



Full-Throttle Pretreatment at Yamaha

Cross functional team makes a change in Yamaha's pretreatment line.

BY TIM PENNINGTON EDITOR

ABOVE: Yamaha's Newnan facility manufactures four recreational product lines including the company's side-x-side utility vehicles.

Yamaha Motor paint engineer Chet Sweatman can only cringe when he sees his company's products put to the test by its customers, be it all-terrain vehicles or personal watercraft.

That's because most of Yamaha's products are run at full-throttle through mud and sand, or splashed around lakes and rivers like a toy boat. Customers have fun with their Yamaha products.

Nonetheless, the powder coatings on these vehicles withstand even the most severe punishments its owners can dish out, all a testament to Sweatman and his crew's persistence in pretreating the metal surfaces correctly, and getting good adhesion through electrocoat and powder coating application.

"The coatings have to hold up; there's no question in our minds," says Sweatman, who is paint engineer at Yamaha Motor Manufacturing Corp. of America's Newnan, Georgia, plant just outside Atlanta.

"They do get subjected to some of the worst road conditions you could imagine, but Yamaha products are known to withstand whatever a customer wants to give it," he says. "That's

what has been known for years, and I don't want to have anything to do with changing that."

The Newnan facility employs more than 1,000 people in three plants. They manufacture four recreational product lines including golf carts, ATVs, personal watercraft and the company's side x side utility vehicles.

Corrosive Environment

Sweatman's job is to make sure each product and part coated and shipped out the door can withstand any type of weather, corrosion, rock or surf it may encounter. He is engineer over the pretreatment and cleaning line, an ecoat line and several powder coating lines.

But it was about a year ago when a cross functional team decided a change was in order for Yamaha's pretreatment line. The previous operation forced him to dump his baths every two to three weeks, causing a delay in production while the line was down, or forcing him to bring workers in on weekends to perform the changeover.

Besides the downtime—and overtime—being a pain to Yamaha in both efficiency and operational costs, the change-outs were also environmentally unfriendly, as the 10,000-gallon tanks were using valuable resources in water and energy to heat them.

"It wasn't a good situation for us, and we knew that something needed to be done," Sweatman says. "It wasn't very efficient."

On top of that, a zirconium bath that Yamaha was running from a previous vendor was starting to leave a red film on top of the pretreated parts, which was definitely a no-no for Sweatman and his team.

In late 2012, Calvary Industries, headquartered in Cincinnati started to ask Yamaha about taking a look at their pretreatment line. It took the engineering team some time, but he eventually invited Calvary and a few other vendors to come in and offer an assessment and test some of their products with Yamaha.



Yamaha Motor paint engineer Chet Sweatman checks the controls on the finishing line.

Yamaha's side-x-side utility vehicles get a powder coating following the new pretreatment system.



Pretreatment Switch

Tyler Morelock, a representative with Calvary, offered some unique solutions to Yamaha, which got its attention. A year later, at the end of 2013, the company made the switch to Calvary products. The switch has resulted in a substantial cost savings, but also an extremely efficient pretreatment operation—the bath was just recently dumped after almost 13 months in operation.

“We could have pushed it longer with the bath, but we wanted to make sure we changed at the right time,” Sweatman says. “But going from every two or three weeks to well over a year is just an incredible improvement for us.”

The cost savings? Try more than 70 percent on chemicals and materials in the pretreatment line.

“Unbelievable,” Sweatman says. “When one of our company board of director members from Japan stopped by recently to see what we did, he gave me a great big hug. That meant something to me.”

Morelock says once he rolled up his sleeves and saw what was occurring at the Yamaha line, he knew that Calvary could provide some much-needed improvements for Sweatman and his crew. Yamaha had Calvary dump the tanks

Yamaha products are being used more frequently in agricultural settings.

Advantech has no phosphate or phosphate sludge in tanks or risers, has very low conductivity, so it has easier rinsing and better performance in seams, and in most cases can be dumped to drain.

and descale them, then run a 30-day inline trial after spending a few months testing chemistries on the company’s parts.

“We did a ton of testing for them in the lab until we knew we had exactly what would work best for them,” Morelock says. “Once we started the trial, we knew it would work well based on all the research we did for them. And it all came out great.”

Cutting Stages

Yamaha had an existing 11-stage pretreatment system, with an emphasis on removing carbon smut and weld scale from the parts for the ATVs and golf carts. Stage 6 and 7 is where the pretreatment focus began, and changing to the Calvary system allowed Yama to remove stages 8 and 9, which were two rinses.

In addition, a sealer the previous supplier was using in stage 10 was also removed, another maintenance headache that quickly disappeared.

“They were also having to activate their zirconium with a pretty aggressive acid, and our chemistry doesn’t need that,” Morelock says. “So we were able to take them from four chemicals down to two, which is a huge improvement in overall efficiency.”

Calvary’s Cal Clean 947 was used in stages 2 and 3. It’s a mild-alkaline cleaner for use in spray washers to remove loose smut and carbon with about 70 percent less alkalinity than traditional cleaners. Operating at a much lower conductivity allows for easier rinsing and reduces water usage. Cleaner parts allow the pretreatment to be more effective.

