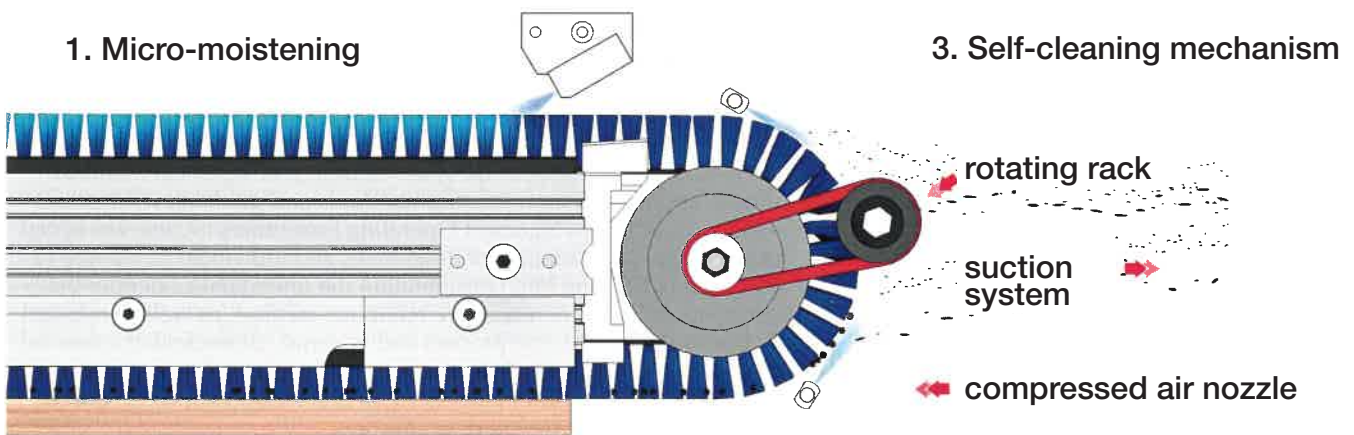


# Deep cleaning



Evaluating a furniture panel  
after a performance test  
in the Technology Centre  
(Images, Graphics: Wandres)

Wandres Technology for the professional and efficient cleaning of furniture panels



Cleaning product surfaces  
using the 'Ingromat' procedure

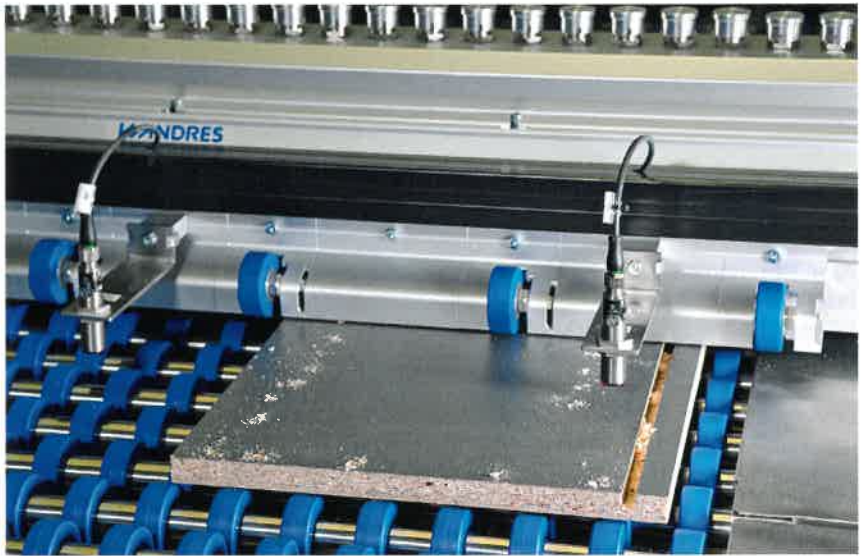
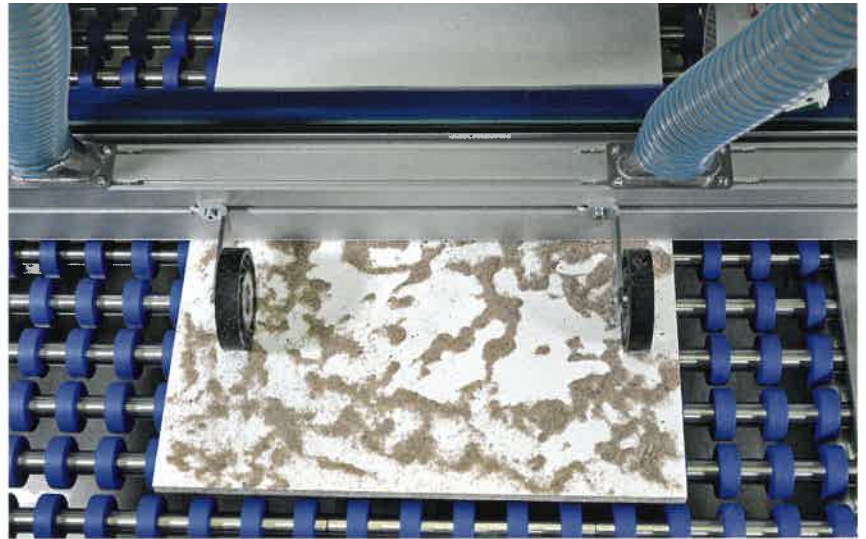
**D**ust and shavings are generated as a result of many different production processes throughout the manufacture of furniture panels, for instance during sawing, drilling, milling, sanding and nesting. These particles frequently disrupt downstream processing, interfere with camera inspection and pollute the air in the production environment. Particles can also compromise the surface quality of the finished furniture panel during coating or stacking. To avoid quality issues and guarantee a reliable production process, shavings and dust particles need to be removed without a trace. To make this happen, the Wandres Company GmbH micro-cleaning, Stegen have developed a range of in-line cleaning machines.

