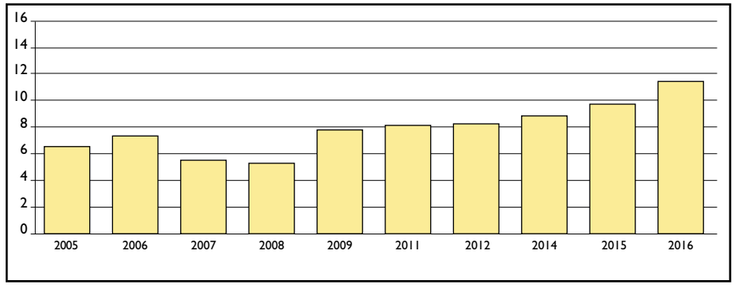
an equivalent descriptive word when necessary. An example of when a word may be required could be when a pigment is tested following ASTM D4303 protocol but is not yet officially accepted by the ASTM Committee. If one wishes to understand more about how the Delta E* is calculated we would recommend reading "Delta E: A Key to Understanding Lightfastness Readings" by Sarah Sands [6].

A common and historic way to monitor and visualize changes in UV energy was to include the blue wool standard. This reference consists of various cloth samples which were dyed using colorants of varying integrity, in such a way that they fade at specific rates in sunlight. With the rise of very precise spectrophotometers, allowing for measurement of change from an unexposed standard, blue wool has become less frequently used as a reference. For demonstration purposes, to allow ease of visualization, we exposed a blue wool standard for the full duration of Xenon energy required to meet ASTM D4303 in Xenon[7, 8]. In Figure 1 (page 10, bottom right) we can see a really nice representation of how various levels of change may appear. It is commonly stated that a DE* value of 1.0 is the amount of change an untrained human eye can detect, which may be helpful when looking at the numerical and visual changes displayed.

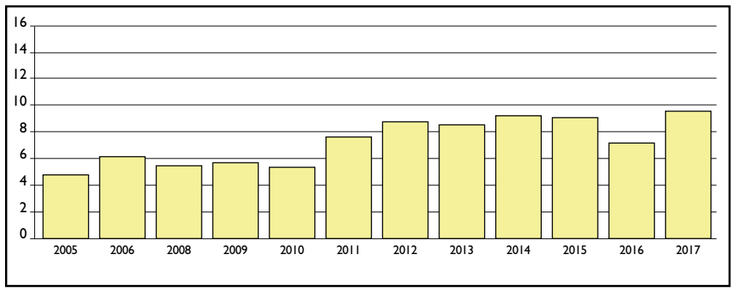
Now that we have reviewed what lightfastness ratings are and how they were achieved, let's take a look at the test results that gave us pause regarding Hansa Yellow Light (PY3) and Medium (PY73). In a recent test where we wanted to see how all the current batches of Heavy Body Acrylic colors were fairing in lightfastness, we submitted every color we produce as supplied, mixed with white to an equal max absorbance of 40% (as measured by a spectrophotometer), and also a light valued version of 25:1 Titanium White (PW6) to color. To half of each sample we applied an Isolation Coat (Soft Gel Gloss 2:1 water) and Varnish (MSA Varnish Gloss 3:1 MSA Solvent). These samples were then exposed in Xenon, Arizona under glass, as well as placed outside without glass for direct weather testing both in South Florida and at the GOLDEN factory in New Berlin, NY, for various months and years of testing. To give the reader a sense of the amount of labor required for this type of test array it should be mentioned that we created around 3,000 separate applications on primed aluminum cards for exposure! We do these tests because we want to go above and beyond for our customer as well as make sure we are still performing where we would expect. From this test series we received a very large amount of comforting data but also a few surprises!

Colors used in tints	Max Absorbance	DE* Xenon	DE* Arizona	Listed ASTM LF rating per D4303
HB Hansa Yellow Light (PY3)	40%	11.34	6.82	ASTM LF 2
HB Hansa Yellow Medium (PY 73)	40%	11.18	9.06	ASTM LF 1
HB Hansa Yellow Opaque (PY74)	40%	4.56	2.45	ASTM LF 1

Table 1 – Lightfastness results of PY74 vs. PY3, and PY73 in tints.