In tanks 6 and 7, Calvary used its Advantech P600, a multi-metal, water-based pretreatment that operates at ambient temperature and is safe for mild steel washers. It can be dried in place or rinsed with DI Halo in ecoat applications without reducing performance, Morelock says.

“It’s formulated to improve the impact resistance and flexibility of topcoats over traditional pretreatments,” he says. “It has matched the performance of competitive chrome-sealed iron phosphate and zinc phosphate in SAE-J2334 cyclic testing and ASTM B-117 salt spray testing.”

Plus, Advantech has no phosphate or phosphate sludge in tanks or risers, has very low conductivity so it has easier rinsing and better performance in seams, and in most cases can be dumped to drain





Yamaha had an existing 11-stage pretreatment system before entering electrocoat and powder coat stations.

because of its low conductivity, near-neutral pH, and being a greener chemistry than what Yamaha had been using.

Improved Salt Spray

“One of the biggest successes in this entire project was we doubled their salt-spray testing,” Morelock says. “Not having to dump the pretreatment tanks is great for them, but overall, Yamaha is getting a much better protection for its coatings when it goes into ecoat and then powder coating.”

That is important to Sweatman and the coatings personnel at Yamaha, especially when the company transferred all its ATV manufacturing from overseas to the Georgia plant in 2012. That resulted in 200 more jobs at the plant, and even more jobs at the 125 North American part suppliers. Plus, Yamaha invested more than \$250 million in the factory over the past 10 years, creating a state-of-the-art facility and ensuring top-quality products are built in a safe and environmentally responsible manner, says Yamaha Motorsports President Henio Arcangeli Jr.

“This production transfer shows Yamaha’s commitment to this facility and the U.S. motorsports market—the

world’s largest ATV market,” Arcangeli says. “Manufacturing ATVs in Georgia will allow Yamaha to respond more quickly to its customers’ demands, while streamlining its supply chain and distribution processes.”

Yamaha has about 2,800 employees in the U.S., and says it supports more than 30,000 additional jobs through its manufacturing facilities, corporate offices, field staff, distribution centers, suppliers and dealer partners.

“We are extremely excited about this production transfer to the U.S.,” says Mike Chrzanowski, senior vice president of operations and engineering services at YMMC. “Above all, it is the YMMC employees and their longstanding dedication to the company, their own quality of work, and their communities that has made this transition possible.”

Yamaha was started by Torakusu Yamaha in 1887 when he began building reed organs. In 1955, Yamaha Corporation formed Yamaha Motor Co., Ltd. to make motorcycles, the first ones powered by a simple two-stroke engine. Yamaha Motor Manufacturing Corp. (YMMC) was formed in 1986 to manufacture golf carts, ATVs, water vehicles and side-by-side utility vehicles.

Side x Side Vehicles

The latest beast to roll off the Newnan production line is



Yamaha's finishing line coats everything from golf carts, ATVs and personal watercrafts.

a new utility side x side vehicle, the 2015 Viking VI EPS six-person side x side. With an extended cab, the Viking VI has become a great farm and agricultural vehicle because it combines performance and durability with comfort and convenience, including maximum headroom, legroom and shoulder room for six occupants.

For the farm and agricultural community, it has loads of power for off-road duty with Yamaha's fully automatic transmission, four-wheel drive, power steering and a 700cc-class engine. With 600-pounds hauling and 1,500 pounds towing, the Viking VI is often used instead of a smaller pickup truck at a considerable cost savings.

"We expect to see it working ranches and hauling hunters from Texas to California, Oregon to Pennsylvania and everywhere in between," says Steve Nessler, Yamaha's ATV/SxS group marketing manager.

But of course, the wear and tear these vehicles face make it especially important for the coatings to withstand treacherous use. Sweatman says the Yamaha coating system uses ecoat and a powder coated topcoat using Axalta Coating System's products. The plant coats several hundred vehicles and accessory parts every day, using two shifts, five days a week.

"We know how people are going to use these vehicles, so we need a more robust coating application," Sweatman says. "The ecoat and powder coat system works great for us. It's very proven. And the pretreatment is better than ever, and very efficient."

Going International

The system has been so successful for the Newnan plant that Yamaha is looking at copying it at other manufacturing plants in the U.S. and internationally, especially a plant in Brazil.

"We're using half the chemicals we had been using," Sweatman says. "Everything worked out well for us, and we appreciated Calvary's help. They were very flexible and showed that they wanted to meet what we need by modifying their own product to meet our specs. That was a huge deciding factor."

Sweatman's advisor at Yamaha—he says every department has someone they work with from the Japanese office—has been extremely impressed and has taken the idea back to Japan to share with other departments and manufacturing facilities.

"We feel very honored here in Georgia to show a major corporation like Yamaha how to improve efficiencies," he says. ■■

For more information about Yamaha Motor Manufacturing Corp. of America, visit yamaha-motor-georgia.com. For information on Calvary Industries, visit calvaryindustries.com.



See Yamaha Motor Manufacturing In Action

Hear Chet Sweatman talk about the new pretreatment line that Calvary Industries helped them install. Scan the QR code, or visit

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