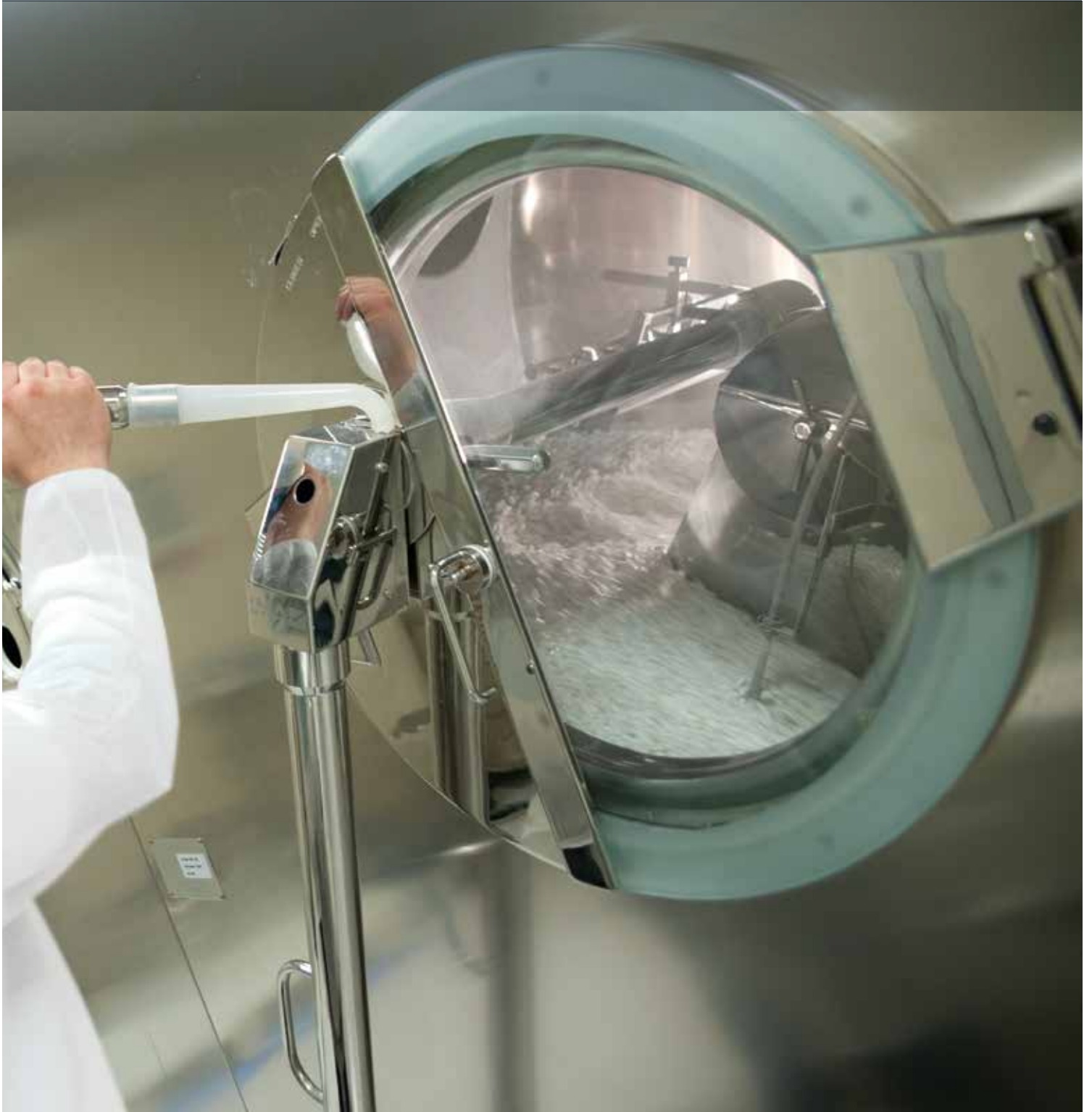


Pharma in focus - Dedicated vacuum and cleaning solutions





Nilfisk – Dedicated solutions for health, safety and productivity

Let us help you attain safety, hygiene, automation and product quality in pharmaceutical production

Of all the product sectors that Nilfisk operates in, pharmaceuticals is certainly the most demanding. Standards of hygiene, safety and productivity are extremely high, as they should be when the ultimate aim is to provide the user, with an effective product.

