

# Combining Quality and Flexibility

Solarlux, a manufacturer of glass folding doors and glass extensions, has been powder coating its aluminium profiles in-house at its new site for the last year with the aim of improving the quality of its products even further and cutting the costs of production. A new and highly flexible power-and-free conveyor system ensures a smooth flow of materials.

Solarlux supplies solutions made from high-quality aluminium or wood profiles that include exclusive stadium glazing systems, complete facades, bright and airy conservatories and glasshouses to customers all over the world. The family-owned firm has around 790 employees at more than 50 sites worldwide and of these 600 work at the company's new headquarters in Melle in Germany. For just over a year, Solarlux has been pow-

der coating the aluminium profiles and other components of its prestigious glass structures in-house. Previously the task was performed by external service providers at three different sites. The company put into practice its principle of always remaining one step ahead by investing in a modern production system. This included a power-and-free conveyor (323 model) from Louis Schierholz. The powerful and robust conveyor system also links a

heat recovery zone with the production area, which reduces the plant's energy consumption and helps to heat the large production buildings.

## **Intelligent, customised conveyor system**

In order to allow as many aluminium profiles and other components as possible to be coated simultaneously, Schier-



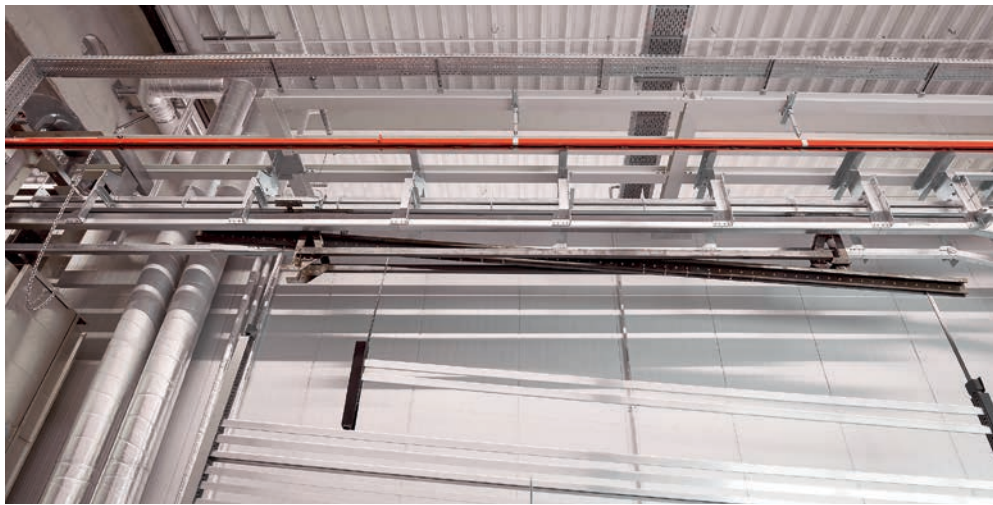
The compact design of the new power-and-free system at Solarlux allows it to operate in a very small space

The load bars are lowered into a shaft to enable the parts to be attached and removed ergonomically.



holz customised its conveyor system. Non-guided lifting and lowering units in the three loading and unloading areas allow the components to be attached to and removed from the load bars ergonomically. They are designed to accommodate parts that are a maximum of three metres high and seven metres long. The conveyor system can transport parts weighing up to 600 kilograms and has increased the efficiency of the company's production process. Employees use a foot switch to position the load bars at the correct height for loading with three-metre-long poles. The load bars are lowered into a narrow shaft in the floor to allow them to be loaded from top to bottom.

The power-and-free conveyor is designed to ensure that the aluminium profiles undergo a high-quality pre-treatment process. A folding mechanism inclines the load bars so that the components are at the correct angle of five degrees. This prevents the chemicals in one tank from being carried over to the next and allows any remaining fluid and all the fine particles to be removed from the cavities in the components in the flash-off area. In order to increase the efficiency of the process in the powder booths, Schierholz has integrated a reversing and positioning system with its own chain circuit into the conveyor. This allows Solarlux to intervene in the coating process and make improvements if required. For example, if the coating on the components is not thick enough or has faults, after the quality control process the load bar trav-



The angle of the load bars reduces the carry-over of chemicals in the pre-treatment areas, the dryer and the flash-off zone.

els back through the powder booth and the parts are coated for a second time. This also allows new workpieces of different shapes to be introduced to the process easily and cost-effectively.

