

JUST PAINT

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From Mark Golden

Welcome to *Just Paint* – our long-form love affair with materials and our commitment to the professional arts community. This issue shares some recent activities at GOLDEN, including our latest Gallery show featuring extraordinary work by Ann Walsh. *Ann Walsh: Colors*, to some might sound a bit too expansive, but once you walk into the Gallery, it is clear this title is in fact, an understatement. The other major 2018 SAGG show celebrated our 2017 SAGF Artists in Residence, again entitled, *Made in Paint*. We could create another title, but truly the residency emphasis is the smorgasbord of materials these artists get to play with. And in September, we organized and sponsored our final exhibition of the year, *Artists & Mentors at The Painting Center in NYC*, which showcased 12 artists and educators who over the last four years, have been part of our unique Scholastic Residence program aimed at recognizing amazing high school teachers around the country who also maintain an active painting career.

We are thrilled to introduce Mirjam Hintz, our newest Materials & Applications Specialist in Germany, who is also a professionally trained Conservator.

Several new products will become available spring 2019, but one that is available now is the relaunch of our Virtual Paint Mixer (MXR). This resource is absolutely supercharged with new features and we're excited to get your feedback!

Two articles will be seminal resources for artists and material geeks. One, about varnishing watercolor by Cathy Jennings, provides recommendations for artists seeking a different approach to this medium. She shares best practices, but also covers a wide swath of possible effects, pitfalls and new potential for watercolor artists. The second, by Sarah Sands, begins to unpack some of the myths around yellowing of oil colors and what we might expect as we watch these materials age. Sarah's original research will shine a new light on this topic, which one would have thought was resolved centuries ago. Enjoy!!

Mark

On the Yellowing of Oils

by Sarah Sands

You would think that we would know more by now; that the questions would be answered, the arguments settled. But we don't, and they aren't. Even basic and fundamental issues continue to remain unaddressed by research. Will cold-pressed or alkali-refined linseed oil yellow more? Do historical and traditional processing methods lessen that? How do all of these compare to poppy and walnut and safflower? Does adding drier help or hurt? And what about the other ingredients that find their way into paint recipes? Or is a more purist approach better? What follows will not answer any of those things; certainly not in any satisfying and definitive way. But it's a start, and we want to share our research as it unfolds. And that means many results will be provisional, even provocative, and will need time to settle into something that feels like surety. Long before

and alongside our efforts, many of you conduct and share your own tests, write blogs and post in forums, take workshops and classes, all with the hope of figuring this stuff out. What we can add to the mix is the value of results drawn from standardized, controlled and longterm testing, focused around similar questions and driven by a similar curiosity.

Causes of Yellowing

It is surprising how little we have been able to narrow down the causes of yellowing. This is especially true given how old the issue is. Right from the get-go, from the earliest days of oil painting, it was front and center one of the problems to solve. But over all this time, the likely suspects have only seemed to multiply. Humidity, temperature, the amount and type of light, periods of darkness, exposure to chemicals, the pigments used, the



A range of test samples exposed to the typical mix of fluorescent and indirect window light for the last 30 months.



Image 1: One inch square sections of Whatman® filter paper that had 3 drops of oil placed in the center. Three sets using 13 different oils were aged for 2.5 years in room lit with full spectrum fluorescent lights running on alternating 12 hour cycles.

type of oil and the method of processing it, presence of impurities, the thickness of the paint, use or lack of driers, added mediums, differences in formulations, and a host of other variables, all appear to play a role. This makes any research on the yellowing of oils a daunting task, especially as the variables are not simply the physical make-up of the paints and pigments, but all the usual environmental factors that need to be controlled. And the present studies are no exception. What follows does not attempt to solve or lend support to a particular theory. Rather it simply shares our empirical findings from a multitude of tests that have been ongoing since 2010, when we first acquired Williamsburg Handmade Oils. In terms of age, the examples run from just under 9 years old up to ones that are currently 2.5 years. Collectively all of these would still be considered very young films, still in the first stages of the processes and changes that will continue for centuries.

Which Oils We Tested

We tested 14 oils in all, representing a wide range of the common ones available from different oil and paint companies, as well as more unusual options. They included 3 Alkali-Refined (ARLO) and 4 Cold-Pressed (CPLD) Linseed Oils, a fifth CPLD labeled as 'Bleached', a water-white almost 20 year old ARLO that was kept in a sealed jar near a window, 2 additional CPLDs that were water-washed and hand-processed following historical methods, and finally a Poppy, Safflower, and Walnut oil. The oils were tested by themselves, as well as being made into a series of Titanium White paints. In that part of the testing, we followed two different approaches.

In one, we created a basic, representative formula for Titanium White and simply changed the oil being used, making minor adjustments when needed to keep the thickness of the paint the same. We created a second series where the same oil and pigment were blended with different components, as a way to gauge the impact of each ingredient, moving from a simple combination of just pigment and oil all the way to a fuller and more complex formulation.

conditions, exposed to alternating cycles of 12 hrs. of darkness and full spectrum fluorescent lights. Nearly every sample was prepared in triplicate and no variance was noted in the results.

As one can see, the results on the filter paper are tightly grouped. While the poppy oil is indeed lighter, followed by walnut and safflower, all the other examples tended to be indistinguishable (Image 1). Separately, the glass slides

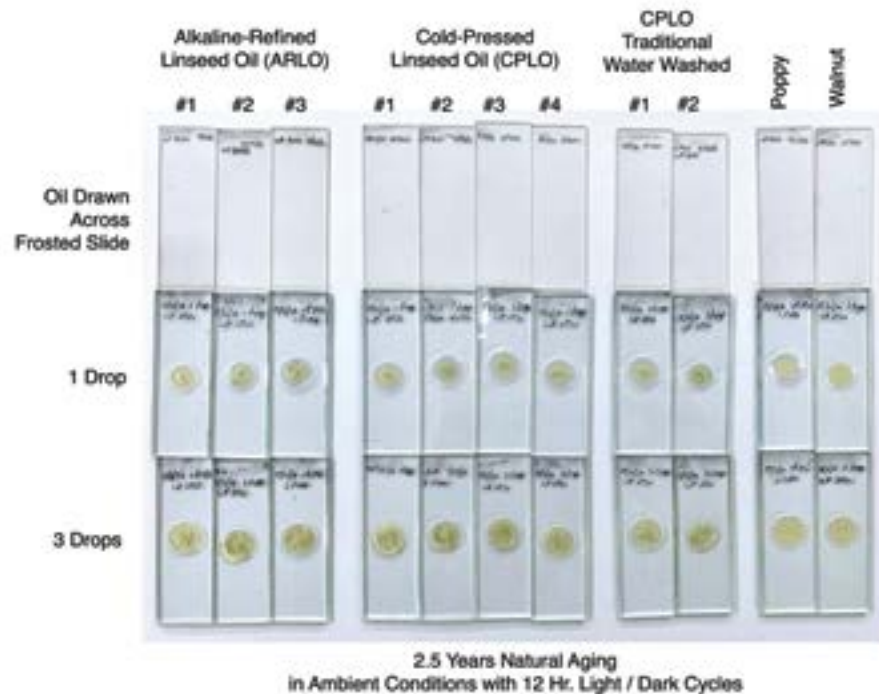


Image 2: Set of 11 different oils on glass slides. All samples were done in triplicate. Top row: frosted slides with oil drawn across the surface, leaving a thin layer. Middle and Bottom rows have 1 and 3 drops of oil placed in concave wells. Aged for 2.5 years in room lit with full spectrum fluorescent lights running on alternating 12 hour cycles.

The Yellowing of Oil Alone

This area of our research held few surprises at the broadest level: poppy yellowed least, followed closely by safflower and walnut, and behind them a large grouping of linseed oils showing only the slightest variations among themselves. And perhaps just that sense of sameness was the most noteworthy and compelling feature; like most, we went into this expecting to see a clearer difference between alkali-refined, cold-pressed, and the traditionally water-washed versions. In fact, that was the initial hypothesis we wanted to document when we started these trials.