This is just one of the reasons why the manufacturing process of any type of medicinal product is often complex. Just consider the number of phases involved and the different substances being handled: from active ingredients handling to tableting, right through to the finished packaged product. The substances used can sometimes pose a risk to the health of the operator and are often characterised by a high intrinsic value.

So guaranteeing the highest levels of hygiene and safety is vital, in order to avoid any kind of contamination, exposure or direct contact with such products as well as ensure the highest productivity.

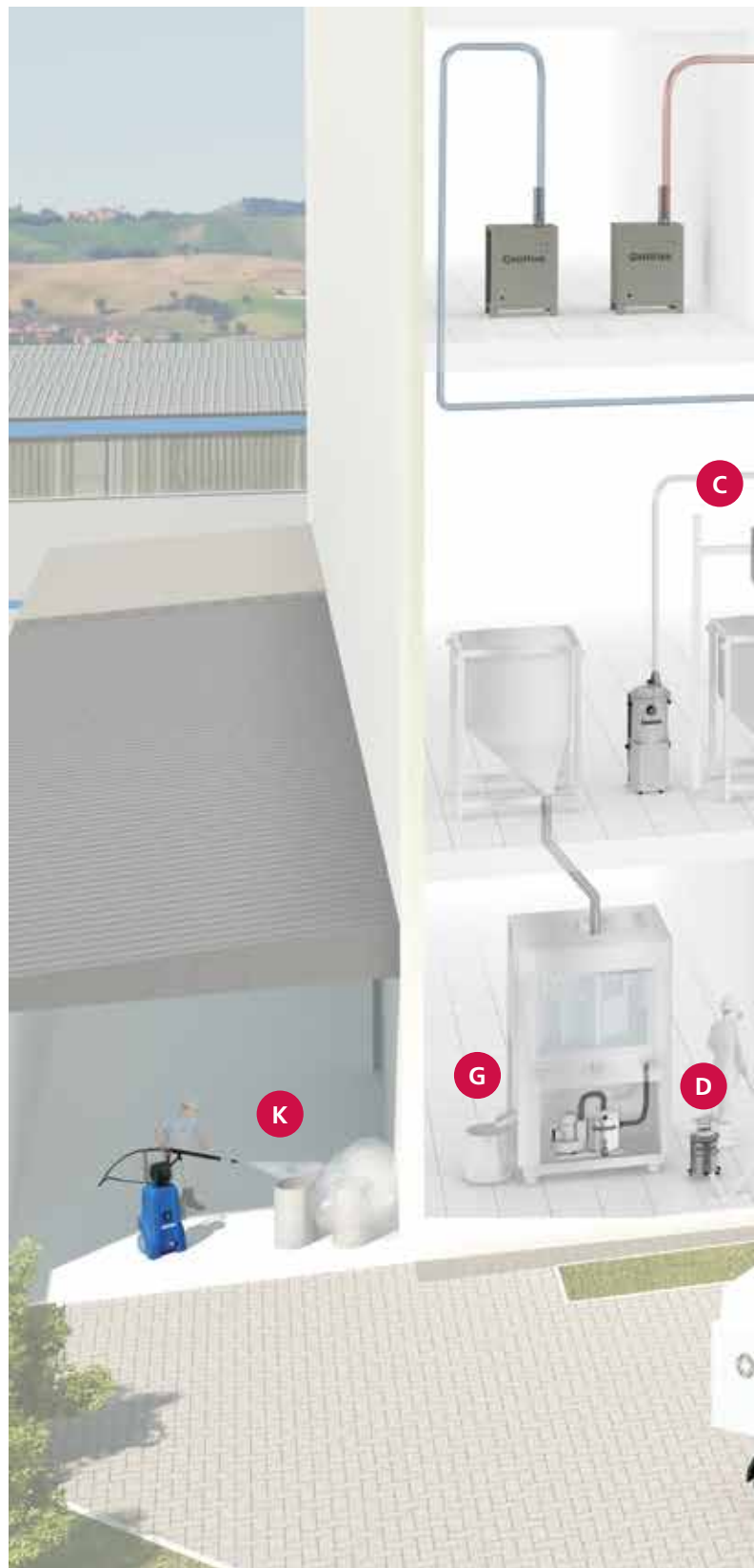
Therefore, with both its products and its thirty years of experience, Nilfisk strives to offer itself as the ideal partner for all those companies that work in what is a most complex sector, that of chemicals and pharmaceuticals.

