JUST PAINT

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From Mark Golden

Just Paint 25 comes at a time when we're able to share many projects that have come to completion. We are delighted to announce the opening of the Golden Foundation Artist Residence, which I know will serve as a tremendous resource and will continue the conversations with artists, which has been the hallmark of Golden Artist Colors for over 30 years. Simultaneously is the opening in the SAGG of 'VELOCITY,' a thrilling show of works by Larry Poons, both a longtime friend and supporter of the company.

The featured technical article is by Sarah Sands, Technical Services Supervisor. Just as we delight in watching paint dry, we also delight in writing about how paint dries. I'm pretty sure it can't get any dryer than that, yet Sarah has a way of making drama appear in the least obvious places. Her work advances our knowledge of how oils dry, especially important in understanding the various layers of a successful oil painting.

I hope you enjoy my interview with Ulysses Jackson, an amazing artist and talented member of Technical Support. Please call Ulysses or anyone else on the team as issues or problems arise. I know you'll be delighted with their skills and ability to meet your materials needs.

Ben Gavett, Regulatory Affairs & Facilities Director, has been working with colleagues and experts around the world, assuring our art materials meet the highest standards for safety and compliance in a very fast pace, confusing, and at times, conflicted global environment. Ben's article sorts through much of the complication, providing a clear, practical explanation of the very complex topic of materials safety and labeling.

Finally, it is with great pride that we share the announcement made in *Inc. Magazine*, that Golden Artist Colors was named one of the winners of the "Winning Workplaces" award. As proud as we are of our product and service, this award stands as one of our most satisfying achievements thus far.

Mark

Golden Foundation Artist Residence Opens its Doors

Western view of Golden Foundation Artist Residence, showing apartments and patio spaces on lower level.

By Mark Golden

All the construction is headed to its final crescendo for the new Golden Foundation Artist Residence, capping off a 30 year dream of the Golden family to create a site where artists could live, work and most importantly, collaborate with the substantial material resources of Golden Artist Colors. It is no mistake that the company has remained in its original location on the site of Sam and Adele's home. Amongst these verdant rolling hills are some of the most beautiful rural landscapes probably more appropriate for painting than locating a modern manufacturing facility. But we couldn't help feeling that making beautiful colors in a beautiful environment was worth extra effort. And anyway, who would have thought a paint factory started in a barn, would become a worldwide center for artist materials?

Having started Golden Artist Colors in a barn, it is fitting that the Golden Foundation Artist Residence also starts in a barn, just 300 yards from the factory. The Residency had its preview party this past August, sharing a mostly completed building with staff and families, the local community, and artists and friends from around the country. The timing was perfect as that weekend was also the opening in the SAGG at the Golden Factory of the show "VELOCITY"; works by Larry Poons. Larry has been a longtime friend and collaborator with both Sam and Golden Artist Colors. It was Larry and his wife Paula, who provided Sam with the first list of artists to go visit when the company began in 1980. We're very fortunate that this capstone for the Golden family and Foundation could be celebrated together.

The Golden Residency structure consists of 3 artist apartments, a common kitchen, dining room, and living room, all in the lower level

The view from Bell Road, just a short walk from the Golden Artist Colors facility.

of the building. The second floor contains the Foundation offices and a small gallery space. Also on this floor is an open plan studio of 2400 sq. ft., capable of being divided into smaller spaces depending upon the needs of the artists. The 3rd floor consists of a smaller loft studio approximately 900 sq. ft. and another open floor plan studio space approximately 1200 sq. ft. Beyond a catwalk bridge spanning the 3rd floor is the materials area, which is stocked with supplies required for the various needs of the residency artists. All the floors are accessible by elevator.

In planning the programs for the Golden Foundation Artist Residency, Barbara Golden, the Foundation Executive Director, has organized several professional advisory panels, consisting of artists, artist residency executives and staff at Golden Artist Colors. The continuing discussion with these groups has begun to coalesce the specifics of the programs and the sorting out of the selection process for the residency. Until there is a formal program for the residency, artists have been invited as residency advisors to work in the space and help us establish the requirements for the building and the studios to assure a successful residency experience.

The Golden Foundation Residence will offer a variety of different programs. Beyond providing beautiful studios and wonderful scenery, the residencies will be quite unlike any other residency experience. They will include an 'Exploratory Residency', allowing artists the opportunity to investigate a wide range of painting materials as well as a 'Technical Residency', allowing artists to extend the vocabulary of what paint is and can be. Each of these residencies will be awarded on a competitive basis, selected by a committee of highly regarded art professionals and the Executive Director.

The Golden Residency will also provide a range of artist workshops, allowing a larger group to experience the residency on a shorter basis, alongside a master teaching artist.

The official program announcements and applications will be available online by November 2011 on the Golden Foundation website, which is www.goldenfoundation.org. The anticipated dates for the first residency are for fall of 2012. The artist workshop schedule will begin the summer of 2012 and will also be listed on the website.

The Sam and Adele Golden Foundation for the Arts was originally conceived in 1997 as a way to thank the community of artists for their support and encouragement and as a means of celebrating the legacy of Sam and Adele Golden. This next chapter will allow the Foundation to continue that dialogue with artists in a most unique manner. Not unlike the small shop on 15th Street in 1936, where Sam Golden and Leonard Bocour began making paint and inviting artists into the process, or the small barn on Bell Road in 1980, where artists have continued to be the center and the heart of the creative effort. Now again in a barn, the Golden Foundation will continue the effort to support artists working in paint to continue its quest to become a significant resource for professional artists.

Weighing In on the Drying of Oils

By Sarah Sands

For several days now the painting was on fire. Not a literal one – no flames or smoke wafting into the air, no one scurrying to find a fire extinguisher. Rather it was a slow, barely perceptible simmering under the surface as unsaturated fatty acids reacted with oxygen in a process frequently described as a form of 'flameless combustion' or, in more technical terms, 'autoxidation'. As this oxygen was being absorbed, highly reactive free radicals were being spun off, along with unstable hydroperoxides that quickly decomposed into an array of often-volatile components. Slowly, out of this process, crosslinks were formed between the polymer chains, binding them together into an increasingly dense network of long entangled strands. As a result, the oil that once flowed between the pigments would initially thicken, then gel, and ultimately feel dry to the touch. However, because it absorbed such a large amount of oxygen along the way, the oil also grew in volume before the volatile by-products that were slowly being released helped to settle things down and find some form of apparent equilibrium. Eventually the fire would die down, the slow oxidization would give way to even slower processes that would continue morphing and changing for centuries to come, and the film, initially so pliable, would become increasingly stiff and brittle over time.

While the details of this process have been covered in numerous publications, for our purposes it is enough to realize that oil paint never actually 'dries' through evaporation, but rather oxidizes and undergoes a series of chemical reactions to form a solid film. One way to follow this process is by simply weighing a sample of oil paint over a period of time in order to gauge the amount of oxygen it has absorbed. *(Sabin, 1910; Tumosa, Mecklenburg, 2003)* The more oxygen, the more crosslinking. In the pages that follow we share some of our initial results from longer-term testing initiated over the last year. As we will see, the resulting weight gains can be quite substantial, with linseed oil growing by some 15- 20% in mass before gradually declining to more modest levels. By examining the data in some detail, we can develop a much better understanding of how various factors impact the overall drying rate. However, before embarking on that path, it is valuable to touch on some of the more basic components involved, including the type of graphs that are generated.

