

Translation of the
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Wandres cleaning technology designed specifically for
applications involving MDF & Co.

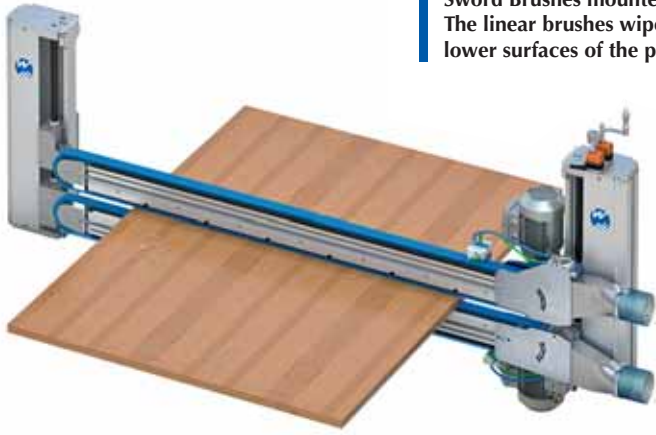
Air technology is combined here
with brush cleaning technology:
installation of a Combi Sword Brush
with a 'Tornado Channel' at the
infeed and Sword Brushes at the
outfeed (Photos: Wandres)

Surface planing mea



ms .. dust

The Combi Sword Brush Type 'Una X 121' features two Sword Brushes mounted on one shared height adjustment unit. The linear brushes wipe in the same direction across the upper and lower surfaces of the panel and crosswise to the direction of travel.



Surface planing MDF and other engineered wood, not to mention drilling, routing or sawing, inevitably produces chips and shavings. In addition, high levels of fine dust are generated by sanding wood-based panels. Piles of dust on panels, shavings in drill holes and edge fragments and chips on the surface of wooden composite board arguably have one thing in common - they disrupt subsequent production processes and cause quality issues and rejects. Fortunately, the Wandres GmbH is here to help with cleaning systems that are designed to handle each specific application and to offer reliable, long-term solutions. For the past 40 years, developing the most effective systems for the removal of particles and dust in the production lines of the panel and furniture industry has proved both challenging and motivating for the company from Stegen in Baden-Württemberg. Over the years, Wandres has developed a

comprehensive range of cleaning systems. Now, thanks to a flexible configuration concept, Combi Sword Brushes can offer the ideal solution for every single cleaning task in the furniture and panel industry.

A total of 55 sexdecillion possible configuration scenarios for Combi Sword Brushes

A sexdecillion is a colossal number, consisting as it does of a 1 followed by 51 zeros. Combi Sword Brushes are individually configured to suit a client's specific requirements by combining different components as appropriate. Up to four cleaning modules can be mounted on one central height adjustment unit. This could be four Sword Brushes, for instance, or even a combination of different Sword Brushes and 'Tornado Channels'. Due to the fact that there are, quite apart from the type and number of cleaning machines, a multitude of other variables such as the nominal width of the

machines, the position of the direct drive motor, the kind of height adjustment, the number and type of pressure rollers and so on, it is theoretically possible at present to configure about 55 sexdecillion different Combi Sword Brushes. In practice, however, the choice is usually restricted to a comparatively limited number of configurations that have been tried and tested many times over in industrial production and proven to solve the cleaning tasks at hand effectively and efficiently.

Optimal cleaning of drill holes for furniture panels

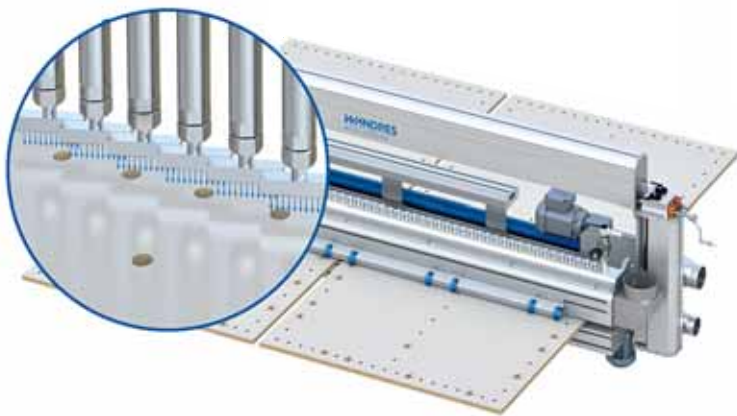
The effective cleaning of drill holes requires the extraction of shavings and particles, often tightly wedged, from the recess, followed by the secure removal by means of suction. A 'Tornado Channel' Type 'TKF' cleans blind holes and through holes very effectively and without touching the panel surface. So-called 'Power Nozzles' emit powerful blasts of compressed air that strike the surface at a slight angle and dislodge every single particle from the holes. A compressed air tank ensures that compressed air can be instantly supplied to all the nozzles simultaneously across the entire width of the panel. Ideally, the magnetic valves of the 'Power Nozzles' are controlled via a PLC control system so that only those nozzles in the vicinity of drill holes are activated for a