We tested oils in several ways and at various thicknesses. In one test we applied them to glass slides that were frosted, as well as ones having a small concave depression or well where we placed either one or three drops of oil. We also applied three drops to large disks of Whatman® filter paper, allowing the oil to spread outward in a uniform manner. All samples were then kept under ambient

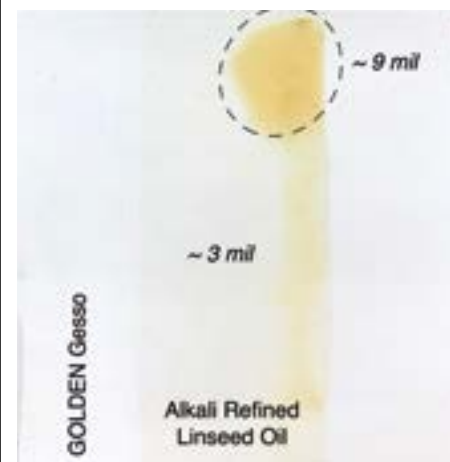


Image 3: Three mil drawdown cast in 2014 of alkali-refined linseed oil on top of GOLDEN Acrylic Gesso. Maintained on office wall exposed to mix of both fluorescent and indirect window light.



Image 4: Titanium Whites made with 13 different oils using same formulation and aged for 2.5 years while exposed to a mix of both fluorescent and indirect window light. 1.5" squares taken from 6 mil drawdowns on polyester film coated with GOLDEN Acrylic Gesso.

showed similar results, although the larger volumes of oil did seem to generate slightly more variance in color, while oils like poppy and walnut displayed far less surface wrinkling, likely due to slower drying times delaying the formation of surface skin. Very thin films on frosted slides, on the other hand, appeared nearly identical across all samples and displayed such a small degree of color they appear essentially clear (Image 2).

This difference between thick and thin films is something we also noticed in other testing, where 3 mil films of oil (about the thickness of a sheet of paper) were drawn down on top of acrylic gesso. In the example we show (Image 3) of an alkali-refined linseed oil, cast in 2014 and later kept pinned to a wall in an office, the very thin area has just the slightest tint of color, while the oil that spread and gathered off to the right side, culminating in a 9 mil area towards the top, took on an increasingly amber tone. Whether the drops of oil on the slides will develop along similar lines over the next 4-5 years remains to be seen.

This dichotomy between thin and thicker films of oil makes it problematic to hang too much weight on examples of yellowing where the oil has pooled and formed a solid mass, like one can sometimes find around the neck of an old tube of paint. While these can be dramatic and raise alarm, it is also true that it is never advisable to use oil in this way. Even in glazing, where mediums start to play a dominant role, the applications should always be kept as thin and lean as possible to limit any yellowing. This also holds true when working with thickened oil or alkyd-based impasto and extender mediums, where it can be tempting to

create thick translucent textures that can unfortunately yellow dramatically and irreversibly over time.

From Oils to Paint

If the oils themselves felt close in appearance, things became even tighter once they were made into batches of Titanium White. After 2.5 years, what differences you can tease out are subtle at best, and the overwhelming feeling is one of similarity. In fact, the differences are so small that the inherent limitations of screens and printed pages have made capturing them reliably in a photo next to impossible (Image 4). In the end, the hoped for evidence that this or that oil causes the whites to yellow markedly more than another simply never materialized. Rather the dictum that eventually, ultimately, most oils converge toward a similar appearance would seem the better fit for what we eventually found; at least given the test conditions and time frame. Further aging might still crown a clear winner, and other factors besides the oil alone might prove to have the more lasting and decisive impact.

You can see this convergence taking place over time by using a spectrophotometer to measure the initial yellowness of the paints fresh from the tube and following them as they dry and age. In the graph (Figure 1) you can see that the paints have their greatest differences right at the start. After just one day most of the paints actually became whiter, and by the end of the week, when they had all dried

to the touch, their differences began to flatten out. From there to their current state at 2.5 years is simply a slow drift upwards to an almost identical degree of yellowness among each of them. For a point of reference and comparison, we have also included the data from GOLDEN Acrylic Heavy Body Titanium White. The importance here is not simply to highlight the difference between the two mediums, but because the brightness inherent in white acrylic paints and gessos have set a standard that we often judge things against.

Finally, before one is tempted to read too much into the pecking order of the paints, the amount of difference between the first and last oil paint is just a single point, or Delta E (ΔE) of 1, an amount considered just-perceptible for most people. Also, keep in mind that the b* scale runs from 0-100, while the graph zooms in from 0-10, allowing you to see the subtle movements that are happening. However this can also end up magnifying our sense of just how much difference you might actually notice if you saw these swatches, especially if separated by some space or in the context of different paintings

If anything stands out as remarkable, it is perhaps the overall sameness that we noted when looking at just the oils – the different brands of alkali-refined, bleached, or cold pressed linseed, as well as traditionally cleaned and water washed ones, in the end all simply crowded close together. Does this mean that all the pas-

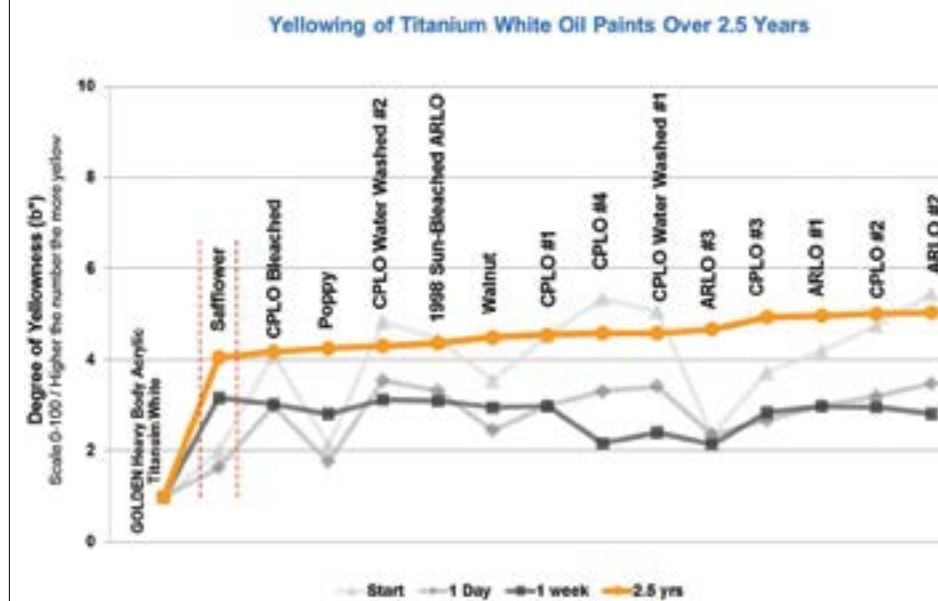


Figure 1: Degree of yellowness based on the b* values from CIE LAB readings. Readings taken by an X-Rite non-contact spectrophotometer from 6 mil drawdowns cast on polyester film coated with a layer of GOLDEN Acrylic Gesso. Readings shown were taken when wet, after one day, one week, and 2.5 years.