Oil

The handful of plant oils that will form a film if exposed to oxygen usually have higher percentages of three unsaturated fatty acids in particular: oleic, linoleic and linolenic. How unsaturated each of those are is determined by the number of reactive sites, known as double bonds, which are available for crosslinking. Oleic is the least reactive, with just one double bond, while linoleic and linolenic have two and three sites respectively. The more sites, the more reactive, and ultimately the more durable, faster drying, and crosslinked the film will be. Historically linseed, walnut, and poppy have all been used at one time or another, although linseed has clearly been the most prevalent of the three and, with the highest level of linolenic acid, produces the strongest and fastest drying film as well. More recently safflower has gained in usage, where its very light tone and resistance to yellowing makes it particularly popular for use in whites. Those qualities come at a cost, however, since it has no linolenic acid to speak of, so produces a more fragile and slower drying film.

Beyond these basic differences, there can also be differences in how the oils are processed. Probably the three most commonly encountered are Alkali-Refined Linseed, Cold Pressed Linseed and Stand Oil. Alkali-Refined is extracted using heat and solvent, and then further processed with alkaline chemicals to remove impurities. Cold Pressed, as the name implies, is extracted through pressure alone and impurities are removed through mechanical filtering and cold processing methods. Stand Oil is more accurately described as heat-polymerized or heat-bodied, and is made by subjecting linseed oil to very high temperatures (~300° C / ~570° F) in the absence of oxygen. This allows it to polymerize without ever undergoing oxidization and imparts a viscous, self-leveling quality that is one of its hallmarks. Because Stand Oil also has far fewer reactive sites still available, it dries slower than regular linseed and is quite resistant to yellowing over time.

Pigment

The way pigments influence the drying of oils is too broad and complex to cover here in any great detail, but a few factors can be mentioned. First among them are impurities that act as catalysts to accelerate drying and are found in many natural pigments, such as the manganese in Burnt and Raw Umbers, or pigments made from reactive metals, like Cobalt or Lead. On the other hand, some pigments can have a retarding effect, containing elements such as phenols that function as anti-oxidants and are often associated with Carbon Blacks and genuine Van Dyke Browns. Each pigment also has its own oil-absorption index, which refers to the amount of oil needed to turn a fixed quantity of pigment into a useable paste. Everything else being equal, the more oil it takes, the slower the dry time. However, one should not jump from this to an assumption that higher pigment loads will automatically translate into faster drying times. The overall picture is much more complicated and just as often the opposite can be true. For example, in one published study, the more titanium dioxide that was added to a gallon of linseed oil, the slower the drying became. *(Nicholson, 1939)* And in fact, the fastest samples were simply the oil by itself, with no pigment

whatsoever. How to make sense of this seemingly counter-intuitive finding? Certainly a pigment as opaque as titanium dioxide can easily block the penetration of light into the film and therefore inhibit the role of photo-oxidation in the curing process. In addition, just the presence of solids can impede the diffusion of oxygen throughout the film. As if all this was not enough already, research points to the impact of such other issues as particle shape, size distribution, or simply the length of time that the oil and pigments have been in contact. *(Simunkova, et al, 1985; Rasti, Scott, 1980)*

Substrates and Grounds

While substrates were not the main focus of our study, and we stuck primarily to inert sheets of polyester film and lacquered cards, they can certainly play a role in the drying process. Absorbent surfaces and primers can pull oil down into themselves, leaving the paint leaner and faster drying, while metal ions found in metallic substrates or lead grounds can migrate into overlying paint films and act as a catalyst for accelerating oxidization. And for thinner, more translucent films, even the color of the surface could make a difference as the amount of light absorbed or scattered back through an oil paint film might impact drying times in a measurable way. If nothing else, this is certainly an overlooked variable we hope to include in future testing.

Driers

In oil paints driers are typically composed of heavy metallic salts that act as catalysts in the drying process, speeding up or optimizing many of the underlying chemical reactions. Some, like cobalt, are known primarily as surface driers because they promote oxidization at the paint/air interface, while others like manganese are more intermediate, helping with oxidization at the surface while also serving as a 'through' drier that aids with overall polymerization. Supplementary driers, such as zirconium and calcium, are sometimes used in conjunction with one of the above to help improve overall performance, but by themselves appear to have little or no effect. For many artists it can be tempting to use driers liberally as a way to speed-up the normally slow curing process, but their over-use can cause increased brittleness as well as surface defects like wrinkling.

Current Testing

To investigate the process of drying in oil paint films we initially focused on a single pigment, rutile titanium dioxide, in a range of formulations from very basic combinations of one or two ingredients, to variations on more complex recipes. The test samples were cast on clear polyester films as 3 and 10 mil drawdowns, as well as 2" diameter, 60 mil disks. As a point of reference, a typical piece of standard copier paper is 3.8 mils thick, while 62 mils is approximately 1/16". Weights were recorded daily for the first week, then 5 days a week for the first month, and then weekly for the remainder of the period. Temperature and humidity were not controlled but stayed within ambient conditions of 40-55% RH and 70-75° F. One set of samples combined the titanium dioxide with different oils, including safflower, alkali-refined linseed, cold pressed linseed, and a lower viscosity stand oil. A second series was made from alkali-refined linseed oil and titanium dioxide in combination with one of the following: blanc fixe, calcium carbonate, precipitated calcium carbonate, beeswax, and zinc oxide. A third group was based on our own Williamsburg Titanium White, which we make with no added driers, and comparing its performance to batches where two differing levels of cobalt-manganese driers were mixed in. We also share results from a very early weight study we carried out based on samples cast over a year ago at thicknesses of 4, 10, and 60 mils.

Test Results

What follows are simply selected highlights of the broader testing outlined above, which will continue for years if not decades to come. In order to better understand the data, it can be useful to start with a couple of very basic graphs. The first (Figure 1) shows the percentage of weight gained over a number of days by just the oil contained within a 10 mil film of titanium dioxide ground in alkali-refined linseed. In order to generate this data, we had to subtract out the constant weight of the pigment and the substrate from the constantly changing weight of the overall sample.

As one can see, the most dramatic change happens in the first few days, when the oil gains almost 16% in weight. As it approaches this mark the paint begins to skin over and will feel touch-dry when it finally achieves its highest level during the 4-6 day period. This correlation between