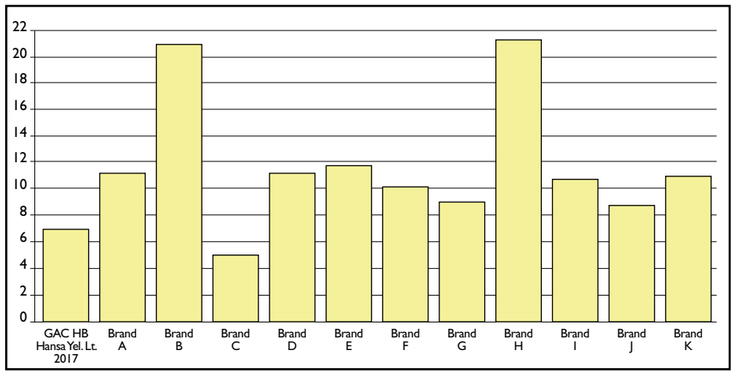
Graph 2 – Hansa Yellow Medium (PY73), Xenon lightfastness results of tinted historical samples.



Graph 3 – Hansa Yellow Light (PY3), Xenon lightfastness results of tinted historical samples.

As one can see from Table 1 (left), Hansa Yellow Opaque (PY74) tested very close to an ASTM LF1 in both Arizona and Xenon testing, and the follow-up of multiple lot testing in Xenon arc returned values ranging from DE* 2.7 to 3.81, all of which in relation to the Arizona test results of DE* 2.45, still provide us confidence in Hansa Yellow Opaque's listed ASTM rating. But the values returned for the other two Hansa Yellow colors gave us pause. While listed as ASTM LF1, looking back at some historical lots (Graph 2, left) at 40% in Xenon testing we started to see a trend of Hansa Yellow Medium (PY73) moving from the equivalent of a LF2 rating to what would be considered LF3 or Fair when mixed 40% with white.

For Hansa Yellow Light (Graph 3, left) we saw a more surprising degree of change that made us want to look not only at our historical batches but also how PY3 paints from other competitors performed. In reviewing historical batches of Hansa Yellow Light (PY3) we see performance that is in line with ASTM LF2 until 2012 when we start to see results trend above the delta 8 maximum. There was also a parallel increase in Tint strength that may possibly relate to more fine dye like particles being present in the pigment.

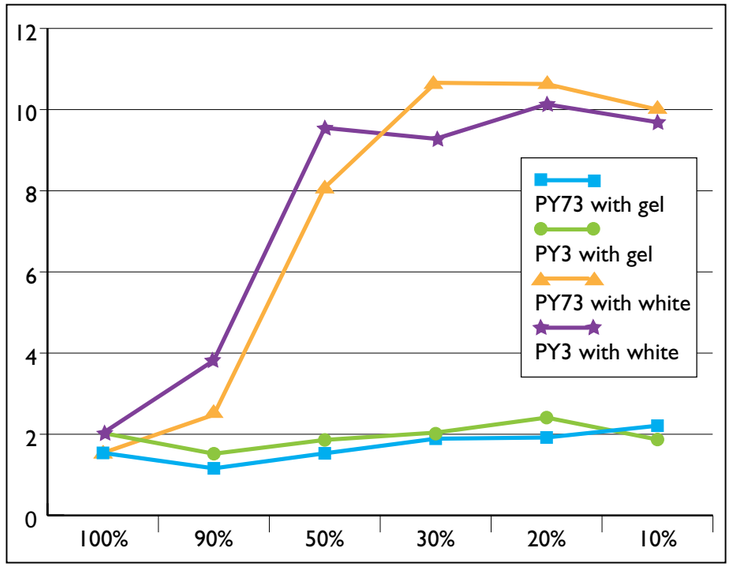


Graph 4 – Hansa Yellow Light (PY3), Xenon lightfastness results of tinted historical samples.

In Graph 4 (above) we see that across brands PY3 mixed to 40% reflectance (with their own Titanium White (PW6)) performed fairly similarly for change with three exceptions, two of which performed much worse and one that performed much better. However, the exception that performed better was very weak in tint strength requiring over 200-500% more color than the other brands to reach the same 40% tint. This may mean that there is dramatically more medium present in the system acting to insulate the pigment, or the crystal structure of the PY3 being used is larger.[9]

It should also be mentioned that in lightfastness testing of Williamsburg Oil paints and QoR® Watercolor we observed that colors containing PY3 performed well for lightfastness and we do not have any concerns for using these colorants in those systems at this time.

