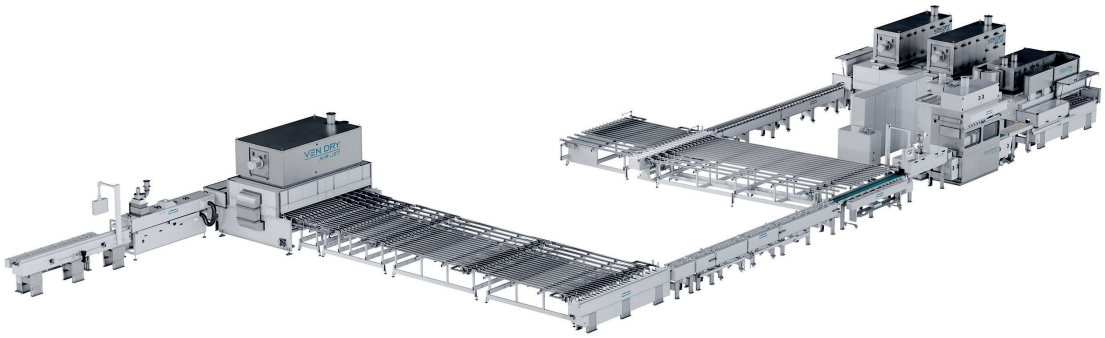
FULLY AUTOMATIC COATING OF INDIVIDUAL WINDOW COMPONENTS ALLOWS FAST AND FLEXIBLE PRODUCTION

Venjakob has developed a fully automatic coating system for the Norwegian window manufacturer Gilje Tre for coating window frames with modern water-based coatings. The system concept is geared towards the highest production efficiency, the fastest possible drying time and in terms of parts logistics, towards maximum output.



CUSTOMER PROFILE

Gilje Tre is a leading manufacturer of windows and doors in and for Norway. Around 120,000 windows and 20,000 exterior doors are produced annually. The family-owned company, founded in 1948, now employs 280 people. To meet constantly changing customer needs and strict requirements for quality, function, design and the environment, investments and expansions in machine and system technology have long been a high priority.

THE REQUIREMENT

VEN SPRAY *MOULD* Spray coating machine for mouldings and profiles

Complete automation of the coating process

Up until now, the coating process for window frames at Gilje Tre was largely manual. In the first step, the individual parts were impregnated with blue stain protection, then the frames and sashes were pressed, placed on an overhead conveyor, and primed and spray coated by hand. The window parts were carried from one processing station to the next. The drying times on the overhead conveyor took several hours and a lot of floor space. The customer wanted a complete automation of the coating process with the aim of being able to produce more windows in less time and with a consistent high quality.

THE IMPLEMENTATION

Fenstereinzelteil in der Spritzlackierkabine mit Coolac®-Lackrückgewinnungssystem

Faster drying process ensures maximum output

The fully automatic coating system was integrated into the Gilje Tre manufacturing process, specifically the pre-fabrication. Each individual window part is fed directly from the profiling into the coating system. The RFID technology used, identifies the individual parts and the pre-set coating program is triggered. In a closed system, the components are impregnated, primed, dried, top coated, dried, automatically turned and fed back into the process until the six-sided coating is complete. The components then go straight to the picking area, where the frame and sash can be pressed. The window part, which is coated on all sides, combines the advantage of complete weather protection with a stable corner connection. The powerful drying system is responsible for most of the time saved. “A coating run takes about 12 minutes, making 60 minutes for all four sides. Before that, around four to six hours were

spent on the drying process. There is no faster way to coat and manufacture windows," says Oliver Milde, Venjakob's customer advisor. „The automatic coating process also simplifies the production of individual parts, for example if a component has to be reproduced because of a broken frame." .

THE PROCESS

VEN BRUSH - sanding and denibbing machine for intermediate coating sanding

Variety of colors with water-based coating and fast drying

1. Window components come from the profiling and are automatically conveyed horizontally via a roller conveyor into the closed coating system for 360-degree impregnation. The coating system is designed for the standard sizes used by the customer and can process mouldings and profiles with a length of 380 mm to a maximum of 3500 mm. After impregnation, the workpieces are dried in a drying oven and temporarily stored in a workpiece buffer.

2. The batches are automatically transferred from the workpiece buffer to the circular priming line. The window components go through this twice to complete a coating on all sides. Since modern water-based coatings are used, the window parts first roll into the IR heating station. The individually defined surface temperature generated, prepares the surface for coating. This improves the application flow and the quality of the surface. Coating with water-based coatings takes place in the VEN SPRAY MOLD spray coating system, which is equipped with a Coolac® paint recovery system. After a flash-off zone the parts are gently dried in the optimized infrared zone VEN DRY OIR with a laminar air speed of 5 to 10 meters/sec. To flatten the paint, the temperature is then increased to 30-40° Celsius and the air speed to 20-25 meters/sec. The third step, a combination of high air speed and infrared radiation, completes the drying process. The components coated on the top side are ready for coating the bottom side and are conveyed in a loop to the control station via a return path and an angle transfer. Here, the workpieces are manually turned over by a system operator who also performs quality control. The workpieces are then fed back into the process until the coating has been completed on all sides. A coating process including drying takes 12 minutes for one side of the component..

3. After the last pass in the priming system, the completely coated components are transported via transport trolleys to the topcoat system, in which the topcoat is coated in one or two passes. From here, the workpieces are fed to the subsequent assembly line via trolleys.

FACTS AND FIGURES

Components of the following dimensions can be processed

Length:
min. 380 mm to max. 3500 mm

System performance

Capacity max.:
5,5 workpieces per minute

SPECIAL FEATURES OF THE COATING SYSTEM AT A GLANCE

- Semi-automatic handling
- Finishing of the individual part supported using RFID technology
- Coating material savings through application efficiency of up to 90 percent
- Paint recovery system
- Powerful, fast drying process on an area of 4 x 8 meters
- Fast throughput of the components - approx. 12 minutes/ side
- Production starting from a one frame batch size is possible.
- Seamless integration into the production process
- Compact, modular design

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