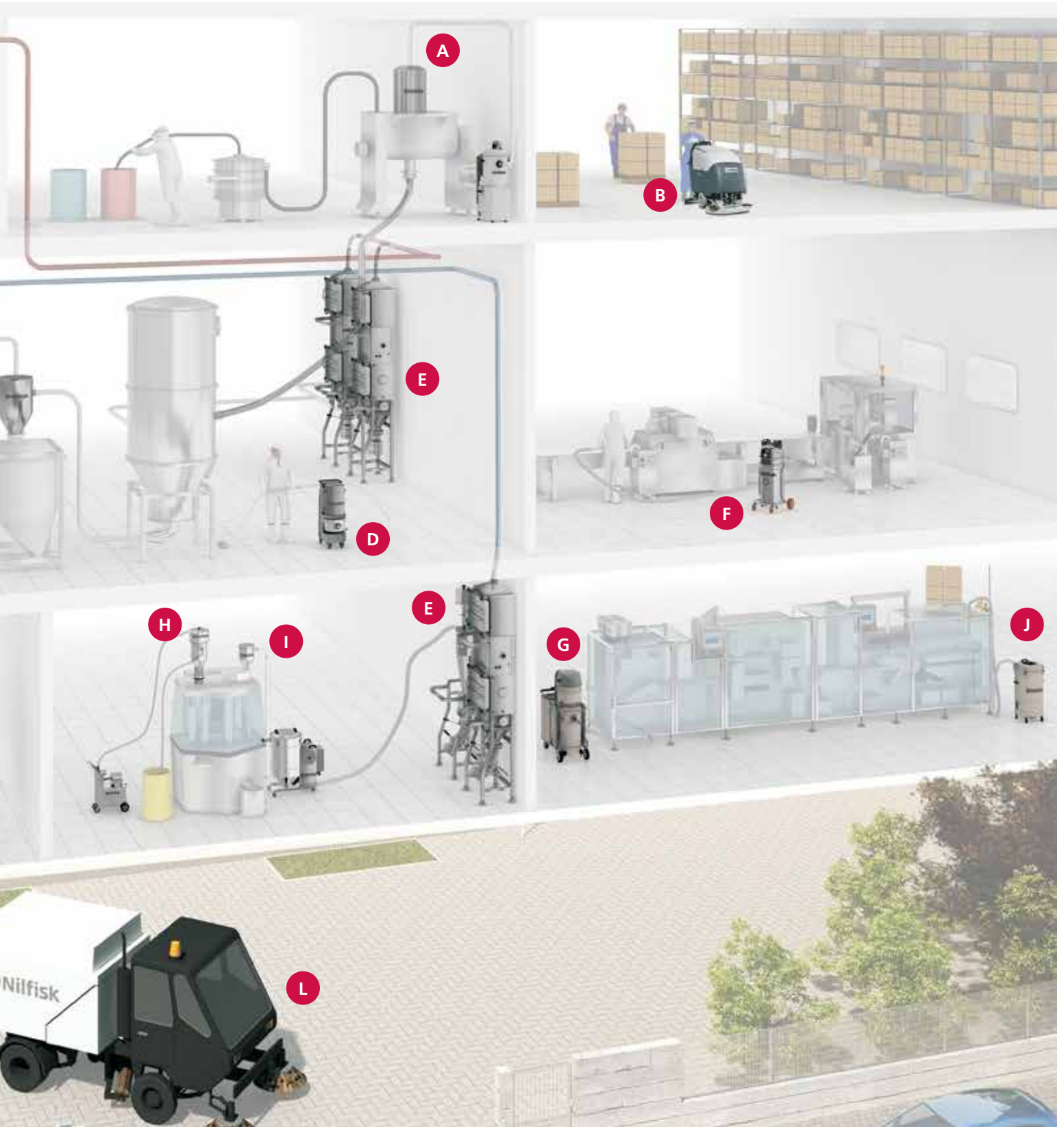
This brochure offers a fast overview of Nilfisk solutions provided by industrial vacuums, dust containment filter units, pneumatic conveyors, scrubber dryers and high pressure washers machines.

Discover more on www.nilfisk.com.

