

JUST PAINT

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From Mark Golden

Dear *Just Paint* readers,

We've just reached our 30th edition of *Just Paint* and with it, just a moment of reflection on what we have tried to create with our newsletter. First, a huge thank you to our Editor for the last 20 issues of *Just Paint*, Jodi O'Dell. Without her dedication to this process, I'd still be on issue #11.

The focus of *Just Paint* has always been to provide artists, material specialists, colleagues and friends with the most updated research, information and happenings here at GOLDEN. Many of our articles have become significant additions for the advancement of research in modern materials. Some are just to inform you of the exciting things happening at the facility and with the Golden Foundation. We've done our best to keep the promotional content at bay, but sometimes we just need to shout with excitement as we bring on-board new products to share with you. Such is the case in this issue as Sarah Sands shares the introduction of the New Williamsburg Safflower Oil colors as well as Scott Bennett's article on using refillable markers with our GOLDEN High Flow Acrylics.

We have also used *Just Paint* to present topics that resonate with our customers in conversations with our Technical Team. The questions around mural painting have steadily increased. To this end we are delighted that Jenny Wiley Arena from Heritage Preservation agreed to provide an introduction to their new website, which has been years in the making and is the most complete resource for 'best practices' for creating public murals. Mike Townsend has added an additional resource by sharing insights into best practices for choosing colors for murals.

Another topic receiving more attention is the resurgence of artists using Fluorescent colors in artwork. Amy McKinnon shares her research on the materials that literally cry out for attention. Finally, we update you on the activities at Golden Artist Colors where we get to share with you our Kids Day event and the next "Made In Paint" show of the 2013 Artist Residents at the Golden Foundation. We hope you enjoy our 30th as I get to enjoy my 60th!

Warmest regards, Mark



GOLDEN High Flow Acrylic navigates easily from brush to refillable marker or from pen to airbrush.

Markers, Mops, Daubers and GOLDEN High Flow

By Scott Bennett

Drawing with pens and ink in artwork is not new. Artists have always combined drawing with painting, and the very act of painting itself incorporates drawing as line whenever one color or value is placed beside another, a thicker passage shows its edge against a thinner passage, or wet paint is scored by the end of a brush, palette knife or other tool. The use of drawing media such as pencils, charcoal, pastel or crayons of various sorts has often been used as part of the underpainting or as surface accents. It is common to see pencil lines showing through translucent passages in works by Matisse or Cézanne, and in watercolor paintings in general.

What is unique is the current range of different marking tools for artists. Some of this has been around for quite a while now, yet the proliferation of new drawing tools manufactured for artists has been exploding. Add to that the ingenuity of urban artists experimenting with their own designs. The options are enormous and continue to grow.

With the introduction of GOLDEN High Flow Acrylics, artists now have the ability to draw with a professional acrylic paint made in an ink-like

consistency to work with all these new tools and more. GOLDEN High Flow Acrylic navigates easily from brush to refillable marker or from fountain pen to airbrush and more.

The unique feature of High Flow Acrylics is that artists can mix and blend them to make an infinite range of colors. The translucency of the color can also be adjusted by adding any amount of our Airbrush Transparent Extender while still maintaining the same liquid, flowing quality of the paint. Additionally, adding Titanium White to any color is a valuable tool in both increasing opacity and creating an infinite range of pastel tints. This means that artists have the ability to create an entire range of markers and drawing tools with their own custom colors that fit perfectly with their personal palette or precisely with the painting they are working on. The new addition of High Flow Acrylics to the GOLDEN line of products expands the capabilities of acrylic paints and the audience of artists who might not have considered acrylics before.

Markers and Pens in Fine Art:

Artists have continued to search for a truly artist grade permanent marking tool. Many have become resigned to simply using office supply or craft



There are a wide variety of markers with varying tips and nibs available. The nib sizes range from .7mm up to 60mm with many sizes in between. We tested tips and nibs in the following sizes: 2mm, 3mm, 5mm, 10mm, 15mm and then 60mm.

type markers or pens in their work with the subsequent issues of bleeding or fading of the inks, or some kind of incompatibility with the other art materials they are using. With any mixed media work, the potential for mismatch of some sort increases greatly with the number of different brands and types of materials used.

To reduce incompatibility issues and help increase the long term life of an artwork, it is always best to stay with quality brands, use only fine art grade materials whenever possible, and keep the number of different materials to a minimum. When in doubt, always test your materials first. (See our JP13 article, "Testing for Your Application.")

"Permanent" Markers:

There is a plethora of pens and markers at the local office supply store but most are not made with fine art use in mind. Most pens and markers are not tested in the same way as fine art grade paints or other fine art grade materials. The term "permanent" is often used as part of the description with many markers and pens but this typically refers to the paint or ink's ability to be water resistant or waterproof to some degree, and perhaps to its ability to adhere to certain

surfaces, and does not necessarily refer to the lightfastness of the color.

GOLDEN High Flow Acrylics, used in these drawing and mark making tools, will enable a new level of fine art grade drawing potential with the widest range of color possibilities for use with acrylic painting and a variety of mixed media applications. With this system, the terms "Permanent", "Lightfast" and "Fine Art Grade" can be applied with confidence, as the High Flow colors have the same durability and stable film qualities as all our other regular paint lines, along with compatibility in mixing and layering.

The Tools - Markers, Mops and Daubers:

These are the common names of a large variety of refillable paint and ink drawing tools. All of these empty and refillable paint and ink drawing systems incorporate plastic containers with a tip or "nib." The nibs on most high end markers are "spring loaded" so they can be pumped (pressing the tip to a surface repeatedly up and down) to prime them and they tend to be fairly stiff or hard and micro porous while the Mop and Dauber tips are soft with a very open porosity like a sponge or a piece of felt. The Mop and Dauber bodies

are typically soft as squeezing them is often part of the delivery system. There are many different brands and types to choose from. My experience is limited to about 4 or 5 different brands, the most common being Molotow™ and Montana®. Check out your local art supply store to see what's available or go online to check out the range of YouTube videos describing how to make your own mops. You'll have plenty to choose from!

I have divided the discussion between "Markers" and "Mops and Daubers", as these are different enough tools to warrant separate discussions.

Markers -

What are typically called paint markers or paint pens are most often hard bodied, with harder, micro porous nibs that are replaceable. Some of the nibs can be inverted when they begin to wear out, and while others do not have the same chisel tip or shape on the opposite end, they can be inverted if desired. This type of drawing tool will tend to suit artists who need to make more controlled lines.

All of the markers that I tested were spring loaded. While most have mixing balls or barundums, some do not. If they don't, we advise adding them,



Many markers are spring loaded with glass balls or barundums for mixing. Some marker brands conveniently offer replaceable nibs and tips.

as this will help greatly in keeping the High Flow pigments thoroughly homogenized. You can use ball bearings, small marbles, or even stainless steel nuts and bolts, as long as they fit and move freely when shaken.

Mops and Daubers -

These very simple liquid paint or ink drawing tools are usually more painterly in use than the pump tip paint markers. This means they can be messier, but also more desirable for painterly applications. They are often soft bodied with either sponge tips or synthetic sponge and fiber tips. They come with all sorts of names, including Paint Mops, NYC Mop™, Bingo Daubers, Sponge Daubers.

Some tips will have longer synthetic fiber “hairs” coming out of a domed spongy fibrous pad, and are often called “mohair tips” or “padded nibs”, while others have very short fuzzy hairs on a spongy fiber dome. I should point out that the term “nib” does not apply to mops and daubers, as a “nib” generally refers to a harder pen tip, such as the classical pointed metal tip of a quill pen. Sponge markers or paint daubers are commonly used in Bingo halls for quickly putting down a blot of color, and are called “Bingo Markers” or “Bingo Daubers”. All are very simple systems where the ink or liquid paint flows into the most often fairly wide porous tip and allows for a delivery where the flow is controlled via gravity, some capillary action in the tip, and pressure from lightly squeezing the container body. What is often called a NYC Mop, due to the invention by graffiti artists in New York City, is a larger and typically homemade variety that uses a fairly soft bodied container (think roll on deodorant) stuffed with a thick piece of felt or a folded piece of felt around a longer piece that acts as a wick. These are the most painterly types as they are larger, softer, squishier and the flow can be increased dramatically by squeezing the container. Graffiti artists prize these for how well you can get them to drip and splatter in use.

Drawing with these tools can be a joy for painters who like a more free flowing system, as the High Flow Acrylics will flow very nicely from this kind of large and very porous tip. If you are using one of the larger sponge or felt tops, then you can squeeze

and move quickly and get some very painterly marks. Expect them to be messier and have some replacement tops on hand. Do not store these upside down as they tend to leak.

