

Image: Wandres GmbH micro-cleaning

Tilting the blank towards the light makes particles visible to the naked eye. These must be completely removed before forming processes can begin.

# Effective surface cleaning for coils and blanks

Even microscopic particles can disrupt the production process. Cleaning systems developed by the Wandres Company are here to help.

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Particles and dust are produced as a result of many different industrial processes. Even the most minute particles, however, can compromise quality and cause rejections or costly reworking. Cleaning systems developed by Wandres GmbH micro-cleaning deliver optimal and reproducible cleaning results in continuous industrial operations, thereby promoting a stable and smooth production process.

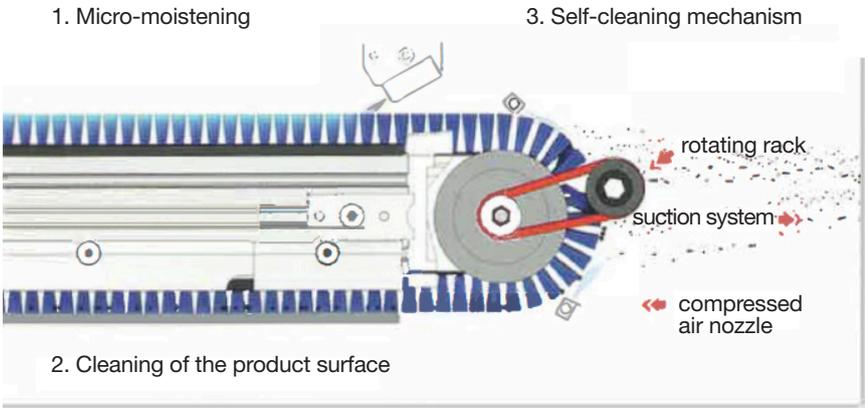
Particles need to be efficiently removed from product surfaces during production to ensure product quality remains uncompromised and guarantee a reliable production process. Wandres

A special cleaning procedure has been developed for cleaning after laser blanking

has developed cleaning machines designed specifically for this purpose. The cleaning modules can be individually tailored for integration into any manufacturing line. Sword Brushes wipe across the direction of transport and are available for widths of between 400 mm and 4.500 mm. Due to their narrow installation depth, these cleaning machines may easily be integrated into new or already existing manufacturing lines.

## Sword Brush Technology

The Sword Brush is a cleaning machine that utilises brush cleaning technology and wipes



The Ingromat process consists of three steps: micro-moistening of the filaments, cleaning of the product surface and self-cleaning of the linear brush.

crosswise across the surface being cleaned. The linear brush, a closed brush belt with filaments made of polyamide, circulates at constant speed around a sword-shaped guiding element. The use of linear brushes that are produced in-house by Wandres, guarantees the highest quality standards and the availability of replacement parts long term. The service life of the brushes in the sheet metal industry is 4,000 hours on average.

The Ingromat method was invented nearly 30 years ago by Claus G. Wandres. The principle is based on a micro-moistening of the filaments and the adhesive forces between brush filaments and particles resulting from this. Particles cling to the brush filaments and are transported to a self-cleaning unit where a rotating rack and compressed air jets detach particles from the filaments. The particles are then removed from the production environment by vacuum extraction.

The linear brush is constantly refreshed during the process. This ensures a reliable and high-performance cleaning operation that delivers repeatable results.

**Cleaning applications in the rolling mill and steel service centre**

Metal strip is cleaned prior to temper rolling to prevent particle-related indentations in the surface of the material. A large number of rolling mills deploy the Cevomat for this purpose. Using a total of four Sword Brushes, the Cevomat cleans fast-moving metal strip running at speeds of up to 800 m/min on both sides extremely effectively.

A unique feature of the Cevomat is that the brushes are lifted at the edges and lowered back down onto the surface of the strip a few centimetres further on. This extends the service life of the brushes when cleaning sharp-edged metal strip. The entire surface is still cleaned seamlessly as there are two brushes wiping from above and two brushes wiping from

To prevent quality issues and guarantee a reliable production process, particles need to be effectively removed from product surfaces during production.



## Surface & Edge



The Cevomat cleans steel strip at a galvanising plant using brush cleaning technology.