A modular system offers flexible cleaning solutions that can be tailored to suit each individual application. The machines are easily integrated into existing production lines due to the high level of flexibility. A core element of the system is the Sword Brush. The Sword Brush wipes across the surface with micro-moistened brush filaments leaving the surface dry and ready to be coated or printed immediately afterwards. Due to a micro-moistening of the filaments with 'Ingromat' anti-static cleaning agent, even fine dust particles are bound adhesively to the brush filaments. The brush removes both coarse particles as well as fine dust in a high-performance cleaning operation. Ideal for continuous operations in industrial production, filaments are constantly refreshed in a self-cleaning unit and particles disposed of by means of a suction system.

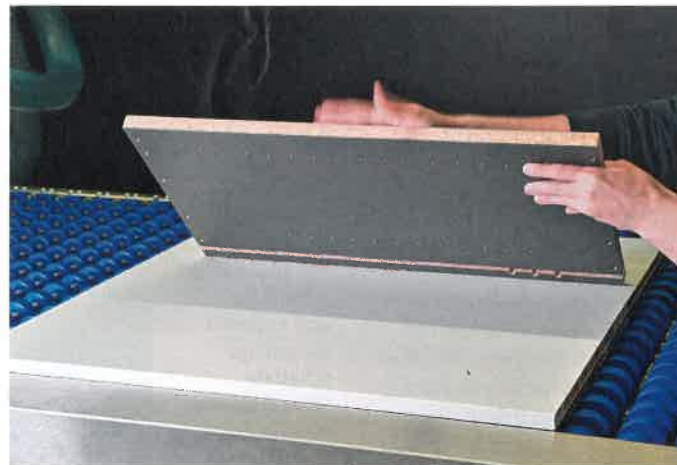
Extremely high volumes of particles are eliminated by the 'Trans-Vac-Unit', enabling the Sword Brush to remove residual fine dust in a subsequent process

Large amounts of shavings and particles accumulate in bore holes and grooves and are removed by the 'Tornado Channel TKF' using air technology

Precision cleaning performed by Sword Brushes utilise brush cleaning technology to remove even very fine dust from the surface of panels







A knocking test dislodges substantial amounts of particles from bore holes prior to cleaning

After cleaning with the 'Tornado Channel TKF', bore holes are dust-free

As a rule, the contact area of the Sword Brush is flexibly mounted on a pressure buffer. The pressure buffer compensates for uneven surfaces and small variations in the thickness of the material. This ensures that a constant wiping pressure is maintained and optimal cleaning results achieved, even when running panels of slightly irregular thicknesses. The cleaning performance remains undiminished throughout the service life of the brush. The Sword Brush is available for working widths of between 400 mm and 4500 mm. Shorter brushes can be installed, for instance, to clean panel edgings after edge processing or for cleaning narrow panels during longitudinal processing. Two Sword Brushes can be combined to clean the upper and lower surfaces of the panels in one go.