Guidelines for Using Refillable Markers, Mops and Daubers:

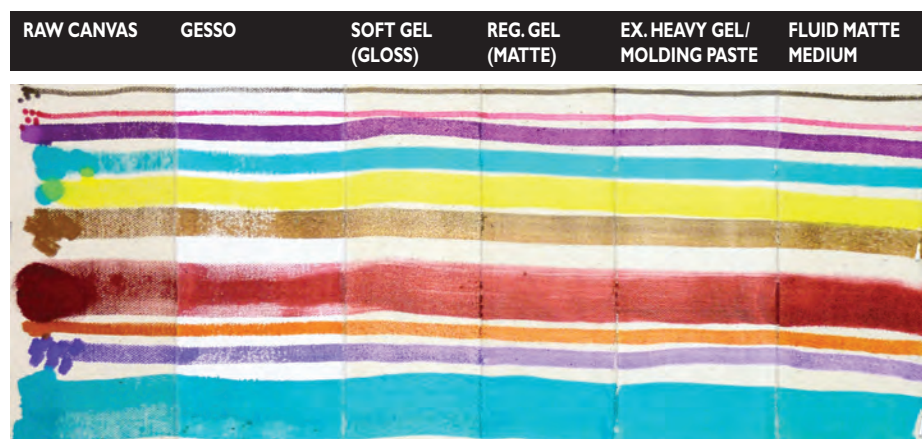
- Never store larger markers, mops or daubers tip side down.
- You can store 2mm and 3mm paint markers tip side down.
- Be careful squeezing mops and daubers and always make sure the applicator tips are firmly secured. This is to avoid messy situations; use your imagination and some caution.
- While you can use our Fluorescent or Iridescent colors in most of these markers, mops and daubers, these pigments will not last as long without clogging. Fluorescents will last about a month before seeing some clogging and Iridescent colors will go for about a week before needing increased priming of the tip. Eventually, the tips will begin to trap too many of the larger mica pigments and the flow will decrease. If using these colors, make sure to have replacement nibs or tips on hand. Adding a few drops of Acrylic Flow Release mixed with water will greatly improve the flow of these larger pigment particle colors.
- Use on rough surfaces will degrade the tips faster, and the marks will have gaps or a more broken line quality.
- Use on smoother surfaces will allow for faster mark making with less broken line quality.

Substrate Surface:

It is clear that there are some commonalities when using various grounds as drawing surfaces. Gesso,

Fluid Matte Medium, Absorbent Ground, Acrylic Ground for Pastels, Light Molding Paste, a variety of Gloss Gels and Mediums, and raw canvas are just a few we’ve examined. As one would expect, the rougher surfaces such as Gesso on canvas, Absorbent Ground, and raw canvas caused drag and created broken lines whereas smooth surfaces, such as gloss mediums and gels or any other smooth painting ground or surface allowed for a slick and fast drawing ability. It is relatively easy to get the kind of line quality and “feel” that you want with these drawing tools by matching the marker, mop or dauber with the right painting ground. As with any new painting technique or material, testing and experimenting will be necessary to find the matches that work best.

There are certainly other paint application tools available that many of you may already be using that are not markers or mops, such as sponge rollers, fiber rollers, oversize brushes, paint pads, etc., that can make large scale drawing marks. There are other delivery systems such as pens and airbrush that can also be used with High Flow to create lines. Expressive calligraphy and brush painting in the Eastern tradition is possible with the High Flow Acrylics, allowing a wonderful density, sensitivity and flow off the brush. But not until now, has it been possible to create your own infinite array of colors for use in drawing tools that hold a consistent reservoir of acrylic paint. Although all these tools tend to make mark making easier by holding a consistent reservoir of paint, painting is about mark making and above all, these tools simply provide artists an ever expanding resource for realizing new marks and new discoveries.



Williamsburg's New Safflower Colors

By Sarah Sands

The evidence was undeniable as our eyes swung slowly across the drawdowns that spread out before us. The handful of initial colors ground in every possible combination of oil all pointed to a similar conclusion: there was something here that simply could not be ignored. The clarity of the colors was exceptional and in some cases, the difference in the results was almost shocking. But there was also caution. As enticing as the results were, they represented just a beginning, a first tentative evaluation. The bulk of the research and trials still lay ahead.

Those initial thoughts took shape over two years ago, and only now can we finally share that spark of excitement and offer the fruit of all the endless testing: a selection of thirteen Williamsburg Handmade Oil Colors ground in expeller pressed, refined safflower oil.

We will go through some of the research and address many of the questions about safflower and its possible role on a painter's palette, but in the end here is what matters most: it allows certain colors to hold onto a luminosity that would otherwise be lost. It helps preserve a blush of azure blue as it spreads across the sky, the final crisp flickerings of white, the translucent violet held within a skin of glaze, or the palest notes of gossamer greys and cool green earths. Each of these are moments of nuance, gauged and held in balance until "just so". Without those reasons, there would be little cause to give safflower or any other alternative oils a second glance.

A Dozen Plus One

The first twelve colors we chose for the new line were ones that would clearly gain by being made in a less yellowing version, while the thirteenth is a unique color we are offering for the first time. Each of these will have a light blue 'SF' displayed as a watermark on its label to clearly show that it is made with a different binder, and will use



The thirteen new Safflower colors feature a light blue 'SF' as a watermark on their label to clearly distinguish them as colors made with a different binder.

'SF' as a prefix in front of their name when being referenced in color charts, price lists, and on the website. Below we touch on each group separately.

Traditional Whites (Flake, Silver, Titanium, Titanium-Zinc)

The well-known, essential whites that almost every painter relies on. The use of safflower will assure that passages and tints made with these will retain their clarity with little if any noticeable color shifts.

Porcelain White

Porcelain White is based on a new pigment for Williamsburg, PW 5, a complex co-precipitate of barium sulfate and zinc sulfide more commonly known as Lithopone. Created in the 1870s and for a while a rival to both lead and zinc, it captured some 60% of the market for white pigments in 1928 before declining to 15% by 1945 in the face of a growing dominance by titanium dioxide (Alphen 1998). It holds a renewed interest for us as an alternative to Zinc White, which forms a brittle film and has been linked to issues of cracking and potential delamination when used extensively. Historically known as Enamel, Orr's, or Charleston White, we chose the one we felt was the most descriptive: Porcelain White.

Blues (Ultramarine Blue, Ultramarine Blue French, Cerulean Blue French)

Of all the colors impacted by the yellowing of linseed oil, translucent and delicate blues are some of the hardest hit. Traditionally these blues are among the colors most frequently mentioned for grinding in alternative oil. The impact of the yellowing is seen most when creating light tints or in glazes. Using the new safflower versions of these blues should provide more stability and glow in this important area.

Violets (Ultramarine Violet, Ultramarine Pink, Cobalt Violet Light)

These transparent violets are particularly sensitive to any color shifts when used alone or in glazes. With age, or after prolonged storage in the dark, the linseed version of Ultramarine Violet can take on a grayish pallor, while the similar Ultramarine Pink and the prismatically pure Cobalt Violet Light develop a muted orangish patina. The new safflower versions should preserve the beauty of these subtle tones.

Transparent Earths (Italian Terre Verte, French Ardoise Grey)

Unlike other transparent earths with a strong warmish cast to them, such as our Italian and Brown Pinks, these two

colors are extremely weak tinters and more impacted by any hint of a yellow cast that might develop.

The Continued Role of Linseed

It should be stressed that none of these colors will replace the current linseed-based versions. Williamsburg has always believed that linseed provided the strongest and most durable film possible, despite its tendency to yellow – *and we still do*. That core commitment remains and will continue intact. In addition, both materials and conservation science have amassed a solid body of evidence justifying linseed's central role. There is simply no way around that. However, it is also important to acknowledge that other oils appear quite frequently throughout the historical record and play important parts. In particular, both poppy and walnut have long traditions associated with them, and were constantly sought out by artists wanting to find a less yellowing alternative for their whites, blues, and pale tints. There are even brief periods and regions when one or the other enjoyed broad popularity. Starting about 75 years ago, safflower slowly began to emerge as an addition to the list, and eventually became the most common alternative to linseed, especially for whites.

When we began this study in 2011 it was natural to include all three of these oils in the initial trials. However, both poppy and walnut were dropped fairly early on as not representing strong directions to move in: walnut because it did not show enough of an improvement in terms of yellowing, while poppy created softer, less durable films. Because of that, the vast majority of the work quickly focused on optimizing our use and deepening our

understanding of safflower oil.

Overview of Drying Oils

To understand safflower and how it differs from other oils, we need to pull back a touch and take a look at drying oils in general.

All natural oils are composed of triglycerides (Fig. A), a combination of three fatty acids attached to a glycerin backbone.

It is those fatty acids that we are most concerned about because which ones are attached, and in what proportion, is what decides if a particular oil is suitable for making paint, how much it will yellow, its durability, and even when and how you use it in your painting.

For an oil to function as a binder it needs to be classified as a drying oil, meaning that if spread in a thin layer it will eventually form a film. This happens through a highly complex process called autoxidation, where oxygen is absorbed from the air, forms unstable compounds called hydroperoxides that decompose and trigger the creation of cross-links with other fatty acid chains. As this process continues, a dense, tangled network of linkages is created, causing the oil to continuously thicken until it forms a rubbery solid.

