# Food cups

# Your ingredients for successful automation

**20120** Evolving automation

# Evolving ourselves. Evolving you. Evolving automation.

Benefit from automating your processes with vacuum technology, which offers an extremely versatile range of solutions for almost any application. As a gentle technology, it leaves products flawless while holding them strongly and reliably even in high speed applications. To enable high process efficiency we optimize solutions to your needs and continuously develop state-of-the-art suction cups and soft grippers, robot and cobot gripping solutions, endof-arm-tools (EOATs) and palletizing solutions, vacuum ejector pumps and cartridges.

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# Automate food handling

In the food industry you are faced with stringent requirements for hygienic, regulation compliant, reliable and efficient automating systems. Piab's vacuum technology offers you the needed solutions for a wide range of applications.

Whether you are into bakery products, pasta, confectionery, fruit and vegetables, eggs, meat, fish or plant based alternatives, dairy products or canned foodstuffs, you need to handle them during processing and packaging.

With the long-standing expertise in vacuum and ejector technology as well as the developments of our specialized suction cups Piab provides reliable solutions for different applications in the food industry, from direct handling to pouch opening, foil wrapped product packaging up to palletizing of full layers of can, jars or bottle handling

**Utilizing Piab's vacuum** technology you can optimize your procedures along the value chain, increase efficiency, reduce energy consumption and facilitate predictive maintenance.

**The selection guides** after each chapter provide an overview of the products and aim to support you to choose the right product for your application and specific requirements.

**All cups in** the first two chapters comply with FDA 21 CFR 177.2600 and EU 1935/2004 regulations. In addition the detectable cups are made of high quality silicone with a dash of metal powder (Fe additive) for detectability.





#### Get in touch!

Our experts will assist you in choosing the right suction cup and vacuum ejector to help you configure your optimal solution!

Brochure

### Vacuum meets food

**Suction cups offer** endless possibilities for gripping, lifting and moving needs. You can handle food directly, open bags, pack items into cartons and put these on pallets, for example.

The main challenges with suction cups in food handling are to ensure that they adapt and seal properly on the surface of the product, limiting the leakage as much as possible, and at the same time to avoid any damage on it.

Additionally, it is crucial to match the suction cup and the vacuum generation unit. As too

deep vacuum can damage a product while too little may lose it. The art lies in balancing the vacuum flow to offer a stable grip and keep the product undamaged. Piab has developed a range of suction cups that work reliably with low vacuum levels.

**Compliance with FDA** and EU regulations is a must when handling food items, as is in many cases detectability. Piab provides suction cups designed for food industry requirements and allow detection through added metal powder, as well as blue colored cups for detection by camera. When it comes to direct food picking, gentleness, hygiene and monitoring has first priority. Therefore, Piab has developed a range of detectable silicone food suction cups. They comply with FDA and EU regulations and have a low percentage of metal additives (Fe) mixed to their rubber material to enable detection. Combined with detectable plastic fittings or stainless steel fittings, they reliably protect food production from contamination in case of machine failure.

# Food cups Detectable



# Detectable food cups Blue with a dash of metal – the recipe for food safety

Ensure that you are on the safe side! Piab supports you with specific detectable suction cups in numerous shapes and its soft grippers for different food objects from bread, fruits and pralines to frozen, raw or prepared foods.

**Pick up a** wide variety of foods safely, hygienically and automatically. All of Piab's detectable suction cups are made of FDA 21 CFR 177.2600 and EU 1935/2004 approved silicone to which a low percentage of a metal additive (Fe) is mixed.

**They can be** equipped with fittings of either food grade detectable plastic material or acid resistant stainless steel, both with large vacuum flow orifice.

**These suction cup** types have a special design to give a good grip on irregular food surfaces and require only low vacuum levels to actuate the bellows. Additionally, they are hygienically designed without any dust pockets.





# New product! Fruit cup – FCX50



**Q** Innovative lip design

**⇔** Energy efficient

Selection of the select

# A gentle grip on any fruit from avocado to zucchini.

In fruit picking, flexibility is key. You need a suction cup able to handle items with difficult, leaky textures and various shapes. Piab's new fruit cup is all this: Flexible bellows for off-axis grips and adaptation as well as multi-lip design to ensure great sealing. This allows using a smaller vacuum pump which saves energy.

