

# Modernizing a paint shop for improved quality of coatings

## SUCCESS STORY

MAN Truck & Bus is one of Europe's leading manufacturers of commercial vehicles, and has production facilities in three European countries, Russia, South Africa and Turkey. Its product portfolio comprises vans, trucks, buses, and diesel and gas engines, as well as passenger and freight transportation services. MAN vehicles are renowned for their quality, economy, excellent environmental balance and maximum comfort.

One of its three European plants is located in Starachowice, Poland, which is a competence center for bus production. Here, MAN Truck & Bus Polska produces both chassis and frames and executes final assembly work. Every day, the plant releases eleven completed vehicles.

### NEW BUSES; NEW PAINT SHOP

The introduction of a new generation of lighter, more fuel-efficient and therefore more environmentally-friendly buses brought radical changes to the Starachowice factory. Everything changed, from concept, design and construction to modification of the production process. Manufacturing time was significantly reduced. One of the departments that needed to be renewed was the paint shop, which had to be adapted to paint plastic details of the new generation buses.

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|---------------------------|---|
| <b>Customer:</b>          | MAN TRUCK & BUS                         |
| <b>Country:</b>           | POLAND                                  |
| <b>Graco Distributor:</b> | TECHNIK LAKIERNICZE<br>SOŁTYSIAK SP. J. |
| <b>Equipment:</b>         | PROMIX 2KS. PRO XPC AUTO                |
| <b>Industry:</b>          | AUTOMOTIVE                              |
| <b>Application:</b>       | ROBOTIC PAINTING                        |

The paint shop is divided into four operational sectors: primer line, main coating line, decorative coating line (e.g. customer-specific signage), and semi-finished coating line (e.g. of fixed elements such as windows). The most significant changes concerned the main coating line. Here, the overall objective was to optimize the line's operation to make it more efficient and more economical to operate, while ensuring a higher quality of painting.

### MANUAL TO ROBOTIC PAINTING

The most significant change was to move from manual to robotic painting. The work necessary was assigned to the authorized Graco distributor in Poland, Techniki Lakiernicze Sołtysiak Sp. J. . The equipment they proposed and then installed was the ProMix™ 2KS electronic two-component paint proportioner, President™ 3:1 piston

pumps, and the automation robots were equipped with Graco's Pro Xpc™ automatic, low-pressure electrostatic guns, which are safe to use and extremely durable.

Designed for automatic air spraying, the Pro Xpc guns ensure effective system integration and excellent finish quality, as expected from an Industry 4.0 technology.

It provides flexibility and increased efficiency from basic applications to the most advanced systems. Mixing ingredients with the ProMix 2KS ensures the highest possible precision, since the mixing ratio tolerances reach 1%.

*The ProMix 2KS can be used in simple and highly specialized tasks*



An interesting and highly beneficial feature of the guns is a driver that features 250 user-modifiable default settings and a reminder function. This gives customers great freedom in spraying their patterns with a wide range of sizes and shapes. It also allows local control and easy connection and monitoring via an external PLC.

The electronic multi-component dispensing system selected for Starachowice – Graco's ProMix 2KS – is able to combine 30 colors and 4 catalysts.

This precise and reliable electronic dispenser for multi-component materials is designed to handle a wide range of solvent-based and

water-based materials.

It is also an effective solution for color alteration, and incorporates efficient material tracking and reporting functions.

Another advantage of the ProMix 2KS system is its flexibility; it can be used in both simple and highly specialized tasks, and even in potentially explosive areas. Automatic control of the operating state avoids the possibility of shortages. A simple and intuitive programmer in conjunction with a remote operator station allow for quick and comfortable operating work. The control panel is a small, portable box equipped with an LED screen. Its compact design also allows the system to be

placed in the paint store, while the ATEX certified control panel can be located in the paint shop at the workstation.

Two ABB robots, working independently of each other, move along the booth's wall. The painting software can easily be adjusted to enable it to apply non-standard colors in short series. This is important for a bus manufacturer like MAN, which prides itself on making buses exactly to the specific requirements of customers – and this includes requesting any color.

### OPTIMIZING CORROSION RESISTANCE

MAN is the only bus producer in Poland to possess a cathodic dip painting (CDP) unit. This is an electrochemical process that is well-suited for painting large and complex structures like bus panels, as well as being suitable for automated coating processes. All buses built in Starachowice leave the factory with a CDP coating to give them optimum protection against corrosion, particularly in severe climatic and urban conditions. It also improves paint adherence.

*Robotic painting has speeded up the painting process*

CDP is an eco-friendly process, since water is the solvent predominately used. It results in a very uniform coating of metallic surfaces and hollow spaces with even coating thicknesses and good surface qualities. All types of paint can be applied to a CDP coated layer.

Before each bus body goes to the paint shop, it undergoes the CDP process. The CDP line in the Starachowice plant consists of 10 paint baths that allow the immersion of elements of sizes up to 15 meters long and 3.8 meters wide. The baths are even deeper – up to 5 meters deep. This allows the longest three-axle buses bodies manufactured in Starachowice to be painted in this way.

### SATISFACTION ALL AROUND

Adapting a functioning coating chamber to new painting tasks was a major challenge for MAN Truck & Bus Polska in Starachowice, as it involved a completely new method of painting, with manual application replaced by robots equipped with electrostatic guns.

However, the company was delighted with the results. Robotic painting has speeded up the painting process and increased the efficiency of the new line and consequently the plant as a whole. Improved process repeatability has improved the quality of coatings, and reduced material usage and waste, which translates into cost savings.