The interesting thing is that the masstones of Hansa Yellow Light and Medium continue to test very well, which made us wonder whether the weakness of the pigment is a result of negative synergy between Titanium White (PW6) and the organic pigments.[10] In order to pursue this further we made various blends of each yellow with different ratios of Titanium White (PW6) and separately Regular Gel Gloss. (Graph 5, below). The results from mixtures with Regular Gel Gloss are fairly night and day with even as low as a 10% addition of color offering degrees of change that if in a tint, would fall within the ASTM LF1 rating.



Graph 5 – Comparison of lightfastness of PY3 and PY73 mixed with various amounts of Regular Gel Gloss and Titanium White (PW6).

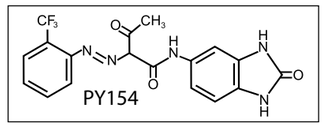
A ladder study with various amounts of Titanium White (PW6) offered a very different story and we begin to see where mixtures with 50% white or less perform as LF1 and LF2 where higher amounts perform only fair for lightfastness. This same effect was also noted in various color blends containing the Hansa Yellows where the Masstones performed much better than 40% tints with white, which further informed our desire to reformulate the blends we produce.

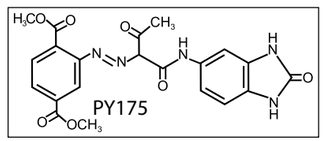
This may be a good time to show (page 13, Graphs 6 & 7) the lightfastness of the two Benzimidazolone Yellows and color blends containing it. These new clean mixing organic yellow colors are rock solid both mixed with white and in glazes as can be seen in the chart below. They are used as performance pigments in both the aerospace and automotive industry and Golden Artist Colors is very excited to now offer them to the fine artist market.

In conclusion, Golden Artist Colors continues to be devoted to providing the best artist materials possible to our marketplace. We do this through rigorous testing going above and beyond what is required to comply with ASTM D4303, and when we observe any shift in quality we strive to be open and transparent with information, as well as offer a better option to the artist as quickly as possible. Finally, we are thrilled to offer two new organic yellows: Benzimidazolone Yellow Medium (PY154) and Benzimidazolone Yellow Light (PY175) as well as newly reformulated color blends with improved lightfastness. We look forward to hearing about your experience with these new colors and happy painting!

Footnotes

1.





2. Note: Standard Museum recommendations for paintings is 150 LUX where a home may be 200-500 LUX Michalski, Stefan. "Agent of Deterioration: Light, Ultraviolet and Infrared." October 2017. Canadian Conservation Institute. https://www.canada.ca/en/conservation-institute/services/agents-deterioration/light.html Quill J., Fedor G., Brennan P., Everett E.; Q-Lab Corporation, "Quantifying the Indoor Light Environment." 2007. Q-lab.com. https://www.q-lab.com/documents/public/1e85c327-1aa2-4e87-808e-df04653e4d5e.pdf "Recommended Lighting Levels in Buildings." Architect's Technical Reference, n.d, archtoolbox.com, https://www.archtoolbox.com/materials-systems/electrical/recommended-lighting-levels-in-buildings.html

3. Agoston, George A. "The Permanency of Artists' Paints: Comments on Levison's Report." Leonardo, Vol. 11, No. 2 (Spring 1978), pp. 89-96

4. DE* = Delta E = (total change) after 510 kJ/(M2.nm) = ~410 hours exposure

5. ASTM D5098-16, Standard Specification for Artists' Acrylic Dispersion Paints, ASTM International, West Conshohocken, PA, 2016, www.astm.org

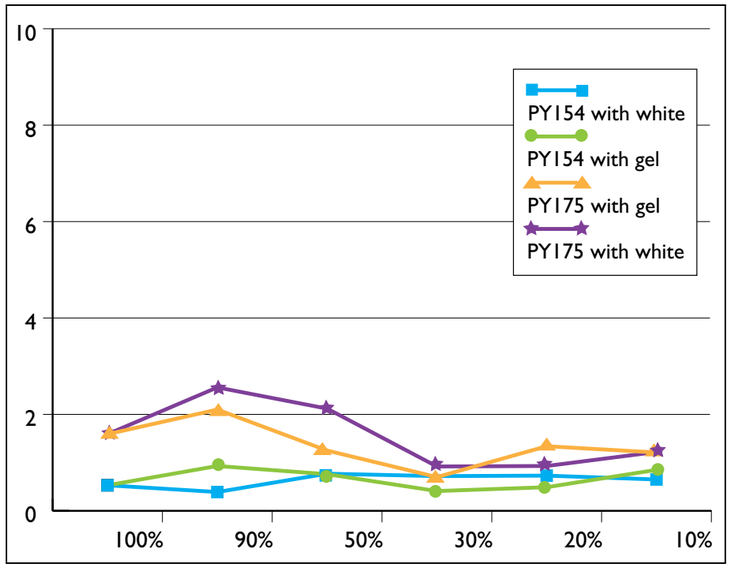
6. Sands, Sarah. "Delta E: A Key to Understanding Lightfastness Readings." February 2016. Justpaint.org http://www.justpaint.org/delta-e/