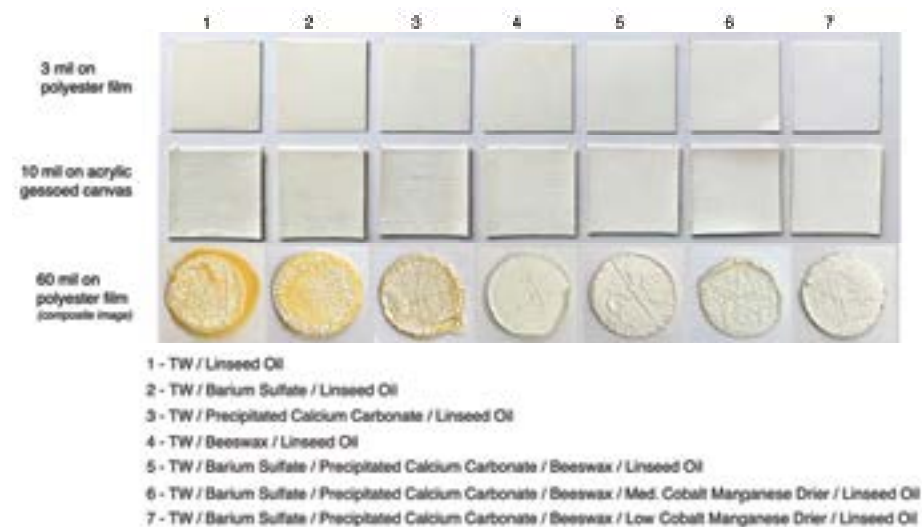


Image 5: All samples cast in 2010 and made with alkali-refined linseed oil. Formulas adjusted so paints had similar viscosity. Samples initially exposed to fluorescent light for first year and for last 2.5 years to a mix of both fluorescent and indirect window light.

sions spent advocating for one or another of these variations are simply much ado about nothing? That all the claims of decreased yellowing might not matter all that much in the end? Perhaps. Or this could simply be the usual bunching-up that one sees at the start of any long distance race. We are barely out of the blocks after all, and patience is called for. Still, these results defy most expectations and stand in contrast to other panels of various whites that even we have created. That said, these are still the first large set of controlled examples that we know of, compromised of some 90 swatches all made to a similar formula and kept under the same conditions, where only the type of oil changes. We will ultimately go wherever the evidence leads, while

still looking to confirm these findings in future rounds.

Impact of Formulation on Yellowing

This is an area that has remained largely unstudied in any systematic way. Research on oils in and of themselves, as well as treated by various methods, are easier to find, along with ones that blend oils with single pigments and perhaps some drier. Absent in all those are studies that take a look at the impact of all the various components that make up most modern oil paints. Our own work in this area dates back to 2010, when we acquired Williamsburg Handmade Oil Colors, and some results start to come in that are interesting to look at.

In the assembled examples (Image 5), the paint made with just Titanium White and alkali-refined linseed oil yellowed the most, belying the common belief that simple blends of pigment and oil are always the best. Perhaps even more significant is what happened when this paint was applied in a thicker, 60 mil (~1/16") application, where you see a dramatic level of oil separation during the drying process. The next two variations, which include the addition of barium sulfate or precipitated calcium carbonate, become increasingly less yellow while also showing a corresponding drop in oil exuding to the surface or out the sides. This sets up a strong correlation between yellowing, at least with Titanium White, and the paint's ability to fully bind and hold onto the oil and prevent it from seeping out. This would also explain why the paints become significantly whiter, especially in the thick application, once beeswax was added in as a stabilizer, or why the addition of drier on top of that would help even further. The beneficial effects of drier in this regard is noteworthy as far too often it is claimed that their use leads to more yellowing, not less. This is the opposite of everything we have observed. However, these tests do not include the full range of available drier combinations, their use in distinctly different paint formulas, under different environmental conditions, or at levels that would be considered excessive.

While the pressing-out of oil is dramatically captured in the 60 mil disks, it is worth speculating that a similar but

much smaller-scale process could be happening in the thinner swatches as well - namely that oil is rising to the surface at a microscopic level, and forming a thin, yellowed film around the topmost layer of pigment. This phenomenon around the formation of a skin of medium on top of the paint has been noted by current researchers of modern oil paints, although the exact cause has not been established (Izzo, F.C., et al, 2014; Burnstock, A. et al, 2014; Cooper, A. et al, 2014). We also know that this type of phenomenon is one of the main reasons that Zinc Oxide was used so frequently in conjunction with titanium dioxide. Essentially Zinc Oxide's rapid ability to form metallic soaps and create a laminar, crystalline structure, appear to help hold the oil in place, although at the cost of creating a brittle paint film, especially at higher levels. The combination of beeswax and drier used in these tests might be helping along similar lines, but without the downsides with zinc.

Dark Yellowing

Dark yellowing is a well-known phenomenon where oil-based paints stored in the dark will yellow significantly, although the yellowing is thought to be fully reversible by exposing the paints to light (Levinson, H., 1965; Townsend, J., 2011). This is an area we have written about before (Sands, S., 2014, 2017) but never comparing the rate and extent of recovery based on simple pigment/oil mixtures alongside a more fully formulated paint. Having a selection of swatches kept in dark storage for around 6 years, and examples of the same formulas kept in ambient, indoor light for 3 months and another set for 2.5 years, has led to some interesting results (Image 6).

Differences in yellowing could be found in all three stages. Of the swatches kept in the dark, the one made with cold-pressed linseed did the worst, followed closely by alkali-refined, then safflower and the others. The paint made with just pigment and stand oil did the best in this category, although it should be noted the paint itself was unpleasant to work with because the oil was so viscous. The fully formulated paint did far better than the same pigment mixed with just ARLO or CPLO, and in the end nearly equaled the paints made with safflower or that included zinc in the mix. It is also critical to note just how long it took these paints to recover from long-term dark storage when exposed to just typical indoor light levels. After 3 months the recovery

was still only partial when compared to similar examples in the same room for 2.5 years. Thus the time needed to fully reverse the effect of dark yellowing can take far longer than many people might realize. Needing this type of long recovery period has also been noted in more recent conservation research (Townsend, D., et al, 2011) where the required period for pieces kept in prolonged dark storage was thought to extend to multiple years in gallery lit conditions.

The Making of the White Paints Used in the Tests

For testing of the 14 different whites, each of the paints was made using a basic formula of oil, titanium dioxide, synthetic precipitated calcium carbonate, barium sulfate, beeswax and a low level of cobalt-manganese drier. These were then cast directly onto polyester film that was either uncoated or had a layer of acrylic gesso applied as a ground. We used polyester because it is non-reactive and stable, while the addition of acrylic gesso simulates some of the absorbency one gets when painting on a typically primed canvas. The samples were then stored under ambient conditions with light coming from color corrected fluorescent bulbs on a 12 hr. light/dark cycle, or else in an office with similar fluorescent lighting supplemented with indirect window light. They have not undergone any prolonged dark storage.

Things Not Tested

In any test, what is left out can be as important as what is included. We did not control for humidity or temperature, two environmental factors commonly linked to increased yellowing. No mediums were included. The driers were limited to either a low or medium level of a single cobalt-manganese combo, and a host of other potential modifiers and additives were left out, such as hydrogenated castor wax, magnesium carbonate, and aluminum stearate. The range of substrates and grounds were also very limited, and we mainly cast the paints onto polyester film that was either coated with GOLDEN Acrylic Gesso or left plain, although one set of examples were applied to acrylic gessoed canvas. In terms of pigment, we tested only one type of rutile titanium dioxide, supplemented by zinc oxide in two examples, but did not test basic lead carbonate, lithopone, or zinc oxide by itself. Finally, we did not include other brands of paint for comparison since we had no way of knowing

their exact ingredients, and therefore no way to know what might be responsible for any results in either direction.

Conclusion

At the moment, none of this testing will definitively resolve which oil or formula of Titanium White will yellow the least. But at least it starts to give us a controlled set of paints kept under controlled conditions that can form one basis of the discussion. More rounds of testing using fresh drawdowns of yet more variations, are in the works and as those results come in, and these original swatches continue to age, we will certainly publish and share those findings. This is work and research that will literally go on for decades, long past the lives of most of us in the Lab. The hope is that in the future, when all those questions about oils and yellowing continue to be asked, that the answers will have a firmer footing.

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Image 6: All samples cast in 2010. Formulas adjusted so paints had similar viscosity. Samples initially exposed to fluorescent light for first year. Top row were kept in dark storage for ~ 6 years. Middle and Bottom rows exposed to a mix of both fluorescent and indirect window light for 3 months and 2.5 years respectively.



