



PCT FEATURE

## Powder Coating Heavyweight

By Sheila LaMothe

*Tractors, harvesters, excavators, loaders, and other equipment vital to the agriculture, construction, and earth moving (ACE) industry are subject to harsh conditions. Few industries rival the exposure to the elements and significant wear and tear to which such equipment is subjected day in and day out. Quality powder coating of components assembled within these massive machines is crucial to their operation and longevity and OEMs demand nothing but the best from their contracted coaters.*

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When Jamie Visker purchased Winona Powder Coating, one of Indiana's first powder coating operations, in 2002, the then-28-year-old company fit the textbook definition of a custom coater. With locations in Elkhart and Mentone, they provided contracted powder coating services for a variety of substrate types and industries.

Initially, Winona's agriculture-related work was limited to springs because they only had a three-stage washer and five-stage was required by the major OEMs. In 2003, the Elkhart location expanded from 20,000 to 50,000 square feet with two powder coat lines, each with a five-stage washer. This provided the opportunity to pursue John Deere certification, which would open the door to more agricultural and heavy industrial coating jobs.

### Entering the Big Leagues

Come 2012, Winona was running a variety of agricultural parts, but Jamie shares one was particularly interesting. "The part featured a fairly light gauge aluminum extrusion, mounted to a much heavier aluminum casting. The trick was to cure the coated casting without burning the powder on the aluminum extrusion." Overcoming this challenge, Winona coated the part for about 10 years until the OEM changed fabrication suppliers to a company located out of the area.

With a lot of smaller coaters in the market, several just like Winona within a 60- to 70-mile radius, Jamie decided that Winona was going to "get big." They continued to up their game on quality certifications, becoming ISO certified in 2012 and increasing certifications to satisfy OEM coating requirements. Jamie explains, "There's a lot involved with OEM certifications. In the case of John Deere, you must be certified by color and by substrate. So, you can't simply be certified to apply John Deere black, for example. You have to go through the certification process to apply John Deere black on cold rolled steel, on aluminum, on cast iron, etc." As a result, Winona holds approximately 20 John Deere powder coating application certifications amongst a myriad of other OEM certifications.

Getting big also required expansion of talent and equipment. Quality-focused personnel were added to the Winona team, and in 2013, the operations in the 25,000 square foot Mentone plant moved to a 170,000 square foot facility in Etna Green with a five-stage washer and increased curing capability. The additional space also afforded Winona the ability to house customer part inventory.

### Heavy Hitters

As time went on, requests to coat heavy parts increased. In response to this trend, Winona built a line specifically for heavy parts. Fully operational in 2019, the 1,000-foot-long line can support 100 pounds every six inches and runs through a 135-foot cure oven with an astounding 7.2 million BTUs of burner capacity. Jamie notes, "It is one thing to keep an oven temperature at 500 degrees, but when you send a wall

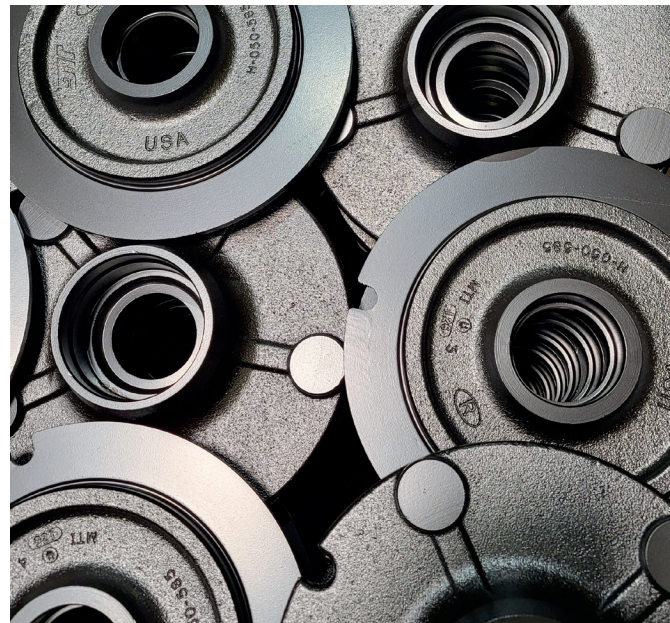
of cast iron parts through it at ambient temperature, maintaining that 500 degrees is challenging because the parts are essentially cooling the oven."