7. ASTM D5383-16, "Standard Practice for Visual Determination of the Lightfastness of Art Materials by Artists and Art Technologists." ASTM International, West Conshohocken, PA, 2016, www.astm.org

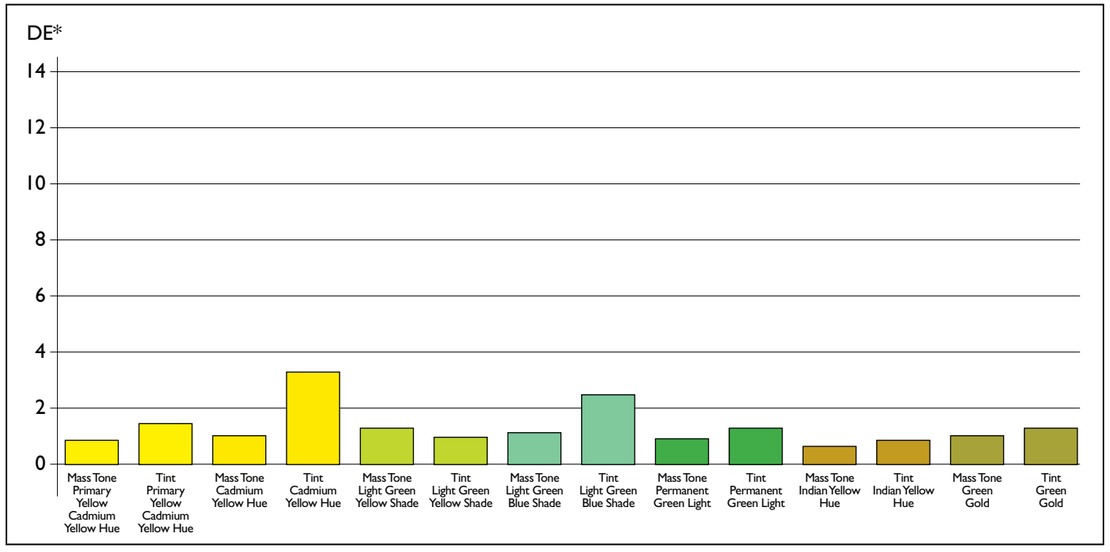
8. Gottsegan, Mark. "Lightfastness Testing of Artists' Materials Using ASTM D 4303 and the Blue Wools." RATS Postprints Volume 1, 2004, pp.26-36.

9. Herbst, W. Hunger K. "Industrial Organic Pigments, Third Edition." 2004 WILEY-VCH Verlag GmbH & Co. KGaA, Weinheim pp.130-133

10. Wicks, Z. Jones, F. Pappas P., Wicks, D. "Organic Coatings, Science and Technology third edition." 2006, John Wiley & Sons Inc. pp.106-107



Graph 6 – Comparison of lightfastness of PY175 and PY154 mixed with various amounts of Regular Gel Gloss and Titanium White (PW6).



Graph 7 – Xenon exposure lightfastness results for tints of reformulated color blends.

Golden Foundation's 20th Anniversary Art Auction Benefit

"Neither snow nor rain, nor heat, nor gloom of night……"

By Barbara Golden

In 1992, when the town of Columbus, NY, the oldest town in the US (named after Christopher Columbus), was asked how they would be celebrating the 500th anniversary of Columbus's arrival in America, Golden Artist Colors with support from the community, held a stirring Gallery exhibition of Native American artwork by renowned artists Kay WalkingStick, Joe Feddersen and Elizabeth Woody, Tom Huff, Joanna Osburn-Bigfeather, Jaune Quick-To-See Smith, and more, and was curated by Phil Young. There was a terrific thunder and lightning storm, with torrents of rain and loud continuous rumbling thunder, as the doors opened to this evening event. However, it didn't stop the show. In fact, a record attendance of hundreds of local community friends and neighbors attended that night, despite the controversial nature of the exhibition and with little regard for our unpredictable Upstate New York weather. But we had not planned for all those umbrellas.