**Suction channel + Sword Brush for large amounts of dust**

Some applications may require a combination of brush cleaning technology and air technology to deal with more substantial amounts of dust. Due to the modular system of the Combi Sword Brushes, this is easily arranged. The separate cleaning machines

are mounted on a central adjustment unit and can each be raised in parallel position.

Following processes that generate extremely large quantities of dust, Wandres recommend installing an extraction channel at the infeed to the Sword Brush. The suction channel type 'Trans-Vac-Unit TKLO 46' extracts large amounts of particles trouble-free from the panel surface, lightening the workload for the Sword Brush that follows on. After vacuum extraction, very fine dust still remains on the surface. These fine dust particles cling tightly to the surface and may not be removed by air technology alone. Using the 'Ingromat' method, the Sword Brush effectively removes even the finest particles.

**Cleaning of panels with bore holes**

To achieve an optimal pre-cleaning process for panels with through holes or blind holes using air technology, a 'Tornado Channel TKF' is installed upstream. This machine has integrated Power Nozzles with fixed nozzle heads that have a prism-shaped surface structure. The Power Nozzles emit high-impact jets of

**The compact bore hole cleaner 'FN 51' cleans individual bore holes effectively**

compressed air that strike the panel surface at a slight angle. Particles are effectively blasted out of bore holes and grooves and subsequently removed by vacuum extraction. Depending on requirements, the nozzles can be fitted with magnetic valves to minimise the consumption of compressed air. Following the pre-cleaning process using air technology, a Sword Brush wipes across the panel surface to remove residual fine dust using brush cleaning technology. Effective cleaning of bore holes pays dividends by preventing issues caused by small particles. Dislodged from holes during stacking, these particles can create dents or scratches on surfaces during onward transport of the panels. Moreover, purchasers of a new item of furniture are

happy to unpack the panels without piles of sawdust landing on the living room carpet. For all these reasons and more, effective cleaning of bore holes is essential. To test the efficiency of bore hole cleaning, a 'knocking test' is sometimes applied as an assessment criterion (see above image).

The bore hole cleaner 'FN 51' provides a simple solution for single rows of bore holes. This compact cleaning device can be attached to the profile of the Sword Brush or to the profile of the 'Trans-Vac-Unit', directly above the row of bore holes that require cleaning and adjusted in position as required. The bore hole cleaning device 'FN 51' has a working width of 30 mm.



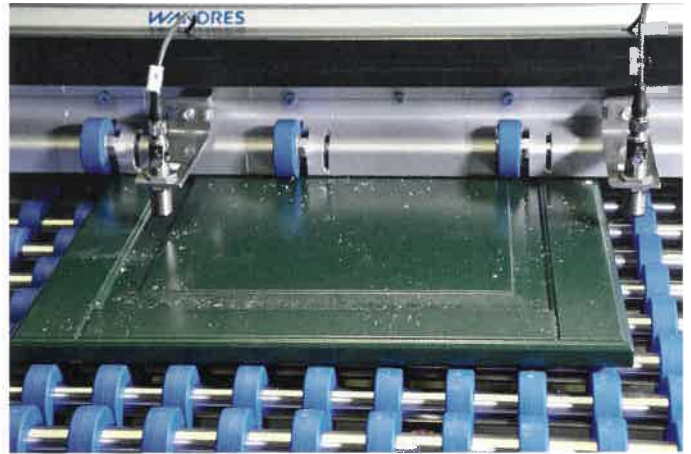
### Cleaning of profiled and sanded surfaces

The air-assisted cleaning machine 'Tornado Channel TKR' cleans profiled and sanded surfaces, for instance kitchen cabinet doors or drawer fronts, highly efficiently in combination with Sword Brushes. Tornado Nozzles rotate at high velocity, emitting compressed air at several times the speed of sound and eliminating particles and dust extremely effectively from structured or recessed-panel surfaces and sanding grooves. The Tornado Nozzles are fitted in a line across the entire width of the Tornado Channel at identical distance to the surface of the board. The arms of the rotating nozzles interlock precisely like cogs in a wheel. The circular cleaning areas overlap and the entire width of the product surface is cleaned seamlessly. Subsequently, Sword Brushes remove the remaining fine dust from the surface of the panel with micro-moistened filaments. Thanks to this thorough cleaning process, a thinner layer of coating material may well be required during the application of surface coating. This not only makes economic sense as it represents a material cost-saving but also achieves a mirror-like gloss finish without particle inclusions.