The line also features a short stage washer to eliminate flash rust on cast iron parts. Parts proceed to dry-off and are then coated in a Gema booth before heading into the cure oven. Vice President of Engineering Scott Eyink notes, "All of this happens on one side of the line, then we have to turn it. While it takes a lot of time to bring the parts up to temperature, it also takes time to cool them down for packing. So, the cooldown run is about 400 feet long." With the added capability of coating heavier components, parts as heavy as 500 pounds travel down the line.

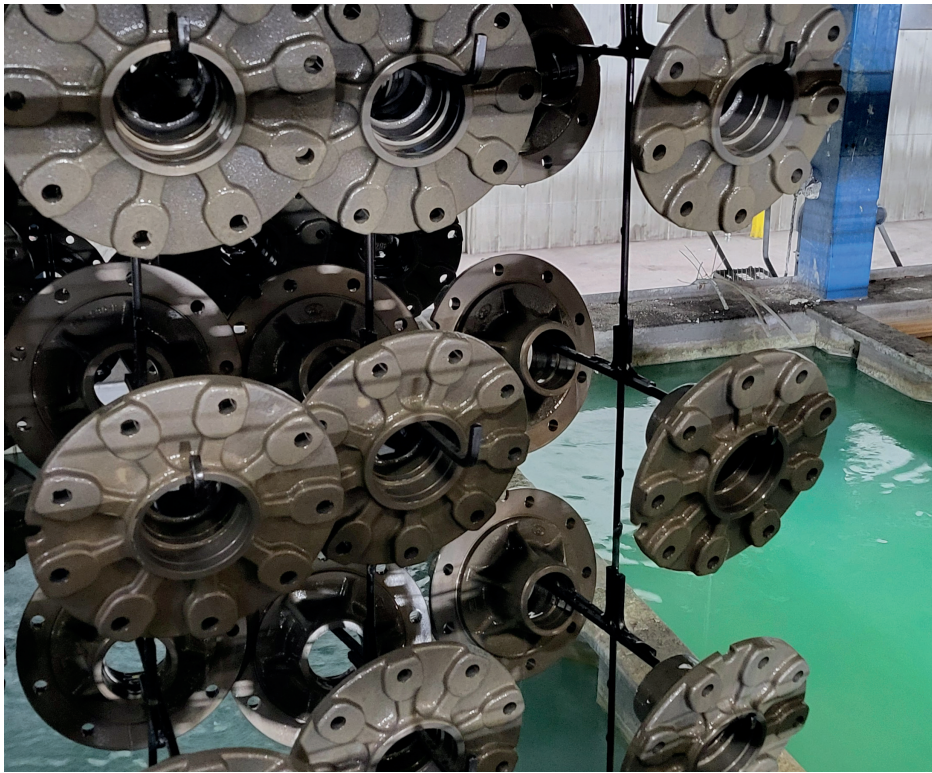
While Winona coats a wide range of substrate types, cast iron coating jobs regularly come through their doors, bringing a challenge along with them. According to Jamie, the majority of cast iron parts are machined to final tolerances after they are powder coated. Due to its porous nature and how it holds heat coming out of the dry off oven, it is easy to coat cast iron heavy. Herein lies the challenge. Jamie explains, "If the coating thickness on a cast iron part is above about four mils, you won't see a clean line in the coating, and it will chip off in areas not machined. This results in a need to recoat post-machining." Winona has consciously developed a core competency in maintaining film thickness on cast iron parts because machining suppliers have had so much difficulty with chipping.

### One-Two Punch

Around 2013, the agricultural and heavy machinery industries began to specify powder topcoat over electrocoat (e-coat). There are multiple benefits to the two-coat process. Pretreatment uses a zinc phosphate followed by an epoxy



*Powder coating cast iron parts has unique challenges that must be factored into your processes.*



*Parts are lowered into pretreatment tanks, then conveyed for e-coating for a protective epoxy coating before a powder topcoat.*

e-coat, creating increased chemical resistance. Powder coating over e-coat significantly improves corrosion resistance, resulting in the ability to more than double salt spray hour requirement—from 1,000 to more than 2,000 hours. It also minimizes the spread of “creep back” when the coating is pierced.

For years, Winona outsourced e-coat and then powder coated parts in-house. When their e-coat vendor no longer had capacity to handle Winona’s requirements, the hunt began for a new supplier. What they discovered was a lot of installed capacity for e-coat, but it didn’t meet the needs of agricultural and heavy industrial parts. Specifically, curing systems were designed for thin gauge materials and simply weren’t set up to cure a 17-pound casting, for example. Unable to find a suitable e-coat vendor for their needs, combined with increasing customer desire to have both processes under one roof, Winona installed an e-coat line, which was up and running in 2020.

