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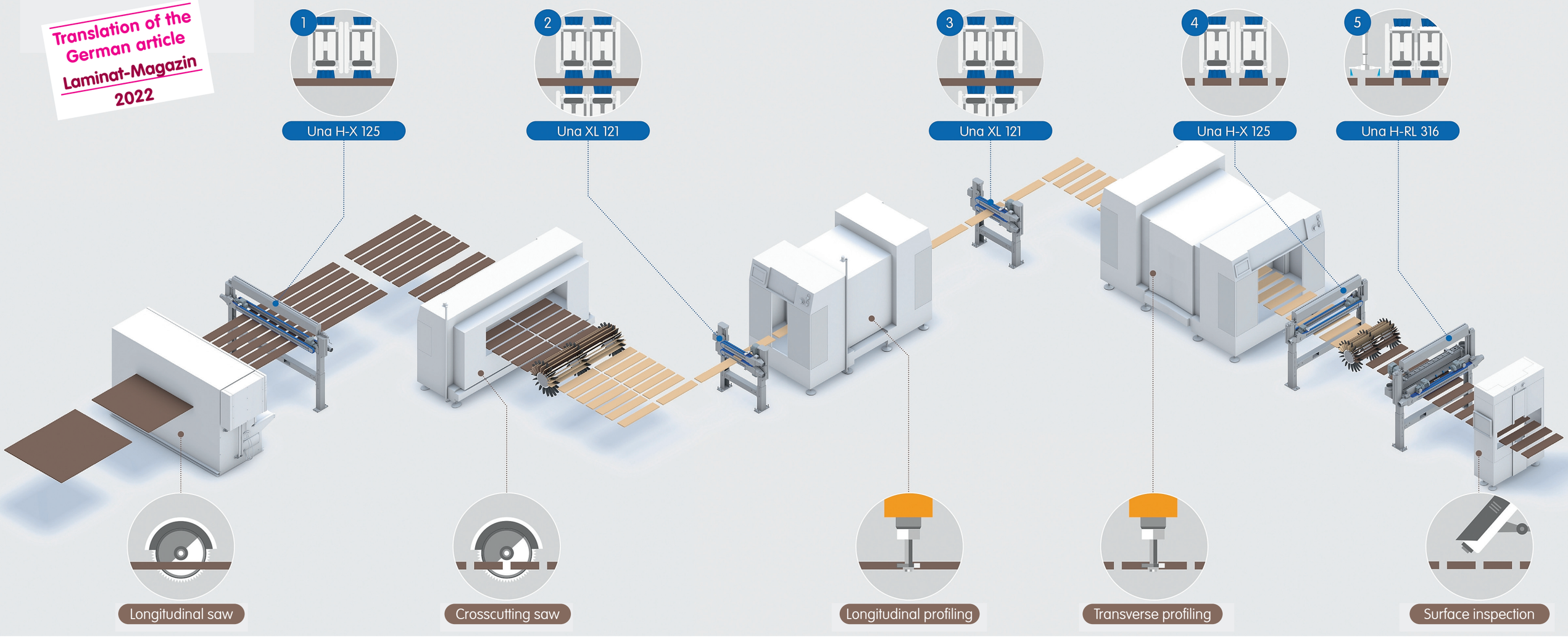

done & dusted

Optimal cleaning technology for the modern production of flooring

As automation becomes increasingly common practice on today's streamlined production lines, clean surfaces play a pivotal role in ensuring manufacturing processes flow smoothly. The cleaning technology developed by Wandres can be integrated into both new and existing lines to facilitate the stable and economical production of high-quality panel flooring.

Over recent years the production of different types of flooring has seen a number of innovations with methods constantly undergoing optimisation. Modern production facilities equipped with top-end machinery and featuring high feed rates allow for increasing levels of automation in processing. Advanced vision systems use software platforms to enable high-precision quality monitoring and sorting.

All the same, even in the digital age, dust and shavings are still created and cause even more disruption to highly automated and sensitive processes which results in machine downtime. Laminate dust is extremely adhesive and remains tightly attached to the panels, building up in the machinery, interfering with transport systems and leading to false positives at surface inspection.

