

FLEXIBLE EDGE SPRAY-COATING SYSTEM FOR ACCURATE AND ENVIRONMENT-FRIENDLY DOOR EDGE COATING

Based on a prototype, Venjakob has developed a modular, automatic CNC-controlled edge spraying system for coating the longitudinal edges of specialized doors with double rebates, single rebates and blunt edges on both sides in through-feed operation. A movable jig system, that can be adjusted with the aid of recipes, protects the door panels from coating material overspray to the greatest possible extent. This reduces cleaning solution use by 15 to 20 tons per year. Yet another challenge was posed by the contract, which had to take into account both Anglo-American and European law - just another way in which Venjakob's support proved invaluable.

CUSTOMER PROFILE



JELD-WEN Deutschland is the most important supplier of interior doors, and part of the American JELD-WEN group, the largest supplier of doors and windows in the world. At its two German production sites in Mittweida and Oettingen and at its distribution site in Hamburg, the company uses state-of-the-art technology and around 900 highly motivated employees to produce a wide range of doors and door frames for specialized doors.

THE REQUIREMENTS



Automatic coating of different edge profiles and door thicknesses

The edge spraying systems used in the Oettingen plant were ready to be replaced with a new more environmentally friendly and cost-minimizing technology. The previous process required the completely coated door panels to be cleaned with highly potent solvents after automatic spray-coating of the door edges in order to remove the overspray. To make production more environmentally friendly, the company's first idea was to find a solution for filtering the solvents out of the exhaust air. But the solvent concentration in the exhaust air was too low to use an exhaust air cleaning system. It would have been necessary to use a gas-operated burner, generating hundreds of kilograms of additional carbon dioxide.

A different procedure, e.g. applying the coating material with rollers, was out of the question due to the enormous variety of edge profiles on different specialized doors.

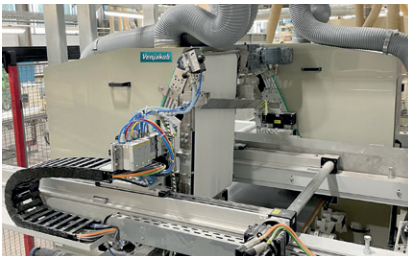
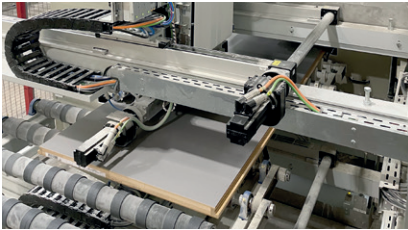
THE IMPLEMENTATION

Movable, recipe-adjusted jig system

Due to years of close contact with the machine engineering company Venjakob, project manager Stefan Randi of JELD-WEN decided to rely on their specialized expertise in surface treatment. The modular edge spray-coating line developed, based on the customer's requirements, consists of individual units: the spray coating system, a moving belt jig system to protect the door panels from lacquer overspray and an extraction system. The jig system has been precisely adapted to the workpiece, as the tolerance for the finished doors is +/- 1.5 mm. "We're working with a tolerance of only a tenth of a millimeter.

That really is pretty accurate," says Oliver Milde, customer account manager at Venjakob. The system has been integrated into the overall coating plant as an independent system with a connection to the higher-level controls. The water-based coating material specially developed by the coating material manufacturer Hesse for precise coating of the longitudinal door edges first underwent a series of tests at the Venjakob technical center and the result was approved by the customer.

THE PROCESS



Detection system communicates with machine control system

Prior to edge coating, the doors are arranged on the left side in the running direction of the customer's inclined roller conveyor. To permit coating of different edge profiles and door thicknesses, the doors are scanned and identified by an installed detection system. The data is transmitted to the local control unit so that the corresponding recipe can be activated fully automatically in the control system. The units are positioned according to the recipe specifications, then the machine control system enables workpiece feeding for the coating process.

Another workpiece detection system is installed just upstream of the edge coating booth. At this point the door is measured precisely to ensure that the distance from the following door is correct. Moreover, the jig system height is fine-adjusted here. This protects the units from damage caused by incorrectly supplied workpieces.

The water-based coating material is applied in two passes. During this process, the coating material application volume can be adapted to the wood type in question based on the program. After the first coating process, the workpieces are dried and then undergo intermediate sanding. After the second coating process, they go through the final drying step.

FACTS AND FIGURES

Technische Daten der zu beschichtenden Werkstücke:

Width: min. 200 mm, max. 1,350 mm

Length: min. 1,550 mm, max. 2,950 mm

All workpieces of less than 1,550 mm length are only transported, not coated.

Kantenprofile der Werkstücke:

The longitudinal edge profiles can be sharp-edged or equipped with a radius to the door face.

Leistung der Anlage:

300 doors per day

SPECIAL FEATURES OF THE EDGE SPRAY COATING SYSTEM AT A GLANCE

- Coating of a variety of edge profiles
- Flexibly adjustable jig system protects door panels from overspray
- Jig system with tolerance of a tenth of a millimeter
- No cleaning process required after spray coating
- Reduction of cleaning solution use by 15 - 20 tons per year
- Recipes automatically accessible via the control system after workpiece detection
- Single piece coating possible
- Integration into overall coating plant
- Compact modular design