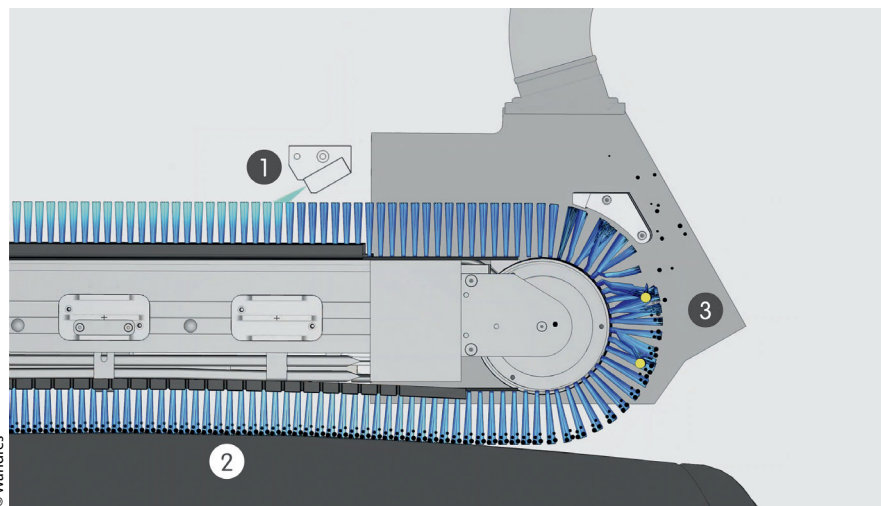


# How to optimise the cleaning process and cut carbon emissions

Saving on energy consumption and reducing carbon emissions are at the top of the agenda for the automotive industry, particularly in view of on-going challenges. Not only the vehicles themselves are under scrutiny, reducing production emissions is also a priority. OEMs are being forced to focus increasingly on rethinking processes. An effective example of one innovation is the deployment of specialised cleaning technology that eliminates the need for a drying stage.

Andrea Rutz

During vehicle bodyshell production, after immersion in the electrocoat tank, a PVC-based, paste-like sealing material is applied to areas such as the weld seams of the bodyshell. Seam sealing of the body is important as it guards against crevice corrosion and prevents the entry of moisture. The wet PVC is tacky and will usually be hardened in a dryer before entry to the primer line. The dryer is a curing oven of about 100m in length that heats the bodyshell up to between 120 and 130 degrees Celsius. This requires an enormous amount of energy. Running a gelling oven on the paint line uses approximately 5,500,000 kWh of gas and, in addition, around 900,000 kWh of electricity. All in all this amount of energy consumption represents greenhouse gas emissions annually of over 1,500 tons in CO<sub>2</sub> equivalents.



The Ingromat System consists of three steps: 1. Micro-mostening of the filaments, 2. Cleaning of the surface and 3. Self-cleaning of the linear brushes