This ability to react with oxygen is only found in unsaturated fatty acids, which are ones that have a number

| | | Stronger Film / Faster Drying | | | |
|----------------|-----------|-------------------------------|---------|-----------|---------|
| | | Linseed | Walnut | Safflower | Poppy |
| % Fatty Acids | Linolenic | 48-60 | 2-16 | 0-1 | 0-5 |
| | Linoleic | 14-19 | 57-77 | 70-79 | 62-72 |
| | Oleic | 14-24 | 9-30 | 7-20 | 10-30 |
| Iodine Value | | 170-190 | 140-150 | 135-150 | 130-140 |
| ~ Drying Index | | 120 | 86 | 75 | 72 |
| | | Less Yellowing | | | |

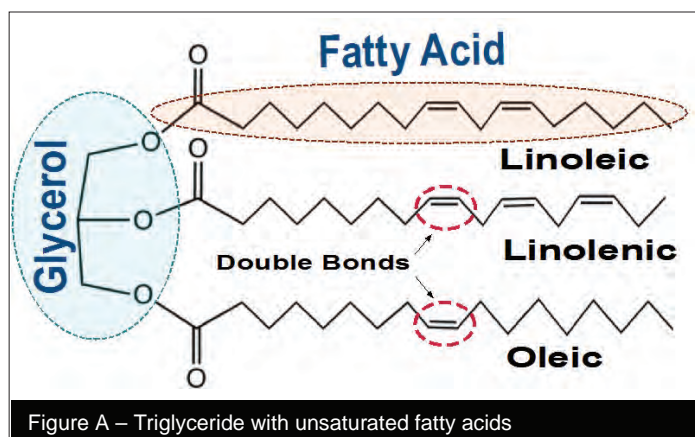
Table 1 - Fatty Acid profiles of drying oils. Data from Mills, White, 2003; Serpico, White, 2000; Baily's Industrial Oil and Fat Products, 6th ed.

of reactive sites called double bonds (Fig. A). The more double bonds, the more oxygen they can react with, and the more potential locations for creating links to other chains. Fatty acids with just one double bond are monounsaturated, while those with two or more are called polyunsaturated. These are the same terms found in the descriptions of everyday cooking oils and margarines, so they might already sound familiar. The unsaturated fatty acids that make up the largest component of drying oils include oleic, with one double bond, linoleic with two, and linolenic with three. While all of these are usually reported when describing a drying oil, it is really just the linoleic and linolenic acids that play any true role in the drying process.

There are two other terms one will frequently come across in discussions of drying oils: Iodine Value and Drying Index. Both are simply ways to measure the reactivity of an oil, which in turn provides a rough assessment of how fast it will dry and how durable it will be. Iodine Value is a basic test where one measures how much iodine is absorbed by the available double bonds in a known volume of the oil. The higher the number, the more double bonds are present. The Drying Index is an equally simple calculation where one adds the percentage of linoleic acid to twice the percentage of linolenic acid.

A Tangled Mesh

It can be helpful to pause here and move away from the purer chemical descriptions for a moment and form a looser visual analogy of the process. Essentially the fluid and free flowing fatty acids are being braided and knitted into a three-dimensional mesh. In place of the long linkages of carbon and hydrogen that make up a fatty



Cobalt Violet Light 2.5 Years Dark Aging



Image 1 – 3 mil drawdowns of Cobalt Violet Light in Linseed and Safflower after 2.5 years of dark aging.

acid, think strands of metal chains or segments of ropes, with the restriction that some can only be tied or linked to others in one, two, or three places.

As one can imagine, the more spots where you can hook them together, the tighter and stronger the mesh becomes, and the better it can hold together as inevitably links and layers begin to fray and break over time. How tight or loose the network becomes will also decide how porous the structure is - how easily the outside air can make its way in, and just as importantly, how easily the many small, volatile materials that start off trapped in the tangle of strands can eventually make their way up and out.

Comparing Oils: The Strong, the Fast, and the Yellow

It can be helpful to compare the fatty acid profiles of the major drying oils, correlating those percentages with what we know about their speed of drying, tendency to yellow, and ability to produce durable films. In Table 1, as you move from poppy on the far right, through safflower, walnut and finally linseed, the films are get stronger, drying faster, have higher Drying Index and Iodine Values, and – the inevitable trade-off in all this – getting progressively and unavoidably yellower.

It is also no coincidence that as you move along in this direction, the percentage of Linolenic Acid increases and Linoleic gets less. Oleic Acid only plays a very peripheral role in terms of oxidative cross-linking, so its impact on film formation and yellowing is much more negligible.

Yellowing

If the only thing that mattered about drying oils was just how durable or flexible their films were, there would be little need or even much temptation to look beyond linseed oil. But yellowing has always been something painters have acknowledged, worried about, and looked for ways to minimize.

Part of that search has been exploring ways to extract and process linseed that might reduce its yellowing: from sun bleached to water washed, from cold pressed to alkali refined, and any number of other methods for further filtering and purifying. However, while some differences can result from these, the range is narrow at best. Indeed, in several studies it has been shown that highly purified, laboratory forms of linolenic acid (methyl linolenate and trilinolenin) yellowed considerably (Rakoff, 1976, Privett, 1961), so even with improvements elsewhere, there is a core degree of yellowing that appears intrinsic to drying oils having appreciable percentages of linolenic acid. Because of that, the only viable way past the yellowing issue is to look beyond linseed as the primary binder.

From the start, Safflower's singular claim to fame as a drying oil was its ability to resist yellowing and produce cleaner, brighter whites, along with some blues and other translucent tones. To get a sense of comparative yellowing we cast drawdowns and allowed them to age in the ambient light of the laboratories, as well as covering half of each sample

so it could undergo 'dark aging'. As odd as it might seem, given the amount of concern that yellowing generates, the exact mechanism that causes it to happen is still very much debated and a topic of research. The majority of theories link it to chromophores created as by-products of oxidation, which would certainly explain its correlation with higher levels of linolenic acid, while some investigators have pointed to possible impurities or environmental conditions as at least contributing factors. What seems irrefutable is that whatever the process happens to be, it is much more strongly tied to linseed-based paints than to safflower ones.

Drying Time

Drytime is never as straightforward as one would hope, especially when oils exhibit such a long period between feeling 'touch dry' and being 'fully cured'. To make matters worse, oil films remain dynamic, undergoing chemical processes that continually transform and degrade the paint throughout its life. Indeed, there is never a substantial period of time when the paint remains stable and relatively inert. Add in the complexity introduced by different pigments, additives, or simply the environment, and one is quickly limited to fairly broad generalizations. One way to study the drying of various oils is to look at the changes in weight as the paint absorbs oxygen, increases in density, and then begins a slow descent brought on by the loss of volatile materials. In the first graph (Chart 1) we show the weight

Flake White 1.5 Years Dark Aging



Image 3 – 3 mil. Drawdowns of Flake White with half of each card being covered after drying.

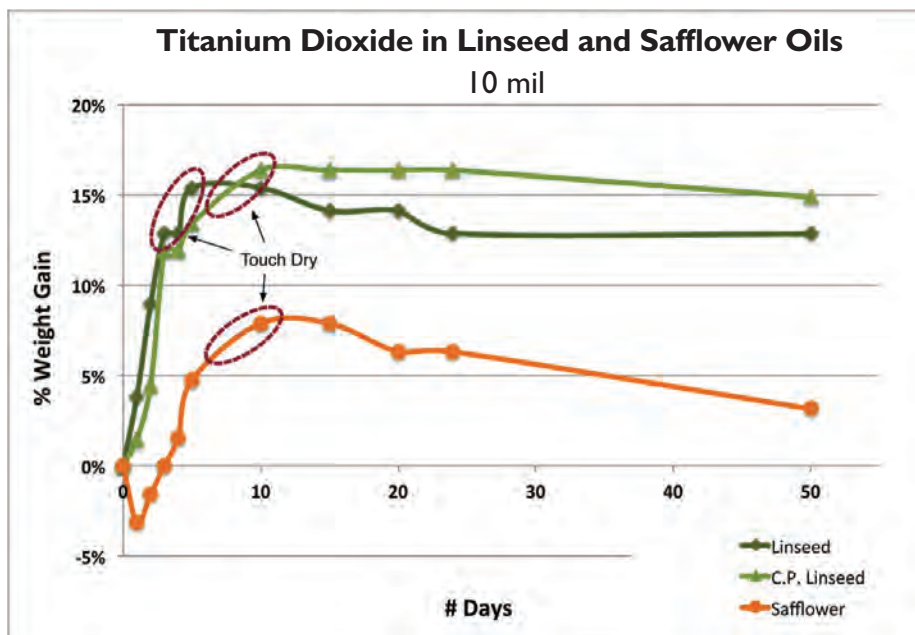


Chart 1 – Drying curves for 10 mil drawdowns of titanium dioxide in safflower, cold pressed linseed and refined linseed oils. Weight gain is for the oil only.

gained by simply the oil in three fairly thin films of titanium dioxide ground in safflower, cold-pressed linseed, and alkali refined linseed. As can be seen, the paint made with refined linseed peaked and felt touch dry in the 4-5 day range, while both the safflower and cold-pressed versions did not reach this level until the 8-10 day range. While this extended period is common for safflower, it is somewhat surprising

that the cold-pressed linseed took just as long. Most likely this points to the presence of natural antioxidants found in minimally processed oils, which are known to inhibit the curing process. It also illustrates one of the complications when trying to predict dry times purely on the basis of fatty acid profiles as these other components can be glossed over. Also, it is worth noting that while the two linseed oils

appear to be leveling off and stabilizing, the safflower has already started to lose weight quite rapidly from the loss of volatile components escaping through its looser, more open crosslinking.