How Nilfisk machines can support your pharmaceutical production

- A** Feeding of a mixer
- B** Floor cleaning
- C** Powder conveying from a dryer to a bin
- D** Cleanrooms cleaning
- E** Dust containment
- F** Cleaning of equipment
- G** Recovery of dust from process machines
- H** Feeding of capsule filling machines with powder
- I** Feeding of capsule filling machines with empty capsules
- J** Recovery of scraps from blistering/cartoning machines
- K** Washing of equipment
- L** Outdoor cleaning





Conveying of powder and granules



Move the pharmaceutical mixtures preserving their integrity, keeping the percentages of the single components intact

Pneumatic conveyors move dry raw materials, such as powders and/or granules, to feed processing machines and systems such as reactors, mixers (ref. A), dosing machines, bins (ref. C), process machines (ref. H), blistering machines, etc... they can move the product from one to different points or viceversa without segregation.

Benefits:

- Moves the pharmaceutical mixtures preserving their integrity, keeping the percentages of the single components intact (validated by a study made in collaboration with the University of Parma)
- Avoids dust dispersion and product contamination: the conveyed material is kept in an isolated environment from the picking to the release point
- Increases the automation and the productivity.

Floor cleaning



Keep the highest level of hygiene of the floors, avoid any dirt to enter in the production areas

All around the production site, assuring maximum hygiene in the minimum time possible is key. The walk-behind Nilfisk scrubber dryer series offers comfort and productivity in a compact and easy-to-clean design. Floors are deep-cleaned and dried in one single pass, even in small and congested areas. The Nilfisk Ecoflex system lets you temporarily boost water and detergent for more aggressive cleaning tasks.

Benefits:

- Delivers total hygiene
- No contamination.

Cleaning of cleanrooms



Maintain a clean and hygienic environment

The key factor for cleanrooms is zero contamination. Maintaining cleanroom standards requires proper cleaning of all floors and surfaces with a HEPA-filtered vacuum. The most important element is the top feature is the filtration for high (HEPA) and ultra high efficiency (ULPA), depending on the nature of the contaminants to be controlled. Nilfisk can provide machines suitable for the most severe non abbiamo nessuna certificazione che dica che la macchina è per ISO4.

Benefits:

- Maintains the purity in the environment
- Collects and contains any kind of dust
- Deeply cleans any angle of the equipment, easily.

Maintenance and cleaning of the equipment



Avoid cross-contamination maintaining top hygiene levels

Nilfisk supports all critical cleaning needs with the most comprehensive line of dedicated vacuum cleaners: the "white line".

White line vacuum cleaners are specifically designed to be used to clean inside and outside process machines. Specific accessories and options are available.

Benefits:

- Avoids cross contamination
- Maintains the condition of the process machine
- Collects and contains all kinds of "waste"
- Dramatically reduces cleaning time
- Suitable for Atex environment, up to Z21.

Recovery of powder from process machines



G

Assure the highest product quality

Vacuuming is an integral part of medicine production process. The automatic machines require a constant vacuum to avoid residual dust contaminating the medicines or being released into the environment. Because the filter is a crucial element in the fixed vacuuming application, Nilfisk vacuum cleaners are equipped with HEPA and/or ULPA certified filters. Industrial vacuums are important tools in pharmaceutical production: they provide quality and maintain safety.

Benefits:

- Top product quality
- Top safety
- Top automation
- Top air quality control.

Conveyance of empty capsules



I

Gently move empty capsules without opening or damaging them

A pushing system is frequently used to move and transfer empty capsules of different sizes to the filling machine, preserving their integrity. The machines move the material to the required location in the selected quantities and within the desired time. The product conveyance process takes place in perfect hygienic conditions, respecting both the environment and the operators' health.

Benefits:

- Gently moves empty capsules of different sizes
 - preserving their integrity and avoiding unwanted opening
- Avoids dust dispersion and product contamination: the conveyed material is kept in an isolated environment from picking to the release point
- Increases automation and productivity.

Dust containment



Avoid any possible contact with toxic materials

The recovery of APIs and HPAPIs requires special devices and features to protect the operator from contact. Nilfisk has designed a high containment filter unit (up to OEB5) for this application. It is available in several versions, from standard to specially customized.

