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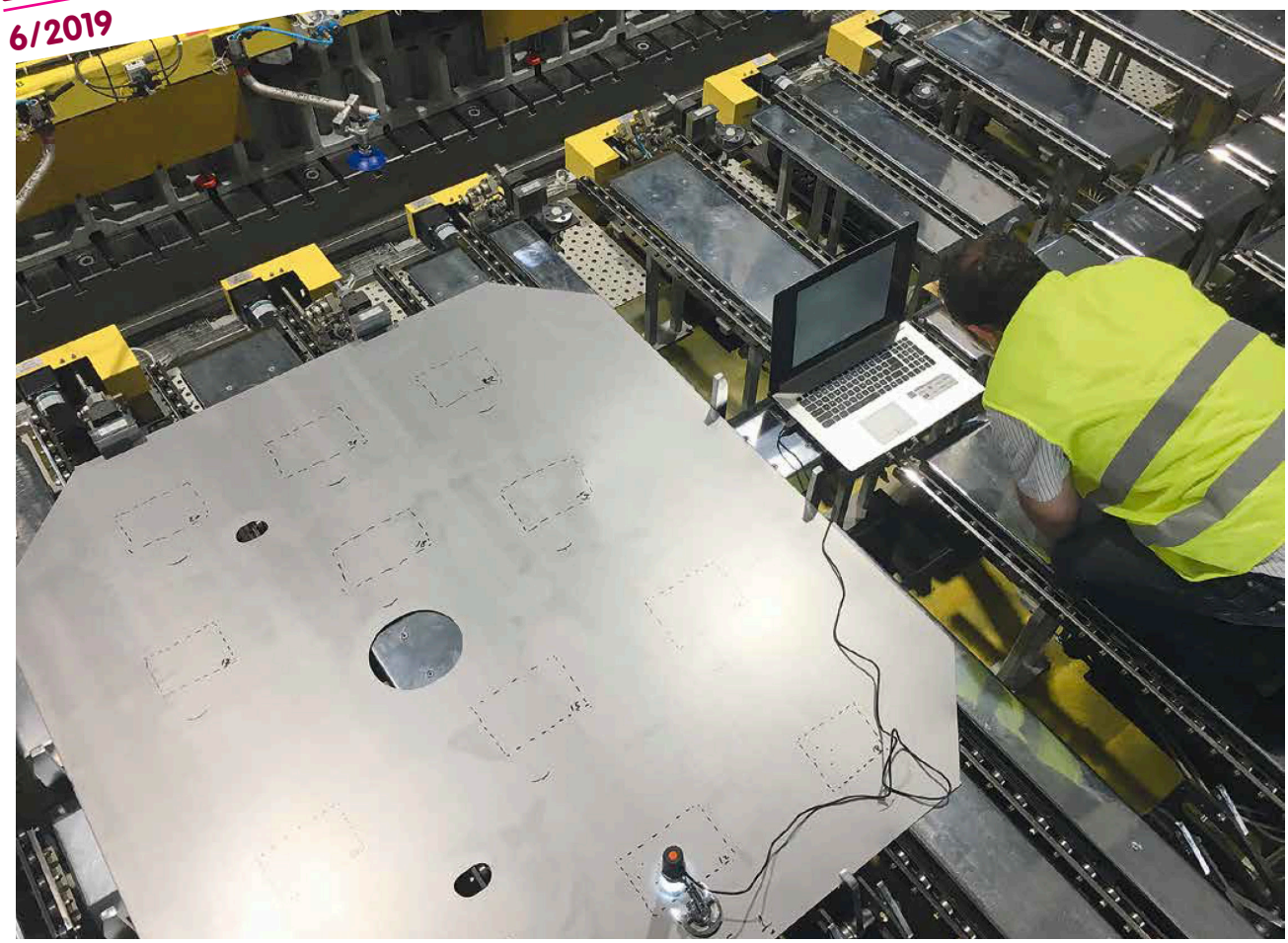


Images: Wandres

Efficient and low maintenance cleaning technology with Sword Brushes replaces the cost-intensive use of washing machines. Image: an automotive manufacturer evaluates cleaning results

Cleaning and lubrication combined

To ensure the best possible results in sheet metal forming, blanks need to be entirely free of particles and the lubricating film applied with precision. Innovative systems take care of both of these requirements at one and the same time.