Self-portrait, acrylic and oil on canvas, 50x70cm, 2017

Mirjam Hintz: Up Close

Golden Artist Colors' new Materials & Applications Specialist is working from her studio in Frankfurt, Germany and gives us our first Materials Support staff in Europe. She has the ability to serve customers in both English and German, strengthening our commitment to artists by answering their questions and assisting with product and application challenges.

Mark Golden: Mirjam, it is a delight to introduce you to our customers. Could you share a little bit about yourself, your history, and your passion for visual arts. How did that get started?

Mirjam Hintz: I think my passion for art was always there because even as a young child, I was fascinated by beauty – everything that was beautiful and pretty around me. After I finished high school I spent two to three years in a spiritual community where I painted icons almost full-time, and in that time I also got to know somebody who was a retired conservator, wall painting mainly. I was fascinated by his knowledge about materials. I always thought I should know more about materials, giving me the freedom to make informed decisions about materials. This desire led me to art conservation.

Mark: As a child, were others in your life involved in the arts? Or was it your own self-interest that led you there?

Mirjam: It was my own self-interest. As a child I mainly spent my time drawing because of my lack of quality brushes and paints. If I had better materials, I would have painted more.

Mark: Did this lead you to pursuing painting in high school? Did you take painting classes?

Mirjam: Yes, I focused on English and painting in high school. I had a great teacher, but in high school you learn a lot about art history and spend less time actually painting. Access to a variety of quality materials was also limited.

Mark: In college you concentrated on art conservation. Were you also able to continue with your own art?

Mirjam: In college I studied conservation full time and continued painting in my free time. Once I focused on conservation of paintings and historically accurate reconstruction of artwork from various time periods, I began to truly appreciate artist quality materials. The greatest experience I had during that time was to reconstruct a 17th Century painting where we made our own oil paint and compared that quality to the less expensive student grade paints that I had at home. That made my awareness of professional grade paints grow tremendously. The variances and what was possible with the professional paints was incredible – they made such a difference! Making ultramarine, real ultramarine tempera paint was a great experience also.

Mark: Tell me about that. What was so memorable about making the ultramarine?

Mirjam: It was like painting with sand because the pigment particles are so big. And if you grind it too much, it loses color intensity. It was eye opening to see how very different each pigment is and how each pigment's properties need to be carefully considered before handling them.

Mark: I know in the States it's unusual to find a program that offers conservation. So where was the program? What college did you attend for your undergraduate studies?

Mirjam: As an undergraduate I was at London Metropolitan University and focused on conservation of wooden objects. After that I became worried that I would end up only working on furniture and frames and I knew I had a very high interest in more decorative objects like sculptures and paintings – panel paintings especially – so I continued studying conservation of paintings at the University of Amsterdam. Ultimately, that led me during my post-graduate training to Delaware where I completed an internship at the University of Delaware, which, as you know, is connected to the Winterthur Museum.

Mark: Can you please tell me a little bit about that experience? What were you working on in your post-graduate work at Winterthur?

Mirjam: I was interested in learning more about alternative cleaning methods that are used on acrylic and modern art paintings. A lot of these alternative cleaning methods have been developed by renowned Materials Scientist, Richard Wolbers, and since he teaches at Winterthur, I became interested in attending his classes and working on paintings under his instruction. It was an incredible experience!

Mark: During this time considering the rigors of this degree in chemistry, materials science and painting conservation, were you able to continue your art practice or did that have to be put aside while you focused your energies into your conservation studies?

Mirjam: Yes, I always continued painting. During the summers I was able to paint and focus on my personal artwork. During the years of my conservation studies I took one year off for traveling and painting.

Mark: Where did you travel?

Mirjam: I traveled to California, Guatemala, Mexico, India, Nepal and Egypt.

Mark: Did your time and experiences in those places inspire your painting?

Mirjam: Yes, absolutely! India had a particularly strong influence on my artwork. In India I was able to do a lot of wall paintings because people there are so relaxed. I would just go to a house owner and ask if I could paint artwork on their walls and some of them didn't even want to see a sketch. They would say, "Yes, go ahead!" Maybe they didn't understand what I was saying, but yes, I was able to paint a couple of murals, which was great!

Mark: That's pretty bold, Mirjam – and very funny! Back to your time at Winterthur... After you completed your studies at Winterthur, did you go back to school or back to private practice? What happened when you returned to Germany?

Mirjam: I worked in a private practice for half a year in Frankfurt, Germany. My focus during that time was mainly on contemporary art. It was a great experience – very different from working for a Museum or in a Museum setting.

Mark: Obviously, the pace is sped up in private conservation.

Mirjam: Definitely! You work on many more projects in a shorter time.

Mark: We met at Winterthur when I was doing a lecture with Sarah Sands, our Senior Materials & Applications Specialist.

Mirjam: Yes.

Mark: Meeting at Winterthur gave us a chance to visit with one another and speak about opportunities for Conservators to work with our Materials & Applications Specialists team. When I had a chance to speak to you about it, I was surprised that this was something that you were interested in pursuing because most Art Conservation students are interested in doing painting conservation. It was a bit of a different conversation with you. Would you describe that a little bit?

Mirjam: Sure. I think I met you a couple of days after I bought a set of GOLDEN Fluid Acrylics. I already knew that GOLDEN was an outstanding company because in a lot of Art Conservation literature, it is mentioned. A lot of Conservators also use GOLDEN Acrylics for retouching not on original surfaces, but on infills, for example, because of the lightfastness and because GOLDEN produces some Conservation paints.

And interestingly enough, it had already been my plan that after graduating I wanted to work with artists directly in some way. This job opportunity with the Materials & Applications Specialist team really allowed me to bridge my own interest in painting with my Conservation background, and it's very fulfilling to be able to have art as a relief from stress.

Mark: For us it has been that special combination of someone with the depth of professional experience in Conservation as well as a real desire for working with living and working artists. Hopefully also to help them avoid some of the issues that might later occur requiring conservation. It was incredibly exciting to be able to have you consider joining the team!

Mirjam: Yes, and for me as well!

Mark: So tell me about some of the projects that you've been involved with since joining GOLDEN. I know some of it has been setting up something pretty unique as you're our first international Materials & Applications Specialist.

Mirjam: Offering this service in Germany for the European market is going to require a lot of networking in the beginning, of course, and I know that I have great help with our European Sales Manager, Peter France, and our Distributors in Germany and other European countries. I've had great contact already, and I'm looking forward to getting to know the European market better and also learning about art communities in Germany. We really have to work towards establishing more trust between the company as the manufacturer and artists because there's so much mistrust between the two. Since the advent of packaged paint in the 19th Century, the quality was not so much in the hands of the artists anymore, but in the makers of the paint. I just want to help artists to be able to learn from all the experiences and knowledge that the GOLDEN Materials & Applications Specialists have and build good relationships.

Mark: I think that's been one of the most important things for us in the United States. We've been able to really project and share information so easily between our team here and artists around the country and North America. But in Europe, that's not been the case. We felt it was really important to have a person, a Specialist, trained to be able to offer that same kind of service that we so easily offer here, but to offer it for our customers in Europe, so it has been a delight to get this opportunity started.

So tell me a little bit about your experience with the materials. You had a chance to stay with us for around six months, and it was a delight learning about you and your experience with materials. Have there been any materials that you've been able to play with while being here that has crept into your own work?

Mirjam: Yes, Fluid Acrylics, but I started using them before I came to New Berlin. I find the Fluids to be so convenient. You just open the cap or the bottle and you can start painting right away. You don't have to do anything else with them. They already have the perfect consistency and such high pigment load. The vast color range is very convenient as well.

Mark: That's something that I think everyone here immediately is attracted to. It is because it is so convenient. You just open the bottle, and immediately you can mix, you can do whatever you want to do with it. So yes, we all find it to be pretty convenient. And it continues to grow. Some people are a little bit reticent, however, because they see its fluidity and assume that it must mean that it's much weaker in pigment.

Mirjam: No. That's one of the misconceptions of acrylics.