split second. The needs-based activation function of the magnetic valves reduces the consumption of compressed air dramatically. Boards and panels with through holes may benefit from the additional installation of a channel Type 'TKLU 200' to collect falling particles and guide them towards vacuum extraction. As a rule, after the pre-cleaning process based on air technology, a precision cleaning procedure follows, using the 'Ingromat®' Method and brush cleaning technology to remove any remaining fine dust from the surface of the panel both from above and from below.

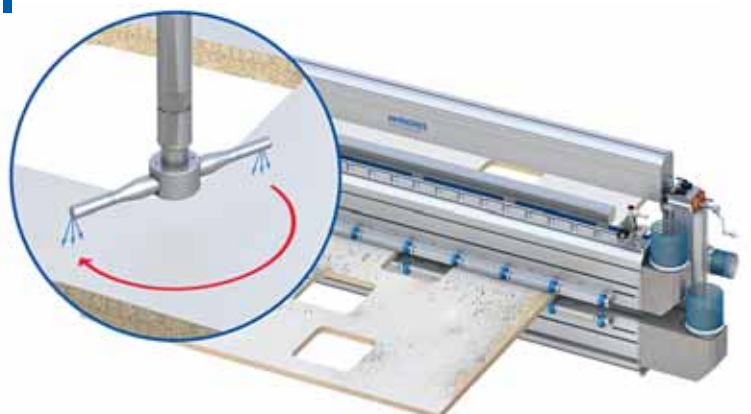
Effective cleaning of coated chipboard

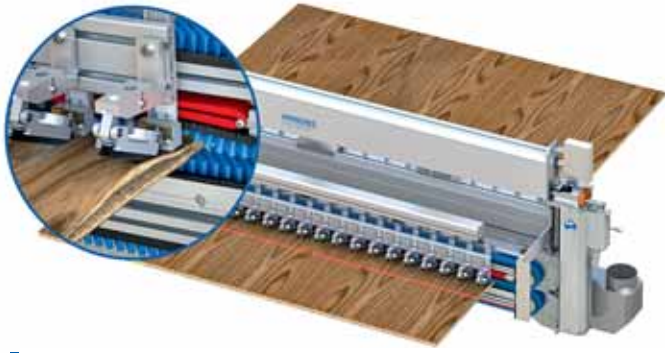
The Combi Sword Brush Type 'Una H-XFT 621' provides the ultimate solution for cleaning decorative faced chipboard on both sides after edge trimming or prior to camera inspection. Thorough surface cleaning is essential prior to optical monitoring to ensure it runs without a hitch, thus avoiding errors during image processing and particle-related rejects. In an initial step, a brush cleaning process removes edge trim and cover layer fragments. Tactile control elements are installed on the upper Sword Brush. If alerted to a warped board, these will lift the upper linear brush mechanically from the surface thereby preventing damage to the installation. In this application, after the pre-

A Combi Sword Brush with a Tornado Channel TKF and Power Nozzles for the cleaning of drill holes at the infeed, in combination with Sword Brushes at the outfeed for precision cleaning using brush cleaning technology.



Positioned at the infeed, Tornado Nozzles deliver an extremely effective cleaning procedure using air technology. Sword Brushes stationed at the outfeed remove any residual fine dust.





The Combi Sword Brush, equipped with tactile control elements at the infeed and a contactless cleaning module to clean both sides of the panel at the outfeed, was developed specifically for cleaning chipboard after the short cycle press.

cleaning process performed by Sword Brushes using a linear wiping technique, a contactless cleaning procedure follows employing air technology. One 'Tornado Channel' cleans the boards from above and another from below using 'Tornado Nozzles' rotating at high velocity. The nozzles emit compressed air at several times the speed of sound. Blasts of compressed air detach particles from the surface and drive them towards the suction system.