Chart 2 looks at the same paints, but now cast in much thicker 1/16" disks and followed over the course of a year. The first impression again presents us with something of a quandary. Based on this graph, safflower clearly appears to be the more reactive oil, gaining the greatest amount of weight at the fastest pace for the first couple of months, and only then starting to decline in mass while the two linseed oils continue their slower, more plodding march upwards. This relates to a dynamic that was noted very early on in commercial studies looking at the drying rates of safflower vs. linseed. Because linseed is much more reactive, it tends to form a tighter skin relatively quickly. While in very thin films this has little impact, in thicker ones the skin acts as a diffusion barrier slowing down the absorption of oxygen into the underlying paint. Safflower, on the other hand, stays wet on the surface for a longer period, allowing oxygen to continue to propagate more freely into the interior of the paint. Even after safflower forms an initial skin, it is much more porous and presents far less of an obstacle to oxygen. But that same permeability works in both directions, allowing volatiles to easily escape and causing the rapid decline in weight later on. So, while safflower might exhibit better through drying in some situations, any initial gains in density is quickly lost. Conversely, heavily applied linseed-based paints can often hide softer, uncured layers beneath a skin that might feel dry to the touch.

As we will see in the next section, it is ultimately these swings in density and loss of mass and volume that are the main issues surrounding safflower.

Durability

The most common concern about the use of safflower, or indeed any of the alternative oils, is that they form weaker, more brittle films, and so carry a greater risk of cracking later on. These issues are ultimately related to how porous and flexible the paint is, and how much it changes in volume and density over time. And as we

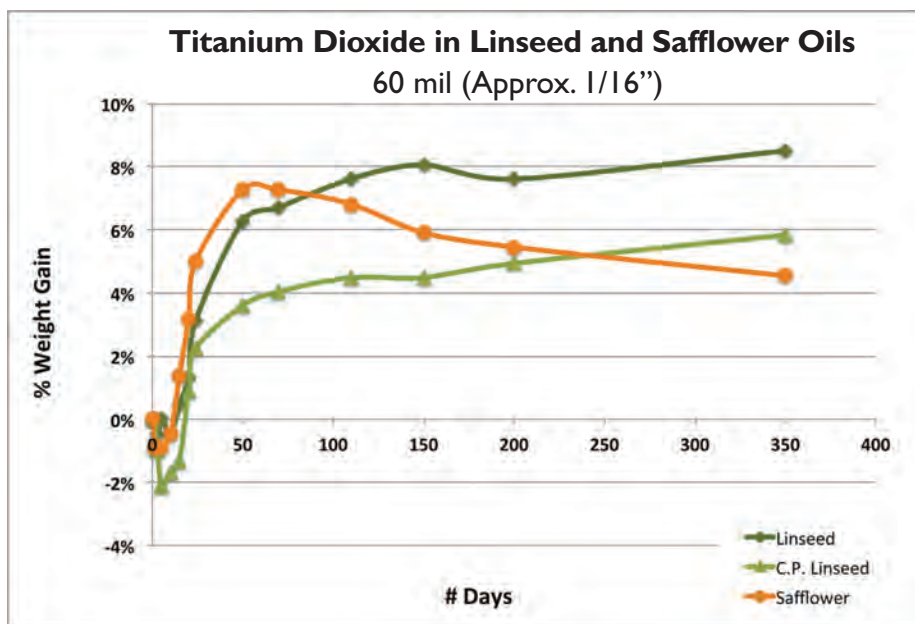


Chart 2 – Drying curves for 1/16" disks of titanium dioxide in safflower, cold pressed linseed and refined linseed oils. Weight gain is for the oil only.

Continued on page 13

Heritage Preservation: *Rescue Public Murals*

By Jenny Wiley Arena

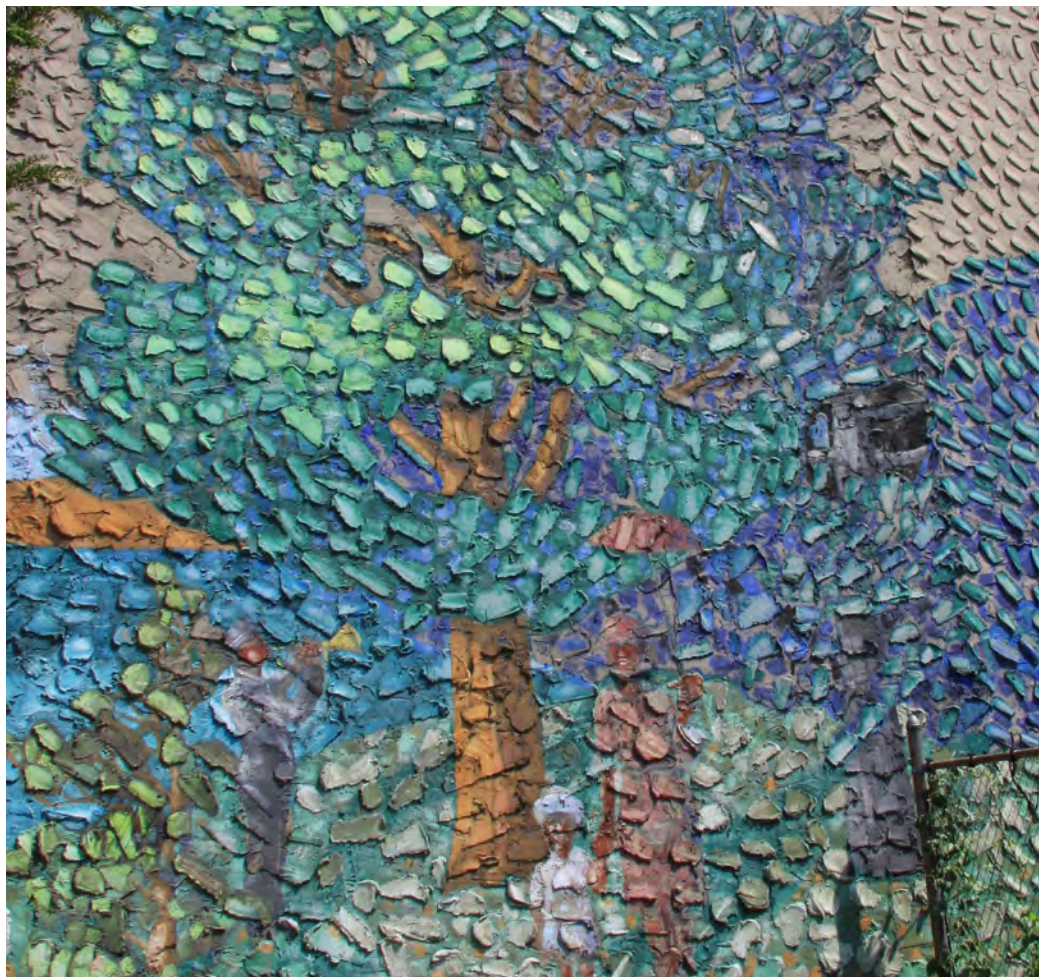
In 1986, amidst the bustle of West Harlem, a rich, jewel-tone mural could be seen rising 30 feet above the lush oasis of Hope Stevens Garden. Homage to Seurat: La Grande Jatte in Harlem, the last remaining work in New York City by the artist Eva Cockcroft, repurposed Seurat's pointillist style to depict the beauty and diverse community of Harlem.

Sadly, by 2007 the treasured community mural was in dramatic disrepair. Portions of the mural had been covered by new stucco to repair cracks and leaks. The once vibrant colors had faded to pastels. The mural was truly at risk of being lost forever.

Heritage Preservation's Rescue Public Murals initiative was founded to address and raise awareness of the immediate needs of murals like Homage to Seurat by confronting the risks that community murals face by being located in outdoor, public spaces. Rescue Public Murals seeks to bring public attention to U.S. murals, document their unique artistic and historic contributions, and secure the expertise and support to save them.

Founded in 2006, Rescue Public Murals has been responsible for bringing conservators and artists together to evaluate the condition of endangered murals. By using both a conservator and a muralist for assessments, Rescue Public Murals brings the best technical and artistic knowledge together to document a mural's condition and determine the most appropriate way to preserve it.

To date, Rescue Public Murals has provided assessments for 16 murals of national significance, including Homage to Seurat. Harriet Irgang of Rustin Levenson Art Conservation Associates and Brooklyn muralist Janet Braun-Reinitz were responsible for performing an assessment of Homage to Seurat in 2006 and recommended a plan for its restoration.



Before and after restoration of "Homage to Seurat: La Grande Jatte in Harlem," by artist Eva Cockcroft.

When performing their assessment, Harriet and Janet discovered that the wall had not been primed before it was painted and it likely had never been sealed. These factors contributed greatly to the mural's degradation over the years.

