

## A Floor Conveyor in a Robotic Paint Facility

# High-Precision Automated Power+Free System

Large, heavy plastic components for the automotive industry are painted by robots in the new paint shop belonging to British supplier Mitras. A new power+free floor conveyor with a low investment cost provides high levels of automation and precision in the painting process.

Mitras Automotive, a Senata Group company based in Winsford in England, is the largest British supplier of moulded components and assemblies to the European automotive industry. At its site in Winsford, it has gained extensive experience of painting plastic parts for the automotive industry over a number of years. Until recently, a Caldan HD 100 floor conveyor met the company's needs with regard to the component sizes and the painting process.

In 2013, new customers and new products led Mitras to prioritise the construction of a new paint shop. As the parts to be painted in the new facility were of high quality, the customer specified the need for a floor conveyor. The new system was to be used for painting even larger and heavier components. In addition, the conveyor sys-

tem had to offer a high level of precision, because robots were to be responsible for the painting process.

### Transporting large parts safely

As Mitras had had positive experiences during its initial projects with Caldan Conveyor, it chose Caldan to supply the new system. Because of the ceiling heights and the maximum size of the parts, Mitras opted for a power+free floor conveyor (P+F 140). The design is similar to that of the familiar P+F 100/HD 100 systems, but with its wider track and larger wagons is able to meet the user's requirements.

The new conveyor at Mitras can transport parts up to 3000 mm in length and with a cross section of 2000 x 2000 mm. It also guarantees the necessary precision for the robot application system in the spray booths. The cy-

cle time of the painting system is four minutes and the conveyor is fitted with two chain systems to accommodate this.

In the power wash section, the conveyor travels at a constant speed of 1.25 m/min, but it is stationary during the loading, unloading and painting processes. The parts are transported on P+F 140 double wagons with suspension devices. Different jigs can be loaded during the manual loading process, depending on whether one or two large or small parts are being transported. The maximum load per wagon is 150 kg.

### Rotary tables allow for loading from both sides

A special feature of the Mitras conveyor is the rotary tables installed in both the loading and unloading areas which enable the complete wagon unit to be rotated through 180 degrees, as operators sometimes have to load and unload parts from both sides. These rotating units allow for the same workflows that would be possible with skid systems.

On its route to the pre-treatment area, the conveyor system has to accommodate a change in floor levels. In contrast to skid conveyors, with a power+free system this can easily be managed using an incline section. As explained above, the entire pre-treatment process, including drying and cooling, takes place using a separate continuous chain conveyor. The wagons only pass onto the power+free chain after this process has been completed.



Small parts in the robotic spray booth.



Plastic parts for construction machinery on the power+free wagon.



Parts up to 3000 mm long and 2000 mm high can be painted in the booth.

### Floor conveyor with high availability

Outside the spray booths, the wagons are moved to a separation and transfer system so that they can be allocated quickly to the robot booths. Only one wagon is in each booth during the spraying process to ensure that the coating has the required quality. The transfer system moves one wagon out of the booth and one wagon into the

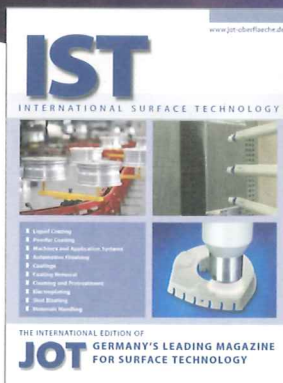
booth at the same time to allow for as long a painting time as possible. The wagons are transported to the areas following the painting booths, such as the flash-off area and drying oven, by the power+free system in stop/go operation. The painting facility at Mitras has been in operation since early 2014 and meets all the company's requirements, in particular with regard to the availability of the conveyor. The benefits of

the floor conveyor were clear in terms of planning, investment costs and operation. The advantages include the much smaller number of actuators and sensors when compared with a skid conveyor and, therefore, the much lower cost of the automation system. ■

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