Even the tiniest particles on the surface of blanks can have serious implications for the forming process. Interfering particles may damage the forming tools and cause irreversible indentations on the metal sheets. Costly retouching work and a high reject rate are just some of the consequences when this occurs.
A number of manufacturers of lubrication systems are therefore now combining systems and offering integrated cleaning units.

4,000 h

WANDRES LINEAR BRUSHES have an average service life of 4,000 hours.

Cleaning with Sword Brushes and precision lubrication

The Sword Brush technology developed by Wandres GmbH micro-cleaning is deployed all over the world for exactly this purpose. Linear brushes wipe across the surface of the blank, crosswise to the direction of throughput, as it passes through the system and remove any particles clinging to the surface.
A continuous self-cleaning mechanism detaches particles that have been absorbed from the filaments, guiding them towards a suction system.

This technology guarantees repeatable results and a low maintenance operation in continuous process applications. The base layer of lubrication remains, for the most part, on the surface of the blank and is evenly distributed by the wiping action of the brushes, thus providing homogenous lubrication. Even aluminium blanks, lubricated with hot melts, can be cleaned without any trouble. Switching between aluminium and steel blanks during production presents no difficulty. If required, a precisely controlled film of lubricant may be applied to the clean blanks prior to the forming process.

Lubrication systems, complete with integrated cleaning systems that utilise the Ingromat procedure, are already being supplied by several market leaders in the industry. A variety of application methods are available for the lubrication process, each with specific advantages.

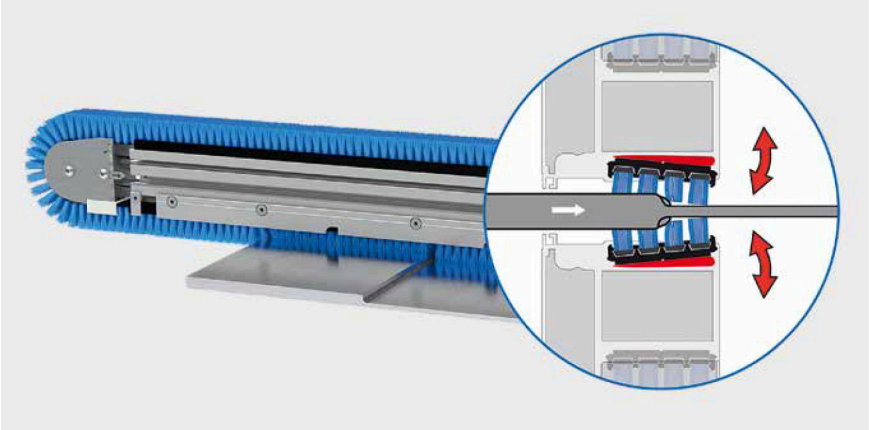
Sword Brush technology delivers results which are at least as good as conventional washing procedures that use emulsions and oils.

Manufacturers choose a compatible lubrication system which is consistent with the overall process.

