UNIGRIPPER
Intelligent Vacuum

UniGripper Sweden
Product Guide 2024

Product of Tepro
Machine & Pac Systems AB

Industry Solutions

UNIGRIPPER Intelligent Vacuum

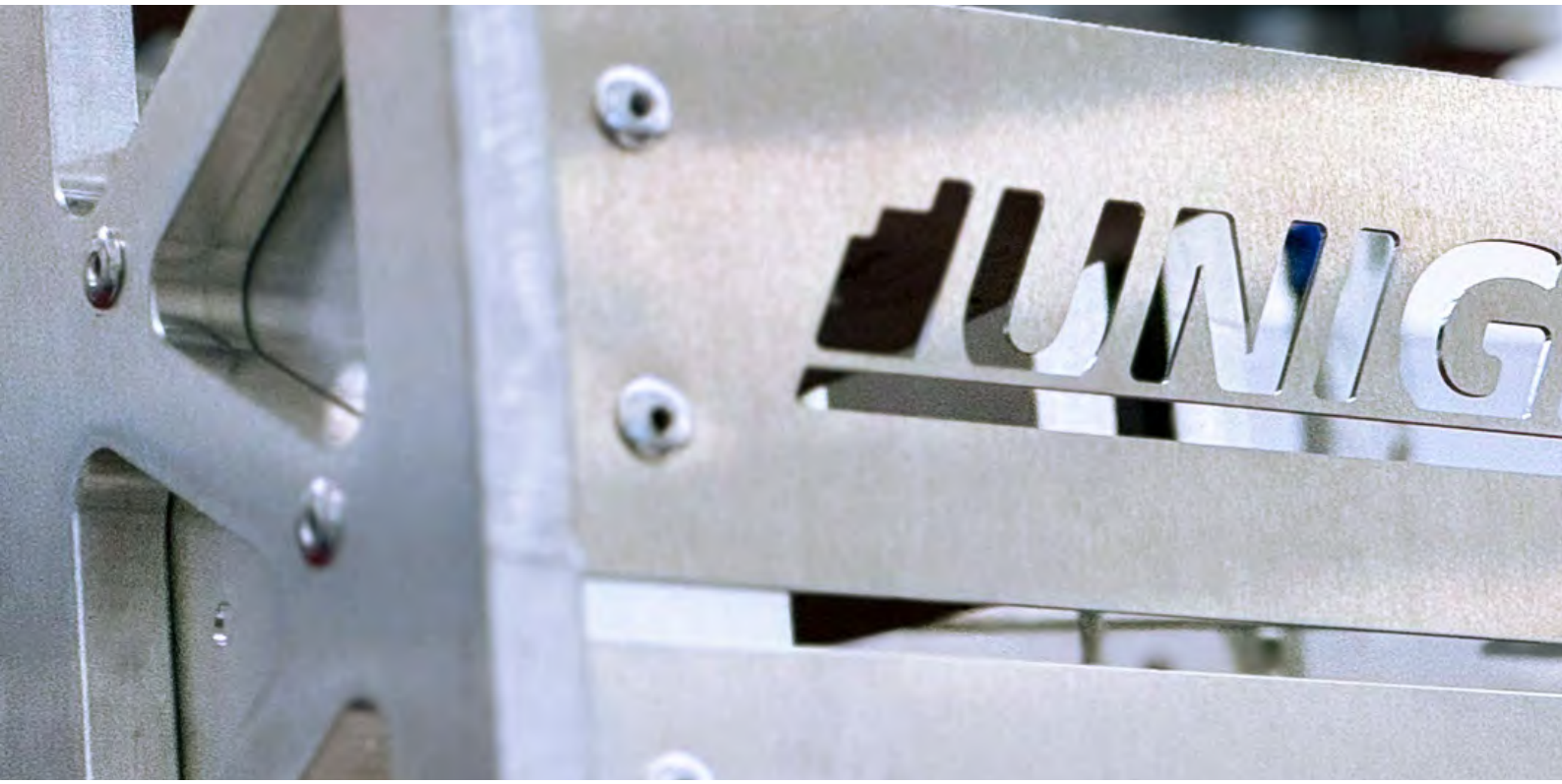
TEPRO MACHINE & PAC SYSTEM

Industry solutions

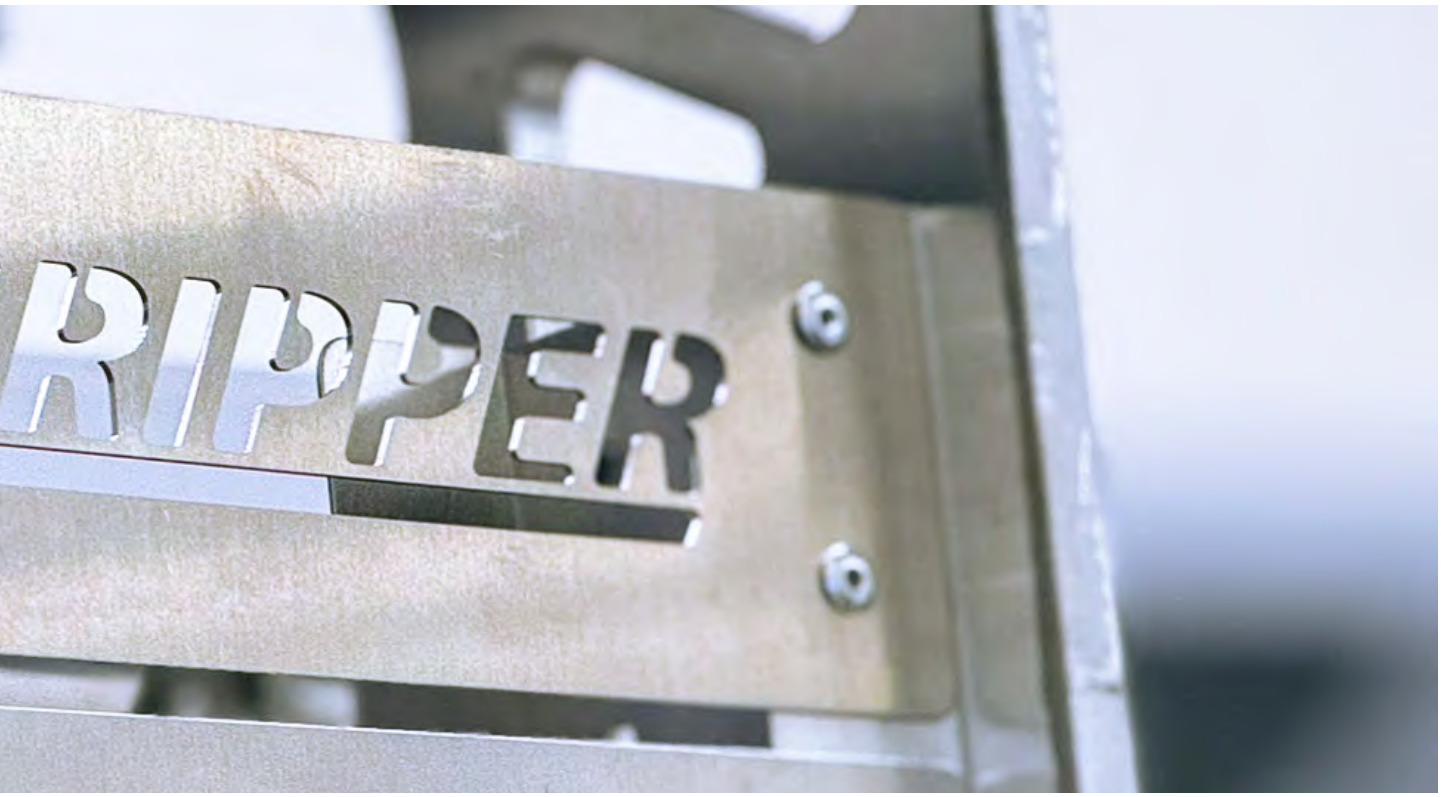
Powered by vacuum technology

UniGrippers are used in almost all industries imaginable — from handling of sensitive medical equipment to boxes on open-sea fishing boats and packages of money at national banks. These grippers all have in common that they are based on the UniGripper Customized concept, which is further described on the next pages.

The UniGripper customized concept is easily adaptable to any kind of industry. The table of contents to the right list handling scenarios which are the most common for us at UniGripper, but every day is a variation of these scenarios and new ones.



A key for most UniGripper applications is an efficient and reliable vacuum generation. At UniGripper we use the most effective vacuum generators, from small to very large grippers as well as a large set of vacuum generation accessories to make the installation of the entire vacuum gripping system quick and easy.



The #1 Supplier of Customized Foam Grippers

A Swedish Success Story

When Tepro Machine & Pac System AB delivered the first UniGrippers in the year 1997, and thereafter released the official UniGripper products to the world market, nobody expected that the technology based on the patented valve technology would be so versatile that we could expand our line of business from picking full layers of open jars to almost any product. We evolved from offering simple tools to supply complete solutions to the most challenging product handling tasks.

Defining Principles

At the heart of our company's beliefs are six important values that have guided UniGripper from the very beginning. These values aren't just words; they're what define us and how we operate. At UniGripper, we stick to these values every day. They help us make choices, create new ideas, and show how we work with our customers, partners, and network. They reflect our strong commitment to ensuring the best customer experience, being honest, and always trying to improve.

01 Our Flexibility