Findings such as this, and on countless murals like it, inspired Rescue Public Murals' most recent initiative, Mural Creation Best Practices. While working to ensure the protection and preservation of existing murals, Rescue Public Murals recognized that many common challenges murals face could be mitigated with careful planning and preparation. Rescue Public Murals has held conversations and brainstorming sessions with muralists, conservators, art historians, arts administrators, materials scientists, and engineers to document best practices for mural creation. These recommendations are detailed at www.heritagepreservation.org/RPM/MuralBestPractices.

Recommendations are not meant to be prescriptive but instead pose

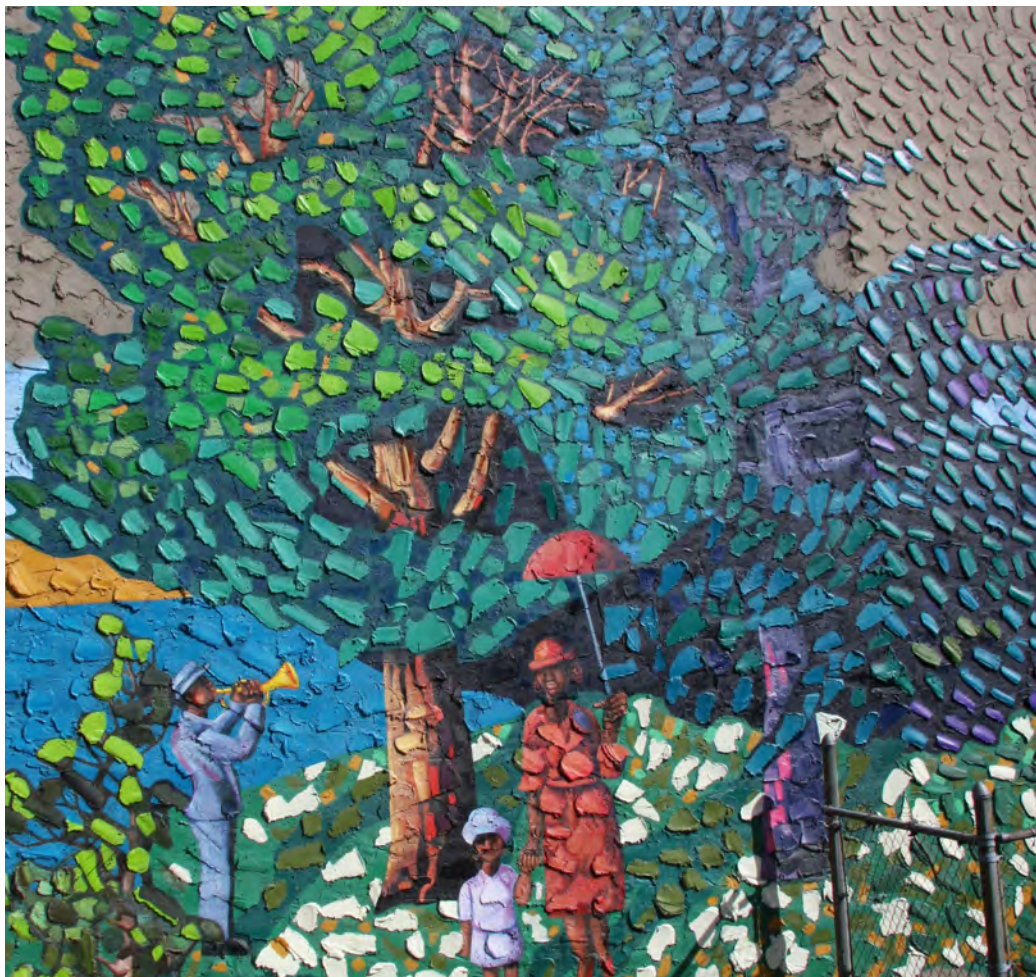
questions and raise issues that should be considered at each stage of creating a mural: planning, wall selection, wall and surface preparation, painting, coating, and maintenance. Below is a snapshot of those recommendations at each stage.

Planning

Community murals that are expected to last require deliberate planning. Each party – the commissioning organization, artist(s), building owners, community members, and other partners – should establish what rights and responsibilities they have in the process of creating and maintaining the mural. This should include defining the scope and lifespan of a mural, determining ownership, and responsibility for long-term maintenance.

Wall Selection

Often the decision to paint a mural comes from a desire to fill a specific blank wall. Murals can serve to brighten a park or schoolyard,



Photos by Camille Perrottet

create interest for a local business, or commemorate a relevant person or historical event. While these are all valid reasons for selecting the location of a mural, it's important to make sure the chosen wall has the physical qualities necessary to limit factors of degradation. Some factors to consider include the security of a specific location, the wall's exposure to direct sunlight, how water flows through or away from the wall, and structural stability.

Wall and Surface Preparation

In addition to taking care in selecting a physically stable and secure wall, it is important to prepare the wall for paint and other materials that may be used. Efforts should be made to properly clean the wall, select a primer that is compatible with other materials being used, and the process should be documented carefully. Primer and paint should be applied when temperatures are warmer than 50 degrees Fahrenheit and only in dry weather.

Painting

The long-term appearance of a mural depends on careful paint selection. Consider using the same manufacturer for primer, paint, and coating. Colors that conform to "ASTM I" are ideal, but "ASTM II" are also acceptable. If using acrylic dispersion paints, the statement "conforms to D5098" is an indication of colorfastness. Some research has indicated that colors mixed with titanium oxide (white) have a greater tendency to fade unless the coating of the mural is well maintained. Likewise, cadmium reds, yellows, and ultramarine blue tend to fade outdoors.

Coating

Coatings are most often used to aid in graffiti removal, although some topcoats also provide protection from ultraviolet fading and may provide protection to the paint layer from deterioration. However, some muralists have experienced issues with clear coatings – they can become cloudy, yellow, or chip and flake. Leave a small portion of the mural uncoated and

mark and photograph this area. This area will make it easier to observe in the future if the coating is clouding, yellowing, or failing.

Maintenance

It is far more cost effective at the start of a project to select materials that are designed to withstand the environment and to begin a schedule of regular maintenance than to restore a mural completely. In addition, a well-maintained mural is less likely to be a target for vandalism. Regular inspections should be assigned to one or more parties. Guidelines about who may make repairs or repainting should be defined.

More detailed recommendations can be found on the Mural Creation Best Practices website, a project made possible by an Access to Artistic Excellence grant from the National Endowment for the Arts. These recommendations assume that a mural painted with careful planning and consideration of technique, materials and receiving regular maintenance could have a significant lifespan.

For the West Harlem community, that is certainly the hope for *Homage to Seurat*. In 2009, thanks in large part to the work of Rescue Public Murals assessors, the mural was finally restored with materials donated by Golden Artist Colors to its former glory and once again provides a colorful backdrop to the community. The artists, conservator, and neighbors that were involved in the restoration have met annually to inspect the mural and, to date, remains in good condition.

Public murals inform citizens, enliven neighborhoods, and comment on events, aspirations, and challenges in communities. Unfortunately, the very qualities that make murals so distinctive also lead to their disintegration. Rescue Public Murals hopes through its endeavors, like assessments and best practices, to raise awareness of these issues and promote the long-term preservation of this very prominent art form.

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Selecting the Best Exterior Mural Pigments

By Michael Townsend

An exterior mural is likely the most extreme test for lightfastness and weatherability of a paint system. One of our most popular Application Information Sheets, "Painting Exterior Murals" is the culmination of decades of experience and research. If you have never read it, please do. You will soon realize a mural is only as durable as its components and preparation is vital for long term success. Naturally, a key to this success comes from selecting paints best able to withstand the worst environmental conditions.

GOLDEN's acrylic paint lines are well suited for use as an exterior mural paint. They have an exceptional exterior binder coupled with pigments chosen for their durability. However, just being artist grade paint isn't enough when it comes to an exterior mural.

"Fine", you say, "I'll stick to just using ASTM Rated Lightfastness I pigments." That's a great start, but the ASTM LF-I pigment rating system is intended for interior use applications without any direct sunlight. Outdoor murals have to be durable against UV, heat, moisture, alkaline surfaces and acid rain. Some pigments only reveal their true durability under a combination of factors; certain paint systems such as oils don't perform well on many of the brick and block alkaline surfaces typical of murals. This is why we do not solely rely upon ASTM LF testing as the only indicator of success.

Artist paints also differ from house paints and other commercial coatings. In artist paints there tends to be a much wider range of pigments used and typically, they have higher pigment loads as well as some larger pigment particles, making them more likely to be exposed to the elements. We regularly suggest adding additional acrylic binder, such as GAC 200, into paints. This adds a harder binder to aid in physical toughness and promotes better adhesion as well. It also yields more paint to use on your mural. Overall though, once the initial concerns are addressed, we



Fluorescent Magenta. 10 mil. Uncoated, with Isolation Coat, and with 2 coats MSA Varnish. Left is unexposed, right after 1 year exposure.

can paint using the same paints for the mural as we use for easel painting.