Benefits:

- Containment level up to OEB5
- HEPA14 absolute filtration
- Safe replacement of filters and disposal of collected material
- 'Wash In Place' to deactivate dust into the unit
- Validation of the unit before installation
- Suitable for combustible dust
- Easy to clean and sanitize.
- Complete disconnection of the filter unit from the vacuum line at the end of the operation to avoid cross-contamination
- 24/7 operating machines
- High capacity container
- Easy replacement of filters and consumable parts

Recovery of packaging scraps



Increase productivity, avoiding machinery downtime and recovering continuously trims

Using a Nilfisk industrial vacuum from the "R" series which has been designed specifically for packaging applications, eliminates interruptions to clean the cutting machine. The trim-extractor collects the waste continuously while the machine is running.

Benefits:

- No machinery downtime
- Keeps packaging machines in perfect condition
- Easy and fast disposal
- Rooms and warehouses always clean.

Washing of equipment

Outdoor cleaning



Maintain and clean any kind of equipment using cold or hot water high pressure washers

Keep the outside of your business clean and tidy

The Nilfisk family of mobile high-pressure washers can cope with the toughest of cleaning situations. You can trust them to do the job in a wide range of settings, including pharmaceutical.

A full range of highly effective outdoor cleaning and maintenance machines help you with 4 main operations: Suction sweeping, lawn mowing, street washing and snow removal.

Benefits:

- Wash equipment in minutes
- Maintains efficiency of the production site.

Benefits:

- Sparkling areas around facility
- 4 seasons cleaning and maintenance with one and same machine
- Dust control during suction sweeping with PM10 certified sweepers
- In winter - safe footpath secured against slippery weather

Accessories and Optionals

– Even more safety with specific accessories and optionals

Upstream absolute filter kit (HEPA H14)

Used for obtaining the maximum filter efficiency for incoming particles. Filters 99.995% (method MPPS) of particles with a diameter of 0.1-0.2 micron. Acts as a backup filter should the primary filter fail. Instruments available to indicate the degree of clogging of the absolute filter.

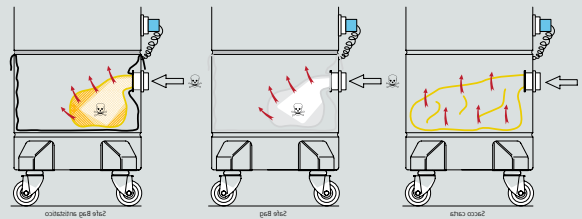
Downstream absolute filter kit (HEPA H14, ULPA 15)

Used for obtaining the maximum filter efficiency for exhausting particles. Filters 99.995% (method MPPS) of particles with a diameter of 0.1-0.2 micron. Instruments available to indicate the degree of clogging of the absolute filter element hence when it's due for substitution.



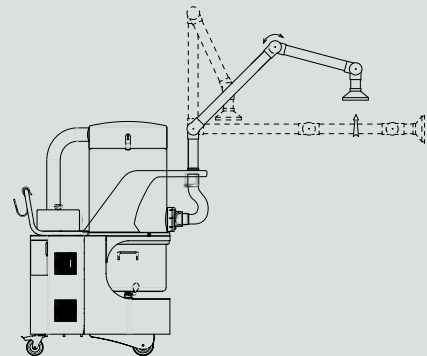
Paper bag, safe bag and anti-static safe bag

The container, which can be exchanged with the original, is able to house the paper bag or safe bag. The safe bag system can be used to collect toxic powders and has a safety closing system that upon its removal prevents the user from coming into contact with the vacuumed product.



Vacuum arms kit

Provides a possible solution for extraction directly on the production line or powder pick-up point. The system has adjustable vacuum arms and hoods.



Nilfisk accessories for pharmaceutical

applications are designed to meet any possible need in terms of safety, hygiene and efficiency. Accessories quality is at the top: FDA certified, the metal parts are made in stainless steel AISI 316L, they can be sterilized in autoclave.





All Nilfisk machines designed for the pharmaceutical industry present a high level of specialisation able to satisfy even the most demanding requirements. From appliances constructed entirely in stainless steel and certified to operate in potentially explosive environments, to machines that are capable of operating inside clean rooms, to filtration and containment systems for hazardous dusts that operate in complete safety.

Thanks to Nilfisk global presence the wide range of products is accompanied by a far reaching client-oriented pre- and post-sales service. In a chemical-pharmaceutical context where needs are often diverse or, in some cases, change quite quickly, it is essential that a company is able to supply made-to-measure, customised solutions: the right solution for every need. This is the Nilfisk philosophy. These are the benefits we pass onto you.