### Cleaning of conveying systems and along the process chain

To prevent particles being dragged along the line by conveyor systems, Sword Brushes are deployed not only to clean panels but also to clean the conveyor belt. As a rule, Sword Brushes clean the slack side of the belt beneath the transport level. This simple but effective method continuously removes the build-up of particles and avoids recontamination of the panels.

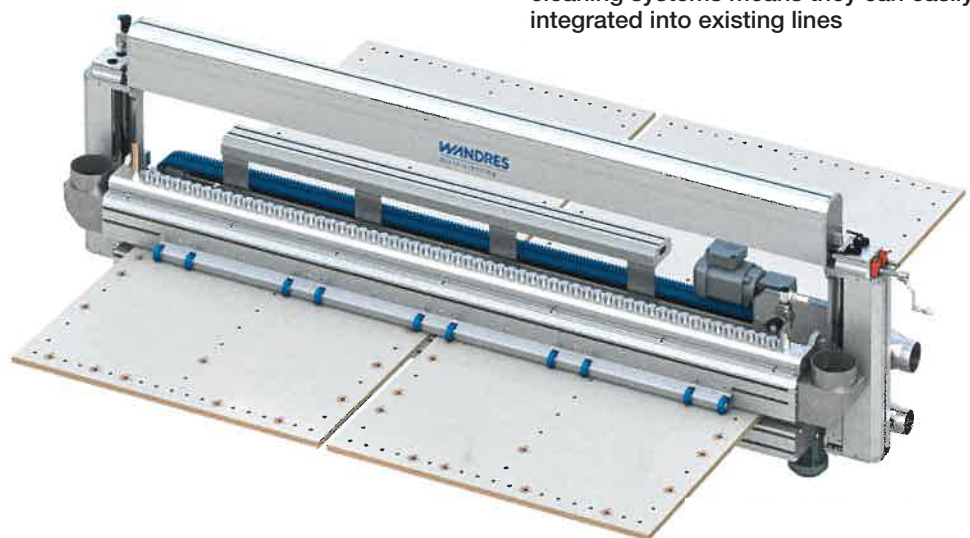
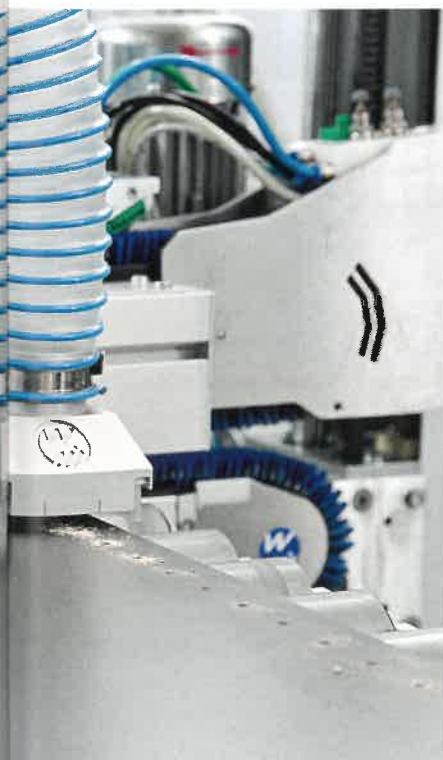
Thanks to the flexibility of the Wandres cleaning systems, they are easily integrated at multiple points in the manufacturing process, for instance after sawing and edge-banding, after drilling, milling, nesting, sanding, before coating and the turning cone and prior to camera inspection and stacking... There is scarcely any step in the production process that will not benefit from an efficient cleaning process. In the industrial production of boards and panels, an investment in the right cleaning system will be recouped within a short period of time and save costs in the long run. Effective surface cleaning guarantees a consistently high quality product and a low rejection rate.



The 'Tornado Channel TKR' cleans profiled or structured surfaces using sophisticated air technology



To achieve the best possible cleaning result, a Sword Brush removes residual fine dust following cleaning with air technology



The space-saving design of Wandres cleaning systems means they can easily be integrated into existing lines