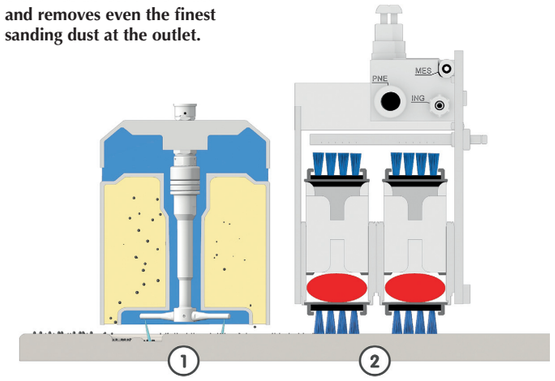
Translation of the German article Türen-Magazin 2021

A‘Power Sword Brush’ wipes crosswise across the surface and removes even the finest sanding dust at the outlet.



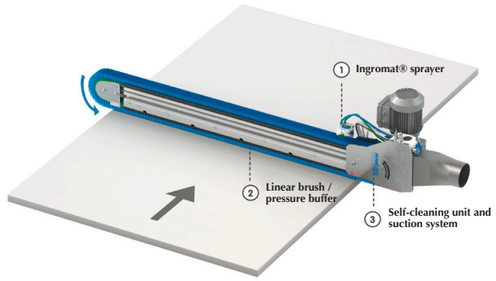
A cross section shows the cleaning technology: (1) ‘Tornado Channel TKR 200’, (2) ‘Power Sword Brush’ with pressure buffer (red)

At the infeed to the cleaning installation, the doors are initially cleaned after sanding by a ‘Tornado Channel’ utilising air technology.

Fine Dust - Stop

Optimal cleaning before coating in the manufacturing of doors: Prüm opts for Wandres Technology

After the intermediate sanding of primed, painted and lacquered surfaces, fine sanding dust can cause flaws and quality issues during coating applications. Prüm-Türenwerk GmbH, door manufacturers in Weinsheim, have fitted their coating lines with cutting-edge cleaning technology developed by the Wandres Company. Finally, repeatable results and the best possible quality can be guaranteed.



Sword Brushes clean in three steps: (1) Micro-moistening of the filaments, (2) Cleaning of the surface, (3) Self-cleaning
(Photos, images: Wandres)

A finished door on the outfeed of the drying installation after painting

A multiple-layer acrylic coating application is made by a robotic spray system

Popular with customers: The 'Primo' door collection by manufacturer Prüm scores top marks for white doors with a satin finish.

White doors, whether painted or lacquered, have already been on-trend for a number of years and never really go out of style. In particular, the RAL 9016 colour Traffic White is currently an immensely popular shade. However, creating a white surface finish with a pearly semi-gloss sheen that looks impressive, has excellent durability and a pleasant haptic feel, presents considerable technical challenges. At their plant in Weinsheim, the Prüm Company manufactures doors with a range of different solid core construction methods and frame systems.
The surface layer of the door panel in the coating process is a HDF substrate. Raised and recessed panel doors are first sprayed manually with a primer. Subsequently a water-based primer is applied to the flat surfaces in an environmentally friendly roller coating process. Before the final top coat application can be added by means of a robotic spray system, intermediate sanding is required. Fine-sanding to an ultra-fine P600 grit generates dust that sticks tightly to the surface and proves tricky to remove.

When the coating line was first commissioned, an attempt was made to clean surfaces after sanding with the aid of compressed air and round brushes. The results were inadequate to say the least. Residual dust repeatedly turned up as flaws in the surface finish after coating, demanding time-consuming remedial work.

Effective cleaning technology from the Southern Black Forest

The project manager turned to the Wandres GmbH for help in resolving this issue.
The Wandres Company specialise in industrial surface cleaning and have the ideal solution for precisely this situation. The Combi Sword Brush 'UNA H-XL 311' is perfectly suited to removing high levels of contamination from both recessed panel doors as well as flat panel doors.
A 'Tornado Channel TKR 200' is installed at the infeed of the machine. Rotating compressed air nozzles detach dust from the surface and instantly dispose of it via vacuum extraction.

A 'Power Sword Brush' is installed at the the outfeed. Two linear brushes wipe crosswise across the surface and effectively remove any remaining particles from the surface.
A pneumatically regulated pressure buffer at the contact area of the linear brush compensates for differences in material thickness and ensures a constant wiping pressure on the surface. Sword Brushes clean using a procedure that was developed by the Wandres Company and has been tried and tested in applications across multiple industries. A thin film of Ingromat liquid is applied onto the tips of the brush filaments. The resulting increase in capillary adhesive forces allows even the very finest dust particles to be absorbed when the linear brush wipes across the surface. The particles that have been captured are detached from the brush in a self-cleaning unit by a rack and compressed air nozzles and guided towards a suction system. The procedure has a decisive advantage in industrial production. As opposed to round brushes, any risk of recontamination is excluded and consistently high performance cleaning results are guaranteed.

Process stability in production with a low maintenance system

Thanks to a small footprint, the cleaning installation can be embedded in the line without any difficulty. The speed of throughfeed is approx. 10m/min. Due to the fact that coating applications require a longer process cycle time, the cleaning installation is turned off at intervals to economise on energy and compressed air. An electrical height adjustment unit adjusts automatically to accommodate varying door widths. Since the Combi Sword Brush was installed, there has been a noticeable improvement at the Weinsheim facility. The project manager Manfred Backes summarised: 'The reject rate on the coating line has been reduced significantly. Wandres cleaning technology enables us to achieve stable manufacturing cycles with repeatable results in 24/7 operations.' Maintenance costs for the new cleaning installation are very low. The linear brushes are manufactured in-house by Wandres, have a service life of 4,000 hours and are replaced once a year.
The investment has definitely proved well worthwhile for Prüm. The specialist door manufacturer can now keep the coating line running 24/7 while ensuring economical production and a first-class quality product. The constantly growing demand for white doors has by no means collapsed during the corona pandemic and a second coating line is currently being planned. The space for this will be available as soon as the door manufacturer's new facility for frame fabrication, which has a total manufacturing area of 25,000 m², goes into production in 2022.