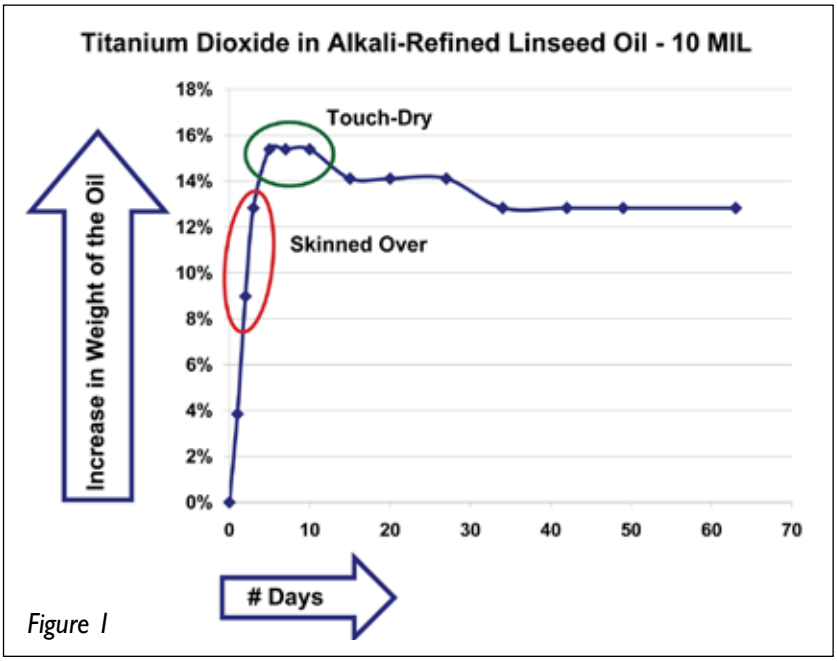


Figure 1

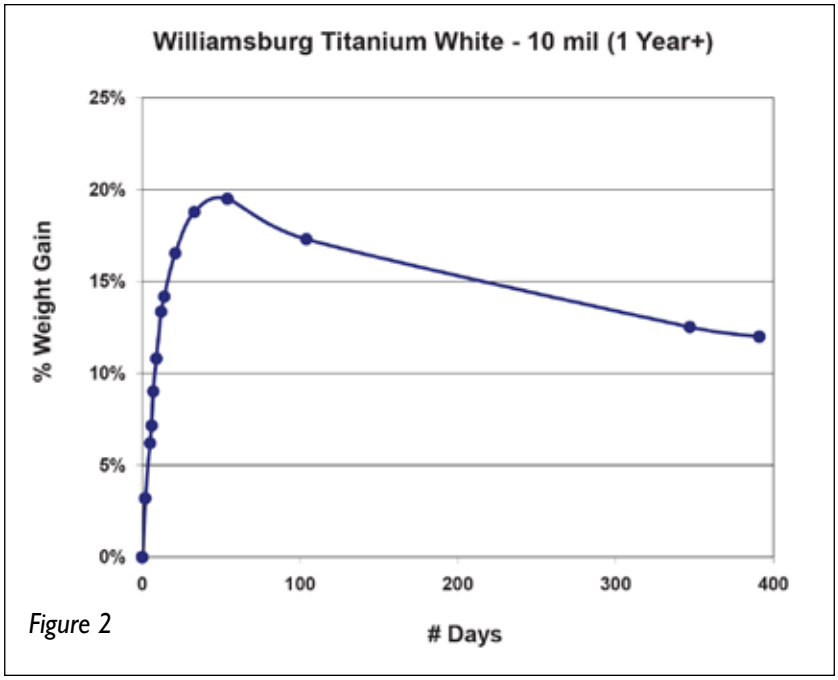
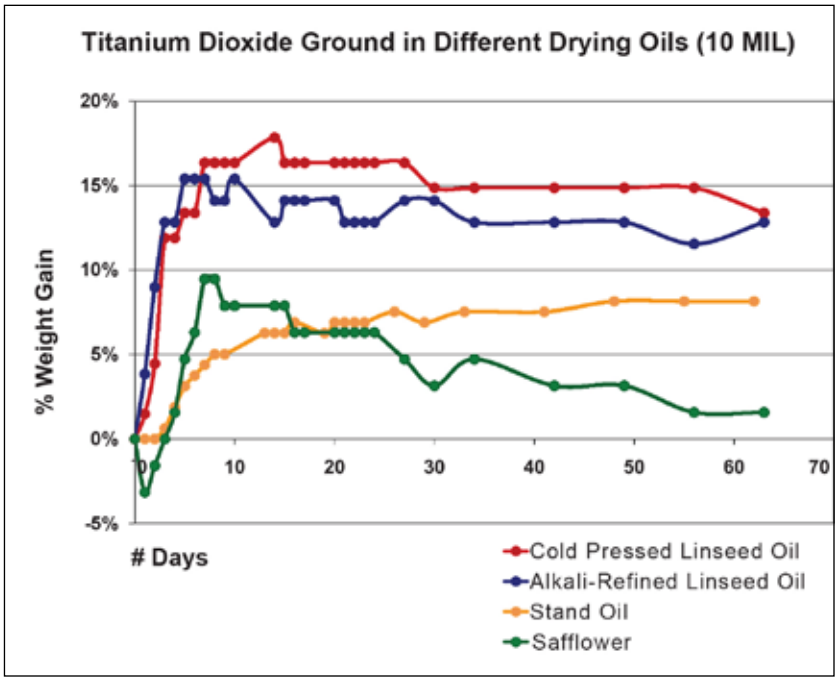


Figure 2



changes in weight and actual stages of drying has been recorded by other researchers as well, and can allow one to roughly calculate when an oil paint will feel touch-dry by simply noting when it reaches its maximum weight. As it turns out, that moment also corresponds with the largest degree of oxygen uptake, and therefore the highest amount of cross-linking activity. One would have a very false sense of the overall dynamics, however, if you only looked at data drawn from such a brief period. For as stable as the paint might appear as it coasts along comfortably for the first couple of months, settling into a seemingly constant 13% level, when we track similar paint films over a much longer period of a year or more, the story is quite different.

As we can see in Figure 2, after the dramatic climb during the first few weeks, the weight appears to stabilize for a while slightly below the 20% mark, but then experiences a fairly steady decline as volatile by-products from ongoing chemical processes continue to escape. As Tumosa and Mecklenburg *(Tumosa, Mecklenburg, 2003)* have shown, as an oil paint film continues to age this decline will eventually level off to a large extent, but it really never completely ends and even after several centuries oil paint films continue to be fairly dynamic materials. The graph also helps inform the oft-repeated advice that even thin films of oils should be allowed to cure for 6-12 months before varnishing. Certainly before that point the paint film is still undergoing not only dimensional changes but chemical ones as well, both in terms of forming longer chained polymers and off-gassing any volatile components created as a result.

Dry Times and Different Oils

If we now expand this same process of tracking, we can look at a graph that shows the weight gain for various oils ground with titanium dioxide and notice some clear differences between them (Figure 3).

Initially both alkali-refined and cold pressed linseed oils, which are the most reactive, display a dramatic increase in weight during the first few days, peaking at 15-18%, before eventually leveling out. From a more tactile point of view, one would experience the paint as forming a heavier and heavier skin in the days leading up to those maximum levels, and then sense it becoming increasingly touch-dry as the line began to flatten out. Stand oil, by contrast, has very few reactive sites for absorbing oxygen and gained weight at an extremely slow pace, taking almost 50 days to reach its maximum level of ~8%. And while it did skin-over much earlier than that, and could even be described as touch dry by the end of the second week, the film remained very soft with a high degree of tack even after a full two-month period. Lastly, samples made with safflower oil had their own unique trajectory, consistently showing a slight loss of weight in the initial period before climbing towards a maximum gain of ~9% after more than a week. After that, the oil showed a steady loss, falling back to just over 1.5% by the end of a two month period. This dramatic decline is similar to

the one recorded in a study *(Tumosa, Mecklenburg 2003)* where a continuous drop in weight was followed for more than 2 years and resulted in the film even weighing less than it did at the start. This unusual pattern is attributed to the fact that safflower's fatty acid profile is heavily weighted towards the less reactive linoleic acid, while containing essentially none of the linolenic prevalent in linseed. And this presents a double-edge sword whenever considering the use of safflower oil in artists' paints. On the one hand, by being less reactive, safflower oil is less prone to yellowing because a lower level of oxidization produces fewer of the by-products believed to be at the center of those color changes. However, with fewer double bonds available for crosslinking, safflower oil produces a more fragile film that is also more permeable, allowing for a greater loss of volatile products and hence a greater loss of weight as well. All of which makes the use of safflower oil in underlying layers potentially problematic and something for the artist to take into account.

Film Thickness

So far we have focused exclusively on 10 mil films, but other thicknesses can produce very different results. In the next graph we show the average percentage of weight gained by multiple samples cast at three different thicknesses. As before, we have subtracted the weight of the pigment and substrate in order to study the changes in the weight of the linseed oil itself (Figure 4).

The 3 mil films were touch-dry and reached a maximum of 22% weight-gain by the second day, then quickly lost mass over the next two weeks before settling in around 16% for the remainder of the test period. 10 mil films were less dramatic, gaining an average of 14% by day six, and then basically maintaining their general weight for several weeks more before revealing a slight downward trend. In contrast to both of these, the 60 mil samples barely budged for the first three weeks until finally, and very slowly, starting to gain weight at 50 days out; a process we anticipate will continue for some time to come.

