

COMBINED ROLLER AND SPRAY COATING LINE FOR PREMIUM WHITE LACQUER DOORS

CUSTOMER PROFILE

Prüm-Türenwerk GmbH in Weinsheim (Eifel) has been known for high-quality living room and functional doors for over 50 years. The white lacquer doors, timeless classics, were added to the product portfolio in the 1990s. This was followed by a wide range of design varieties and surfaces. Since 2018, the company has been continuously investing in the expansion of the site.

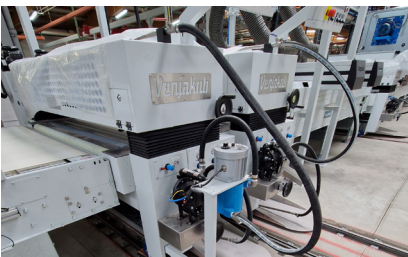
THE REQUIREMENTS



Faster and more resource-efficient production

Two individual systems were previously used for coating the premium white doors: one for rolling and priming, and one for top coating using the spraying system. As the capacity in the white coating area had reached its limits, the company wanted to invest in a new coating system. The new investment was to combine both processes, including all necessary pre- and post-treatments, in one automated line. The special requirements of the white lacquers to be used had to be taken into account as well as the quantity to be achieved.

THE IMPLEMENTATION



Combination creates more doors and saves paint

Venjakob has combined the advantages of both technologies in one line for the Prüm door factory with roller and spray coating. The conveyor and air technology also comes from Venjakob. Smooth and textured door surfaces are primed using a roller coating machine and the top coat is applied by spray coating. Within the painting and priming process, three sanding machines are used for pre-sanding and intermediate lacquer sanding on the surface and edge, as well as four roller coating machines for priming. The combination of roller and spray coating enables a throughput of 12 meters per minute.



Savings through air humidification feature

When applying the top coat in the spray booth, an air humidification feature was used to apply as much paint as possible to the door. In addition, a special extraction system (Cyclone) developed by Venjakob enables high savings to be made by avoiding lacquer sludge, reducing the use of filter mats and eliminating the need for defoaming and coagulation agents.

Edge sanding in throughfeed

Another special feature is the continuous sanding of the edges. As the edges have different widths, the width of the door edge sanding machine is adjusted accordingly. A moving diagonal sanding unit is used to sand the front edge in throughfeed. A trailing unit with three brushes moves along the head edge as it passes through.

PRÜM | SUCCESS STORY

THE PROCESS



The combination of rolling and spraying process, including turning and return of the workpieces, comprises 14 production steps. The system was designed in an U-shape.

A robot cell loads and destacks the workpieces. At position 2, the workpieces are automatically pre-sanded and then dedusted. The doors prepared in this way are transported via the belt conveyor into the roller coating machine for the application of the water-based base coat. They are then dried in the eight-meter-long nozzle drying channel. After further applications of UV coating, the workpieces are first partially cured and then completely cured in several UV dryers.



In preparation for the top coat, the longitudinal and top edges are sanded with the door edge sanding machine in a continuous process. After transportation via a 180-degree cross angle transfer, the door surfaces are also sanded again. The belt conveyor transports the workpieces to the spray coating machine for top coating. Subsequent drying is first carried out in the flash-off channel, in the OIR dryer and in the belt pallet high dryer and finally in the nozzle drying channel. After the UV component has cured, the doors pass through a seven-metre-long air-jet cooling channel and are then automatically stacked.

FACTS AND FIGURES

Technical data of workpieces to be coated:

Door dimensions (L x W x H):	
min.	1000 x 140 x 12 mm
max.	3000 x 1500 x 100 mm
Door weight max.:	200 kg
Coating material:	1K water-based UV lacquer

Performance of the system:

System cycle time:	35 seconds
Conveyor speed:	12 meter/min.
Drying time:	40 seconds (Nozzle drying channel 1) 44 seconds (Evaporation channel and OIR) 660 seconds (High dryer) 35 seconds (Nozzle drying channel 2)
Throughput per hour:	approx. 102 batches

SPECIAL FEATURES AT A GLANCE

- Combination of roller and spray coating in one line
- Fully automated handling
- Door edge sanding in throughfeed
- Textured door surfaces can also be rolled
- High-performance humidification system for less paint consumption during spray coating
- Special exhaust system reduces consumption of filter material
- Complete system (except surface sanding machines) from Venjakob