Mark: Yes, it's true. That's the amazing part about acrylic. It offers so much formulating latitude. We can make the paint as thin as water, and so thick you could hold it in your hand without getting wet, and all those iterations in between. And this is just the tip of the iceberg of what you'll be sharing about our materials in Europe as part of your new role at GOLDEN!

Again, we're so delighted to have you join us Mirjam and look forward to our collaborations with all our customers overseas!



Ann Walsh : COLORS by JN

The exhibition, *Ann Walsh: Colors* at the Sam & Adele Golden Gallery through March 15, 2019 comprises twenty-four works made from 1986 through 2018.

A dynamic language, enabled by color, is the thread that winds through the show. Ann Walsh's color is amplified, saturated, buoyant, made inescapable. Color selection and color relationships are pre-eminent.

Nine stretched paintings, three of them being 'reverse' paintings from 1986, in which Ann Walsh applied acrylic paint in several layers to a polyethylene sheet that would allow the dried laminated 'sandwich' to be removed and adhered to a canvas support. The final image would be therefore in reverse — the first layer painted being the topmost in the finished work, the last layer painted would be effectively the ground layer. This process

produced a combination of control and surprise while making the painting.

In the six more recent paintings, color areas were spray applied on canvas. The surfaces of several of these works involved smoothing Molding Paste as evenly as possible to impart a super flat ground onto which the sprayed acrylic would level to a glassy finish. The depth of the acrylic spray coats are varied to emphasize or modulate the colors.

Freestanding works continue the investigation into the possibilities of the saturation, brightness and density of color. These pieces have been fabricated from plexiglass or plywood. Several utilize sign painters vinyl sheeting that adheres to the planar, geometric surfaces. Using sign painters vinyl approximates working with dried paint films.

Standing eight feet high, 'Block' 2015 is



Nimbus, 1986, Acrylic on Canvas, 21" x 26 1/2"

both imposing and inviting. The three equidistant vertical bands pulse with each high-keyed color selection. Walsh has experimented with an armamentarium of paints and surfaces to investigate an immersion into the expressive potential of color.

Writing for the exhibition catalog, Franklin Einspruch states, 'Walsh had become captivated by the possibility that the right manipulation of materials could exist as a freestanding object that appeared to come into existence by force of its own being. It could at once look like it was made by an artificial process but retain all of its humanism.'

Giving voice to color, Ann Walsh imbues her works with a 'maximalist' intention, rendering essentials, and letting color burst forth to be what it uniquely is.



Aesthetics of Varnishing Transparent Watercolor: Creating the Least Change by Cathy Jennings

For artists who push the boundaries of traditional watercolor, work in sizes large enough that framing is not practical, or just dislike the barrier created by glass, varnish is a valuable option for protecting their paintings! Varnishing is likely to alter color, value, contrast, granulation, and the appearance of the paper in a watercolor painting. These modifications can be acceptable when balanced against the freedom varnishing offers.

In a previous article² we investigated the changes that occurred when varnish was applied to washes of QoR Payne's Gray, a paint chosen for its status as a chromatic neutral. The current test expanded our investigation to encompass washes of QoR Ultramarine Blue (PB29),

Benzimidazolone Yellow (PY154), and Quinacridone Magenta (PR122) coated with GOLDEN MSA, Polymer, and Archival Varnishes. This combination allowed us to build a broader understanding of the aesthetic changes created when a watercolor is varnished. This article will discuss the varnish application that created the least aesthetic change to the watercolor over which it was applied, paying particular attention to the watercolor it changed the most.

The "Least Aesthetic Change" Challenge

We wished to see which varnish application came closest to the appearance of transparent watercolor on paper. Archival MSA Varnish Matte applied over Archival Varnish Gloss without an isolation coat won the "Least Aesthetic Change" accolade. We selected Ultramarine Blue as a visual example of this test (Image 1) since it presented the most change even when coated by the winning varnish. More information on the structure of our test may be found further into this article.

Depending upon the viewpoint and lighting, Matte Archival Varnish applied without an isolation coat marginally

darkened and desaturated color. The matte sheen also slightly subdued the appearance of paper texture. Lighting and point of view influenced how easy it was to see these changes.

There also appeared to be variation in how people perceived the changes. Those of us with more background in watercolor found the differences to be obvious, while others thought the alterations so slight as to be negligible. Due to this difference in interpretation, plus the impact different colors, wash dilutions, and papers might have on the results, we would recommend that artists conduct their own tests before varnishing a watercolor painting.

Related Matte Varnish Results:

The runner-up to the combination causing the "Least Aesthetic Change" was structurally different through the use of an isolation coat between the two types of Archival Varnish. The isolation coat created a shinier surface than the Archival Varnish Gloss layers did by themselves. As a result, when Archival Varnish Matte was applied on top of this coating, it appeared less matte as well. Color also darkened a bit more than seen with the winning Archival Varnish Matte without an isolation coat. The varnished areas warmed color slightly, resulting in a more noticeable but still slight desaturation of color.

The other matte varnishes created more changes to the QoR Ultramarine Blue washes and watercolor paper (Image 2). Brush applied MSA Varnish Matte and Polymer Varnish Matte both desaturated color, and either lightened or darkened the paint or paper surface depending upon viewer position and lighting. The lightening is more obvious on darker color applications, and was seen with both of these brushed-on matte varnishes. Polymer Varnish appeared to darken the blue color slightly more than MSA Matte, while the MSA warmed the color more than Polymer Varnish Matte. The light blue wash shows these changes most clearly. Interestingly, these two matte varnishes appeared to emphasize granulation in the dark and medium washes of Ultramarine Blue, which is unique among all the varnishes tested.



Image 1: QoR Ultramarine Blue varnished with (2nd from Left) Archival Varnish Matte over an isolation coat. (4th from Left) Archival Varnish Matte with no isolation coat. Both applications began with Archival Varnish Gloss. Left, center, and right columns are uncoated controls.

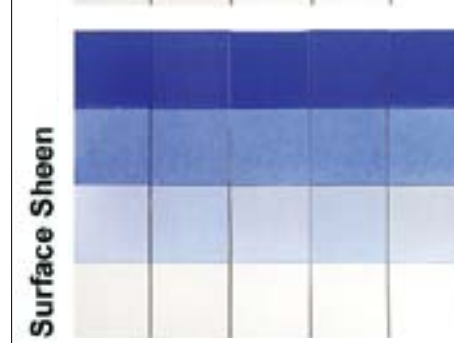


Image 2: QoR Ultramarine Blue varnished with (2nd from Left) MSA Varnish Matte and (4th from left) Polymer Varnish Matte. Both varnishes applied over a Soft Gel isolation coat, which itself was applied over Archival Varnish Gloss. Left, center, and right columns are uncoated controls.

LAYERS APPLIED TO TEST PANELS

Arch - Archival Varnish
 Iso - Isolation Coat
 MSA - MSA Varnish
 PolyV - Polymer Varnish