Image: Wandres GmbH micro-cleaning



The Evomat cleans blanks prior to lubrication and forming processes.

Image: Wandres GmbH micro-cleaning



Vacuum belt conveyors are cleaned non-stop from below to prevent a transfer of particles onto the blanks.

Image: Wandres GmbH micro-cleaning



Scanning this QR code gives access to a short augmented reality animation showing the cleaning of dry lube aluminium blanks and explaining the thermal self-cleaning function of the brush.

below, positioned one after another. The Cevomat is also deployed for cleaning steel strip after hot-dip galvanising and helps to improve product quality significantly.

Sword Brush technology is basically suitable for cleaning any kind of fast-moving metal strip whether it is hot-rolled or cold-rolled, electro-galvanised or hot-dip galvanised strip and hot-dip aluminised sheet metal made of steel, stainless steel, aluminium or non-ferrous metals. Sword Brushes can also be used in steel service centres for cleaning dry lube aluminium coil.

Not only the strip itself requires cleaning, a build-up of particles frequently occurs at the deviation rollers, too. To prevent these particles from being dragged onto the strip, the rollers can be cleaned very effectively by a Sword Brush. This straightforward procedure is the final step towards securing the surface quality of the metal sheet.

### Cleaning on the cutting line

Particle indentations in the metal strip that occur during levelling need to be avoided at all costs. On a large number of cutting lines, the upper and lower surfaces of the sheet are cleaned before the leveller using brush cleaning technology. The linear brushes are mounted on pneumatically regulated flexible buffers which guarantees a consistent wiping pressure on wavy metal strip. Parallel guides prevent the linear brushes from tilting into the direction of travel of fast-moving metal strip. The brush filaments will always meet the surface, therefore, at right angles and deliver consistent and high performance cleaning results.

Conventional stamping operations generate metal particles while laser cutting can create scorch marks and debris that sticks tightly to the edges of the cut line. Sword Brushes eliminate this type of contamination very effectively. To make this happen, a special procedure has been developed specifically for cleaning after laser cutting that enables the brushes to effectively remove even particles that are particularly firmly attached.

Trapped particles may be pressed into the surface of the blanks during stacking due to the heavy weight of the material. To avoid surface defects, a cleaning process prior to stacking is critical. Due to a narrow footprint, the Una HZ-BB cleaning unit can be directly integrated into the stacking system and clean the upper and lower surfaces of the blanks on the spot.

### Cleaning systems in the press line

Spotlessly clean blanks are essential in a modern-day press shop. Even minute particles can leave marks on the surface of the blanks and damage the press tools. The Wandres Company cooperates with several different manufacturers of lubrication

The non-stop removal of particles that accumulate on conveying systems is crucial to preventing recontamination of clean blanks.

systems to combine systems and supply integrated cleaning solutions together with lubrication. If blanks are cleaned by Sword Brushes and undergo the appropriate lubrication process immediately afterwards, then nothing stands in the way of an optimal forming process.

### Cleaning of dry lube aluminium blanks

The Evomat cleaning machine not only cleans steel blanks with oil-based lubricants effectively but also dry-film coated aluminium blanks. During the cleaning of surfaces that are lubricated with a dry-film lubricant, the filaments are sprayed continuously with a micro-thin film of Ingromat anti-static cleaning agent. The Ingromat minimises the adhesion of the dry lube to the brush filaments. When the brush wipes across the product surface, therefore, only a small amount of lubricant remains attached to the filaments. A thermal self-cleaning function then detaches the mixture of dry lube and particles from the filaments of the brushes. The liquified mass flows through heated suction connections into a cyclone separator where it is separated from the extraction airflow and deposited in a collecting bin.

Switching between dry-film lubricated and oily blanks is trouble-free and merely requires the application of Ingromat in pre-determined cleaning intervals to refresh the brushes. This prevents the transfer of any lubricant or particles from one material to another. The cleaning machine requires no retooling.

The non-stop removal of particles that accumulate on conveying systems is crucial to preventing recontamination of clean blanks. Sword Brushes are frequently deployed to clean the slack side of the conveyor belt beneath the transport level. This simple but very effective method prevents the build-up of particles permanently. ■