The UniGripper concept was first drafted with flexibility as its north star. Our efficient implementation means great flexibility for our customers.

02 Focus on Optimization

At UniGripper we see the process of optimization as a necessity for any great tool. Our grippers are selected by optimizing multiple parameters.

03 Our Experience

With close to 30 years in the industry, and thousands of projects completed — our most valuable asset is our experience.

04 Product Maintainability

The success of any tool is measure in its runtime, therefore UnIGripper is designed to provide short downtime with optimized maintainability

05 Close Working Relationships

Installing automation is a long process, and our favorite part of the job is making sure our clients get the best possible solution.

06 Quality Results

UniGripper is built to last, and there's no proof better than the grippers that were delivered almost 3 decades ago and are still running at 100% capacity.

Intelligent Vacuum

UniGripper, with its patented valve technology, applies the vacuum only on the products to be handled. Thus avoiding unnecessary losses. While others have tried to copy this technology, UniGripper has developed the technology further and further. Even the smallest component of an UniGripper is fully customizable to the customers need. Together with the several types of foam, UniGripper is capable of being a total solution provider for EOAT. UniGripper can deliver everything from vacuum-based tools to mechanical solutions, whichever suits the task best.

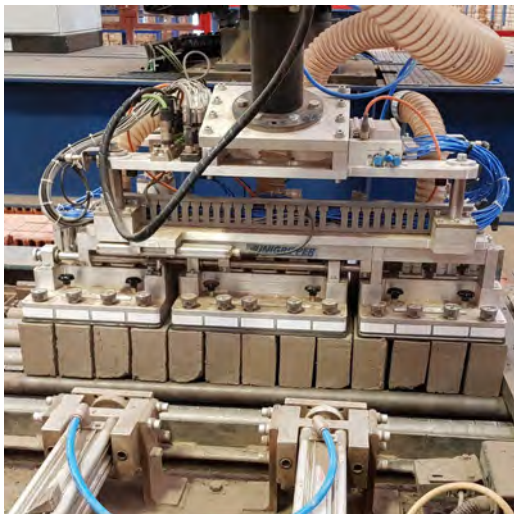
How do I choose the best gripper for my use case?

Reach out to us and tell us about your requirements and let us make a recommendation:

1) Type of product(s) / material(s) to be handled
2) Average dimensions of the material
3) Average weight of the material
3) Average daily volume that needs handling
4) Size and weight variation in the material
5) How the product(s) or material(s) is to be handled
   (cycle times, multiple pick/release, palletizing or depalletizing,
   single or full layer etc)
6) Operating conditions (temperature, humidity, space limitations etc)

We also have a selection of standardized grippers that are available off-the-shelf, low cost and have a wide range of applications.