Wandres GmbH micro-cleaning in Stegen, in consultation with manufacturers of flooring, has succeeded in defining at exactly which points in the production process a clean surface is crucial. The appropriate machines have been developed specifically for each of these production steps to meet the requirements regarding cleaning quality, speed and process stability in full.

Plant concept with inline cleaning

Following the panel sizing of large format planks by means of the longitudinal rip saw, the cuts are deposited on the conveyor belt together with a great deal of dust and shavings. To enable downstream processes to proceed optimally, two Sword Brushes clean the cuts from above by wiping in opposite directions (1). After the crosscutting saw, the decorative surface of the panel is turned to face downwards and each individual panel is transported onwards for processing in longitudinal position. Prior to edge-processing, the panels are cleaned on both sides (2) thereby ensuring that the transport chain track of the double-end tenoners can function accurately and trouble-free. Consequently, tight tolerances in profile milling can be maintained long-term in line with requirements. Due to high feed speeds, two Power Sword Brushes, each with twin linear brushes, are assigned to clean the panels here, one cleaning from above and one from below. The particles generated by longitudinal profiling are

Fig. 1: Woodgrain textured flooring panels and freshly lacquered bevels demand specialised cleaning technology.

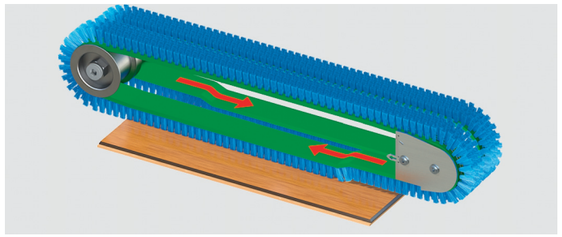

Fig. 2: The brushes are raised on nearing the edge of the panels thus protecting the freshly lacquered bevelled edges while at the same time minimising wear and tear on the brushes.

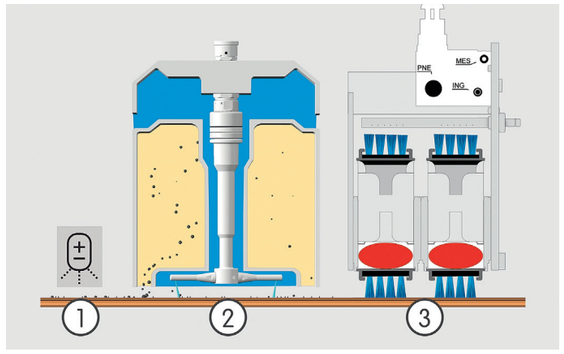

Fig. 3: The cleaning system prior to camera inspection consists of: Ionisation electrode (1), Tornado Channel TKR (2) and Power Sword Brush (3).

reliably removed using the same procedure (3).

After edge profiling, the lower face of the panels is cleaned in transverse throughfeed using brush cleaning technology (4). Subsequently, the panel turner turns the decorative surface to face upwards again. Cleaning prior to downstream camera inspection is absolutely key since automated quality control tasks can only deliver valid results when monitoring clean surfaces. At this point smooth surfaces can be cleaned using two Sword Brushes that wipe in opposite directions. Decorative surfaces with different textures require the additional use of a Tornado Channel that powerfully removes the dust wedged tightly in surface structures with the aid of rotating compressed air nozzles (5).

Thanks to air technology, particles are also removed from tongue-and-groove edging at the same time so that, in the end, a perfectly clean product can be stacked and packed.

Sword Brush technology

Surface cleaning with Sword Brush technology has proven extremely effective in multiple areas of industry. This is basically down to the fact that, in comparison with other cleaning technology, Sword Brushes are capable of performing consistently and maintaining high-performance cleaning results while any risk of recontamination is avoided. The filaments of the linear brushes are micro-moistened with a very thin film of Ingromat® antistatic cleaning agent. Due to the resulting increase in adhesive forces even ultra-fine particles are removed from the surface and absorbed. The particles swept up are then detached in a self-cleaning unit with the aid of compressed air nozzles and a rack and guided towards the suction system.