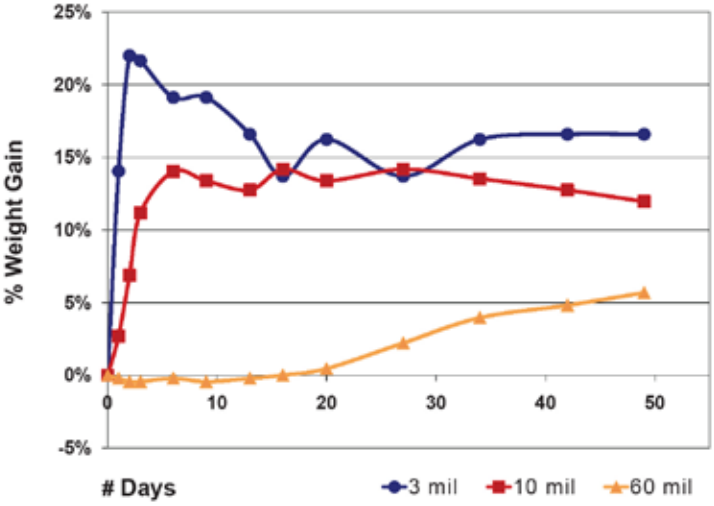


Figure 4

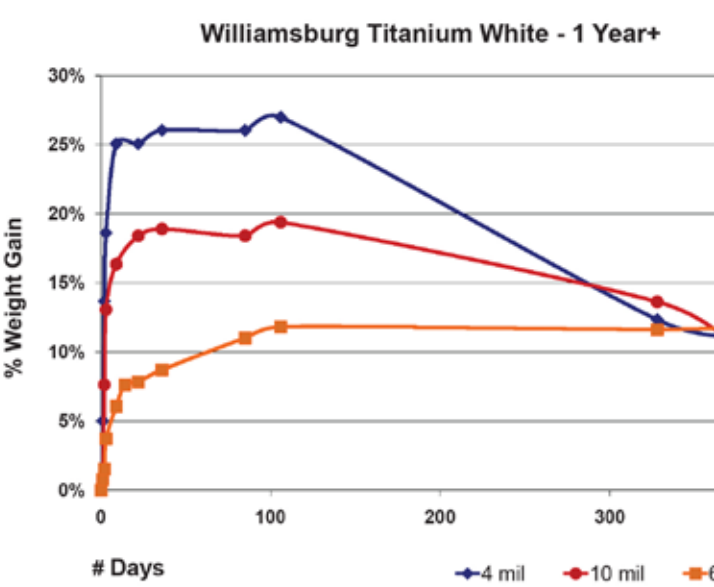


Figure 5

While each of these thicknesses behaved very differently during the early stages of drying, many of our longer-term studies show a similar range of samples ultimately ending up with nearly identical percentages of overall weight-gain, even though each of them clearly peaked at a different level. One can see a good example of this in the above graph of three films of Williamsburg Titanium White tracked for more than a year (Figure 5).

The dynamics at play here are complex enough to make it difficult to ascribe a single reason for this convergence, but at least one possibility does suggest itself. To start with, it's important to realize that the observed weight at any particular moment is really the combined measure of both the oxygen that has been absorbed minus the loss of any volatile by-products that have been generated. So the fact that films, as they get thicker, do not reach as high a percentage of weight gain as very thin ones might simply mean their ratio of oxygen in and volatiles out is more balanced. In this regard the driving force might simply be an issue of surface area. Oxygen can clearly permeate a thin film more easily, thus allowing a

Figure 6: 60 mil test sample of titanium dioxide ground in alkali-refined linseed oil.

Figure 7: Williamsburg Raw Sienna squeezed from the tube, then sliced open after 1 year.

very large percentage of the paint to undergo oxidation all at once and only then to start the process of gradually losing mass. Conversely, as a film gets thicker, an increasingly smaller percentage of its material can undergo these processes at any one time. Rather than the meteoric rise seen in the thinner films, a much gentler slope would describe the percentages of weight gained. Which of course is what we see reflected in the charts.

The fact remains, however, that oil paints applied in significant layers still present some very real difficulties in terms of drying. Both oxygen and light, for example, can have an increasingly hard time permeating the entire volume of paint because the pigments and any other solids simply block their way. In addition, thicker applications will form an initial skin on the surface, which then acts as a diffusion barrier, and further limits the free flow of oxygen – especially as this skin becomes more and more substantial. Taken together, these factors can result in a core of still-wet paint being present years or even decades after it was applied. It is also why these types of applications are very prone to wrinkling, since this initial skin usually forms while the paint is still gaining weight and at maximum volume, and before shrinking from the loss of volatiles later on. We can easily see examples of these issues by looking at a 60 mil sample as well as a line of paint squeezed directly from a tube and left to dry for more than a year (Figures 6, 7).

Cobalt-Manganese Drier Additions

One of the final issues we explored was the impact of different levels of drier when added to a paint formulation. For our purposes we primarily focused on a cobalt-manganese blend because this combination remains the most common and readily available for the artist to use. However, these metals are considered primarily surface driers and other combinations that might improve through-drying, such as the addition of zirconium and calcium, would have likely given different results.

The most significant finding in this area was the very counter-intuitive observation that increasing the amount of drier above a certain level did not increase the drying rate, as one might expect, but in fact, clearly slowed it down. This actually agrees with similar results of research that looked at the impact of driers on linseed oil alone *(Mallégol, et al., 2000)*. As one can see in Figure 8, which shows the results for 10 mil films, the paint containing a small amount of drier (.005%) actually did gain more weight more rapidly, suggesting a more complete level of oxidation in a compressed amount of time. However, when the percentage of drier was more than doubled to .011%, the sample ended up doing no better than our standard Williamsburg Titanium White, which contains no drier whatsoever.

Thicker films showed a slightly different pattern but essentially demonstrate the same concept (Figure 9). Unlike before, the paint with the most drier this time did appear to get out to a faster start, breaking past the 3% level of weight-gain a few days early. However, this boost was short lived and its rate of increase quickly leveled out and even fell beneath the sample containing less than half that amount of drier. Perhaps what is most surprising, though, is the fact that the regular Williamsburg Titanium White – which again has no driers of any kind – ultimately ended up with the highest overall increase in weight among the three.

What is happening in these two

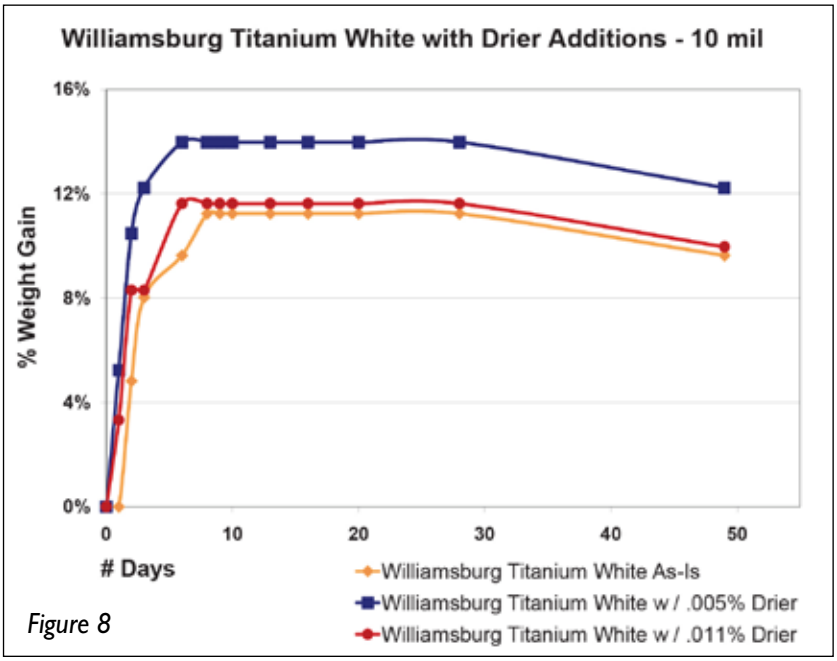


Figure 8

examples? And how can adding driers actually slow down the rate of weight-gain, and by implication, the degree of cross-linking as well?