Learn more at: www.unigripper.com









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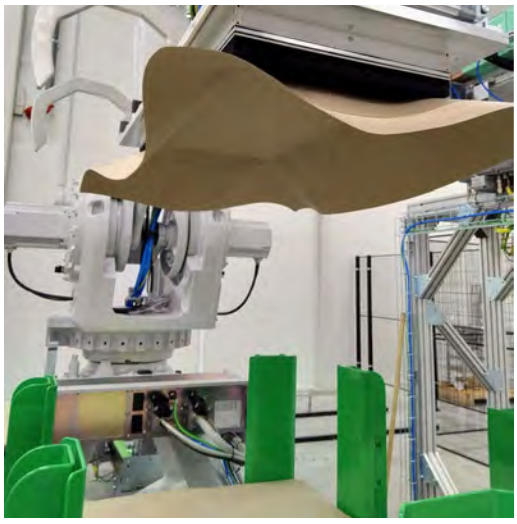




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GRADE A
LARGE EGGS


UNIGRIPPER

Customization is our Standard

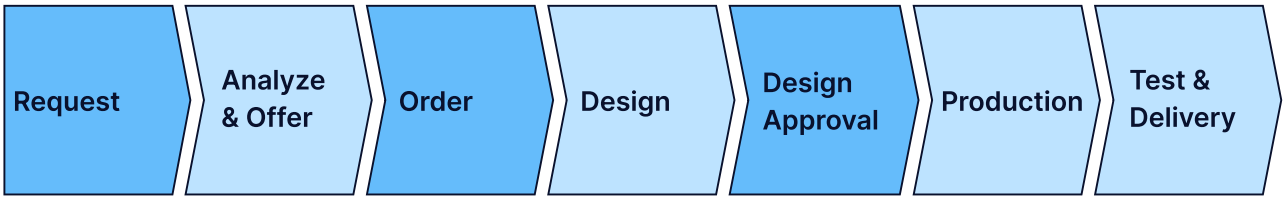
Most automation projects are unique to some degree. Anything from size constraints at the location of installation to specific properties or combination of products make one handling scenario different from another. UniGripper's answer to this variation is UniGripper Customized.

UniGripper Customized combines decades of experience of what is the optimal solution for every project with an efficient way-of-working for designing and manufacturing this solution in a fast and cost-effective way. Fact is; the time from ordering a UniGripper Customized solution until receiving it, is no longer than the delivery time of many standard components. The short delivery times coupled with the function guarantee we provide with a UniGripper Customized solution makes it the natural choice also for time-critical projects.

The flexibility of the UniGripper Customized concept combined with the know how of the UniGripper organization make us a great partner for all steps of an automation project, from pre-studies to implementation. We take pride in delivering high-quality solutions that are easy to maintain and last for decades also in demanding production environments.

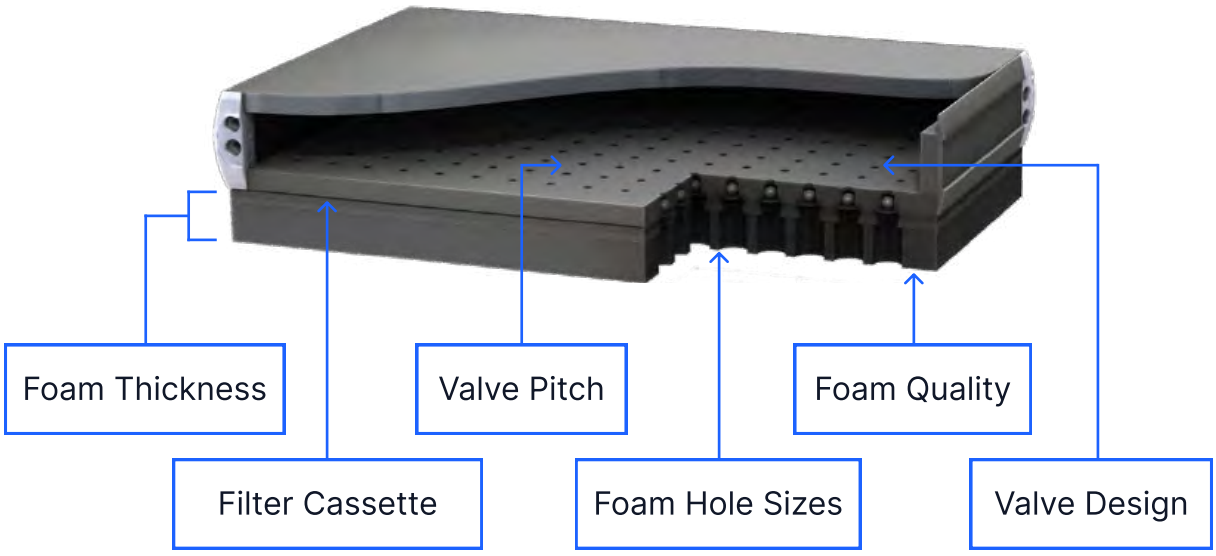
The UniGripper Customized process

Below are the main steps in the UniGripper-Customized process, ranging from a request until installation of the UniGripper at the final implementation site. The steps are carried out in cooperation with you as a customer, sorting out important aspects from a gripper perspective at an early stage, reviewing the gripper design together to make sure it is fit for the entire installation and after production, test and delivery and making sure that the installation is made in the best possible way.



Designing the UniGripper

Below are the main parameters that are customized in the UniGripper base plate. Selecting the right configuration for all parameters ensures a good function that lasts for many years and minimum maintenance needed.



Valve Pitch

Selected carefully to get a good distribution of vacuum force and securing enough active valves also on the smallest objects to be handled.

Valve Design

The intelligent UniGripper valves are crucial for optimal gripper performance, tailored for each application to ensure solid functionality & efficiency. Ruggedized design for high performance in dusty environments.

Filter Cassette

The foam carrier assembly is also the enabler for the filter cassette, a removable filter between the foam carrier and the rest of the gripper also serving as a gasket.

Foam Thickness

The thickness of the foam pad controls how much height variation a gripper can handle. Both height variations within single objects and over entire layers are considered when selecting the proper thickness for an application.

Foam Hole Sizes

The hole-size in the foam pad is related to which lifting forces are generated on the lifted objects, but experience shows that maximizing holes size area is not always optimal. A careful selection is made from application to application.