### **Technical Decision**

Continuing their pursuit to increase capability, efficiency, and quality, 2020 also brought the installation of a Dinamec Fluid Systems fluidized thermal sand bed to improve the cleaning of part racks. The system offers a variety of benefits, starting with a significant reduction in rack stripping time. A process that took four to six hours using traditional burn off ovens was reduced to a mere 45 minutes.

Winona’s burn-off ovens were huge consumers of natural

gas. From an energy standpoint, the Dinamec process consumes substantially less natural gas, resulting in Winona receiving the largest rebate available from their gas supplier.

In addition to reduced process time and energy consumption, racks experience minimal damage due to the 850-degree Fahrenheit process temperature versus the 1,500 to 1,600 degree Fahrenheit temps in the burn-off oven exhaust chamber. And, from a part quality perspective, stripping the racks down to the bare metal helps ensure proper grounding, and proper grounding means more consistent powder coat film thickness.

### **Formula for Success**

Winona Powder Coating has taken full advantage of technology as evidenced by their addition of a

heavy part line, an aluminum line, in-house e-coat capability, regularly

upgraded powder coating equipment, and sand stripping system. However, Jamie shares the most surprising advancement he has witnessed over the past 22 years is how far powder formulations have come. “What the powder manufacturers have achieved in a relatively short amount of time is impressive from color and gloss retention, post coating formability, attaining AAMA required performance, and more. Powder coating has taken market share away from competing technologies because powder manufacturers have developed solutions that rival or exceed other coating processes in terms of aesthetics, durability, and sustainability. They’ve made the custom coater’s job easier.”

Low cure powders, in particular, helped fuel Winona’s growth. Jamie says, “The powder cure window really has very little to do with the oven temperature. What really matters is the ability for the part to hold the cure temperature for the required amount of time.” Holding cure temperature is a challenge with heavy parts, and until the low cure powders came along, Winona wasn’t able to coat them. Scott notes,

“In addition to enabling us to go after new markets, with low cure powders we can run the line faster, which increases throughput and allows us to be more competitive.”

### **Quality in Their Corner**

At the coater level, Winona has seen customer demand for certifications and robust quality systems continue to grow in the agriculture/heavy equipment space. In fact, requirements for ag and heavy industrial are trending

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towards the standards of the auto industry, which has the highest quality systems requirements for suppliers. Jamie notes, “You can’t just coat a part. You have to have all of the supporting documentation, etc. They want parts coming in they know are ready for assembly. They are looking for consistency in supply.” As a result of this trend, Winona has seen a consolidation of suppliers to these industries.

To keep up with the tougher requirements, Winona continues to grow its quality department under the leadership of Quality Manager Michele Flees. Michele started with Winona in 2021 and brought her 22 years of automotive quality experience to the company. New hires have direct experience in the Tier 1 automotive supply space, an industry Winona also serves, and they continue to modernize equipment. A new powder booth was installed on the heavy parts line in December 2022, and another is planned in 2025 for the aluminum-only line, which was installed to serve the architectural market.

Striving to be good environmental citizens, Winona has full onsite waste treatment at their Etna Green facility. The Elkhart location dumps wastewater to the city and Winona is installing additional waste treatment prior to discharging to the city, due to an increase in galvanized/galvanneal product coming through the facility. According to Jamie, these materials have zinc scrub off if you run all stages of the washer. Installing a treatment system enables the removal of any residual zinc prior to disposal of the water. To further illustrate their commitment to the environment, Winona’s lab manager, Cortnee Hyser, is a state certified wastewater operator and to have her on staff is both a bit unusual and an accomplishment.

While it might seem unlikely that Winona would be thinking about further expanding their footprint, they are looking at a couple of projects that would require additional warehouse space. Scott shares, “Some jobs, especially automotive, require suppliers to hold three days of finished goods. When you pick up an 800,000 piece per year job you need space to ship the finished parts.” Hence, Winona is looking to add 60,000 square feet of warehouse space.

Over the past 22 years, Winona Powder Coating has grown from a traditional custom coater shop into a high-volume industrial coater running bigger jobs for bigger companies. This evolution is rooted in a commitment to ensuring the highest quality systems are in place along with



*Bearings are powder coated as they are conveyed through the booth.*

the most recent coating technologies. As Scott says, “We try to function as an extension of the OEM or Tier 1 supplier. We know the rules when you work with OEMs like John Deere, Ford, and GM—and we play by them.”

*Sheila LaMothe is editor of Powder Coated Tough.*

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