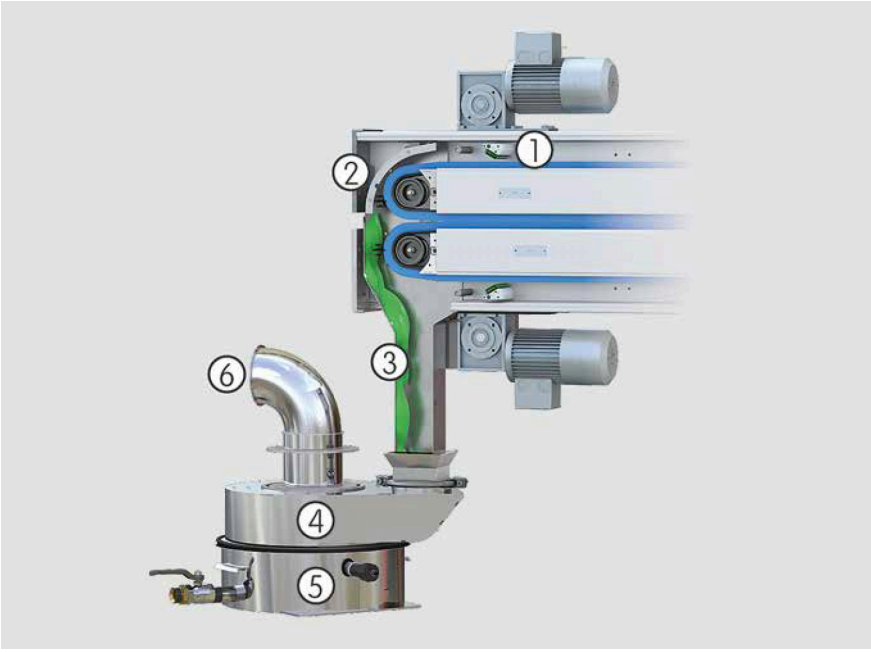
Convincing in practice

Those manufacturers who have already integrated OEM machines built by Wandres into their lubrication systems, report receiving a regular stream of positive feedback from end users. The unique features of this sophisticated cleaning technology deliver convincing results in continuous applications in industrial production.

The linear brushes used here are manufactured according to the very highest quality standards and have an average service life of 4,000 hours. The contact area of the brushes is flexibly mounted on a pneumatically regulated pressure buffer. Any variations in the thickness of the metal sheet are thus automatically compensated and, consequently, the uniform pressure ▶



Sword Brush with pressure buffer



Cleaning unit with self-cleaning function
1) micro-moistening of the filaments
2) cleaning of the filaments with rotating rack and compressed air nozzles
3) heated suction connections
4) cyclone separator
5) collecting tank
6) suction system

Images: Wandres

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applied by the brushes provides for optimal cleaning of the tailored blanks. The linear brushes can be moistened slightly with the Ingromat cleaning agent. Even the very finest dust particles are thereby absorbed and, in addition, the filaments are prevented from clogging up with wax-like lubricant. Ingromat may also be applied at intervals to achieve a more intensive self-cleaning effect, for instance, before switching from aluminium to steel.
A thermal self-cleaning function can liquify the accumulated mass of dry lube, oils and particles and siphon it off with ease. The mixture is extracted through a cyclone separator, collected in a collecting tank and disposed of trouble-free.

Experimental evaluation of cleaning performance

This year, an experiment was conducted at an automotive manufacturing plant together with the plant constructor, for the purpose of evaluating cleaning performance. A lubrication system, complete with an integrated cleaning unit of the Type Wandres Una H-BB 121, was under investigation. First of all, two automotive blanks of galvanised steel were each marked into 12 sections. In addition to any contamination already present, particles of steel of varying size were distributed on the slightly oily surface. Two different methods were applied to compare the surface before and after cleaning. Initially, a direct examination using a digital microscope determined the size of the particles present.

"All of the samples revealed excellent cleaning results that easily meet the key requirements of the automotive industry. The homogenisation of the basic layer of lube is an added benefit."

Trial samples were also taken and subsequently analysed with the aid of a microscopic system to provide automatic measurement of particles.

On all 24 sections the test results were very good. After cleaning, merely one very small particle, of about 10-20 µm in size, was to be found on each of two sections. According to the manufacturer, these particles would have no effect on the surface quality of the blanks. The production manager in charge was exceptionally happy with the results of the test: 'The cleaning result was very good on all the samples and easily meets the requirements of the automotive industry. The homogenisation of the basic layer of lube is an added benefit.'

Far more economical than washing machines

Cleaning with Sword Brush technology achieves results that are at least as good as those of conventional washing procedures that use emulsions and oils. In fact, as a rule, Sword Brush technology exceeds their cleaning performance by far. Maintenance and operating costs are considerably lower, however, than for conventional blank washers. This explains why several automotive manufacturers have already decided in favour of replacing their cleaning systems while revamping the press line. Wandres has developed a stand-alone cleaning unit with a precise conveying system specifically for these applications.