Foam Quality

UniGripper offers a variety of high-quality foam materials with different properties suitable for different applications. Cycle times, roughness and unevenness of handled materials are important factors for selecting the right foam quality or combination of qualities.

Accessories

UniGrippers can be customized with a multitude of different accessories to increase the versatility of the tool and make the integration and implementation of a project as quick and easy as possible. The accessories range from function to improve the vacuum performance, to functions that add additional handling capabilities of for example pallets and slip-sheets, to control mechanisms like valve and input terminals that makes the installation of the UniGripper a plug-and-play operation.

Swibot

Swiveling vacuum connection into the center of the gripper for 360°-rotation without rotating the vacuum hose

Swivel Joints

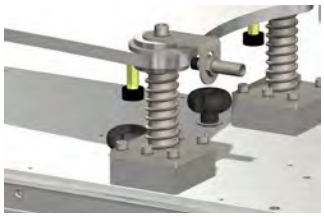
Swiveling vacuum connection helps to prevent twisting of the vacuum hose when moving and rotating.

Robot Spacer

To create extra space between the gripper and the robot arm for increased flexibility in robot movement

Sidegripper

Side Grippers are used in order to elevate the capability of the UniGripper, especially when handling heavy products.



Floating Attachment

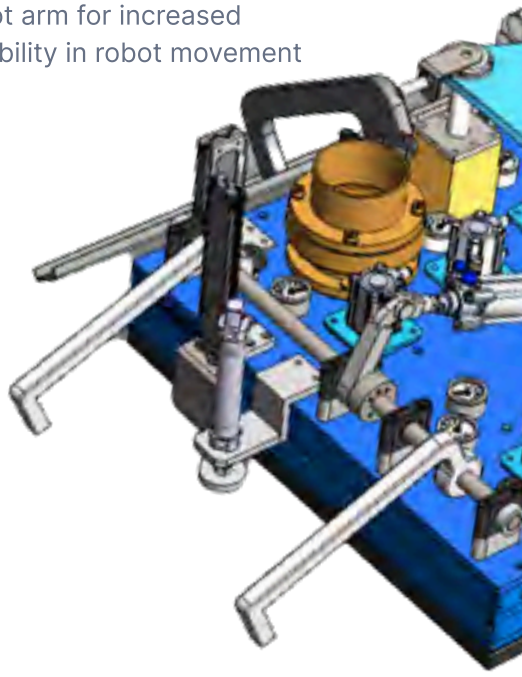
Supports finding optimal picking position and foam compression when products or layers are tilted or at unknown height.

Pallet Hooks

Splinters, nails, debris shorten the lifespan of the foam. Pallet hooks lets you avoid unnecessary maintenance by safely handling the pallets.

Slip-Sheet Handling

The UniGripper can pick up and remove slip sheets using cylinders with suction cups and an in-line vacuum generator.

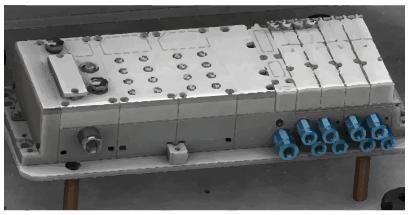


Preloader

A preloader enables with small footprint, the possibility to shut off one or more grippers in a multi-gripper system and allows the side-channel blower to buffer vacuum in the hose system.

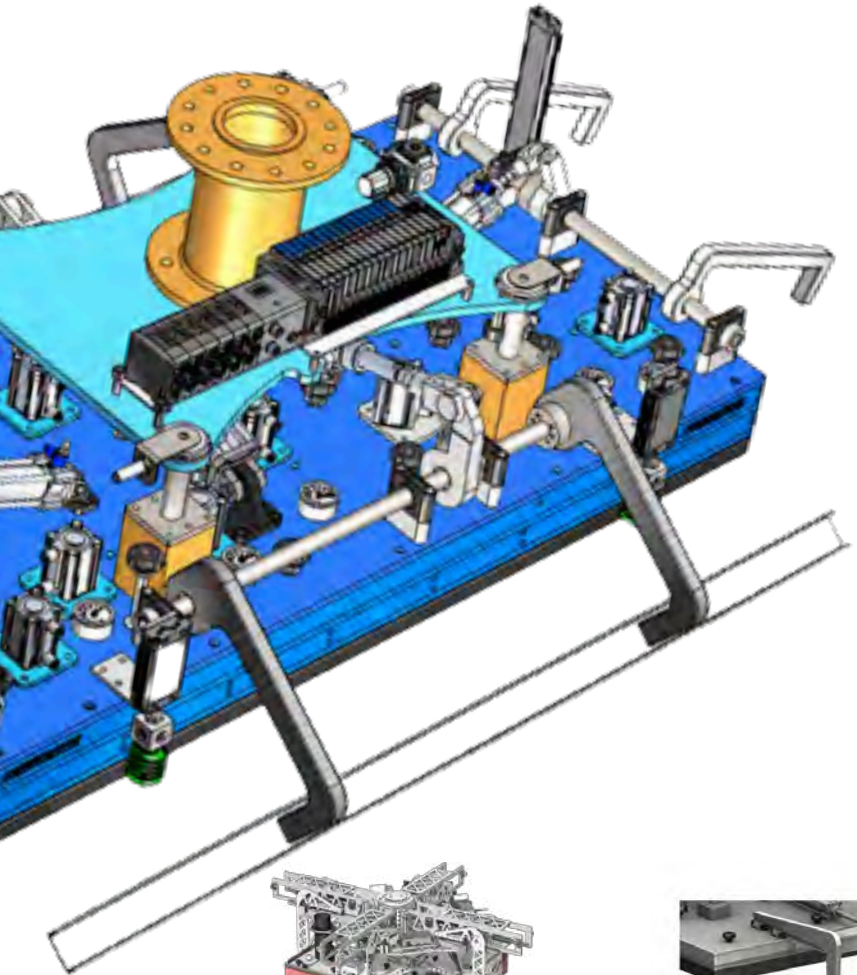
Slide Valve

With low height, a slide valve enables the possibility to shut off one or more grippers in a multi-gripper system and allows the side-channel blower to buffer vacuum in the hose system.