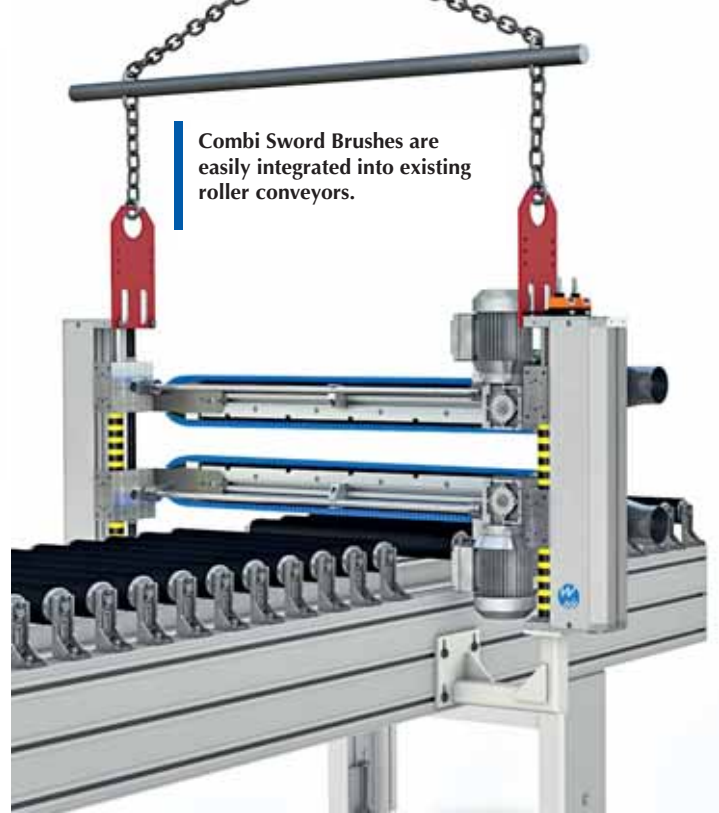
Cleaning systems specifically for MDF and sandwich panels

After the intermediate sanding of MDF boards, large quantities of fine dust remain tightly attached to the surface and left stuck in sanding marks. If this fine sanding dust is effectively removed, the final cover layer can be applied with far thinner layers of coating material to achieve a much glossier satin sheen on the surface. In particular, when it comes to the production of furniture panels or doors, this guarantees a high quality product at the same time as minimising the amount of coating material required and reducing the reject rate. During the milling of sandwich panels, however, large amounts of different types of chips and dusts are generated. An optimal cleaning procedure is critical here to ensure accurate optical monitoring and seamless downstream processing. In addition, the transport rollers and the floor of the facility will remain clean and workplace exposure of the employees to wood dust and glass fibre dust

reduced substantially. At first glance, these two cleaning applications may seem quite different. At the end of the day, though, a similar combination of air technology with brush cleaning technology is perfectly suited to both MDF and sandwich panels. In both scenarios, electrically driven, rotating 'Tornado Nozzles' eliminate large amounts of dust and particles extremely effectively with the aid of compressed air. After a pre-cleaning process using air technology, two Sword Brushes with micro-moistened filaments wipe any remaining particles from the surface of the board. A pressure buffer guarantees a consistent wiping pressure and high quality cleaning results.

Trouble-free integration into roller conveyors

Combi Sword Brushes feature a space-saving footprint and can be integrated without difficulty into either new or existing roller conveyors. A Combi Sword Brush Type 'Una X 121', equipped with one upper and one lower Sword Brush, has a narrow installation depth of merely 204 mm. An additional 'Tornado Channel TKR' installed



Combi Sword Brushes are easily integrated into existing roller conveyors.

at the infeed increases the installation depth required to slightly more than 460 mm. As a rule, then, only a couple of elements of the roller conveyor will need to be removed to accommodate a Combi Sword Brush. In the space which is created, mounting brackets are then used to attach the cleaning machine directly onto the frame of standard roller conveyors.

Digitalisation and fully networked systems with remote maintenance

If a plant operator wishes to integrate Combi Sword Brushes into the plant control system, the interface is realised according to these requirements. The motors of the height adjustment unit can be controlled with different fieldbus or absolute value encoder systems, for instance

Profinet, Profibus DP, Ether Cat, EtherNet / IP or CANopen. Wandres plans the electrical power distribution according to the client's specifications and handles the electrical equipment installation. If Combi Sword Brushes are ordered together with an integrated control cabinet then the data exchange mechanism will transmit digital and analog signals or via Profinet or Profibus DP, for instance from Siemens. On request, a remote diagnosis module can be installed to allow access to diagnostic values and to alter or adapt software. This also opens up the possibility of remote commissioning worldwide, for instance in America or China, without the expense and complexity of international travel. This is certainly an interesting option, not only during pandemic times.



Wandres also offers mobile devices with a touch control panel to operate installations remotely, for instance for larger cleaning systems in the sheet metal industry.