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Paint to order

At Mercedes-Benz's Wörth truck plant in Germany, robots play a crucial role in a new top-coat spraying line that uses special water-based paints.



> When demand for Mercedes-Benz trucks increased, the company naturally responded by increasing capacity at its factory in Wörth in Rhineland-Palatinate in Germany. Last fall, Mercedes-Benz began operating a spraying line, converting an existing filling line into a fully automated top-coat spraying line for water-based paints. The company wasn't merely raising its capacity however: the aim of the investment was a significant reduction in solvent emissions during spraying of the truck cabs. This is made possible with mono-hydro top coat paints, in which the solvents in the paint are over two-thirds water.

While the No. 2 top-coat spraying line, which went into operation in 2002, has a highly flexible color-supply system for over 250 colors, on the new Line 3 the "highrunner" colors - those shades most

frequently ordered - are at the forefront. Interestingly, more than every second truck leaving the world's biggest assembly plant for commercial vehicles is white.

As with the existing line and the previous filling line, with the new top-coat spraying line ABB is responsible for the color supply and for automation. For the field of automation the paint-technology experts from the town of Friedberg in Hesse supplied eight IRB 5400 painting robots and four IRB 5300 robots, which act as door openers, including the relevant travel axes. Application equipment and vision systems for all the robot stations plus documentation and quality-assurance systems complete the delivery.

The new line comprises a total of six stations: a cleaning station, four connected robot stations and a

manual station. In the stations, the cabs for many types of Atego- and Actros-model trucks are painted, along with various components of both metal and synthetic materials. The cycle time per station is three minutes.

The cabs, which are attached to transportation sleds, are brought into the cleaning station after the filler painting process. At the station, they are given a thorough manual cleaning. Then comes the internal painting station - the first of four completely automated, robot-supported painting stations. With each new cab brought in, a vision system measures its location in the room, recognizes whether components are present and passes the data on to the robots. After the opening of the doors by the two ABB handling robots, the two paint robots enter the interior, paint the door rails and folds and the actual doors, and finish with the external painting.

In the following underbody station, the cab is lifted to a height of about 1.70 meters, and two IRB 5400 robots paint the underbody area and the add-on parts. At the next station, parts of the interior and the outer skin of the cab are again coated, using two paint robots and door openers. In the final automated station, two IRB 5400 robots perform the final application on the outer skin. In the touch-up station, a visual inspection is carried out, the final step in this part of the process.

The cartridge system for painting applications is a key part of the application. The innovative concept guarantees both relatively simple potential division during electrostatic valve (ESTA) atomizer application of water-based paints and reduced paint losses during color changes. With ABB's FlexBell system, a color cartridge is immediately combined with the high-rotation atomizer, so that only the atomizer has to be cleaned using solvents. The cartridge contains only the amount of color actually needed for one painting process. This means nearly loss-free color changes are possible, with the expensive rinsing of leads during color changes avoided. ☉



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MERCEDES-BENZ TRUCKS

The Mercedes-Benz plant in Wörth am Rhein is the world's biggest truck assembly works. It has an area of 2,463,186 square meters and a developed area of 544,729 square meters. Average daily production is over 400 CBU (Completely Built-Up) units as of 31 December 2007. Approximately 10,000 employees work at the Wörth factory.

Careful spraying of the underbody, above, and the interior, below. At right, ABB FlexShield provides continuous painting with internal charge of waterborne paint.