This year, on August 12, the Golden Foundation celebrated its 20th Anniversary on another stormy night, with a benefit art auction held in the Galleries and hallways of Golden Artist Colors. Over 200 generously donated works of art, created by artists and friends of the Foundation, were available for purchase through a silent, live, and first-time online auctions. Many of these artworks had come to the Golden Foundation over the years, some from artists with significant international acclaim and honors, some from those represented in important collections, both public and private throughout the world, some from past residents, and many, from our local community.

When the doors closed to the Silent Auction at 7:00 pm, the Live Auction began with hundreds of community members preparing to raise their gold paddles (yes, painted with GOLDEN paints!), or, at least to fan themselves. Volunteers from Golden Artist Colors carried the artworks, one at a time, up onto a wooden stage, while two auctioneers worked together to cajole the audience to get the best possible prices for the artwork. What are the odds of having two GOLDEN employees with auctioneer backgrounds?!?! Bill Mattice's family had previously been in the cattle auction business and Keith Rifenburg's experience was with antiques. Their booming voices, infectious energy and movement on the stage to a rhythm of "yup!" "yup!" "yup!" created an atmosphere of friendly, and not so friendly, competition among those in the audience, as they bid against each other for a treasured painting.

In the main Sam & Adele Golden Gallery (SAGG), paintings and sculpture were viewed before the online auction closed within the next 24 hours. Works by artists who had collaborated with Sam and Mark Golden in paint, Jackie Battenfield, Ken Noland, Dan Christensen, Dale Chihuly, Paul Jenkins, Frank Stella, Ronnie Landfield, Friedel Dzubas, Roy De Forest, and works from artists in the Golden residency program, Jane Fine, Ruth Hiller, Clarence Morgan, Kate Javens, Donald Martiny, Robin Tewes, Shea Hembrey, and Pat Lasch, just to name a few, were hung on the gallery walls, studio style. Friends of the Foundation and many community artists, Steve Achimore, Susan Roth, Darryl Hughto, Mary Frank, John Griefen, David Mackenzie, John Bentham, Scott Bennett, Mark and Judi Witkin, and Richard Saba, all generously donated their work to support the Foundation's efforts to raise funds.

We're thrilled to share that the auctions ended up raising well over $110,000. We attribute this to our incredible local and global community of supporters, friends and family, staff of Golden Artist Colors, our vendors, and to our Sales Representatives from all over the world, who coordinated their annual three day sales meeting at Golden Artist Colors on the weekend of the Foundation's auction. The proceeds from the sales of these artworks were given to the endowment, both for continuation of the Foundation's unique Artist Residency program, and for sustained future growth.

Much like the Gallery exhibition of 1992, a severe wind and rain storm occurred 15 minutes before the Foundation opening event. A large tree fell across Bell Road, and alum Resident Shea Hembrey and incoming guests jumped out of their cars to remove the huge limbs that blocked the entrance to the driveway. The rain and heat raised the humidity of the night and lights from the parking lot accentuated the heavy fog in the air. As the evening ended, several employees volunteered to clean up as the last guests exited the building. We finished within an hour or so, and as we descended from the third floor to the second, we noticed that the hallway walls were "moving". Closer inspection revealed thousands of mosquito-like insects that had entered the building through the doors left wide open by the last guests. The foyer walls and ceiling were crawling with insects so thick it changed the color of the white walls to gray. This Amityville scene was accentuated by the quiet, hot humid summer night air, which must have triggered an explosion of insects that were then attracted by the interior lights of the building. Nevertheless, just like that night in 1992, our community came out to support us. And this time we were ready with several umbrella stands.

The distinctiveness of the Golden Foundation Residency program lies in the ability of artists in residence to have access to a wide range of materials, supplies and equipment. The Labs at Golden Artist Colors will work to produce requested custom product, whether in color, viscosity, or texture, within a 24-hour turnaround. Each 4 week long residency includes not just the ability to explore and experiment with materials, but also the opportunity to converse with GOLDEN's Lab technicians, covering topics such as frugal use of water in the studio (wells supply our water here in Upstate NY), or proper wastewater disposal. None of the company's or the Foundation's wastewater goes into the ground (http://www.goldenpaints.com/just-paint-article3). Other educational components to the program include sharing the latest research and cutting edge, groundbreaking materials. And yes, we do give the artists time to paint, to network with each other, to share meals in a communal kitchen or to walk the over 140 acre fields and wooded trails surrounding the residency barn.