### Maximum flexibility in the handling process

A fully automatic high-bay warehouse is where the surface coating process at Solarlux starts. Here the components are stored on shelves up to 23 metres high and sorted into 3140 compartments. The aluminium profiles, which can be up to seven metres long, the corners and the other components for each order move from the

warehouse to one of three loading areas in the production building. Here the Solarlux employees attach them manually to one of a total of 85 load bars between two suspended poles. The system is managed by a software package on the central computer and provides precise information for each component in advance, including the starting location, day, time and colour. Monitors in the loading areas display details of the current order and the two subsequent orders for the employees. The load bars that the corners and aluminium profiles up to 310 x 250 x 7000 mm in size are suspended from move horizontally in a longitudinal direction through the four pre-treatment chambers where the parts



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Lifting and lowering stations for the long load bars with two parallel, non-guided belt lifters.

### An overview of the system

<b>Components</b>	Aluminium profiles for conservatories and glass folding doors
<b>System</b>	Schierholz power-and-free Duomatic PF 323 system
<b>Capacity</b>	15 wagons per hour
<b>Size of components</b>	7000 (7300 including poles) × 300 × 3000 mm (length × width × height)
<b>Weight of components</b>	Approximately 600 kg
<b>Chain length</b>	Approximately 1400 m
<b>Number of drives</b>	8
<b>Number of chain circuits</b>	8
<b>Speeds</b>	Pre-treatment/powder booths 2.7 m/min, frequency regulated Transport areas 8 m/min, frequency regulated
<b>Number of wagons</b>	85

are pickled, rinsed, rinsed with deionised water and undergo a chrome-free passivation process. Solarlux has planned for a total of six chambers to ensure that the system is equipped to meet future requirements. An integrated vacuum evaporator keeps the wastewater from the pre-treatment process to an absolute minimum. After pre-treatment, the components move on to the manual and automatic flash-off stations. If a manual process is needed, a flashing light on the conveyor notifies the employees. The parts are then transported through the clean rooms to the subsequent processing stations.

### Heat-resistant and highly flexible

After the parts have automatically passed through the dryer, they return to a hori-

zontal position and move into the cooling zone. The load bars are collected together in the buffer area that follows and sorted by colour. The parts are then automatically powder coated in two narrow spray booths, each of which has ten electrostatic spray guns arranged vertically on either side. The fully automated powder booths are preceded by a manual pre-coating station with a scissor lifting platform and followed by a quality assurance area. The aluminium parts are coated with one of the main colours in booth 1 or with one of many other colours in booth 2. “We use up to 650 colours and it’s normal for us to have an average of 30 colour changes a day,” says Sebastian Göpel, head of powder coating at Solarlux. The heat-resistant power-and-free conveyor also transports the powder coated parts

through the gelling zone where the temperature is 150 degrees and through the curing oven which is set to 230 degrees. The speed of the parts is frequency regulated and has been adjusted precisely to meet the requirements of the production process. The load bars with the aluminium components are deliberately set to travel at only 2.7 metres per minute through the pre-treatment and powder coating zones. In between the different processing areas they move at a much faster speed of eight metres per minute. After powder coating, the parts, which are used to build glass structures up to six metres high, move on to other parts of the production process.

### The investment has paid off

A comprehensive and detailed requirements specification was drawn up for the conveyor. During the construction of the power-and-free system, which took two months, Schierholz introduced the Solarlux employees to the new technology. This was followed by training courses covering the operation and maintenance of the conveyor. The conveyor system was planned specifically for Solarlux down to the smallest detail, including automatic lubrication units for the rails. Schierholz carried out advance tests of the special angled position of the load bars during the pre-treatment phase in its technical centre in Bremen. All the company’s efforts proved successful, as Frank Heise, production manager at Solarlux explains: “As soon as it was brought into operation, the entire conveyor system functioned perfectly.” Solarlux has already received the GSB quality seal for premium coaters in recognition of the high quality of its products. //

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