Valve Terminals & Dressup

Valve terminals can be assembled on the gripper with all pneumatics and wires nicely routed on the gripper to provide a true plug-and-play experience when installing your UniGripper. We can supply our tools with or without electrical & pneumatic dress up.



Curtains

Curtains are used in order to maximize the airflow in the middle by preventing the flow to escape on the sides.

Side Clamps

Side clamps are fixed side supports for keeping products together and provide support for high lateral accelerations

And much more...

These are just some of the most frequent accessories for UniGrippers. New accessories are constantly being developed.

Vacuum sources

Ejectors

Ejectors are vacuum generators using compressed air and the Venturi principle. Ejectors benefit from being easy to install as well as having lower investment cost for small to mid-size gripper, provided a compressor is already available in the factory. UniGripper ejectors are assembled into housings in three different sizes, which in turn can be configured with one or more active Venturi cartridges. When analyzing a request for a UniGripper Customized solution, the UniGripper sales team configures the gripper and the vacuum source together to select the optimal number of housings and active ejector cartridges to get the best trade-off between high vacuum flow and energy consumption in the compressor.

Ejector solution examples

-ES — Silent Power

Exhaust with extra silencing for environments where low operating sound level is key.

-ER — Reversing

Exhaust with integrated reverse blow function for efficient cleaning of the gripper and the ejector itself.

-E — Cost Effective

Cost-effective exhaust for applications without extra silencing or cleansing needs.

-EB — Basic

Compact and simple vacuum pump in a single configuration.

UVR-E30

For smaller grippers or space constraints. Provides several mounting options to allow the ejector fit into smaller spaces.

Electric Power Supplies

Side channel blowers are a common solution we use for grippers using an electric power supply. A side channel blower uses an impeller to remove air from the inlet and push the air out at the exhaust, thus creating vacuum in a gripper connected to the inlet. Compared to other blower kinds, side channel blowers are cost-effective blowers that generate high vacuum flows from atmospheric pressure to medium-deep vacuum levels, which is the ideal depth for most gripper applications. Side channel blowers are mainly beneficial for mid-size to large grippers where the running costs with a side channel blower can be many times lower than if vacuum is generated using ejectors.

UniGripper works with leading manufacturers of electric power supplies to provide high quality blowers & pumps in different sizes depending on application.

In addition to supplying the electric power supply, the UniGripper program also includes a variety of components that make the installation of the vacuum system smooth and easy. Several of these components are listed below, but there are other smart accessories like relief valves included, which automatically helps to protect the blower from overheating.

Electric Power Supply examples

Side Channel Blower

Side channel blowers use an impeller to remove air from the inlet and push the air out at the exhaust.

Rotary Vane Pump

Rotary vane pumps compresses air to create a void where vacuum is created.

Two Stage Side Channel Blower

Two-Stage blowers convey the air to a second stage after one rotation. This leads to higher differential pressures.

Hose Connections and Routing

UniGripper's own-developed swivel joints are popular accessories when routing the hose along the robot arm.

Installing the swivel joints at positions where the hose otherwise would twist increase lifetime of the hose and makes the installation easy.

Hoses

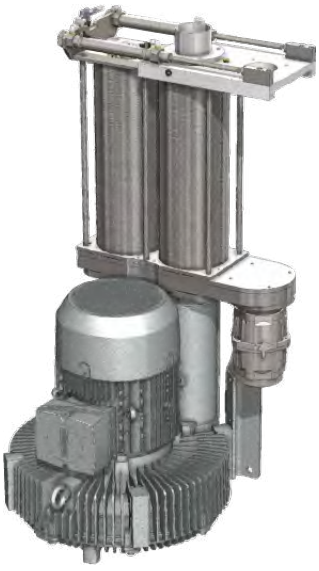
Most industrial vacuum hoses are not made for the dynamic installation the routing along e.g. a robot arm means. UniGrippers delivered with side channel blowers are supplied with high-quality vacuum hose of the right dimension for each application.

Filtration

Dusty environments may require filtration, both for protecting the gripper and the vacuum source. The filters in UniGripper itself can be complemented with external filter systems to provide extra protection for the side channel blower.

Reverse Blow Units

Side channel blowers generate a continuous vacuum flow and a continuous exhaust flow. The UniGripper reverse blow unit is used to switch the connection to the gripper between the vacuum flow and the exhaust flow. This enables a fast release of the products as well as an efficient cleaning of the filtration systems. The reverse blow units are available in several sizes depending on what vacuum flow level is needed for a specific application.



UniGripper Silent Power

Silent power . UniGripper's compact sound enclosure for side channel blowers, providing premium noise reduction for blowers . All sizes. The Silent Power sound cabinets come in a compact design which makes them easy to ship and install. The cabinet.... Also, integrates a reverse blow unit and thus only requires a hose to be routed to the gripper.

The standard version of the sound enclosure is small enough to fit in a EURO-pallet and low enough to enable conventional airplane freight, if needed. UniGripper Silent Power is delivered with complete wiring, ready to be connected to power supply and control cabinet

UniGripper Silent Power comes in two sizes, one size for vacuum flows up to approximately 1000m3/h and one for flows up to approximately 1500m3/h. UniGripper Silent Power reduces sound levels around 10-20 dB. From app. 80-90 dB without the silencer cabinet to app 65-75dB with the cabinet. Exact level that is reached depends on blower model and application.