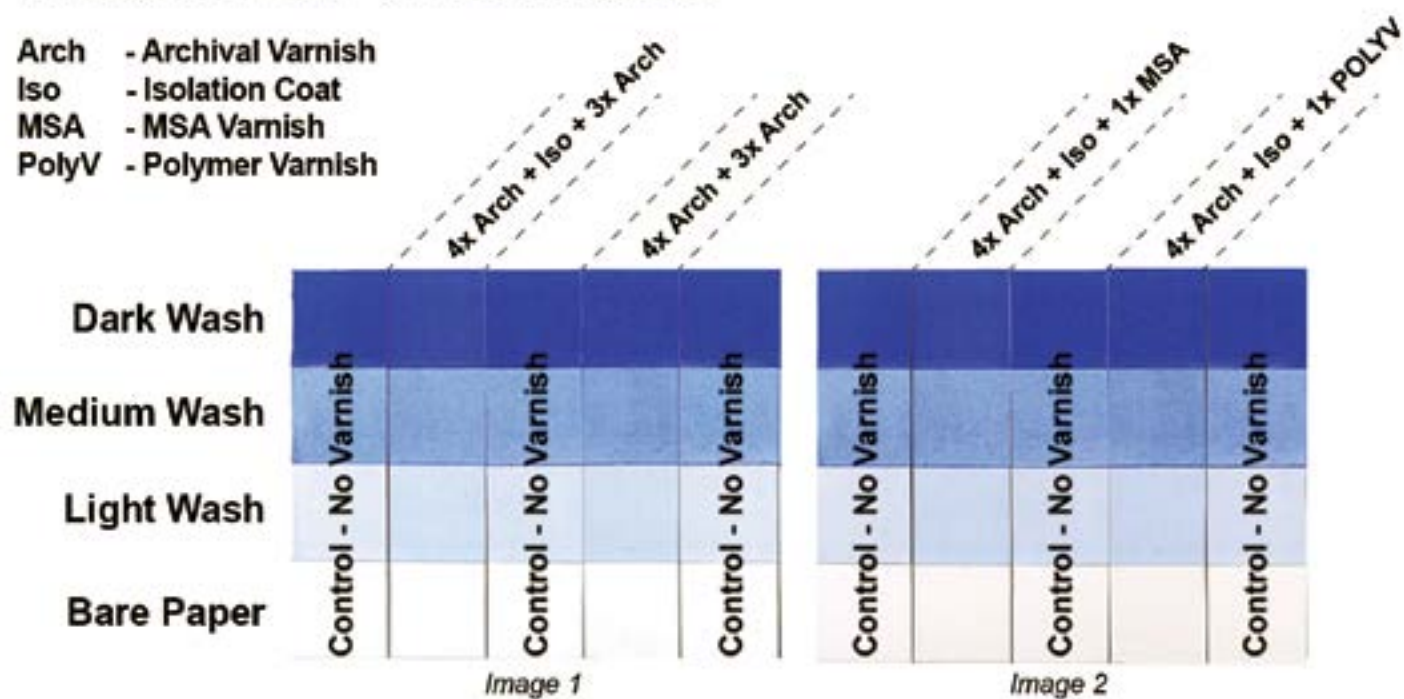


Diagram 1: Application layers for varnish testing

Why would someone use an isolation coat?

An isolation coat creates a barrier between two layers of product. Since GOLDEN Varnishes are removable, having an isolation coat would allow a conservator working in the future to remove and replace the final layers of varnish without damaging the painting. Potentially, this replacement could return the artwork to its pristine just-varnished state, and rejuvenate a surface marred or dirtied by time. However, the more layers of product on top of a painting, the greater the aesthetic change will be. An artist should balance the potential for varnish replacement against the alterations an isolation coat might bring.

An isolation coat is especially important for brush application of MSA over an absorbent surface such as paper. Without a barrier, the solvent-based MSA sinks directly through the Archival MSA Varnish and into the paper. As our test shows, however, every additional layer over the painting's surface increased the possibility of aesthetic change. Comparing the test results for Archival Varnish with and without an isolation coat shows this clearly.

Result Summary:

Varnishing created changes to color, value, paper texture, and sheen. In some cases, varnish modified color intensity

and appeared to slightly warm the color of paint and paper. The appearance of change can be subjective, with varnished color appearing darker or lighter depending upon viewpoint and lighting. Viewing context also altered the perception of sheen and texture. We found that Archival Varnish Matte applied without an isolation coat created the least changes.

The Structure of the Tests:

We began with 300 lb. / 600 g.s.m. Fabriano Artistico Cold Pressed Extra White Watercolor Paper. Over this, we brushed horizontal dark, medium, and light washes of QoR Modern Watercolor Quinacridone Magenta, Benzimidazolone Yellow, and Ultramarine Blue. The test also included an area of unpainted paper. This created four horizontal bands across the paper (Diagram 1).

We applied varnish in vertical strips perpendicular to the horizontal washes. Uncoated "control" areas of paint and paper remained between each varnish test to allow for more accurate assessment of change. This created alternating vertical sections that were either varnished or left untouched to act as 'controls' for comparison. The process of creating the test specimens is described below:

First, to protect the water-sensitive and absorbent surface of paint and paper, four coats of aerosol Archival MSA Varnish Gloss were sprayed only where the varnish would be applied. Three or four coats are

usually needed in this step, for the goal is to seal the surface and lock down the paint so no color will lift if a waterborne acrylic is brushed on the surface. Gloss preserves the greatest color clarity in the final result and is our recommendation for all early layers when varnishing.

Second, once the varnish was dry, an isolation coat of Soft Gel Gloss diluted 2 parts Gel to 1 part water was brush applied to three of the four varnish test areas. The goal with the isolation coat was to create an even, glossy surface and further seal the painting in case the final varnish needed to be removed in the future. An isolation coat was used to prepare for the MSA Varnish, Polymer Varnish, and one of the two Archival Varnish tests. The fourth varnish test area was preserved without an isolation coat.

Third, we applied the final varnish application. The MSA was diluted 3:1 varnish to MSA Solvent and the Polymer Varnish was diluted 4:1 varnish to distilled water. These two varnishes were brushed over dry isolation coats. The third test area with an isolation coat was sprayed with three layers of Archival MSA Varnish. The fourth test area, without an isolation coat, was also sprayed with three layers of Archival MSA Varnish. The two Archival Varnish applications would allow for a comparison between the Archival Varnish with and without the isolation coat.

Lighting for the Photographs

Two different lighting situations were used when photographing examples for this article. Light directed on the surface from the side created a more diffused illumination that allowed us to photograph color changes with less interference from varnish surface reflections. Moving the side light sources more to the front increased glare and emphasized sheen and its impact on the cold pressed paper texture.

Conclusion

Varnishing transparent watercolor permanently changes the painting while adding a protective surface that allows the artwork to be displayed without glass, much like an oil or acrylic painting might be.³ In this article, we discussed Archival Varnish Matte without an isolation coat since it came the closest to the original look of the watercolor on paper. We discussed the Matte Ultramarine Blue results because this color showed the most change even with the "winning" varnish. Please also keep in

mind that the addition of acrylic varnish to a transparent watercolor might cause the artwork to be categorized as mixed media by some watercolor societies. To see images of all of the test panels, please go to the digital version of this article at JustPaint.org.

There is a component of subjectivity when applying varnish or evaluating the finished surface. Variances in application and materials may create different results, and viewpoint and lighting also change the way a varnished surface reads. We believe it would be best for an artist to create tests by varnishing sacrificial painted surfaces created with the paints, techniques, and papers used in the artist's own watercolor paintings. These varnished examples would provide a more accurate example upon which to base a decision about whether to varnish a watercolor painting. The artist then would weigh the transformation against the liberating benefits offered by varnishing, to see if this is a direction he or she wishes to pursue when protecting a painting.

References

- 1 Cathy Jennings, "GOLDEN Archival MSA Varnish Over Transparent Watercolor on Paper," Justpaint.org, October 4, 2017, Accessed October 3, 2017 (justpaint.org/golden-archival-msa-varnish-over-transparent-watercolor-on-paper/)
- 2 Cathy Jennings, "The Aesthetics of Varnishing Transparent Watercolor" Justpaint.org, May 15, 2017, Accessed October 3, 2017 (justpaint.org/aesthetics-of-varnishing-transparent-watercolor/)
- 3 Golden Artist Colors, "Application Information Sheet: Varnishing Watercolors with GOLDEN Products," accessed October 4, 2017 (goldenpaints.com/technicalinfo_varnwatercolor) and Golden Artist Colors, "Resource Guide: Varnishing," accessed October 4, 2017 (goldenpaints.com/technicalinfo_varnishresources)

New Sample Kit



Golden Artist Colors has always been generous with paint samples. The last two years have seen a significant increase in the number of general sample requests (versus samples of specific products).

The sheer number of requests exceeded our capacity to respond quickly and with the level of care and quality people expect from GOLDEN.

In October of 2018 we began sending a new kit with samples from each GOLDEN color line and two mediums, a product guide and a personalized note. The new kit is more efficient to produce and ship, while providing more samples and a better experience to customers.