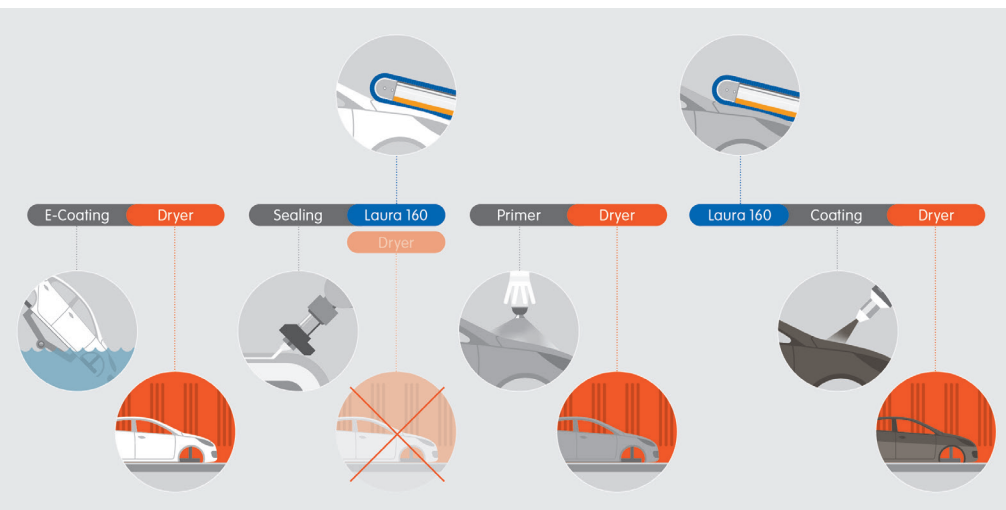
## Dispensing with drying

Optimising the cleaning process that follows seam sealing means the gelling oven is no longer required in most cases. This is all down to the use of Robot Sword Brushes. Robot Sword Brushes follow the lines of the bodyshell with maximum precision. All the while the brush filaments, which are made of polyamide, never actually come into contact with the freshly applied seam sealant. For exactly this reason, it is no longer necessary to heat-cure the tacky sealant before cleaning.

It is quite sufficient if the sealing material applied is cured in the primer oven in a subsequent process step. Existing coating processes are thus simplified considerably and manufacturers can dispense with the cost-intensive running of the gel oven. Over the course of a year, this means energy costs savings alone in the mid-six-digit range. The investment in a cleaning system with Robot Sword Brushes has, therefore, a payback period of only a few months.



A thorough cleaning procedure is crucial before vehicle bodyshells can enter the paint shop.



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Deploying Robot Sword Brushes to clean the bodyshell after seam sealing means the dryer can be dispensed with at this point. The Robot Sword Brush Laura 160 also cleans vehicle bodies reliably prior to top coat application.

### At work worldwide

If Robot Sword Brushes are already included in the initial planning stages of new projects, the primer line will take up considerably less space since a dryer is no longer required. Consequently, seven-figure investment cost savings for the gelling oven can be made. Robot Sword Brushes have been successfully deployed worldwide for more than a decade now on the paint lines of top OEMs in the automotive industry. The cleaning technology is used not only after seam sealing but also prior to top coat application. Following the primer coat process, sanding of blemishes or defective areas of the primer coat creates very fine sanding dust. Robot Sword Brushes perform highly efficient surface preparation in readiness for the paint shop. Removing sanding dust before the application of the final top coat eliminates trapped particles in the paint and avoids cost-intensive manual re-work. The high-performance cleaning action of the Robot Sword Brushes effectively prevents particle-related defects in the top coat. For this reason, there are very few returns and first-time quality (FTQ) can be improved significantly.

### Combines air technology and brush cleaning technology

In the meantime, the Robot Sword Brush Laura 160 has been successfully integrated into a number of lines that carry out the application of wet PVC-based sealer and in many more projects that are aimed at improving the quality of the painting process. The Robot Sword Brush Laura 160 is equipped with dual linear brushes that run in parallel. In addition, to perform a contactless pre-cleaning process, 11 rotating Tornado Nozzles Type Janus are fitted in a line between the twin linear brushes. The aperture diameter of the nozzles can be adjusted tool-free and the blowing angle of the air jet is also variable. This means that the ultimate cleaning effect can be achieved for every contour. Tornado Nozzles expel compressed air at several times the speed of sound. The compressed air powerfully removes particles and dust from grooves and recessed areas on the surface of the vehicle body in a non-contact cleaning procedure. Roof seams or grip recesses, for instance, are initially cleaned in this way using air technology. The two linear brushes circulating in parallel follow up, cleaning

the entire surface of the bodyshell in a brush cleaning process. An integrated flexible buffer ensures the linear brushes adapt perfectly to the lines of the vehicle body and to convex and concave surfaces. The brush filaments are lightly moistened during the cleaning procedure with an ultra-fine spray of Ingromat, an anti-static cleaning agent. Micro-moistening of the filaments causes even ultrafine particles to be absorbed while the surface still remains dry. The particles are detached from the filaments again in a self-cleaning unit and disposed of by vacuum extraction. The linear brushes, meanwhile, are refreshed and ready again for continuous operations in industrial production. The combination of air technology with a brush cleaning system achieves ultra-high-performance cleaning results at fast cycle times in the innovative paint shop of today. //

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