Partial Layer Handling

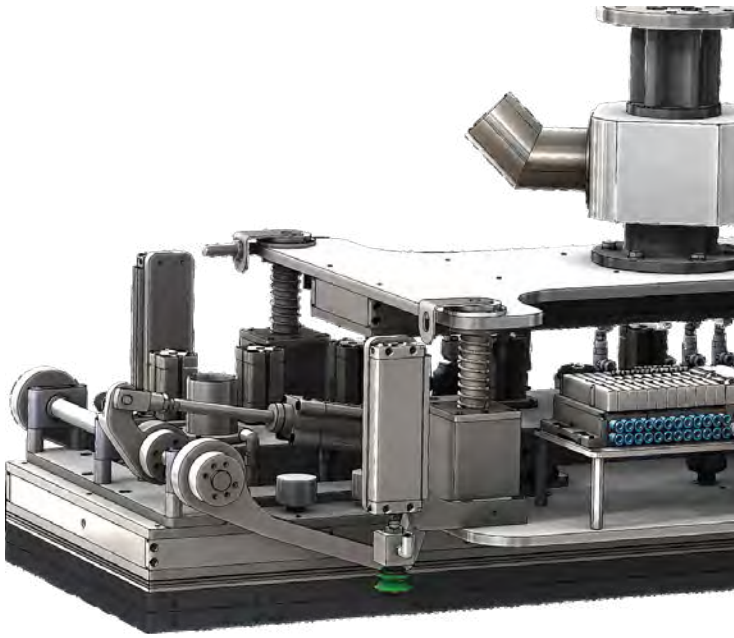
Palletizing using vacuum grippers provides a storage- and cost-effective solution for creating pallet patterns for different products at the same time and same place as palletizing is achieved.

Grippers can be designed to handle anything from single cases to semi layers. By dividing the gripper into zones, vacuum can be applied at some areas of
the gripper surface while other parts are inactive. Such solutions cater for optimized cycles as the gripper can pick a full row of cases and the release them at different positions, only making small robot movements between each release.

Palletizing of boxes, trays and shrink wraps can be enabled with the same UniGripper. Depending on product properties as well as what is most optimal for each installation, the vacuum source can either be venture ejectors or a side channel blower. Partial layer tools often do many rotations and the UniGripper product program includes many accessories that make it easy to achieve such movement irrespective of which vacuum generation technology is used. The UniGripper accessories program also includes all add-ons to make the palletizing tool complete for handling pallets and slip sheets, etc.

Optimizing the Cycles

For high-speed applications with extra difficult products the UniGripper can also be equipped with side clamps or side grippers to withstand excessive centrifugal forces. Grippers with multiple zones can be equipped with fast-release mechanisms to automatically blow compressed air into zones where vacuum is deactivated.



Full Layer Handling

UniGripper LayerGripper is a well-proven concept for palletizing, de-palletizing or re-palletizing products in full or semi layers. The products include all kinds of boxes and shrink wraps as well as closed and open trays and crates. The LayerGripper has the patented UniGripper intelligent vacuum technology as a basis and combines this with supportive technologies, such as side-bar clamping, servo positioning of clamping height and vacuum sealing curtains depending on complexity of the layers being handled.

UniGripper LayerGrippers can be equipped with many accessories, such as hooks for pallet hand-ling, suction cups for lifting slip sheets and floating attachments for automatic alignment of the LayerGripper with the layer. The UniGripper LayerGripper is offered as a complete system including selected side channel blowers for vacuum generation and smart solutions for the installation of the vacuum hose.

Vacuum Gripping

Vacuum gripping is the common function for all UniGripper LayerGrippers. For many products, the vacuum force generated through the intelligent UniGripper valves is quite sufficient to safely and quickly lift and move the layers. The vacuum technology is flexible for product variations and future changes in the products and the foam pad sealing the vacuum on the products caters for a gentle handling of also sensitive packages.

Side Skirts

Side skirts allows vacuum to be applied on a complete product layer whereas vacuum gripping in general focuses vacuum on each case. Side skirts are useful for products where it is difficult to create vacuum on the top pf the product, e.g. shrink-wrapped PET bottles, or when the top is mainly open, like open trays. Side skirts can also enable lifting multiple layers in one lift.

Clamping

Side clamps are used as the sole mechanism for lifting some kinds of products, most typically crates for soda bottles and similar. Clamps also provide stability when lifting products with vacuum and can allow higher accelerations and thus shorter cycle times. Depending on need UniGripper LayerGrippers can be designed to allow adjustment of the clamping height in cases of large variation in product height.

LayerGripper Ed. 4 — All forces combined

UniGripper LayerGripper Edition 4 is our most dynamic LayerGripper, combining powerful vacuum gripping, automatically height-adjustable side clamps and flexible side skirts for a truly versatile layer handling. The most common use case for LayerGripper Edition 4 is re-palletizing in distribution centers where a single grippers have showcased handling of more than 10000 different articles. The weight of LayerGripper Edition 4 is optimized to allow that the most common use cases can be enabled with robots of payloads around 500kg.

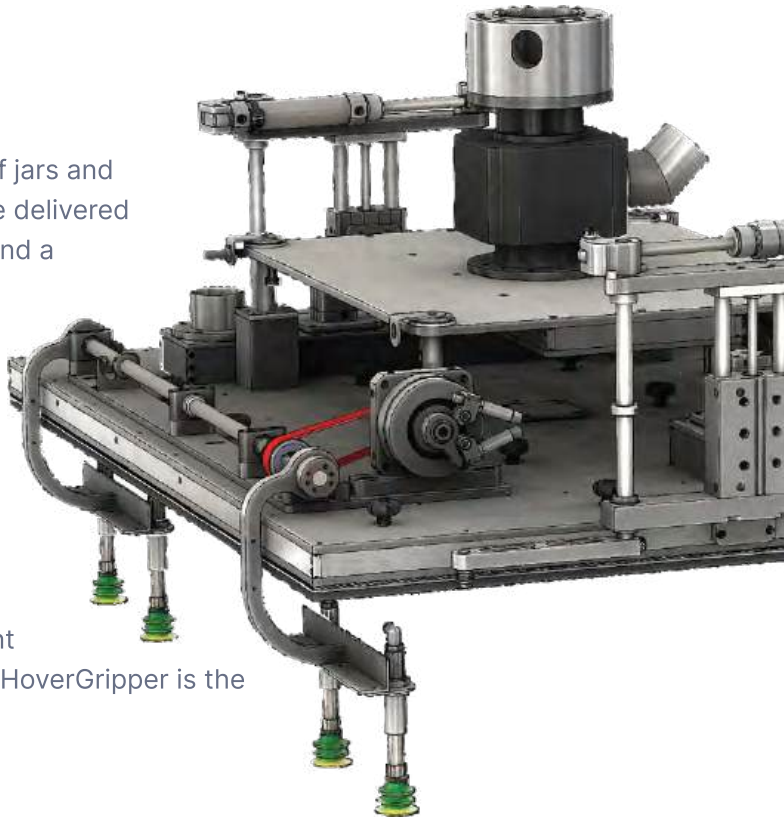
Jar and Bottle Handling

UniGrippers for handling jars and cans provides the ability to handle large variations of open or closed containers. The intelligent vacuum technique allows a single gripper to handle various sizes without any kind of modification of the gripper head. The jars and cans can be of almost any material, such as glass, metal, paper or thick plastic. Grippers can be configured to handle everything from rows to partial or full layers.