Sample requests may still exceed our capacity at times. For that reason, we can't always accept requests and we limit kits to one per person. When available, you can use the *Sample Request* option on the *Contact Us* menu at goldenpaints.com.



January 9, 2019 marked the launch of a new outreach to artists, the *Just Paint Experience* - a new expression of GOLDEN expertise centered on the practical needs and perspectives of artists. Where *Just Paint* offers scholarly depth and detail, *Just Paint Experience* (referred to as "JPE" around the factory) is more quick-reading, studio-oriented content in a variety of forms.

New content will be added all the time with a focus on specific topics or issues each month. January will consider the preparation of surfaces for painting and drawing, February will explore grounds and texture.

Going farther into 2019 there will be in-store demonstration kits to provide hands-on experiences to match the content available online.

Perhaps the most important aspect of

JPE is the dialog we want to have with artists. Much of the content is available only to subscribers (free) and comments, discussion and feedback are encouraged. Subscribers will be notified when new content becomes available, and also get content, product previews, and offers exclusive to JPE.

Within the factory, JPE is engaging employee owners from a range of departments and disciplines to look at our products from an artist's perspective and participate in conversations about the possibilities, limitations and experience of making art with them.

We encourage everyone to visit JustPaint.org/exp so they can get in on the ground floor of a new approach to talking about art studio materials and practices, join the conversation and help shape the future of JPE.



Bryan Wilson, *Naturally Speaking: Doll Test Redux, 2016*
30" x 24", Oil on Canvas



Rebecca Buchanan, *F143K, 2018*
20" x 16", Acrylic and Ink on Board

Artists & Mentors: The Painting Center, NYC

by Mark Golden

This past September 4th – 29th, Golden Artist Colors, in collaboration with the Scholastic Art & Writing Awards and its affiliate national nonprofit organization, the Alliance for Young Artists & Writers, sponsored the group show *Artists & Mentors*. The show included 12 artists who had been selected for the GOLDEN/Scholastic Artist Residency. This show shined a well-deserved spotlight on the talented practicing artists who are also teaching and inspiring their young students in the classroom.

Since 2014, Golden Artist Colors has annually sponsored three teachers whose students received Scholastic Art & Writing Awards to attend a two-week residency program hosted at the Golden Foundation Residence. Each year, several hundred teachers apply and an independent selection committee makes the residency awards based on the quality of their submitted artwork.

These teachers who were honored with a Residency all have teaching credentials that would be the envy of any school. It is no small feat to both teach a full-time

schedule in our schools and to have a successful art practice. The show, curated by Jim Walsh and with the incredibly valuable support of The Painting Center, allowed us to share the talent of these amazing artists and educators.

The artists in the show included:

- **Isaac AlaridPease**, NM
alaridpease.com
- **Rebecca LS Buchanan**, OR
- **Jessica Clark**, NC
jessicaclarkart.com
- **Geeta Dave**, LA
geetadave.com
- **Cristina González**, NM
cristinagonzalez.com
- **Jeffrey Deane Hall**, VA
jeffreydeanehall.com
- **Lucy Harackiewicz**, MA
lucyharackiewicz.wixsite.com/ portfolio
- **Kevin Kelly**, KS
kevinpkelly.com
- **Claire Lerner**, CA
clairehlerner.com

- **Brian Payne**, OK
piercepayne.com
mrpayne.org (teaching)
 - **Elizabeth Stainton**, NY
elizabethstainton.com
 - **Bryan Wilson**, NC
bryanwilsonstudios.com
- During the show, on September 15th, Golden Artist Colors also sponsored a panel discussion at The Painting Center entitled "Teaching Our Children to Think Like Artists". On the panel were:
- **Dr. Jerry James** – Director of Teaching and Learning, Center for Arts Education, NYC
 - **Tendo Mutanda** – Senior Program Manager, Scholastic Art & Writing Awards
 - **Barry Nemett** – Faculty, Painting Department MICA (Chair 1990-2016)
 - **Stacy Rosende** – Director of Education at Golden Artist Colors
 - **Elizabeth Stainton** – Fine Arts Teacher, Brearley School, NYC & Scholastic Artist in Residence.

This panel of distinguished educators was brought together to discuss how we assure that our schools, our teachers, and our parents are prepared to create, prepare for and to demand to make available the critical skills taught through the arts. Eric Pryor, now the President of the Harlem School of the Arts while still the Executive Director of the Center for Arts Education in NYC shared and I'll paraphrase: "We don't expose our children to math because they want to be accountants and we don't expose them to English because they want to be journalists. It's because we think it's core to their development. So similarly, we don't teach art because we want our children to all become professional artists. But clearly an art education is also core to their development."

In an article written by Alison Cole, she shares, "Creativity and the arts have never been more relevant to a world that will set great store by human ingenuity, resilience and adaptability." The evidence for a well-grounded education is quite clear as to the benefits and has been shared by Americans for the Arts: Students involved in the arts are four times more likely to be recognized for academic achievement. They are three times more likely to win a school attendance award. Low income students who are highly engaged in the arts are

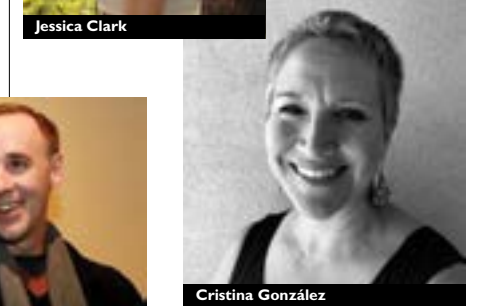
more than twice as likely to graduate from college compared to peers with no arts education. Students engaged in the arts score higher on their SAT's and are more likely to graduate on time compared to peers with little school day arts instruction. Students who participate in the arts are less likely to receive out of school suspensions. We know the arts inspire students and promote growth in self-confidence, empathy and increased social tolerance. Finally, 72% of business leaders say that creativity is the number one skill they seek when hiring. Yet, despite this, we still have to defend even the small amount of resources provided to our children.

The discussion from both the panel and the audience was incredibly engaging and supported the ideas around teachers

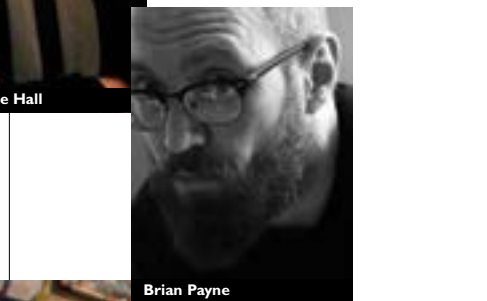
continuing an art practice and the value that creates for their students, as well as working with our colleges offering art teaching credentials to amplify not just the teaching of art skills, but the ability to teach the tools of creativity.



Geeta Dave



Jessica Clark



Cristina González



Rebecca LS Buchanan



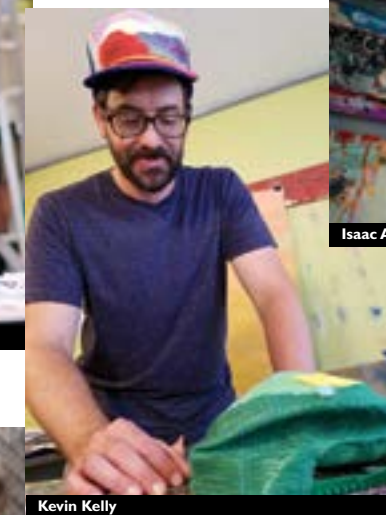
Jeffrey Deane Hall



Brian Payne



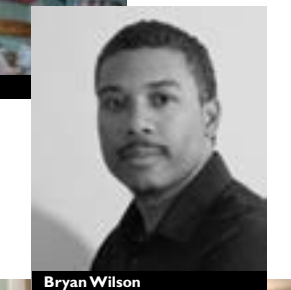
Claire Lerner



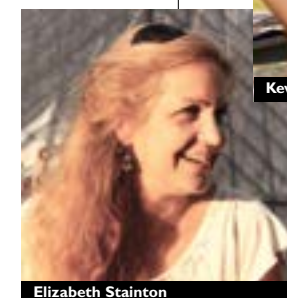
Kevin Kelly



Isaac AlaridPease



Bryan Wilson



Elizabeth Stainton



Lucy Harackiewicz

WE HEARD YOU: NEW PRODUCTS FOR 2019

by Michael Townsend



The product development process at Golden Artist Colors is a constant collaboration between artist and paintmaker. Over time, this has resulted in the wide array of painting tools offered for today's professional artist. We are always in a state of continuous improvement of current products as well as creating new ones that benefit the artist. For 2019 we offer unique products, a new studio tool, and a newly designed tube cap.