A unique feature of the technique can be activated if the edges of the panels have freshly lacquered bevels. The linear brushes are then lifted slightly on nearing the edges of the panels and are lowered back down onto the surface again a few centimetres further on in offset position (see Fig. 2). This prevents the fresh paint from being smudged while at the same time reducing wear and tear on the brushes. Due to the opposite wiping directions of the linear brushes, the entire width of the material is still cleaned seamlessly.

Air technology and ionisation

Cutting and milling melamine resin laminate produces fine and very adhesive dust. Moreover, a high synthetic content may cause a build up of static electricity. The use of an additional ionisation electrode will reduce any electrostatic charge. Thanks to the rotating compressed air nozzles, dust is removed without a trace from difficult-to-access areas of decorative panels that have a heavily structured finish. Tongue-and-grooved bevels are cleaned in the process. The Tornado Channel has been specifically built to dispose immediately of any dust particles that have been dislodged by vacuum extraction (see Fig. 3).

The technology in use - opinion

Sword Brush technology is already widely recognised as standard-setting in the industrial production of flooring and is currently being deployed by leading machine and plant manufacturers. For the investment in a new production plant to really pay off in the long run, it is advisable to already consider the inline cleaning of product surfaces at the planning stage of a new plant. Numerous examples from the field indicate that this approach can achieve extremely stable and economical 24/7 operations for the whole plant.

Matthias Eisele (Wandres, Technical Sales) has been supervising projects in the flooring production sector for around 15 years and is aware of the steadily increasing demands in the field: “In modern plants a reliable cleaning process is becoming ever more important and at the same time technically increasingly challenging. At present the latest flooring trend is for decorative engineered panels with a woodgrain texture. In combination with a procedure utilising air technology, Sword Brush technology delivers flawless cleaning results. At our Technology Centre we can performance test our cleaning systems on the client’s own sample surfaces to determine the optimal cleaning solution for each product. The results can then be assessed on the spot.”

The flooring manufacturer Alsapan SAS has installed a cutting-edge cleaning system with ionisation, air technology and brush cleaning technology at the production plant in Marlenheim. Straight after commissioning, the plant manager Jérôme Brua was suitably impressed: “Our camera inspection works like a dream with the upstream cleaning system.” (see Laminat Magazin 2021, page 68f). After nearly two years in continuous operation, the low maintenance aspect of the system is striking. The linear brushes from Wandres have an astonishingly long service life and only need replacing once a year during annual servicing.

After installing the cleaning technology, numerous manufacturers also remark on the knock-on effect of a much cleaner production environment and a lot less dust in the workplace. That is certainly a real advantage for the employees on-site. Last but not least, the end user will be handed a spotlessly clean product.

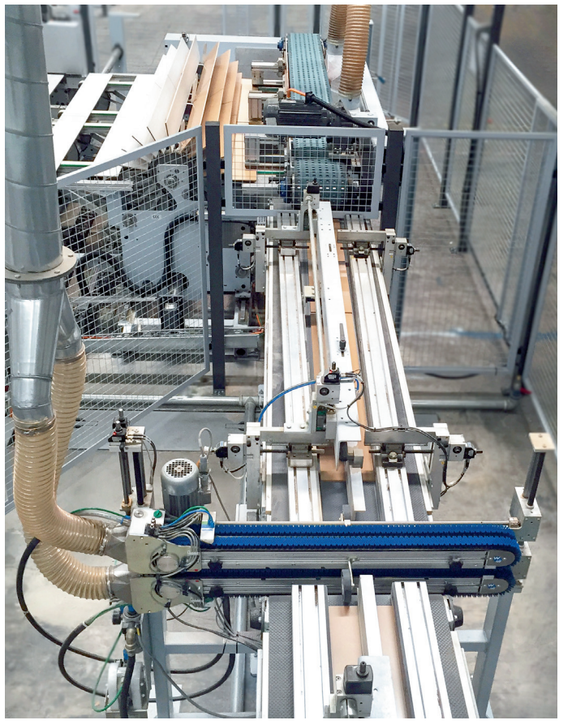

Fig. 4: Cleaning during transverse processing (Photos/Images: Wandres)

Fig. 5: Cleaning during longitudinal processing

Fig. 6: Cleaning before camera inspection. The Tornado Channel TKR viewed from the infeed.