

Rapid Changeover during Ongoing Production

Moving from Water-Based Paint to Powder

For 20 years, a manufacturer of automated storage and material flow systems coated its products using recyclable water-based paint. Then, the company decided to move to powder coating on the basis of the results of a comparative study. The new machine with separate single-colour and multiple-colour systems has reduced material consumption by 50 percent.

The Kardex Group is a global provider of intralogistics solutions to industry and a leading supplier of automated storage solutions and material flow systems. The group consists of two divisions: Kardex Remstar and Kardex Mlog. Kardex Remstar develops, produces and maintains dynamic storage and retrieval systems, including vertical and horizontal carousels and lift modules. These lift modules are used, among other things, to store and retrieve powder boxes. At its site in Bellheim in southern Germany, Kardex Remstar has been coating its products with recyclable water-based paint since 1992. The system allowed differ-

ent paints to be used for coating the product interiors.

During this time, Kardex Remstar's portfolio of products has gradually changed. The result is an excess amount of recyclable paint that can no longer be used. The large amounts of maintenance required, the high material prices and the unusable paint were the main reasons behind Kardex Remstar's decision to investigate the use of a new coating process for its products.

Disadvantages of the water-based paint system

In 2013, a study was carried out into the solutions that would best meet the

company's wide-ranging coating requirements. On the basis of a number of calculations and comparisons and the results of previous experience, the company decided to opt for electrostatic powder coating. The main reasons for its choice were as follows:

- The pumps and other installations in the water-based paint system required an increasing amount of maintenance.
- The employees working with the existing system had to wear full respiratory protection equipment. In addition, the ventilation system was inadequate, which meant that the painters had to take mandatory



The multiple-colour system (right) and the single-colour system (left) ensure that Kardex Remstar has highly flexible and reliable production processes.

breaks. The poor ergonomic design of the water-based paint system did not meet current requirements.

- The efficiency level of the water-based paint system only just reached 60 percent, partly because of the large amount of overspray and partly because of the poor range of the application devices.
- The preparation and supply of the paint and the application process itself were highly labour intensive.
- As the number of colours increased, the recyclable paint could no longer be used, which led to high disposal costs.
- Liquid coatings are generally expensive to purchase.

Conversion and new installation during ongoing full production

During the company's comparison of different modernisation measures, electrostatic powder coating emerged as the clear leader. The result of the planning process was a combined single-colour/multiple-colour powder coating system which guaranteed high



The powder centre is the key feature of the powder supply function and controls the multiple-colour system.

levels of flexibility and reliability. The next question was how to continue with production while at the same time installing the new powder coating system and dismantling the existing water-based paint system. The answer to this was careful planning, reliable partners and a team which could dismantle the old system and install the new one quickly and efficiently. Within the

shortest possible time, the new multiple-colour system was installed next to the existing water-based paint system that was still in operation. During the company holidays, the multiple-colour system was connected to the conveyor. After the production capability had been fully guaranteed, work began on dismantling the water-based coating system. During this process, 100



Rapid access to materials, optimum use of the space available and ergonomic handling are the main features of the Kardex Remstar shuttle system.



Fresh powder for the single-colour system is pumped from big bags in the basement to the spray booth.

Technical data at a glance

Parts: Metal components for storage systems

Max. part size: H 1800 mm
W 1000 mm
L 6200 mm

Conveyor speed (v): 2,0 – 3,6 m/min

Key components of the system:

2 AS04/18P powder coating devices
2 reciprocators (ZA05-18/XT10-10)
2 controllers (ICS/CM30)
2 Magic Compact EquiFlow BA04 powder booths
(1 x cyclone system for rapid colour changes)
(1 x single-colour system for the standard colour)
OptiCenter OC02 powder centre
PTS 650 powder transfer system

tonnes of scrap metal were taken out through the open roof of the plant. While the water treatment plant was being broken up and removed from the basement, the new powder coating system was already operating at normal levels on the ground floor. At this point, the installation of the single-colour system began in parallel. After only 10 months, the powder coating system with separate single-colour and multiple-colour areas was operating at full capacity. This represented a major success from a planning and logistics perspective.

Powder supplied by the shuttle system

The intention was for the new system to significantly increase efficiency at Kardex Remstar. A key component in achieving this goal is the advanced powder procurement and consumption process. Heiko Schlindwein, industrial engineering and plant planning manager at Kardex Remstar, developed a material flow concept for this purpose that has an in-house product as its central element.

The shuttle system from Kardex Remstar supplies the right colours to the multiple-colour booths at the right time. The powder store is in the basement, which is where the powder management system operates.

The shuttle system that makes up the powder box management system has a number of benefits:

- No valuable storage space is used, because the equipment is tall and has a small footprint, which means that it makes optimum use of the space available.
- The powder boxes are removed at the ideal ergonomic working height. This reduces the strain on the employees' backs and speeds up the process of handling the boxes.
- Direct and rapid access to the materials ensures that the right colour is available for the next coating process.
- The decentralised storage and removal of the powder boxes means that fewer staff are working around the machine.

- The shuttle system protects the powder boxes from exposure to the weather and from dirt.
- The system allows for an ongoing stock control process. It is linked to a warehouse software package, Power Pick Global from Kardex, which means that barcodes can be used to make it easier to manage.
- The powder is stored at constant temperatures with an air conditioning function.

The shuttle supplies the powder boxes directly to the powder centre (OptiCenter). From there, the powder passes into the circuit of the rapid colour change system (MagicCompact EquiFlow). The single-colour system is also supplied with powder from the storage area in the basement. A big bag system transports the powder to a sieving machine and then into the powder circuit.

Change of system brings positive results

The changeover from water-based paint to powder was a bold step for Kardex Remstar and was completed in a very

short time. But as a result of excellent planning and trustworthy partners, Heiko Schlindwein and his team successfully managed the process. This makes Schlindwein's positive summary of the project even more pleasing: "The move from water-based paint to powder has allowed us to increase our efficiency while ensuring the highest possible level of reliability for our processes. This means that we have doubled our capacity and reduced our resource use. Previous problems, such as the need to coat parts several times and the occurrence of bottlenecks and waiting times, have been fully resolved by the new system."

Paid off in three years

The savings that the company has made are impressive. Material consumption has fallen by 50 percent and energy costs are 10 percent lower. Employees from the process phases that have been affected are now working in other areas. Because of these figures, Kardex Remstar was able to predict after five months of operation that the system will have paid for itself within three

years. The investment has been well worthwhile and will have paid off in a very short period.

Schlindwein explains how projects can be run quickly, efficiently and smoothly: "In critical, large-scale projects of this kind, it is very important to be able to put your trust in reliable and experienced partners. At Kardex Remstar, we analyse the requirements for projects very carefully in advance together with our customers. This creates a sense of trust. Clearly defined objectives allow for end-to-end planning and successful implementation. We now have a reliable system that will allow us to respond flexibly to the need for increased capacity in future and to continue producing the high-quality products that our customers expect from us." ■

Contacts:

Kardex Produktion Deutschland GmbH, Bellheim, Germany,
Heiko Schlindwein, Tel. +49 7272 709524,
www.kardex-remstar.de;

Gema Europe Srl, German subsidiary, Rödermark,
Tel. +49 6074 81944 0, info.germany@gema.eu.com,
www.gemapowdercoating.com