



Gema

Switching from paint to powder

Increasing quality and productivity

Replacing an old paint shop with a new powder coating booth brought far more benefits for a Danish wheel manufacturer than just compliance with the requirements of the VOC directive: Degree of automation as well as efficiency have been raised and the surface quality and the working environment improved.

KEYWORDS

Huge parts, Off-road Vehicles, MagicCylinder, OptiStar, OptiSelect

THE SITUATION

Until the summer of 2009, GKN Land Systems, a Danish manufacturer of wheels for heavy off-road vehicles, used a wet paint system for coating its products. The company urgently needed to replace its existing paint shop in order to comply with the VOC directive. However, there were also other objectives which the new system needed to fulfil, including optimizing the throughput time, improving the working environment and producing high-quality finish. These were the main goals

for the company when it came to choosing and designing a new system. In September 2009, the entire coating system was replaced and only the pretreatment area remained unchanged.

A PERFECT EXTERNAL FINISH WITH AS LITTLE POWDER AS POSSIBLE ON THE INSIDE

The majority of the wheels which GKN supplies, are an eye-catching feature of the vehicles in questions. This applies particularly to the large wheels which are of-



INSTALLATION:

- Control Cabinet Optiflex A2 with 28 Gun Control units
- 24 Automatic guns OptiGun GA02
- 4 Manual guns OptiSelectD
- 4 Reciprocators ZA06
- 1 System control CM10
- 1 Booth MagicCylinder
- 1 Powder center VZ02
- 1 Integrated fire suppression system



A high gloss finish is required on the visible outer part of the rims. On the internal areas the minimum of powder must be applied, without the need for masking

ten at eye level. As a result, customers require a perfect surface finish for the visible part of the wheels. In contrast the coating on the areas which cannot be seen, powder deposition should be avoided. The pressure and the forces applied to the tyres are so high that the tyres can twist on the rims because of a lack of grip if the inner surface of the wheel is powder coated.

Therefore, one of the main features of the new system is application process control. This is based on a barcode system, with both the hangers and the parts being labeled with a barcode. This gives the staff who manages the process a complete overview of the production planning and control.

A fast color change system developed by ITW Gema was integrated into this fully automated production process. The high level of automation of the entire plant is also reflected in the coating system. The coating is applied to the rims to produce a smooth and glossy finish on the outside. Only a very small powder quantity reaching the internal area and no masking is needed. This is achieved simply by a highly advanced system for controlling the spray gun control..

A FIXED CYCLE TIME, REGARDLESS OF WHEEL SIZE.

Another feature of the system is the extended area for pre- and post-coating. This ensures that there are no bottlenecks in the manual coating area when very large

and complex rims are being processed. The manual coating areas are designed to allow two coaters to work in parallel, resulting in a fixed cycle time, whatever size the wheels are.

After almost one year of operating, GKN is very satisfied with the results. All the company's wheels can be manufactured and coated in a single production line using the new coating system.

Once a rim has been attached to a hanger, it is transported automatically along a conveyor system with a length of 1000m and passes through the entire pretreatment area, the coating section, the oven and the cooling area.

The Introduction of powder coating has reduced the total throughput time for the production of one rim from three days to five hours. The new coating system has a fixed cycle time, regardless of the size of the wheels. With the conveyor speed of 3.5 m per minute and a production volume of around 1000 rims per day, GKN was able to cut one of its shifts.



OBJECT DATA

diameter 400 - 1400 mm
depth 180 - 860 mm
weight 50 - 250 kg

PRODUCTION DATA

cycle time per rim:
wet paint 3 days
powder 5 hours

capacity: 1000 rims per day.