The answer resides in a couple of areas. First, because these driers are more active at the surface, they often cause a paint to skin over much more quickly, which in turn creates that diffusion barrier we mentioned earlier. In this way an innocent attempt to boost drying times can actually end up slowing down the overall process, and in some cases even hindering the paints from curing completely. Like the example shown in Figure 7, where the center of a bead of paint remained wet even after a year, driers are simply causing an outer skin to form much earlier in the process, which increases the risk of wrinkling and can cause any underlying paints to remain soft and mobile. Secondly, the effectiveness of cobalt drier appears to be fairly short-lived once it is exposed to oxidation. In fact, the researchers that conducted the study *(Mallégol, et al, 2000)* estimate that it starts to significantly decrease in strength after just 7 or 8 hours due to the generation of specific by-products that suppress their reactivity. This could also explain why the rates of increase for thicker films appear to wane well before a substantial skin is ever formed.

The Path Ahead

This has only been a cursory sampling from some of our current, ongoing testing. Inevitably these trials will create more questions than they can possibly hope to answer, and in the process will open many new avenues of exploration for decades to come. The hope is to ultimately bridge the gap that can sometimes exist between conservation research, with its emphasis on analyzing and understanding the past, and the need for practical answers that can help current artists make informed choices about their materials and create the basis for best practices.

For further updates from this research, please visit us on the web at goldenpaints.com and WilliamsburgOils.com.

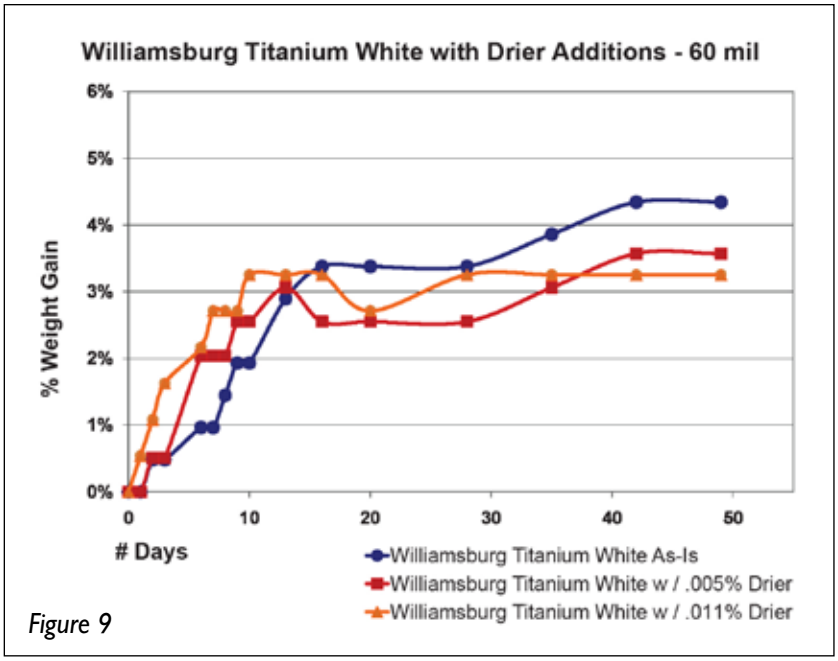


Figure 9

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Williamsburg Handmade Oil Colors Dry Time Chart

FAST	MEDIUM	SLOW	VERY SLOW
Bohemian Green Earth	Brilliant Yellow Extra Pale	Cadmium Orange	Alizarin Crimson
Brown Ochre	Brilliant Yellow Pale	Cadmium Red Deep	Alizarin Orange
Brown Pink	Cadmium Lemon	Cadmium Red Light	Alizarin Yellow
Brown Umber	Cadmium Red Medium	Cadmium Red Purple	Carl's Crimson
Burnt Sienna	Cadmium Yellow Deep	Cadmium Red Vermilion	Cinnabar Green Light
Burnt Umber	Cadmium Yellow Extra Deep	Cobalt Teal	Cobalt Violet Light
Cadmium Green	Cadmium Yellow Light	Dianthus Pink	Egyptian Violet
Cadmium Green Light	Cadmium Yellow Medium	Flake White	Fanchon Red
Cerulean Blue French	Canton Rose	Iridescent Bronze	Graphite Gray
Cobalt Blue Deep	Cerulean Blue	Iridescent Pale Gold	Indian Yellow
Cobalt Teal Deep	Chromium Oxide	Iridescent Pewter	Italian Lemon Ochre
Cobalt Turquoise Bluish	Cobalt Blue	Italian Pompeii Red	Permanent Orange
Cobalt Turquoise Greenish	Cobalt Violet Deep	Lamp Black	Permanent Yellow Medium
Cobalt Yellow	Cold Black	Permanent Green Light	Provence Violet Bluish
Courbet Green	Davy's Gray Deep	Permanent Yellow Deep	Zinc Buff Yellowish
Cyprus Orange	Interference Blue	Permanent Yellow Light	Zinc White
Dutch Brown	Interference Green	Persian Rose	
Earth Green	Interference Red	Phthalo Blue	
German Earth	Interference Violet	Quinacridone Magenta	
Indigo	Iridescent Copper	Quinacridone Red	
Italian Black Roman Earth	Iridescent Pearl White	Quinacridone Violet	
Italian Green Ochre	Iridescent Silver	Silver White	
Italian Pozzuoli	Italian Burnt Sienna	Slate Black	
Italian Raw Sienna	Italian Orange Ochre	Ultramarine Pink	
Italian Raw Umber	Italian Pink	Ultramarine Violet	
Italian Rosso Veneto	Ivory Black	Van Dyke Brown	
Italian Terra Rosa	King's Blue		
Italian Terra Verte	Mars Black		
Italian Yellow Ochre	Mars Violet		
Jaune Brilliant	Mars Yellow Light		
Manganese Violet	Montserrat Orange		
Mars Orange	Naples Yellow		
Mars Red	Naples Yellow Italian		
Mars Red Light	Naples Yellow Reddish		
Mars Yellow Deep	Nickel Yellow		
Olive Green	Payne's Grey		
Payne's Gray Violet	Permanent Crimson		
Permanent Green	Permanent Lemon		
Phthalo Green	Permanent Red Orange		
Phthalo Green Yellowish	Permanent Yellow Green		
Phthalo Turquoise	Perylene Crimson		
Prussian Blue	Provence Violet Reddish		
Raw Sienna	Quinacridone Goldish Brown		
Raw Umber	Red Ochre		
Red Umber	Sevres Blue		
Sap Green	Titanium-Zinc White		
Spanish Earth	Ultramarine Blue		
Stil de Grain	Ultramarine Blue French		
Titanium White	Veronese Green		
Turkey Umber	Yellow Ochre Domestic		
Turquoise	Zinc Buff		
Unbleached Titanium			
Unbleached Titanium Pale			
Viridian			
Yellow Ochre Burnt			
Turkey Umber			
Turquoise			
Unbleached Titanium			
Unbleached Titanium Pale			
Viridian			

The following chart shows the relative drying rates for Williamsburg Handmade Oil Colors. Your actual dry times will be affected by how thickly the paint is applied, the absorbency of the surface, and even the surrounding colors.

