

SPRAY PAINTING LINE FOR COATING AND DRYING MATT SURFACES

For Nolte Küchen, a fully automatic system for spray coating and drying matt surfaces was to be used at the Löhne plant. Venjakob obtained the contract as general contractor for the implementation of the complete system including conveyor technology.

CUSTOMER PROFILE



General view

Nolte Küchen, a family-owned company founded in 1958, produces high-quality fitted kitchens and has received the „Beliebtesten Küchenmarke Deutschlands“ (Most Popular Kitchen Brand in Germany) award several times. Nolte Küchen meets consumers’ need for individuality through a variety of colors and appealing surface concepts. Production takes place on an area of around 100,000 square meters at two sites: in Löhne and in Melle.

THE REQUIREMENTS



Color management system

Shorter throughput times, higher flexibility

The variety of colors is in the foreground at Nolte Küchen. This variety has to be produced in the shortest possible time and in the most diverse quantities – from batch size 1 – in a customer-oriented manner. Whereas external partners were previously called upon to coat the surrounding materials, including stringers, visible sides, plinths, etc., this was now to be done in-house using state-of-the-art production processes and individual system concepts.

Nolte Küchen’s project goals: Cost optimization, quality aspects, reduction of throughput times, and greater flexibility within the production process. The system was to be designed in such a way that kitchen furniture components from the smallest sizes up to max. 2,800 mm in length and 1,300 mm in width could be coated automatically as part of a continuous process, using only water-based coatings.

Variety of color as a challenge

The system had to run economically in small batches and allow up to 20 color changes. Another requirement was short lead times. The surrounding materials should be completely dry after the finishing process, thus allowing for the reverse sides to be coated directly afterwards.

THE IMPLEMENTATION



Movable transport belt

Solutions that allow a great deal of flexibility

Except for the sanding machine, all system components as well as the conveyor technology were designed, produced and installed by Venjakob. For flexible use of a sanding machine provided by the customer, a movable belt conveyor on flanged rollers was set up between the sanding machine and the spray coating machine. In the extended state, this allows individual use of the sanding machine and the coating system. For combined operation (sanding + coating), the belt conveyor is in line and allows line operation.

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Display of colour management system



Supply air system



Team of Nolte Küchen

A color management system was used in order to keep setup times for the many possible color changes as short as possible. All adjustable parameters relevant for surface coating can be preset in any quantity at a central control point in front of the spray booth via a touchscreen computer and called up as a spray program. The individual programs are easily modified by the operator and can be stored in the system. For this purpose, all relevant process parameters were stored in the recipes.

Supply air system with humidification

At the customer's request, the humidification system was to be integrated into the supply air system in the spray coating area. The supplied air is heated, cleaned and humidified before it exits and thus has the optimum air quality for the best painting results. A second supply air system without humidification supplies the areas of the sanding machine, dust removal and drying section.

Protected from voltage fluctuations

In-built effective power control compensates for voltage fluctuations that occur in overloaded or unstable power systems, ensuring consistent high-quality results.

Successful production launch due to trained team

Production at the Löhne site started directly after the in-house training in July 2021. The output of the finishing line has been continuously increased until today in 2-shift operation.

THE PROCESS



Recipe management



Pump stations

Sanding machine can be used individually

The workpieces are manually placed on the surface of the belt conveyor on the infeed side and first enter the integrated sanding machine. From there, they are conveyed to the VEN CLEAN SMART dust removal unit. Here, the surface of the workpieces is first cleaned of sanding dust and then preheated. Transport through the cleaning zone takes place via an integrated roller conveyor.

Reproducible coating results

In front of the spray booth, a scanner determines the workpiece shape, quantity and position. The guns are switched on and off precisely above the workpiece. Each individual workpiece is recorded separately. The workpieces are automatically measured. Workpiece measurement can be parameterized. Coating is carried out with four spray guns in high-performance linear mode. The gun speed is infinitely variable and is controlled fully automatically. The belt conveyor system includes a paint recovery system to return the uncontaminated overspray directly to a collection container.

Drying process with rising temperatures

The drying process was designed and coordinated with the manufacturer of the 2-component water-based UV coating used so that the surrounding materials come out completely dry after the coating process and the reverse sides can be coated directly afterwards. Drying is carried out with rising air temperatures: After coating, the workpieces first travel through a stabilizing zone for two minutes. This is

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Drying section

followed by an evaporation channel with an air temperature of 30-35°C. The components are continuously conveyed on closed belt conveyors. Then comes the jet drying channel with a temperature of 40-50°C. Drying is followed by UV curing of the coating surface. The UV dryer has its own electrical control cabinet, but is controlled via the control unit of the entire system.

FACTS AND FIGURES

Operating width:

1,300 mm

Production speed:

ca. 2.5 m/min

Workpieces to coat:

Kitchen furniture components

Workpiece dimensions (L x W x H):

min. 296 x 25 x 12 mm, max. 2800 x 1300 x 50 mm

Spray medium types:

Hydro UV 2C (matt)

SPECIAL FEATURES AT A GLANCE

- Turnkey system, planned completely together with the customer
- Coating automatically in continuous process
- Integrated sanding machine for single use
- Simple operation of the system with recipe management
- Easy handling when creating additional recipes independently
- Color management system: Up to 20 color changes in a short time
- Integration of a humidification system
- Short throughput times
- Drying with rising air temperatures
- Effective power control compensates for voltage fluctuations