It is with great joy that we are able to announce the Foundation's ability to offer free residencies to the 36 artists who will be selected to attend in 2018 and 2019. A goal of the Foundation since the inception of the residency program in 2012 has been to support an artist's ability to attend at little or no cost to them. Our endowment has been growing for over 20 years, and this year's benefit art auction was the event that helped us achieve that goal!

From all of us at the Foundation, we thank these generous communities for their support.

Read more about the Sam &Adele Golden Foundation at www.goldenfoundation.org.

Left to right: Rebecca Buchanan from Hillsboro, OR; Elizabeth Stainton from New York, NY; and Lucy Harackiewicz from Westwood, MA.

Scholastic Educator Residency Fosters Experimentation

By Emma Golden

Now in its fifth year of collaboration, Golden Artist Colors has again partnered with the Scholastic Art and Writing Awards to celebrate educators across America who support and encourage the creative process! Lucy Harackiewicz from Westwood, MA; Elizabeth Stainton from New York, NY; and Rebecca Buchanan from Hillsboro, OR joined us at the Sam and Adele Golden Foundation Residency Barn for a 14 day artist residency experience. Lucy, Elizabeth and Rebecca were selected from a pool of close to 250 applicants through a process conducted by Scholastic and the NAEA. While here in Upstate NY they were engulfed with material knowledge and studio time and celebrated as artists as well as teachers. How lucky their students at home are to have such incredibly talented teachers in the classroom!

While in her studio, Lucy explored color and layering with new materials and tools. When we entered Lucy's studio at the end of her time here, you could immediately tell that she didn't sleep much, as her paintings filled the studio space.

Rebecca loves color! Bright, vibrant and fluorescent color! She was also very much inspired by the landscape of Upstate NY. The rolling hills and farmlands around New Berlin allowed Rebecca to explore these colors and forms. This landscape is easy to fall in love with.

Elizabeth came to the residency mainly as an oil painter. Her ability to capture subtle light as well as powerful curiosity, gives you a sense of truly being in that city or that space at that time. You want to peer around the corner of the building to see what's there. She also allowed herself to discover and play with the acrylics and watercolor, which opened up a new venue for exploration.

The studio and living space provided to these Scholastic Educators included 24/7 access to individual studios, and is situated right down the road from the GOLDEN paint factory. This unique program provides access to all paint materials produced by GOLDEN, including acrylics, oils, watercolor, and custom products. Over the 14 days, Material and Application Specialists from Golden Artist Colors delivered an in-depth survey of different techniques and materials to the artists. Emphasis was placed on the importance of developing one's own artistic process, while gaining access to the most innovative processes and techniques in art making. Experimentation was encouraged.

In 2017 students in grades 7-12 from across the U.S., submitted over 300,000 works of art across several different categories of art and writing. In recognition of the Alliance's efforts to support the arts, Golden Artist Colors also presented 9 additional teachers whose students were awarded top honors within the Alliance program, with a $1,000 gift certificate for materials for their personal use.

To learn more about Scholastic, GOLDEN and the Golden Foundation:

www.artandwriting.org/news-and-events/golden-residency
www.goldenpaints.com
www.goldenfoundation.org

JUST PAINT

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GOLDEN ARTIST COLORS®

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As artists redefine our concepts of traditional media, we embrace the opportunity to challenge perceived limitations and capabilities of painting and seek to empower artists everywhere. The mission for *Just Paint* remains: inform and empower artists in the realization and preservation of their creative vision.

Our role in the arts community has been to provide artists with the best tools to meet their needs. This includes an obligation to provide the most complete information available on artists' materials from our laboratory, research, and collaboration with other innovators and material scientists.

Since 1980 we have been champions of the acrylic medium with the GOLDEN Acrylic brand. In 2010 we were entrusted with the legacy of an amazing oil paint, Williamsburg Handmade Oil Colors, and in 2014 we introduced QoR®, a unique modern watercolor.

We also know that there is more to a paint company than making paint. By joining our mailing list, you will receive content pertaining not only to materials, but the story of Golden Artist Colors, its growth, its legacy, exhibition events and its commitment to social responsibility.

Be sure you don't miss the latest news from GOLDEN and sign up today!!

www.goldenpaints.com/signup