NEW PAINT TUBE CAPS

Sometimes the best improvement to make isn't made to the actual product, but its delivery device: the ubiquitous tube cap. The current caps can be a bit challenging to twist off, so we added some gripping power with a "Deep Cog" design. Starting in the spring of 2019 we'll begin rolling out Heavy Body Acrylics and OPEN Acrylics paint tubes with redesigned caps. The new cap makes it easier to get a grip and provide some substance to hold onto. Marketing Director Matt Cleary aptly describes the new tube cap as "snow tires for your fingers!"



PAINT TUBE CAP TOOL

Along with a new tube cap, we unveil a nifty tube opening device called the GOLDEN GRIPR™ Cap Tool. The Gripr™ is made from durable yet flexible ABS plastic and can be used on a variety of paint caps. It can be used with both old and new style GOLDEN paint tubes, as well as Williamsburg Oil and QoR® Modern Watercolor tubes. The GRIPR™ is easy to use and provides leverage to remove even the most stubborn caps. The tool will be available in stores that sell GOLDEN products.



◀Opposite page: Application of Color Pouring Medium Matte by Michael Townsend (Materials & Application Specialist)



COLOR POURING MEDIUM

Using gravity to direct liquid paints to flow isn't a new technique. However, the following two new pourable acrylic mediums are. Poised to make their debut in 2019, Color Pouring Mediums are intended to be blended as desired with either Fluid or High Flow Acrylic paints. The most unique of these products is our Color Pouring Medium Matte. Typical pouring blends end with a high gloss finish, while our new matte product changes the dynamics for artists experimenting with pours. Other paints may be blended with these mediums, but Fluids and High Flow Acrylics are ideally suited to blend with the Color Pouring Mediums. In order to learn the working properties of these mediums, begin at a simple 10:1 (medium to paint) ratio. Refer to our website for further instruction.

Color Pouring Mediums can be used to create both opaque and translucent paint layers with excellent control during painting. Both are exceptionally adept for paint puddles and "pancake pours" with little risk of cracks or crazes. Mixtures can be stored and applied using a variety of tools and techniques.

Color Pouring Medium Gloss readily flows onto the painting surface, generating uniform pools of paint. The dried surface of Color Pouring Medium Gloss (CPM Gloss) is smooth and shiny. Adjusting the amount of paint added to CPM Gloss controls saturation and opacity. Mixtures can be used in a variety

of techniques, with crisp color boundaries that respond to tilting and gentle persuading. Add small paint additions to create veils of translucent color over previously painted passages.

Color Pouring Medium Matte: If you are not a fan of high gloss paint surfaces, then check out Color Pouring Medium Matte (CPM Matte). This moderately viscous leveling medium allows for uniform color fields without brush or tool marks. It drips and drizzles with ease. Air bubbles readily rise and pop during drying. Although CPM Matte is quite flat, colors remain deep and vibrant. Surprisingly, even Iridescent and Interference Colors retain a great amount of luster.

ISOLATION COAT

The new Isolation Coat is a ready-to-use sealing coat for acrylic paintings. Previously acrylic artists' only recourse was to dilute Soft Gel Gloss with water (our former and still acceptable recommendation) before applying it to completed acrylic artwork. The new Isolation Coat takes the guesswork out of measuring and mixing, with increased flow and leveling and may be applied during any part of the painting process.

Finishing a painting with isolation coat and varnish provide ongoing protection for your artwork from the hands of time. Isolation coat is a permanent acrylic medium that seals surface absorbency and allows for improved varnish application and easier varnish removal. Apply one or more layers before varnishing.

SEMI-GLOSS ARCHIVAL SPRAY VARNISH

Finally we offer a new sheen of our aerosol varnish called Archival Varnish W/UVLS Semi-Gloss. It's relatively easy when using MSA or Polymer Varnish to mix the Gloss and Satin varnishes together to create a semi-gloss, but that's not an option when using spray can varnish. The new Semi-Gloss aerosol varnish serves to lower gloss yet retain color depth, making it ideal for a buildup of multiple coats. As with the previously offered sheens (Gloss, Satin and Matte) Semi-Gloss Archival Spray Varnish may be used on top of a variety of artist media, including acrylic paint, oil, watercolor, ink-jet prints and collage.

The chart below compares the matte properties of our spray varnish.

SHEEN	%SOLIDS	REFL@60°
GLOSS	0	~98
SEMI-GLOSS	18	~71
SATIN	59	~45
MATTE	100	~4

These products are the result of listening to you: our customers. If you have any questions about these tools or any of our products or specific applications - contact the Material and Application Specialists at 800-959-6543, help@goldenpaints.com or via social media. Also visit goldenpaints.com for new product information and videos.

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(RE) INTRODUCING THE VIRTUAL PAINT MIXER *by Sarah Sands*

We are excited to introduce a host of new features and improvements to our Virtual Paint Mixer (MXR). These additions were inspired by your feedback and with the hope that it becomes an even more important and enjoyable tool for artists. So, as our holiday present to you, our customers, we are releasing Mixer 1.1 with the following improvements and features:

Color reduction is back!

This feature was taken offline while we worked on the updates, but now it is back with a vengeance! Once again you can reduce a mix all the way down to a single color with the press of a button. Even more exciting, you can now *undo* your reduction all the way back to your original mix! Simply press the 'undo reductions' button for each step back that you want to go!

Chromatic color order

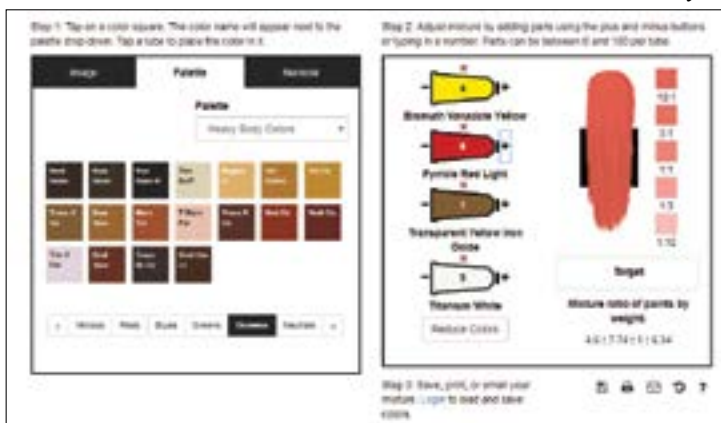
Color swatches are now organized by hue (yellows, reds, blues, greens, browns, and neutrals) and displayed in chromatic order, allowing you to easily locate your favorite color.

Color name abbreviations

Abbreviations for each color are now right on the swatch, making it easier to know which one you are selecting.

Single pigment and color set palettes

A single pigment palette has been



added to the available swatch palettes, and watch for other sets to be added in the future.

Image upload is back!

Users can once again upload their images to the MXR without having to worry about aspect ratios or manual cropping.

Volume-to-weight conversion

Until recently, mixtures have been shown as a volume ratio. We are pleased to expand on this by providing automatic volume-to-weight conversion for every mix! The precise mix ratios are calculated in real time, and displayed below the Target button. The ratio can be used for grams, ounces, or whatever measurement scale you choose!

Go to goldenMXR.com and try it!