As a point of reference, here is what you can expect for a 3 mil film (approximately the thickness of paper) applied to a relatively non-absorbent surface:

FAST: 1-2 Days
MEDIUM: 2-7 Days
SLOW: 5-14 Days
VERY SLOW: 10-21+ Days

VELOCITY : LARRY POONS

BY JIM WALSH, SAGG, AUGUST 2011

'Move over nice dog…'
Move It On Over,
Hank Williams, 1947

VELOCITY is a selection of Larry Poons paintings spanning from 1975 to 2009. VELOCITY is as close to a visit to the New York City studio of Larry Poons as many will get. In Poons's studio, finished paintings ten deep or more are stacked, often according to size rather than chronology. VELOCITY brings to the viewer a glimpse of what such a studio visit might enable: wherein a painting from the 1970s might be next to one freshly painted. And against the opposite wall there might be paintings visible that fill in the intervening decades. This intended, or sometimes merely expedient, storage of his works in this way, delineate similarities and differences in the pictorial dialog that Poons's paintings present to each other. VELOCITY brings the demiurges and eddies of the studio life to the fore.

Larry Poons as artist is forceful, engaged, relevant. During Poons's five-decade painting experience he has made changes in the making and in the look of his art. Poons has not been easy on himself or his audience. With a half dozen discernible periods to his immersion in painting, Poons's works can be a declarative challenge to the casual eye. And a challenge to an artworld that quietly insists that an artists' work have less tumultuous variations from period to period.

Much is made of Poons's early study of music. In particular: symphonic, chamber and hillbilly music, about all of which genres Poons is willing to share his deep understanding for the edification of a listener. The reader is urged to avail him or herself of engagement with Mr. Poons on issues in music if ever possible. (And also query him about poetry, and the care of your internal combustion engines, about which topics you will be glad you did.) But Poons's comparisons of Hank Williams and Beethoven

underscore a unique embrace of the possible emotional and technical range of music. Music has such useful terminology for the composer, player and audience. Painting, try as it may, and for whatever reason, can fall short in the utility of description. Tempo and mood markings in music are practical and more purposeful than the abundant narrative glosses about painting. It can be argued that a Poons painting, like 'P.D.' of 1982, is 'symphonic', with its accumulation of interwoven 'throws' of acrylic paint. 'P.D.' pulses and engages the viewer with its large scale (93 ¾" x 183 ½") and with the intricacies of the small catchments of paint on the low relief of its surface.

As shown in VELOCITY, 'P.D.' as well as 'Log Train' 1985 and 'untitled' 1975, are of a signature series of paintings made in the wildly unconventional, nearly impractical manner of throwing buckets of liquid acrylic against a long canvas enclosure. In those years, Poons needed paint to feel the pull of gravity, declare itself, morph from liquid to solid in order to bring itself into being as a painting.

Thirty years later, in paintings like '20000 Miles to Gram Parsons' of 2003 and 'Mocha Dick' of 2009, Poons returned to brushes. The vectoring of wet paint streaming down a canvas is gone, replaced by the appearance of finger-painting moving in any and all directions, untethered by gravity. Poons, being not in the least precious about his art (if a painting falls over, he has been known to assert '… just make sure to get out of the way...'), has stripped paint application down to the fundamentals.

In Poons's art the seduction of throwing paint, heroic scale, the pouring and the orchestrating of paint are irresistible, but we are left with a primal fact. For Larry Poons, all of the changes, risks and achievements have been made in service to color. In the argument, as documented by Vasari, of 'disegno e colore', Poons, it seems, sides with the Venetians – color being all.

Richard Walker Photography, 2011

Log Train, 1985, Acrylic on canvas, 78 ¼" x 90", Courtesy of Loretta Howard Gallery

Richard Walker Photography, 2011

20000 Miles To Gram Parsons, 2003, Acrylic on canvas, 66" x 160 ½", Courtesy of Danese

ULYSSES JACKSON UP CLOSE

Mark Golden: Ulysses, tell me a little bit about growing up and your connection to the world of art.

Ulysses Jackson: Certainly the arts were a big part of my family growing up. I don't think that I ever wanted to be a visual artist initially. I thought I was going to be a musician and then it happened that at a certain point, even though I tried to be a musician, art had a way of showing up and it slowly became the dominant force in my life.

Mark: Was that in high school or in college?

Ulysses: There are certainly glimmers in high school but it was definitely the college environment where you have solitary time to focus on your craft. That was when I really got "the bug" as I call it.

Mark: Where did you go to school?

Ulysses: I went to University of South Florida in Tampa.

Mark: And originally you were there to study music?

Ulysses: Yes. I was recruited to study experimental music composition and sound production. I worked in that industry during college and in the summers doing sound production for movies and various musicians. I did a lot of sound on Martha's Vineyard and worked for an acoustician firm as well.

Mark: Were you painting during this time?

Ulysses: By that point, I was painting pretty heavily, pretty much every day.

Mark: So you were working during the day on the sound stage and then painting at night?

Ulysses: Exactly. And in some ways, having to listen to other peoples' music all the time pushes you to want to paint more; rather than to start listening to music of your own at night. And so while I still love music and still have my very loud and obnoxious band, I definitely am better at painting.

Mark: So, after you graduated, I know you decided to take a trip and travel the country.

Ulysses: Right. The road trip spawned out of having absolutely no clue what I wanted to do, as many college students realize when they graduate. They really don't know everything, like they thought they did going in.

Mark: Where were you living then?

Ulysses: I was in Tampa and when I graduated, I went back to North Carolina for just a bit to get my bearings. I sent out some emails to everyone I knew, as well as some letters to see if people would be interested in being "ports in the storm."

And then I went off for a year to learn about myself, which was very exciting and formative. It's where I really feel that I learned to paint because I was painting any chance I got, and seeing all sorts of new stimuluses and people along the way.

Mark: We were so delighted to be one of those ports and host you for even just a short time on that trip.

Ulysses: That port was a real joy! And it's your fault that I'm here. Barb gave me a fantastic tour of the factory and I thought, "Oh, this seems like a pretty neat place to work. Maybe someday I'll try to get a gig there." I didn't know that I was going to try to get a job here then, that happened later.

Mark: So you continued your travels all the way across country.

Ulysses: I took a whole year and saw 35 out of 50 states. I finally got road fatigue and just wanted a studio, which is what terminated my travels. At that point I started thinking of where I wanted to permanently settle and sent my resume to the company. There was an opening in the Lab and I was given a trial run of sorts.

Mark: It has been great having you working in the Lab but that you had more to offer to the product development team. The level of creativity that you bring the entire group is really enormous. I also know that the artists that call up and get to speak to you enjoy it as well. How has that been, answering phones and emails? What is that daily interaction like?

Ulysses: Well, it's a real blast! Certainly artists love to talk about making art and since we're all really into materials here, not only does our personal practice allow us to have insight into what the particular artist needs, we also in turn, get direction and learn new things from the artist.

There are those few instances where someone's asking a question we can't answer on the fly. We like to think we know everything, but there are certainly times when we don't. Those opportunities can send us off on a train of research that, while answering the particular customer's question also sparks additional ideas and avenues.

Mark: Were you always involved or always interested in the technical aspects of materials? Was that always part of your work or was that new?

Ulysses: That was new. Quite honestly, I was a little embarrassed at how little I knew about color coming to work in the lab at GOLDEN. It's

through the exposure of looking at the scientific side of the paint, working with formulas, in which that interest was expanded.

Mark: I guess I'm surprised because your knowledge of materials is vast. You're a source of information for folks and I'm surprised that this was newer to you. Obviously you're an incredible student –

Ulysses: Certainly when it comes to application of materials, I've always had an interest, so I can bring information from my studio practice and grow that with the incredible resources available to me here on a daily basis.

Mark: Well, I think that's part of what you've brought here is that sense of learning and wonder and it makes us all – no matter how long we've been here – invigorated as well. So we thank you.

Ulysses: Thank you for allowing it.