Don't Go Changing

Color fading comes to mind first when we think about sunlight exposure. Fugitive colors literally can disappear from view, which has been an issue for centuries. But along with vanishing, there might also be color change. We measure this change with an instrument called a spectrophotometer, which specifically gives us readings of color change in 'delta units'. The amount of color drift from the initial starting point is how we determine if a color is "lightfast" or not. A color may fade, darken or otherwise change its hue. Fluorescent pigments (actually a dye encapsulated in acrylic binder) are notorious for their poor lightfastness. Not only will they eventually fade severely, but they go through a very drastic change along the way. The once vibrant optically bright color can quickly become muddy brown. Fluorescents therefore are an obvious exclusion for the exterior muralist palette, but there are others that may come as a surprise.

Pigments rated ASTM Lightfastness II are completely suitable as artist grade paints, but should be avoided for any exterior use. They include Dioxazine Purple and Nickel Azo Yellow (a key component of our Quinacridone/

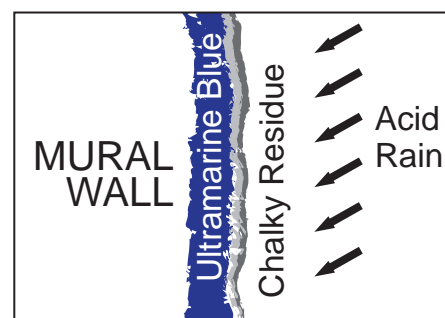


Cadmium Red Light. 10 mil. Masstone and 10:1 tint. Unvarnished. Left is unexposed, right after 3 year exposure.

Nickel Azo Gold). Hansa Yellow Light is also a comparatively less lightfast pigment amongst the other yellow arylide pigments.

Cadmiums are pigments associated with many strong opinions. Yes, they are heavy metal pigments and should be handled with care. Yes, they are an artist staple with rock solid stability for interior use - but therein lies the rub. When Cadmium Yellows come into contact with UV, heat and moisture at the same time, they can change from brilliant yellows to pastels. Cadmium Reds, while a good deal more resilient, are vulnerable to color shift under the same conditions and should therefore also be avoided for outdoor use.

Ultramarine. You didn't want to see Ultramarine Blue on this list. We get it. We love it too. However, as Ultramarine pigments are exposed to mild acids, a chemical reaction causes



Exposure to mild acids can turn Ultramarine Blue chalky white, making it inappropriate for outdoors.



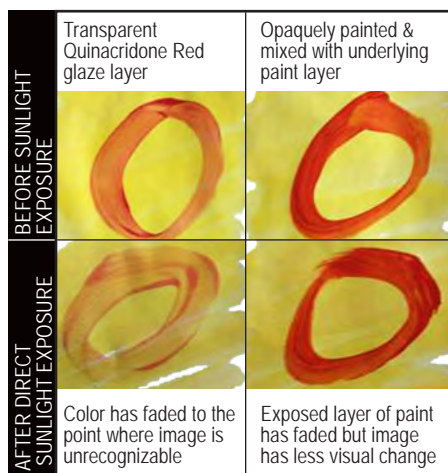
Ultramarine Blue. 10 mil. Masstone and 10:1 tint. Unvarnished. Left is unexposed, right after 3 year exposure.

the bright blue pigment to “chalk” and turn white. We saturated a test card with a vinegar based household cleaning solution to simulate acid rain and upon drying, the surface pigment changed to white.

The Crossroads Blues

The Painting Exterior Murals Application Information on our website provides a list of “good” colors. It is best to think of these paints as “on the fence” for mural use. The colors between “Best Pigments” and the “do not use list,” typically includes colors that can be used for murals but only opaquely because pigments on the surface may change, but as long as there is more of the same color underneath, the change goes relatively unnoticed. For best results we always suggest creating your mural with dense, opaque paint layers regardless of color.

Use these colors with a heavy hand and add Titanium White to lighten the color instead of as a glaze or wash:



Use dense, opaque, paint layers regardless of color for best results.



Diarylide Yellow. 10 mil. Masstone and 10:1 tint. Unvarnished. Left is unexposed, right after 3 year exposure.

- Diarylide Yellow
- Hansa Yellow Opaque
- Naples Yellow Hue
- Turquoise (Phthalo)
- Cerulean Blue
- Cerulean Blue Deep
- Quinacridone Red

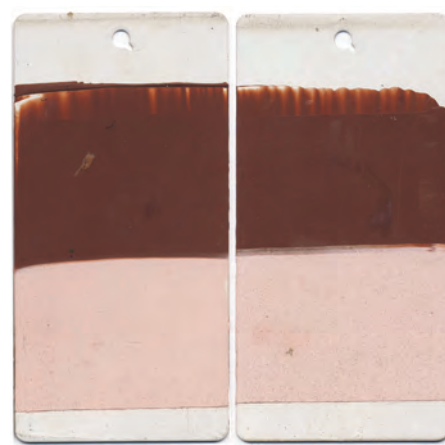
Best Recommendations for Mural Colors

When it comes to the most stable pigments available, iron oxides reign supreme. This is why it makes sense to incorporate them into a mural. We may not realize how widespread these pigments are used by artists, as their common names may or may not reflect their actual base ingredients. When developing the mural concept - with the aid of prototypical maquette (perhaps the best planning tool a muralist can utilize) – try to see if you can work within a group of paints made from mostly Oxides.

Earth Colors

Earthy Inorganics often have a romantic name, evoking images of rolling Tuscan hillsides with mandolins playing in the background as Renaissance-era workers carefully fill a sack of the finest ochre destined for Vasari’s workshop. But wherever a vein of Limonite is found on the planet, it can be named PY-43, Yellow Ochre or Raw Sienna as we know it today. Take that iron oxide clay and heat it and you have Hematite, or what we know it as, Burnt Sienna. Regardless of their name, these are extremely stable and reliable pigments for mural use.

- Yellow Ochre
- Raw Sienna



Burnt Sienna. 10 mil. Masstone and 10:1 tint. Unvarnished. Left is unexposed, right after 3 year exposure.

- Burnt Sienna
- Raw Umber
- Burnt Umber
- Burnt Umber Light

Man-Made Oxides

Rather than rely upon veins of naturally occurring sources for specific earth colors, pigment manufacturers combine the base ingredients at certain percentages to create synthetic versions. We know them as “Oxides” or “Mars” pigments. A wonderful range of pigment choices have come from this process and they are as reliable as their natural inspiration. More recently, a new variation of these pigments has been given to the artist, where it’s been transformed from an opaque pigment into a transparent version. These transparent pigments are every bit as stable, and produce very clean and vibrant colors.

- Yellow Oxide
- Mars Yellow
- Red Oxide
- Violet Oxide
- Transparent Yellow Iron Oxide
- Transparent Brown Iron Oxide
- Transparent Red Iron Oxide

The Bright Side Of Oxides

We tend to think of oxides as being just a range of browns, but there are actually many bright, vibrant colors ranging from yellow, to green and into blues. When iron is swapped out with chromium and/or cobalt, the results are stable and stunning.

- Chromium Oxide Green
- Chromium Oxide Green Dark
- Titanate Yellow

- Cerulean Blue, Chromium
- Cerulean Blue Deep
- Cobalt Green
- Cobalt Turquoise

Ain't Nobody's Bismuth

Bismuth Vanadate Yellow, an opaque greenish-yellow, is one of the more recent color entries into the GOLDEN lineup. As was previously mentioned, Cadmium Yellows are not recommended for use on an exterior mural. Hansa Yellow Opaque can still be too transparent for some artists, and Titanate Yellow is quite pale, eliminating it as a viable option for many color mixtures. Enter Bismuth Vanadate Yellow, which fits nicely between Cadmium Yellow Light and Cadmium Yellow Primrose, yet has the permanence of Yellow Oxide.

- Bismuth Vanadate Yellow

The Royal Family

Pyrrole pigments have been on the art market since the early 90's, as an excellent alternative to the heavy metal Cadmiums. Not only are they similar in opacity but they are vibrant and clean mixers with a history of being solid when used outdoors. No other family of bright oranges and reds can even compare.

- Transparent Pyrrole Orange
- Pyrrole Orange
- Pyrrole Red Light
- Pyrrole Red
- Pyrrole Red Dark

Paint It Black?

While all of the black pigments used by GOLDEN are perfectly suitable for exterior use, their dark value can result in something that catches new exterior muralists off guard when exposed to large amounts of south facing light. This leads neatly into a discussion about color choice for murals. Studies conducted by the Lawrence Berkeley National Laboratory show that, on a 55° day in Los Angeles, black acrylic paint got up to 142° F versus white paint, which peaked at 74° F¹. Granted, these were on roofs exposed to the overhead sun, but it still gives a dramatic example of just how much the absorption and conversion of solar energy into heat increases the surface temperature.

What does that mean? If you use



Pyrrole Red. 10 mil. Masstone and 10:1 tint. Unvarnished.

Left is unexposed, right after 3 year exposure.

large amounts of black in a mural, you can create hot spots on the wall. The impact to longevity of the mural is unclear but any build-up of heat adds additional stress to paint.

