



WEATHERPROOF POWDER COATINGS

Sunscreen for the outback

Be it in mines in the Australian outback or on rainy road construction sites, the paint on Wirtgen's construction equipment has to stand up to tough conditions.

Text: Daniela Renzo



Protective clothing: Massive demands are made on the coating of the Surface Miner in Australian iron ore mines.

It is one of those days on the construction site when the rain seems to come from every direction. Despite gumboots, raincoats and hats, the water streams down the necks of the road crew workers. But they have to keep going because of course the sun will shine again.

Meanwhile, the rain simply drips off the colossal machines, like Wirtgen's new WR 250 cold recycler and ground stabilizer with 777 horsepower and a weight of 31 metric tonnes. With a process width of 2.4 meters, the machine's mill rotors pulverize asphalt that can be up to 25 centimeters thick. In a single day, one such machine can transform nearly two and a half acres – an area roughly the size of three American football fields – into a stable road subsurface. In a single process, the WR 250 grinds up damaged roads, granulating the material and adding the right amount of binder and water to form a perfect mixture "on the fly". This creates a new subsurface that is laid down ready for the addition of a new pavement by the waiting road pavers and steam rollers.

Obviously rain can hardly affect such huge machines. But small stones are another matter. Despite their diminutive size, with the right velocity they can wreak havoc on a painted surface. Add a little humidity or rain, and rust will be inevitable. And not even steel giants are immune to corrosion. In time, water, soil and the atmosphere can make steel as brittle as a cream cracker.

From rain to heat

Mining companies that use heavy equipment such as the Surface Miner, used in Australia to mine iron ore, are all too well acquainted →

How the powder-on-powder method works

The primer protects the surface from corrosion, while the final coat of paint protects the primer from UV radiation and weather effects. The powder paint is applied using the tribo charging technique (rubbing the powder grains gives them an electrostatic charge). The technique involves the use of a spray pistol mounted on a long handle that enables the painter to reach every part effortlessly.

In the final step, the two coats are bonded in the oven to form a single unit. Once the part cools down for about an hour it is ready for delivery. This method has proven ideal for both Wörwag and Wirtgen, because it eliminates the energy- and cost-intensive step of intermediate curing. The products were designed so that the final paint layer bonds perfectly with the primer paint. W 880 (super-durable polyester) is specially made for surfaces that have to stand up to severe weather conditions.

“Of course, we protect our parts with suitable paints.” Johann Kroheck

→ with the damaging effects of UV radiation and soil. These mining machines, with 1623 horsepower and weighing up to 200 metric tonnes, are on the job around the clock. Once again these machines do everything in a single step. They cut, crush and load stone with no need for drilling or blasting. “In the mines our cutting tools are pushed close to their limits. Iron ore is an extremely hard material,” says Johann Kroheck, Head of Surface Technology at the German construction machine manufacturer Wirtgen. “The Surface Miner’s paint also has to stand up to the extreme conditions present at the work site. We cannot afford to have quality problems because parts have corroded due to coatings that do not last.” In mining in particular machines have to be available at all times. Any downtime means material recovery is delayed, and that costs lots of money. “Of course, we protect our parts with suitable coatings. There are a number of products that are good against corrosion,” says Kroheck. “But we want a resource-efficient method and we have closely examined the pre-treatment of parts.”

50 per cent increase in capacity

At Wirtgen’s company location in Windhagen in the German state of Rheinland-Pfalz there is a large-component coating plant where steel elements weighing up to 30 tons are pre-treated and coated. Hanging on the chains above the conveyor system as they move from station to station, the massive parts seem so light. First they go to the automatic spraying system where the surface is freed of any residues, such as rust, scale and slag. Previously, some

of these surfaces had to be sanded so that the primer coat would adhere better. “This pre-treatment is critical because the quality of the surfaces can vary considerably.” Such surfaces are even more robust when the paint is applied in two coats (dual-layer paint system). However, this also drives up costs, as the paint has to be cured between coats and that costs energy. Kroheck smiles, relaxed. “With Wörwag we are able to avoid that. We do powder-on-powder coating with no curing in between. We apply the primer and the final coating before putting the part in the oven. We do it all in one step, just like our machines.”

“Building up the right layer thickness is particularly important on joints – where the surface intersects with edges or seams,” says Jochen Reihls, Head of the Wörwag Customer Laboratory for Construction and Agricultural Machines. “That is why the powder has to be statically charged in a specially adapted application process to ensure that it protects these sensitive areas as well,” says the coating chemist. “The new plant has been in operation for three years without a hitch,” says Kroheck.

Since last year, Wirtgen has been coating more than half of its parts with powder coatings using the new process. This has boosted the efficiency of the plant by 10 to 15 percent and reduced the dwell time of parts in the plant by half. The coatings applied to these massive machines fulfil the conditions for the most demanding category of corrosion resistance and are suitable for coastal areas, high humidity, and aggressive atmospheres. The parking spaces around the production plant in

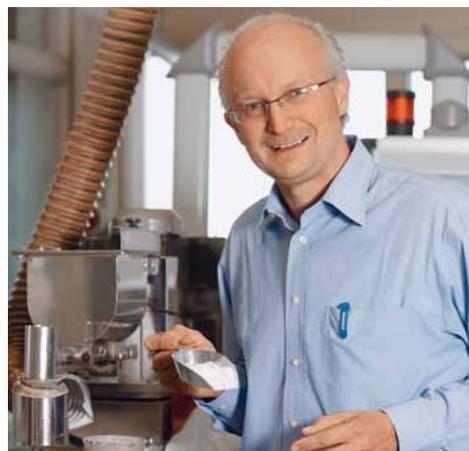


A question of size: A special plant is needed to paint construction machinery.



A question of technique: Experts coat construction machinery by hand in a sheath of protective powder paint.

Windhagen are reminiscent of a science fiction film. There are rows of construction machines some 25 meters long and three meters high, waiting to be picked up by their new owners. You could get lost among them. Every broom, every tool has its place. But the Swiss cowbell that hangs decoratively in the plant does not fit into the scene. "That is a trychel cowbell. It is recognizable by its surface, which is hammered, rather than cast like a normal bell," explains Jochen Reihs, who regularly shares his vast knowledge in Wörwag training classes, "The Swiss plant manufacturer MS Oberflächentechnik gives one to every new customer." ■



JOCHEN REIHS

is an expert in powder coatings and regularly conducts training on the topic. "As the head of the customer laboratory for construction machinery, I can offer a lot of helpful tips and I am happy to share my knowledge."