Mark: So, has being in the Lab, with a lot of different materials influenced any of your art making or the way you make art; the way you think about it?

Ulysses: When I came to work for GOLDEN, I was making these very soft, quiet landscape paintings. The focus was on a perfectly smooth surface. Then one of the first things I began doing in the lab was creating drawdowns with various colors.

Drawdowns, while they're beautiful, it is in essence a calibrated squeegee that pulls a paint film. After you do a couple thousand of them, you don't want to go home and make perfect films. So I started abrading into these films. Now my work is tied to the ability to manipulate dry product as well as the wet product. Learning all the nuances of how colors and pigments function, it allows me certain plays of light that perhaps other painters might find intriguing.

Mark: I think what's been amazing is how quickly you've assimilated so many of the materials that we work with and we think are too many choices. You've made them all work in ways that are just magical.

Ulysses: Well, thank you.

Mark: How do you balance all the work required here with your own career, which has been really pretty successful?

Ulysses: As far as balancing the two, I'm fortunate to be obsessed with art and art materials. My wife is a painter as well, so she understands that dynamic. We can just meet in the hallway between our two studios for a tea break whenever one's feeling the need to see the other. But really, I think it takes a unique individual to want to spend 16+ hours a day with art materials.

Mark: It certainly shows in the dedication here and in the work. So, has there been an unusual call or most unique kind of call that's come in or request that's come in that you've had to respond to as providing tech support?

Ulysses: Well there's certainly been many. And the more outlandish in some ways, the more intriguing they can be. There's always that joy when you can find a little detail that might have been unexpected in that glimmer of excitement, or the extreme excitement you get when you figure out what this person is asking for and can explain it in a way that can accomplish their goal.

This one comes to mind, just because it happened recently. I wouldn't call it outlandish by any means. An artist called and said they work with a lot of found objects. They'd found an object in a forest and they wanted to use it in a sculpture, but it was falling apart. And how would we put it back together?

We went through various options about how to make it more stable. As the person was describing this object, it started to spark memories from my walks through the forest and got me thinking, "What tree could this be?" So I started in parallel, while talking about solvent born concealing agents, looking at different seed shapes. I thought that this was most likely a sycamore seed pod.

I told the artist after we discussed how to stabilize this object, that if you've happened to by accident mess it up, you might look for other sycamore seed pods. They basically calmly thanked me and we hung up. And about two seconds later, someone from Customer Service called, looking for which person in Tech Support was speaking about the seed pod project. And this woman was very enthusiastic that we truly were amazing and that it was indeed a sycamore seed pod. That was very fun!

Mark: It is fun. So often questions that come to us that make you tilt your head wondering – really make it so much fun to be able to then think about the issues the artist is facing in a way that you know that it's going to take some real thought and you're going to have to say, "Let me get back to you" or "Let me have a conversation with my other colleagues to be able to see if there's something else that we can provide as an answer."

Ulysses: Oh sure. We try to figure them all out, don't we?

Mark: You go back and forth between all sorts of applications. Your role here is unique in that you both supply services for artists as well as part of the real innovation team in the company. Want to talk a little bit about the role in innovating new products?

Ulysses: A lot of the new products here come from the New Product Development group. We'll be in our studios in the night, and then be kept up late at night thinking about a paint product we needed. Then we will come into work and there's a spreadsheet everyone has access to where we put in new ideas. Those ideas can come from us or from outside artists. After sorting through them and filtering them down to the best and most interesting opportunities, we will then begin the process to start to make prototypes. Some custom products are developed within days and for others, we spend the next few years in the process.

Mark: Ulysses, it has been just that level of curiosity, creativity and excitement that you bring to us that keeps us all moving forward. As you gain more information and bring us more ideas, I think we all get more excited.

Ulysses: It works both ways. The more excited everyone is, the more revved we get!

Label Update

By Ben Gavett

A lot has happened in the ten years since we embraced what we termed "Reality Labeling" on GOLDEN Acrylics, as reported in Issue 8 of Just Paint, published in April of 2001. At that time, we announced our decision to incorporate advice on our labels indicating to the user that "most chemicals are not fully tested for chronic toxicity", and advised that the term "absence of known hazards" not be taken as a guarantee that a product is "non-toxic". At the same time, we explained the introduction of "California Proposition 65 Warnings" on our labels, which alert the user to the presence of certain chemicals that are "Known to the State of California to cancer, birth defects, or other reproductive harm". As we expected, our experience is that this phrase is too often interpreted as meaning the products themselves are known to cause such health problems.

As far as California goes, the list of products affected has increased. Carbon Black pigment was added to the State's list and at this writing it was announced that the State intends to add Titanium Dioxide (the pigment in Titanium White) to the list. Both of these pigments are listed with the qualification that the warning applies to "airborne particles of respirable size[1]". Both pigments are in our Airbrush, Fluid and Heavy Body lines. Usually, the Airbrush; often, the Fluid; and occasionally, the Heavy Body colors are spray-applied, and a fraction of the spray particulate may be of respirable size, so we will obligingly include the warnings on the labels of affected products. We will brace ourselves for the calls and emails from concerned users, and reiterate the toxicological improbability of harm, even more so if one takes reasonable precautions not to inhale spray mists.

Californians, in our experience, are usually accustomed, and often even apathetic or sardonic in regard to such labeling. However, as a manufacturer, we bear the onus to reconcile Prop 65 warnings with the labeling requirements of not only United States federal regulations, but those of other nations as well. It's not just a question of making the logistics of conflicting requirements work; we want labeling practices to make sense. Shouldn't there be one consistent label statement regarding health effects, regardless of where in the world the product is destined? And shouldn't there be some mechanism to ensure that this statement is as complete and correct as possible? Change for the better, in regard to these issues, has emerged over the past decade in the form of Europe's REACH initiative and the development of the Global Harmonized System (GHS) for preparing Safety Data Sheets and labeling products for health hazards.

REACH, standing for the Registration, Evaluation, Authorization and restriction, of Chemical substances, is Europe's laudable effort toward correcting long-standing deficiencies in society's manner of introducing chemical substances and their subsequent preparations into commerce. As we have seen repeatedly, chemical-based products are often on the market for significant periods of time, only to have it become known that they carry serious health risks. This is attributable to a strong economic incentive to innovate, less than stellar regulatory oversight, and arguably, an imperfect body of methodology to identify chronic health hazards.

To their credit, the European Parliament is leading the world in attempting to overcome these deficiencies through the complex set of regulations promulgated under REACH. These require that manufacturers and importers register the amount of each chemical substance put on the market in the European Community; and require that those responsible for the sale of the substances, either in pure form or as part of another product, assemble a thoroughly defined panel of toxicological and environmental effect data. At the same time, the regulations require that data is shared among all those involved, in order to expedite the process, ensure completeness, and eliminate duplicate animal testing. The data collected is evaluated by the authorities and chemicals are then authorized for use if they do not pose an unreasonable risk to health or the environment. If they do, the chemicals may be authorized only for uses deemed to have a greater societal benefit than risk; or chemicals will be banned altogether. We are still in the Evaluation stage of this process. By the time it is complete, the need to state that "not all chemicals are fully tested for chronic toxicity" will be greatly diminished.

The Global Harmonized System is an effort led by the United Nations to unify the content and format of Safety Data Sheets, and the warning phrases and symbols used on product labels, amongst countries. To that end, guidelines for these practices were developed and await adoption by the agencies responsible for occupational health and safety, transportation, and consumer labeling in participating countries.

Again, Europe has led the way in adopting GHS for product labeling. New requirements for pure substances were put in place in 2010, and will go into effect for preparations (mixtures) in 2015. In the US, OSHA (The Occupational Safety and Health Administration) has begun the process for incorporating GHS into the Hazard Communication Standard, but CPSC (The Consumer Product Safety Commission) has to date, shown little progress in updating its consumer product labeling regulations. Canada, however, is making progress toward doing so.