White Light/White Heat

In the case of an exterior mural, many times it begins with a white basecoat (White Gesso with additional acrylic medium or an all acrylic exterior house paint). Titanium Dioxide has been the darling of the house paint world for many decades and for good reason.

While there are actually many kinds of TiO₂ pigments available, the ones used by GOLDEN have a proven record for exterior applications. Many commercial grades of Titanium Dioxide pigments are prone to a reaction with UV light, which can create free radical formation and lead to chalking of the paint film. Our pigment was specifically chosen for its protective coating which reduces, but not eliminate, the UV degradation. It's an extremely durable pigment so use it and its warmer cousin Titan Buff (unbleached Titanium White).

Zinc White can be used in a mural but its highly transparent nature can be an issue when coupled with Phthalo and Quinacridone, so use with caution.

- Titanium White
- Titan Buff
- Zinc White

Shine On You, Crazy Diamond

The longevity of Iridescent and Interference pigments can be confusing. Although they are listed as "permanent" they are not able to

be measured for ASTM Lightfastness rankings. Why? Because the color spectrophotometer can't read a reflective paint the way it does with regular pigments. Fortunately, we have some equipment that can accurately scan for color change, and it's called the human eye. It's the best device for this task, and we always have more than one pair of eyes take a look at the exposed test cards to see how they fare. After assessing accelerated weather testing – both UVA and Xenon Arc methods – and multiple long term South Florida real time exposures, we feel confident in their ability to hold up when used in an exterior mural system.

The only Iridescent color to avoid is Iridescent Bright Gold because it is a blend of mica and LF II Quinacridone / Nickel Azo Gold, not a pure mica pigment. Colors to use:

Interference Colors:

- Blue (Fine)
- Gold (Fine)
- Green (Fine)
- Orange (Fine)
- Red (Fine)
- Violet (Fine)

Iridescent Colors:

- Bronze (Fine)
- Copper (Fine) & (Coarse)
- Copper Lt (Fine) & (Coarse)
- Gold (Fine) & (Coarse)
- Gold Deep (Fine)
- Pearl (Fine) & (Coarse)
- Silver (Fine)

Actual Metals:

- Micaceous Iron Oxide
- Stainless Steel (Fine) & (Coarse)

Natural Micas:

- Black Mica Flake (Small)
- Gold Mica Flake (Small) & (Large)
- Pearl Mica Flake (Small)

If we pair the colors detailed in this article with appropriate priming and subsequent sealing with a protective varnish, your murals should remain looking great for a long time to come.

Resources

- 1) spinoff.nasa.gov/spinoff2003/er_4.html
 - 2) pcimag.com/articles/a-comprehensive-understanding-of-tio2-pigment-durability
- ¹ lbl.gov/Science-Articles/Archive/heat-islands-and-roof-color.html accessed 1/6/14

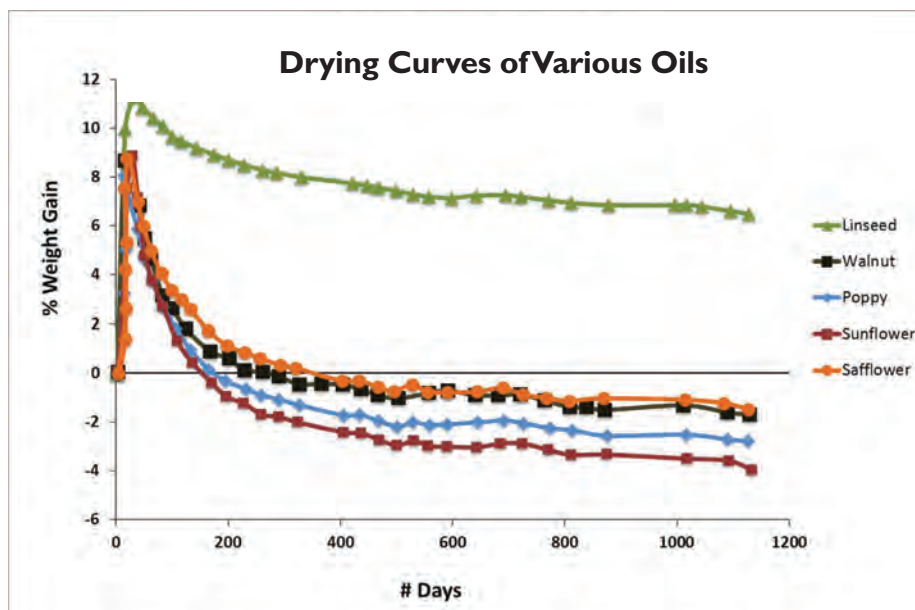


Chart 3 – Data adapted and simplified from Tumosa, Mecklenberg 2013

Continued from page 7

will see, all of these areas are tightly interwoven.

The main vulnerability of safflower is caused by its inability to create a dense network of cross-links; it simply lacks the degree of unsaturated double bonds that would be required. As a result its surface is more porous and volatile components can easily leave the film. Many of these mobile materials, which include both unreacted free fatty acids and smaller components created by internal processes or from hydrolysis, act as plasticizers that ultimately help a film remain flexible. As these are lost through evaporation and solvent extraction, the film becomes increasingly thin and more rigid.

This process can be seen quite dramatically in Chart 3, adapted from research done at the Smithsonian Institute (Tumosa 2013) and showing the drying curves of various oils tracked for over three years. What is most striking is the fact that every one, with the exception of linseed, ends up losing more weight than what they had at the start. It is also instructive to note exactly when each oil dips below the base line, the final amount of weight lost, and the ordering of the oils from the lowest on up. As one can see, these three things all correlate nicely to the relative amount of saturation that each oil has.

The implication is that linseed, with its high levels of linolenic acid, is able to retain its uptick in density while holding onto the free fatty acids and other materials that can act as plasticizers. All the other oils will unfortunately, and inevitably, go on to form thinner, less flexible films. While safflower narrowly does better than the other alternatives, one still needs to approach its use with a good deal of caution.

Limitations and Guidelines

Cautionary notes come with the use of any safflower-based paint. As good of a job as it does warding off yellowing, it does produce a more fragile film, and in the process of drying it shrinks in mass and loses density. Because of that we strongly encourage you to follow these guidelines:

When can these be used?

Moderation is the key here. Safflower oil will not create the same type of robust durable film as linseed, and we do not recommend using them for underpaintings or thick passages of impasto. They should also not be used for a ground. Use them when the benefit of their clarity is most valuable - in the upper areas and when glazing towards the end of a painting. It is also considered safe to use in alla prima techniques where the painting is developed in a single sitting as one continuous wet-in-wet layer, without

any of the structural complications that come with the more traditional approach of layering.

We also recommend, as we do with all oil paintings, to paint on an inflexible support whenever possible or to consider mounting the canvas to a panel once it is finished. Everything we know points to this as the number one thing anyone can do to minimize risks of cracking.

How much slower drying are they?

By itself safflower is considered a fairly slow drying oil so you might find that some adjustment is needed. However, drying is also a complicated issue, especially when you add in the impact of pigments, driers, mediums, and the environment. That said, thin layers of the safflower colors will likely take just 2-3 days longer than their linseed-based versions. Just keep in mind that being touch dry does not mean the paint is no longer going through dynamic changes. If layering on top, provide additional time for the film to cure more completely.

Can I mix them with my other paints?

Yes, absolutely. In the process, you will be creating layers that have properties in-between the two. Not a bad thing, just something to be aware of.

What Mediums can I use with them?

All the same mediums one uses with regular linseed-based paints can be used with these. Using mediums based on Stand Oil will increase durability while preserving the resistance to yellowing, although it will not speed up drying.

The Bibliography for this article can be found at goldenpaints.com/justpaint.





Artist, Professor Clarence Morgan

Spring 2014 Made In Paint

By Emma Golden

While the trees are still draped with snow we are preparing for the 2nd annual Made In Paint exhibition, here in New Berlin, NY. On April 12th we will open our doors at the Sam and Adele Golden Gallery for the Exhibition of the 18 selected artists from this past year's Residency season and two of our invited Visiting Artists. These extraordinary artists from around the world spent one month painting and experimenting with materials.

It was a tremendously exciting year at the Residency. The roster of artists selected for residencies was a diverse international group with an impressive exhibition history. Each session of three artists was an opportunity to both share and learn from these talented professionals. The artists who had been accepted to the Residency all shared a common passion and interest in increasing their working knowledge of their chosen mediums as well as a willingness to expand into mediums that might not be so familiar.

We are thrilled that we are able to present works that truly highlight the talent of these artists. Some works completed or started during the Residency, but not exclusively so. This past year we were also joined by two invited Visiting Artists, Mary Frank and Arlene Burke-Morgan who both spent valuable time at the Residency experimenting with new materials.

For a list of 2013 Artist in Residence websites go to goldenfoundation.org. The virtual gallery will be available at theSAGG.org following the Opening. Email contact@goldenfoundation.org for a catalog.