Each Unigripper is customized according to sizes of current and future products. All parts from valve design to source for vacuum generation are optimized to make an energy efficient and versatile solution. UniGripper JarGrippers can be equipped with many accessories, such as hooks for pallet hand-ling, suction cups for lifting slip sheets and floating attachments for automatic alignment of the gripper with the jars.

Autoclaves

Autoclave applications typically mean handling of jars and cans. All aluminum parts in the UniGripper can be delivered anodized to cope well with moist environments and a special foam-pad design.



Implosive Cans

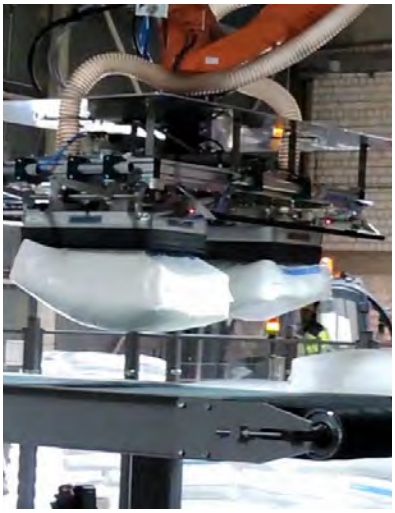
Cans and other containers of paper aluminum or plastics may implode also at relatively modest vacuum levels. UniGripper can be configured for such scenarios and restrict the vacuum level to prevent implosion. For thin-walled containers UniGripper HoverGripper is the best option.

High Versatility

Clever gripper designs allow the realization of grippers that without any reconfiguration can handle closed and open jars and closed tin cans with and without lid-opening flaps. For de-palletizing applications with high degrees of layer dome shapes, extra flexibility in the floating attachment can be added to handle also these scenarios.

Bag Handling

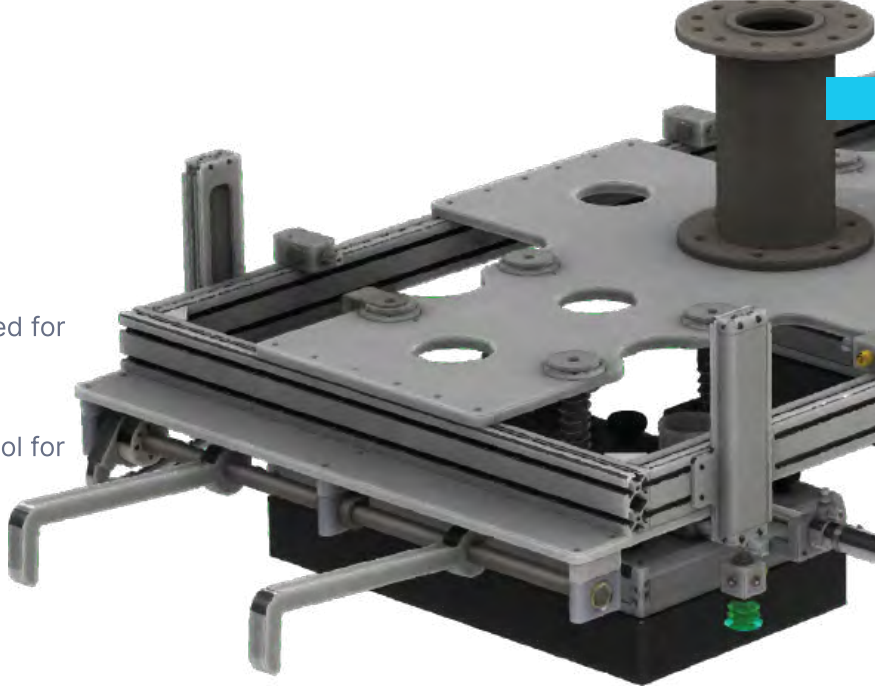
The UniGripper BagGripper comprises customized grippers for bags, pouches and similar products of almost any size. Most commonly the BagGripper is delivered with a side channel blower, efficiently providing high vacuum flows and the ability to handle very loose bags where alternative solutions often fail. UniGripper BagGripper is the ideal solution for bag depalletizing as vacuum is applied at the top of the bag and there is no need to have access to the sides or bottom of the bag. The BagGripper is as standard delivered with a floating attachment, which allows the BagGripper to automatically align with the bag even if the bag is not aligned horizontal when picking.



Bag Grippers for small pouches can be delivered with quick valve systems to switch vacuum on and off swiftly, allowing implementation in ultra-fast pick and- place applications. For high-speed, low-payload robots, the Bag-Grippers can be made using additive printing techniques for lowest possible weight. The BagGripper is flexible in handling bags in different sizes. In cases where there are very large variations in bag size, the foam carrier system enables fast switching of foams suitable for different size ranges. The foam carrier system also caters for short maintenance stops. The unique and adjustable center piece enables an optimized grade of the bag to be held by the UniGripper.

Combination Tools

Applications may sometimes have the need for lifting both bags and for example boxes. UniGripper can offer combination tools comprising a BagGripper and a general tool for handling other objects. This removes the need for tool changers and allows the same vacuum source to be used for all objects.

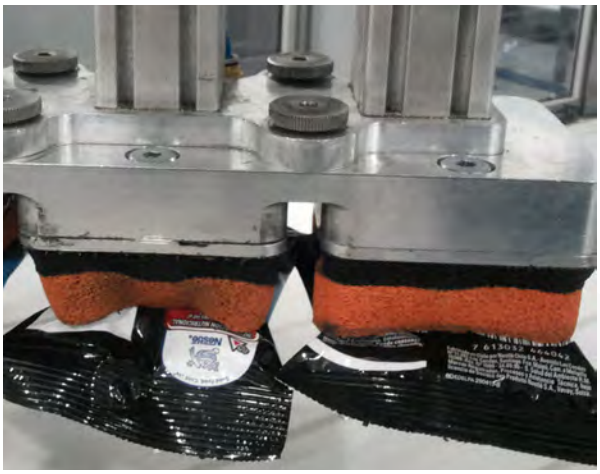


Multiple Bags in One Cycle

In cases where extra-short cycle times are needed, a UniGripper tool can be made comprising two or more parallel BagGrippers, that can pick and place bags individually and thus allow fewer movements between pick position and place positions.

