WATERBORNE IDENTITY

PPG AND THE EVOLUTION OF AUTOMOTIVE FINISHES
Automotive finishes have been evolving for as long as there have been automobiles. Although changes in paint technology don’t happen fast, when they do it’s usually in a big way. Like the jump from lacquer to urethane, or from single-stage paints to two-stage, the shift to more environmentally friendly waterborne materials has been a sea of change for manufacturers, professional refinishers, and hobbyists alike. Though waterborne finishes have been around for a few years, we’ve noticed more and more painters using them on rods and customs. Even the 2013 Riddler winner wears waterborne paint. So we wanted to take a closer look at the place they have in hot rodding today, and to explore the history of the industry that led to this latest technology.

WHERE WE’VE BEEN

We thought that a good place to start was with a company whose roots go back to the inception of the automotive paint business. PPG is one of the most respected and forward-thinking names in auto refinishing. In some ways it’s a place they’ve occupied for the last century. The company we know today began as two separate entities: Pittsburgh Plate Glass Company and Ditzler Color Company. In the early-1900s, the former was in the business of making just what their name suggests, while the latter was formed by two carriage refinishers from Pennsylvania, brothers Fred and Peter Ditzler. Peter was known for mixing his own custom Japan colors—ground pigments in linseed oil—while Fred worked to perfect the application of Peter’s finishes.

They set up shop at 40 West Baltimore Avenue in Detroit in 1902. The year they opened, their roster of customers included the Studebaker Brothers and the Pontiac Buggy Company, who at the time made wagons and buggies respectively, and Cadillac, their first automotive account. In 1913 Ditzler Color Company began...
producing automotive finishes exclusively, becoming the largest such manufacturer in the world.

At that time paints were brushed onto cars and carriages, then hand-sanded and polished (often with a pumice stone) to a smooth, glassy finish. The process was labor intensive and time consuming, sometimes taking over a month to complete. Then in 1921 nitrocellulose lacquer entered the picture. Its discovery is attributed to a container of gun cotton (nitric and sulfuric acid-soaked cotton fibers used in nitrate film and smokeless gunpowder) being left outside over a warm weekend. The resulting clear, viscous liquid was then used in the first nitrocellulose lacquer. By 1922 Ditzler introduced its own durable, high gloss Ditz-Lac nitrocellulose lacquer. At first the new paint was applied with a brush, but two years later spray painting technology was introduced, cutting paint production time to a fraction of what was required by brushed and polished finishes.

Pittsburgh Plate Glass Company acquired Ditzler Color Company in 1928. Ditzler continued operating as an independent subsidiary until 1968, when it was incorporated into the newly renamed PPG Industries, Inc. Throughout those 40 years, however, technology continued evolving as paint manufacturers hunted for ways to make better, more colorful materials. In the early years Ditz-Lac and Ditzco alkyd enamel were the auto finishes of choice for Ditzler’s customers. The development of acrylic lacquer was the first big step from nitrocellulose lacquer, and in 1956 PPG introduced their version with their Duracryl line. Acrylic lacquers boasted all the properties auto manufacturers wanted to hear about: they didn’t chip as easily, there were more color choices, and shorter dry times translated into increased production in the factories.

The ’60s saw PPG’s development of Delstar acrylic enamel, as well as a few protective and elastic coatings geared more specifically for the mass production side of the equation. Then in 1976 Deltron Acrylic Urethane (DAU), which is probably among the products most familiar to hobbyists, was released. Acrylic urethane was a single-stage paint that once again raised the bar for performance and dry times. And it remained the industry standard until the introduction of basecoat/clear coat acrylic urethanes, such as PPG’s two-stage Deltron system, launched in 1984. While the materials were different from earlier lacquer-based paints and clear coats, the premise was much like the clears custom painters used years earlier when shooting candies, pearls, and multi-layer paint jobs so hot rodders adapted quickly.

MOTHER NATURE WEIGHS IN

Up through this point, technology was driven by manufacturers’ quest for durability, expedited production, and of course a quality finish. Basecoat/clear coat acrylic urethanes provided all of that. But by the ’90s change was once again on the horizon, and this time it was driven by environmental concerns and the legislation they prompted.

Acrylic urethanes are solvent-based, relying on substances (solvents) that dissolve the pigment into a sprayable solution and deliver it to the surface. The problem is that as the paint dries and the

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solvents evaporate, volatile organic compounds (VOCs), which are bad for your health and the environment, are emitted into the air. The solution was found in waterborne technology, which uses water to deliver the pigment to the surface. PPG first began working on waterborne paints in the ’90s, and by 2007 launched their production-ready, third generation Envirobase High Performance waterborne basecoat system. Since then waterborne has become the standard basecoat system for 60 to 70 percent of new cars.