Fluorescent Colors - *Bottling a Shooting Star*

By Amy McKinnon

It's dead quiet, the cello, with a low and constant hum, emerges in the space followed by a violin entering with the same subtlety and delicateness. The instruments gently ride the nuanced waves of a slow and lazy river hypnotically guiding listeners to a place of calmness and refinement and then... a toddler, naked and newly walking, quickly totters across the room half running, half catching himself with every new step, shrieking as his mother, red faced and quick, chases him, knowing the drill. In the world of pigments there is history, consistency and refinement, and in this world fluorescent colors are the toddler. They exist and while they are not always on the program, when they show up they make waves, they make themselves known and while they can be jarring and upsetting to some, they make the rest of us appreciate deviation.

Fluorescent colors are valued for a brightness that standard pigments don't possess. While, as their name suggests, they do fluoresce under a black light it is often their high chroma that entices artists to utilize them as tools to emphasize, contradict and compare the other elements within the work without the use of specialized lighting. These high chroma colors are often referred to as neon or dayglow and are typically seen on running and safety gear. They are head turners and attention grabbers and have somehow managed to simultaneously suggest safety and excitement at the same time.

The suggestion of excitement is an actual phenomenon, an effect ultraviolet light has on fluorescent color. When ultraviolet light hits the color it raises the energy of the electrons of the molecules to what is called an excited state. Once in this excited state it does lose some energy to vibrations but the rest of the energy is emitted in longer visible glowing wavelengths. It is possible for these pigments to glow under light other than ultraviolet as long as the absorbed light has a higher energy than what

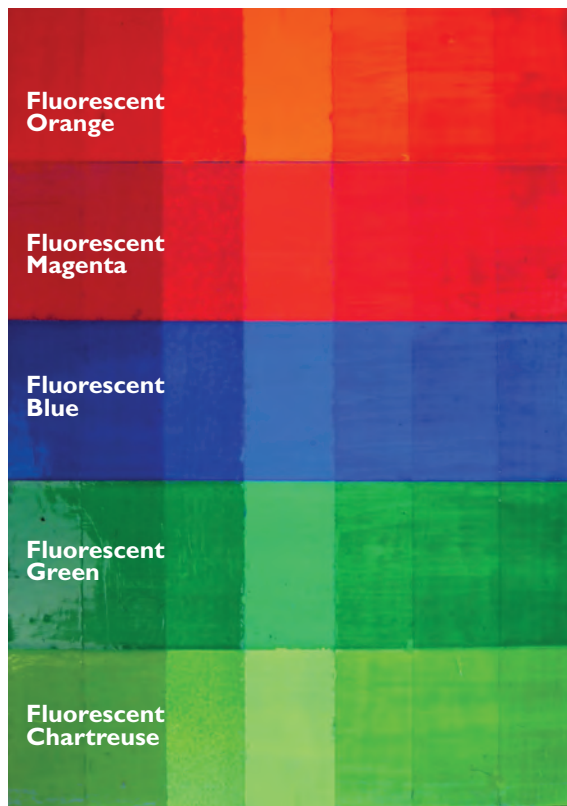
is emitted and the specific color has the ability to absorb that particular color of light. The ability they have to fluoresce under a black light creates a controllable and alternative avenue otherwise unrealized by the viewer and can act as a hidden secret.

The ASTM rates pigments for lightfastness so there exists a standard based on the chemical makeup of a pigment. We do conform to that testing and in addition, we perform our own extensive research and testing of all of the pigments we carry regardless of whether or not the ASTM has rated the pigment. In compliance with their testing we know that all of our pigments can stand up to the lightfastness testing done through the ASTM and falls into one of two categories: Lightfastness I (excellent) or Lightfastness II (very good). Fluorescents, in general, do not perform well in regards to lightfastness. Foremost, fluorescents are not pigments. The fluorescent colors we make are organic dye based fluorescents that are dissolved in a transparent solid polymer carrier. In general, pigments are solid particles while dyes are fluids and overall, due to the physical structure the solid pigment has greater durability and less surface area exposed, resulting in greater lightfastness.

This may lead someone to ask why we carry colors that do not fall within our high standards of longevity. The simple answer is because artists have asked for it. One of our philosophies is to delight the customer. We have built our reputation on creating what the artist needs and base that on actual requests. What we offer despite poor lightfastness, is a product that is the best within its class. We also offer an accurate assessment of performance so that artists can make their own choices as to whether a particular material suits their needs.

When choosing colors to make into paint we examine all of the options available and look at the color in regards to its masstone, tint, opacity, durability, sensitivity, lightfastness and in this case, its ability to fluoresce. This gives us the knowledge to choose the best of what is available and although the color does not have the greatest permanency in comparison to our other pigments, it is the best of what is available.

Fluorescents Under Black Light



Archival Varnish w/UVLS
3 Coats / 2 Coats / 1 Coat

Polymer Varnish
1 Coat / 2 Coats / 3 Coats

Fluorescents In Daylight



Archival Varnish w/UVLS
3 Coats / 2 Coats / 1 Coat

Polymer Varnish
1 Coat / 2 Coats / 3 Coats

When fluorescents fade they not only lose their power to fluoresce but they also lose their high chroma. They do not all fade similarly nor do they fade to the same degree. When exposed to UV, Yellow goes green, orange goes more yellow and dull, pink goes to a light earthy orange color, green goes very blue and dull, and blue goes much darker. They all get duller and either fade or shift.

In addition to a less than acceptable lightfastness, fluorescent colors possess traits that can require some getting used to or manipulation to make them work exactly as the artist intends. Fluorescent colors have a tendency to be more transparent than a fair amount of other artist paints. This can be bothersome if one is trying to achieve an opaque application but conversely can be advantageous if the colors are being used for their fluorescing properties. There are some practical measures that can be utilized when working with fluorescent colors.

If the fluorescent colors are used for their fluorescing properties, then the thickness of the paint applied and what it is applied over top of will make a

significant difference. They will behave differently over each color. Over matte black (Black Gesso) the color will almost be imperceptible due to its transparency with a single coat but as the amount of coats are increased, the color will emerge. When placed under a black light the background will completely disappear making the fluorescing color the only visible element. When the fluorescent color is painted over white, its initial color is very bright as the white behind the transparent color is helping by allowing more light to bounce off of the surface. However, as the coats increase and the opacity increases, less of the white shows through actually leading to a diminished glow in comparison to one coat over white. If an intensely bright fluorescing color is desired over a matte black surface, it would be achieved best by starting with a matte black background and painting the areas to fluoresce in white prior to applying the fluorescent color.

Transparency of fluorescent colors will require some finessing if an opaque passage is desired. Often choosing a similar opaque color and applying

it under the fluorescent color will allow for far greater opacity without losing the chroma or intensity. They can also be mixed together, although the fluorescent color can get lost within the strength of an artist's pigmented paint color. Stippling techniques used by decorative painters can also help break down the brush marks so that an even application can be achieved.

Varnishing can save your intensely high chromatic colors from fading and dulling to a color that is unrecognizable to

its younger self. When MSA Varnish and Polymer Varnish were applied to the fluorescent paints in one, two and three brush coats we saw minimal change in their exposure but they no longer fluoresced. They did fluoresce slightly at one coat of the varnish and just slightly under two coats of Polymer Varnish. At two coats of MSA Varnish there was absolutely no fluorescing. The reason varnish works to not only save but hinder the fluorescent colors is because the varnish contains UVLS (Ultra Violet Light Stabilizers) which block UV light from entering through to the paint film. While varnish will save a painting from fading it will also prevent it from passing light from the source back to your eye.

Like the toddler cutting through the silence, fluorescence will always command attention but there are ways to compose what could otherwise be considered a cacophony. The most exciting thing is when the energy, the fire and excitement of something uncontrollable is not controlled but understood, manipulated and utilized for the very quality that first excited your eyes.

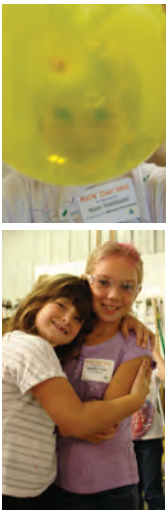
GOLDEN Invites Employees' Families to Factory for Kids Day

By Jodi O'Dell

As a child, did you ever wonder what your parents did every day at work? Where exactly were they going each morning and what could they possibly do for 8 hours every single day? Who were these people and projects they talked about at the dinner table every night? Didn't you wish you could just spend one day with them at work getting all your questions answered?

In October, Golden Artist Colors opened its doors to employees' families (about 70 children attended) to spend a day learning about what their mom, dad, grandmother, grandfather, aunt or uncle do all day long as they produce, market and sell GOLDEN paints for artists all over the world.

In addition to touring the facility and Gallery, along with spending time painting and expressing creativity, many educational activities were held



throughout the day and included sessions in several departments, including Production, Filling and Shipping. During these sessions, children learned how paint is made, how it gets dispensed into different containers and finally, how it gets boxed up and shipped out the door! There was also time just to enjoy each other's company creating balloon animals and learning about animals from a traveling zoo!

"Kids Day is a way for employees to share what they do at GOLDEN with their families," said Mark Golden. "I was always so excited when I got to spend time at the Bocour factory in Manhattan with my Dad. This is a wonderful opportunity for families to learn together and try to break down the mystery for our children of the special things we do here at GOLDEN."

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13630

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