Special Environments

Bags with powder material can be a fire hazard and broken bags may cause powder to enter the vacuum system. UniGripper can supply both effective filtering solutions and ATEX rated blowers for such environments. The BagGripper can be made anodized or in stainless steel for applications with moist conditions.



Timber and Wood Handling

Timber and wood handling reaches from handling of raw timber to smooth furniture parts and large boards. UniGripper TimberGripper is developed for the rough environment that handling of untreated wood implies. TimberGripper is the natural choice when designing a new wood-handing vacuum system, and is also frequently used to upgrade and improve existing wood-handling systems. TimberGripper is equipped with UniGripper's developed valve technology, which automatically senses the position of the product and focuses the lifting force. The technique makes it possible to use the same tool for a broad range of products.

TimberGripper has since its introduction focused on maintenance friendliness and robust solutions. With TimberGripper you always get a solution tailored to your needs. For handling of treated wood and boards, grippers from UniGripper Standard Module System or UniGripper Basic series are possible cost effective solutions to consider.

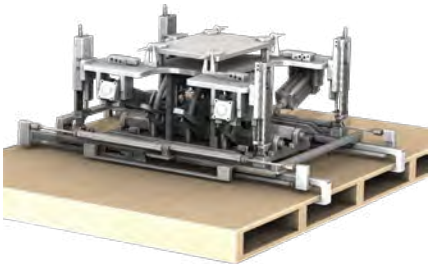
Complete Systems

Wood-handling applications most often involve lifting multiple long, narrow boards or similar objects. Vacuum handling systems for such applications typically involve multiple gripper units being spread out along the lengths of the planks.

The UniGripper offering can include many or few of the components needed for such a vacuum handling system. Either only the grippers with the vacuum generation equipment — typically a side channel blower — to lifting frames two or more gripping units and distribution pipes for distributing the vacuum between the gripping units.

Other Handling

UniGripper is a complete supplier of customized end-of-arm tools, both in terms of applications supported and types of tools. To the right are further examples of handling areas we often supply tools for, but there is almost no limitation to which application areas are relevant for UniGripper. Our everyday business it to provide solutions for all kinds of industries and to work together with our partners and customers to ensure that these solutions are customized to become the optimal solution for each specific application. The main range of solutions from UniGripper has vacuum technology as a basis, but we are also experienced in making tools not based on vacuum, like mechanical tool and tools that use magnets for generating the lifting force, as detailed further below.



Mechanical Tools

UniGripper is a partner for all kinds of tools. Sometimes tools only based on mechanical clamping is the preferable option, and we are happy to supply such solutions.

Magnetic Tools

For handling involving only products made of steel, magnetic grippers can be an option. UniGrippers can be customized to only use magnets as gripping or combine magnetic force with vacuum and mechanical clamping.

Thin-Walled Containers

This-walled containers, typically plastic bottles and jars is a challenge to handle both with mechanical grippers and vacuum grippers as the containers are sensitive for pressure and implosion. The UniGripper HoverGripper is the solution for these applications being able to handle sensitive thin-walled products for both palletizing and de-palletizing.

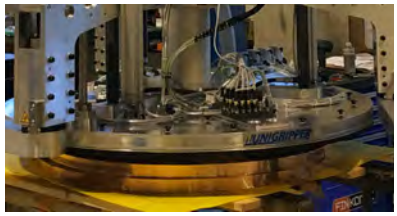
The HoverGripper combines low-force clamping and low vacuum to create a gentle handling in a tool that can handle a broad range of products, varying in diameter, height or material. Full layers can be lifted with or without an accompanying slip sheets. The HoverGripper is delivered with vacuum sources on the tool for easy integration. The vacuum source works at low power levels and at sound levels below 70dBa.

Stone & Concrete

Stone and concrete handling often means grippers working in dusty and demanding environments. The UniGripper is ideal for handling uneven stone surfaces, stones with cracks, palletizing of bricks with varying widths etc.

Raw Foods

UniGrippers is used for handling many kinds of raw foods. Grippers can be produced in anodized aluminum or stainless steel to facilitate regular cleaning and FDA-approved foams are available to support direct contact with raw food. Unpacked bread and crackers, cheese and frozen fish are some examples of raw food that can be handled with a UniGripper.



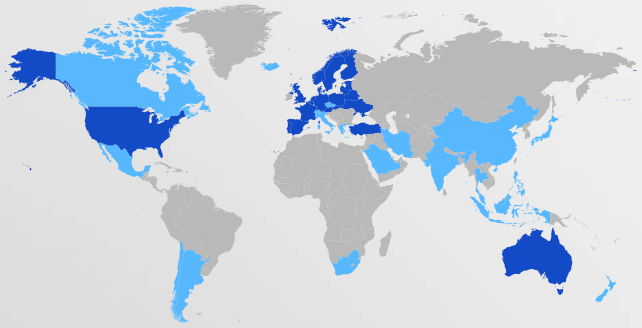
Coils

Coils of for example metal, paper or fabrics can all be handled by the UniGripper CoilGripper. The CoilGripper effectively spreads the vacuum force over the entire coil
surface and can generate impressive lifting forces, handling coils with weights of several tonnes.

Available worldwide

UniGripper has partners and distributors spanning 6 continents and over 30 countries.

Find your closest UniGripper distributor on
www.unigripper.com



For more information and
STEP/PDF Downloads, please visit
www.unigripper.com

phone +46 (0) 560 272 70
mail info@unigripper.com
website www.unigripper.com

Vinkelvägen 10
685 34 Torsby
Sweden

UNIGRIPPER
TEPRO MACHINE & PAC SYSTEM

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