The benefits for manufacturers and production refinishers lie in waterborne paint’s brilliant colors, simple application, lightning-fast dry times, and the ability to easily match colors (not to mention compliance with increasingly restrictive legislation). But there are also benefits for those in our orbit, from hobbyist painters to professional rod and custom shops.

**WATERBORNE IN ACTION**

We wanted to get a hot rodder’s perspective on waterborne, so we turned to Charley Hutton. He’s a spokesperson for PPG and a well-respected custom car painter. Several of his 27 years in the business were spent working with the late Boyd Coddington. He now operates Charley Hutton’s Color Studio in Nampa, Idaho, where he continues turning out award-winning custom paint jobs like that on the aforementioned ’13 Riddler-winning “Checkered Past” ’40 Ford (TR/59).

“Like all things, nobody likes change and I’m no different,” Charley says. “You get comfortable with a product and you don’t want to change. But I’ve been really impressed with the waterborne paints from the beginning.” There is definitely a learning curve involved in transitioning from solvent-based to waterborne, but it’s a short one. Those who have experience spraying lacquer will actually have the easiest time switching to waterborne because, like lacquer, it requires multiple light coats. But we’ll get to more of the specifics momentarily.

A common misconception is that switching to waterborne requires expensive, new equipment like stainless steel spray guns and spray booths with significantly increased airflow. Regarding spray guns, the reality is that many quality guns, even at the hobbyist level, have stainless steel sleeves. As long as they are rinsed with acetone after each use, they will work fine.

Increased airflow shortens dry time simply because more air moving across the paint causes the water to evaporate and the paint to dry quicker. Faster dry times are more of a concern for professional shops, but hot rodders will certainly appreciate the shorter time from spraying paint to unmasking the finished product. Charley equipped his shop’s booth with additional blowers, but he says for the hobbyist painter, “a couple of box fans from Home Depot are sufficient.”

Preparing the surface for waterborne paint isn’t much different than for solvent-based paint, although the significantly thinner waterborne coats are less forgiving of imperfections in the primer. Many painters wet sanding the primer coat to at least 1,000-grit prior to applying the basecoat. Speaking of primer, PPG’s Envirobase High Performance system does include waterborne primers that are great for spot repairs. But they are not geared for painting entire panels, so in most cases Charley still uses solvent-based primers.

When your surface is ready to shoot, it should be wiped down with a waterborne-specific cleaner followed by a solvent-based cleaner like PPG’s Acryli-Clean. “I have no idea why, but if you don’t use Acryli-Clean after the waterborne you will see the wiping marks when you paint.” The cool thing is that the water in the paint negates the dust-attracting static electricity generated by all that wiping. This results in fewer imperfections to address later.

Painting with waterborne is easy as long as you’ve got the right amount of reducer mixed with the paint—something that can be easily checked with an inexpensive viscosity cup. What’s a little trickier is mixing custom colors. With solvent-based paints, you can see approximately what the color will look like with a dip of a stirring stick. Waterborne has a slight blue cast until it is sprayed and begins to dry, so creating custom colors requires spray testing your mix.

When it’s time to spray, the first coat looks blotchy and mottled, but that actually means you’re on the right track. As additional coats are applied, the aqueous material blends beautifully into an even, brilliant finish. Although full coverage can be achieved in two to three coats, custom painters find themselves spraying additional coats depending on the design and the transparency of the colors they’re using.

Typically surfaces are dry enough to tape within five minutes, and to sand in about 15. What’s more, the layers of material are so thin that the build-up between coats is practically non-existent. Multi-layer panels, scallops, flames, and two-tones can be created without noticeable edges that cause runs and require additional attention. When doing multi-layer paint jobs, tape made specifically for waterborne paint is a must because standard paper-based tapes wick the paint and cause edges to bleed. PPG recommends finishing with a solvent-based clear coat. Waterborne clear coats are available, but they’re still in their infancy.

Easy application and quick dry times don’t mean much if the results aren’t as brilliant and rich as those possible with solvent paints. The waterborne finishes already on the show circuit speak for themselves. “With waterborne you can make some of the nicest, most brilliant colors,” Charley says. “They’ve refined the particle to the point where everything is just as clean as can be.” He notes that because the paint is so forgiving, even metallics and pearls are easier to shoot.

Even for a hobby steeped in tradition like ours, new technology can be exciting—even when it makes it possible for more of us, as hobbyists or professionals, to achieve stunning, expert results. The fact that we’ve progressed from mixing explosive chemicals and brush-painting our cars black to creating a wide range of dazzling finishes with the most basic equipment is impressive. Though it will likely be quite some time before there’s another revolution in automotive paints, with the advancements we’ve seen in waterborne basecoats and even primers and sealers, we’re interested to see where technology takes us next.

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