As a relative niche product in a global market, we are always trying to reconcile conflicting labeling requirements, and we see both these initiatives as positive, albeit painstakingly slow, progress toward a world-wide unified approach to toxicological review and appropriate labeling of products.

As mentioned, an outcome of the GHS will be the unification of hazard symbols on consumer labels. Historically, Europe has used the St. Andrews Cross, the United States uses no symbols for sub-lethal acute and chronic toxicity, and Canada has its own set of pictograms for acute hazards, but none for chronic. As described in our article in this publication 10 years ago, we chose to embrace the St. Andrews Cross for our world-wide labels, as we felt it was important to quickly alert consumers to the need to read the labels and follow directions for particular products, such as MSA Varnish, Acrylic Flow Release and Cadmium Colors. By 2015, we will discontinue the use of this symbol as it is not part of the GHS system and we will begin use of the international symbols.

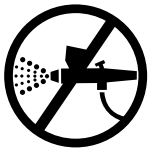
Top: St. Andrew Cross, Bottom: Global Harmonized System (GHS) pictograms.

Meanwhile, we have also been working to meet the requirements for internationally harmonized Safety Data Sheets (SDS). For the first time, it is required that the label warnings be reflected verbatim on SDS, and this has required that we make some interim changes on labels of some of our products that carry health warnings. Here, the challenge is that Europe makes it both

easy and difficult in requiring that only prescribed wording may be used on labels. Since their Risk and Safety phrases are published in each of the 18 languages we include on our labels, it makes it easy to get the exact, correct phrases that are most appropriate and universally understood. However, understandably, not every usage scenario is envisioned, and in the past, we have customized some of these warnings to present the information that we deemed most relevant to the user of our products. Due to our immediate need to Harmonize in Europe, our ultimate desire to do so world-wide; and the impending demise of the St. Andrews Cross as the official European hazard symbol, some of our labels are currently in transition.

While we are not allowed to deviate from the official European risk and safety phrases when using the St. Andrews Cross, we are allowed to include "supplemental label information" as we deem appropriate. This, in combination with the theme of the increased use of pictograms on labels to break language barriers, has led to the following near-term changes of significance on GOLDEN labels:

Cadmium Colors: Use of the St. Andrews Cross is being discontinued and in its place, a pictogram of our own design is being used, indicating that the product should never be spray applied.



Pictogram indicating product should never be spray applied on Cadmium colors.

Acrylic Flow Release: We will continue to use the St. Andrews Cross for the present, and have added the pictogram indicating that the product should never be spray applied.

St. Andrews Cross and pictogram indicating product should never be spray applied on Acrylic Flow Release.

GAC 900: Use of the St. Andrews Cross is being discontinued and in its place, we have added our pictogram indicating that the product should be used with ventilation because it releases small amounts of formaldehyde when heat-set. Without ventilation, a user could be exposed to a few parts per million in their work space. This amount isn't chronically significant, but individuals sensitive to the compound could react to it.

Pictogram indicating the product should be used with ventilation.

Gel Topcoat: We have eliminated the St. Andrews Cross to align with European requirements, as the theoretical possibility of allergic reaction is limited to only those users who are already sensitized from a significant exposure to a constituent component of the product.

In addition to these changes, you may notice that the selection of some of our Risk and Safety Phrases on European labels for Acrylic Flow Release, MSA Varnish and Archival Varnish have been slightly modified based on recent review, reconciliation with our European SDS and expansion into many more EU markets. This effort has also necessitated that we eliminate Directions for Use of some of these products from the product label, in favor of presenting only Risk and Safety phrases in the multiple languages required. The Directions for Use are now included separately, where necessary, also in a multitude of languages to serve our world-wide markets.

The ongoing work of maintaining product labels presents an opportunity to both learn and educate, as well as refine our approach, as we transition to Global Harmonization. Above all, our goal continues to be to present the user with the information needed to make informed decisions about how to safely use our products.

[1] *Respirable size particles are those less than 10 microns in diameter. Airbrushes can deliver mists well below this level. Pigment particles are often less than 1 micron in diameter.*

Williamsburg Health and Safety Updates

By Ben Gavett

Williamsburg Dry Pigments have recently been evaluated for conformance to ASTM D 4236 and have been appropriately labeled in order to be suitable for household use. The exception is Cadmium pigments, which, due to their potential hazard when inhaled, are now restricted to Professional Use Only, and are not available through stores or available for household use.

Labels of the Oil Mediums have been revised to reflect the danger of spontaneous combustion. If oily rags are left wadded or piled up, such that the heat of drying can not dissipate, they can become hot enough to self-ignite. This risk is eliminated if contaminated rags are stored in an air-tight metal container or individually spread out and hung up for drying.

Pictogram indicating danger of spontaneous combustion.

Cobalt color labels no longer carry lengthy health warnings, in order to better reflect the insoluble characteristic of the pigments used, and the paints' subsequent lack of bioactivity. Cadmium colors also no longer carry lengthy warnings based on the current stance of cadmium pigment manufacturers and European regulatory status. They will continue to carry the warning that "this product contains a chemical known to the State of California to cause cancer". The European Chemical Agency will be compiling and reviewing data on cadmium pigments in the future, so the current classification may change.

Williamsburg Flake White and Lead Oil Ground labels have been corrected to indicate that inhalation of the paint vapors during normal use is not hazardous, while continuing to emphasize the toxicity associated with ingestion. Also, lead containing products intended for European and other countries with similar labeling requirements are now labeled with appropriate Risk and Safety Phrases and symbols indicating the products' toxicity and environmental impact.

Updated Material Safety Data Sheets (MSDS) for Williamsburg paints, pigments and mediums are available at http://www.williamsburgoils.com/MSDS/index.php.

Golden Artist Colors Selected as 2011 Top Small Company Workplace

Awarded by Inc. Magazine and Winning Workplaces

By Jodi O'Dell

What a wonderful affirmation to the work of all the folks at Golden Artist Colors that the company was selected as one of the top small companies to work for, according to Inc. magazine and Winning Workplaces. In late May, the company was recognized as one of the winners of the 2011 Top Small Company Workplaces competition – an annual recognition that highlights the nation's best small and mid-sized company work environments.

"We were absolutely thrilled when we received the exciting news," said GOLDEN CEO, Mark Golden. "We believe that if you create an environment that is inviting, supportive and encourages taking risks and learning, people will come, stay and thrive. At GOLDEN, we've always believed that if the people thrive, the company will too."

Golden Artist Colors began as a four-person company producing artist paint in 1980. A commitment to delight its customers has lead to consistent growth. Now employing 150 full-time employees in its 100,000 square-foot facility, GOLDEN continues to extend the boundaries of painting through producing quality innovative products born of a constant dialogue with artists. Such high standards are achieved through efforts from the entire staff in a shared commitment to excellence.

"I think it's wonderful to be recognized as a winning place to work, as we already feel that way," said Customer Service Representative and NY/NJ ESOP 2011 Employee Owner of the Year award recipient, Jonie Bassett. "When you enjoy your work day and know your input is important to fellow owners, the sense of accomplishment keeps you wanting more."

"GOLDEN is not only a leader in fine art materials, but in creating a nurturing environment in which people flourish and succeed," said company President & COO Barbara Schindler. "This award reinforces our dedication to create a positive work culture, resulting in an engaged and committed workforce."

Our employees already know how incredibly unique our environment and culture is here – they get to experience it every single day, so to have Inc. Magazine and Winning Workplaces share our story with others throughout the country was incredibly meaningful to staff.

The magazine's June 2011 issue featured the competition's 50 winners from 80 finalists and nearly 350 applicants.

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