- Secure grip on inconsistent surfaces with indents and protrusions thanks to the innovative multi-lip design
- Keeps fruits pristine due to the gentle but firm grip achieved even with low vacuum levels
- Able to adapt during moment of pick to achieve grip on fruit with varying shapes





# Baking goods

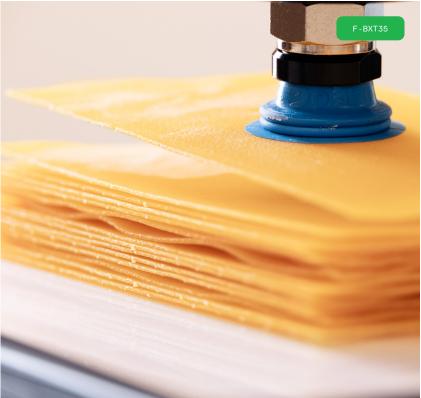
# Getting breadrolls, cakes and pasta crumble free to the table.

To support bakeries in the daily challenge of mass producing their products, Piab has developed its B-BL suction cups. They allow picking hot bakery items coming out of the oven and placing them on de-panner belts. To further support this application, Piab's offer is complemented by retainers and tools that enable swift replacement of the suction cups mounted on depanner belts to reduce downtime.

**In gripping devices** for food, Piab specifically looked at how to avoid breakage. This led to a range of different suction cups, able to handle everything from bread to muffins, brittle lasagna sheets and very thin crackers.







#### Recommended suction cups for baking goods

Bread	Pastries	Pasta	Buns
piSOFTGRIP®	piSOFTGRIP®	F-BXT35 (lasagna sheets)	piSOFTGRIP®
B-BL	B-BL	-	B-BL
-	F-OB	-	F-OB

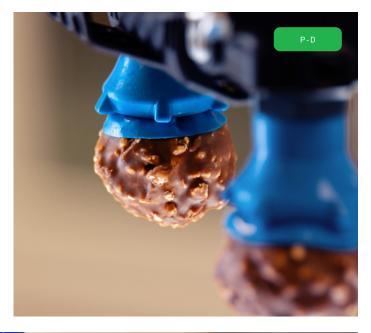
For any other baking goods handling please contact us!

# Confectionery & candy

Whether it is pralines, waffle cones or hollow chocolate eggs, here is your answer.

We listened to you and developed solutions that are as adaptable in its force as a hand and yet as simple as a suction cup. The piSOFTGRIP® family, with its vacuum cavities and soft fingers, allows perfect pick-up of fragile objects such as chocolate and waffle products.

**Piab's praline suction** cups ensure quick and efficient insertion of each praline into the box, while other suction cups hold bags open to fill the right amount of candy.





#### Recommended suction cups for confectionary and candy

Pralines	Bars / waffle cones	Hollow chocolate eggs	Holding bags open
P-D	piSOFTGRIP®	piSOFTGRIP®	F26, F33*
piSOFTGRIP <sup>®</sup>	F-OB	Egg cup – ECX36*	U20-2P*
-	-	-	piGRIP <sup>®</sup> BGI*

\* Please see non-detectable suction cups chapter for more information. For any other confectionary and candy handling please contact us!

### Frozen foods

# The best way to handle frozen peas or burger patties.

When it comes to handling frozen food, you need a solution that is regulation compliant, hygienic and detectable and also cold resistant to maintain machine uptimes with as long as possible replacement cycles. Piab's silicone suction cups offer the ideal combination of all these characteristics, allowing you to handle anything from frozen burger patties and fish filet to vegan meat alternatives.

**If you need** to package frozen bulk foods such as peas, mixed vegetables or ready meals our suction cups offer the ideal solution to hold open thin foil bags in automatic bag filling stations. Their secure but gentle grip leaves bags and products flawless. Please check out the non-detectable suction cup section for further information.







#### Recommended suction cups for frozen foods

Direct frozen food handling	Packaged frozen food handling	Holding bags open
B-BL	B-BL, F-BX	F26, F33, U20-2P*
F-BX	BGX*	piGRIP® BGI
F-OB	piGRIP® BGI	-

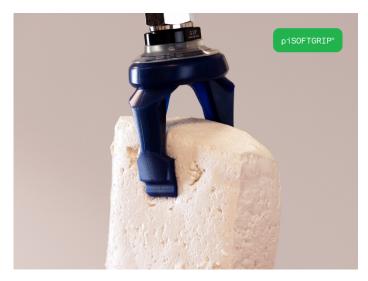
\* Please see non-detectable suction cups chapter for more information. For any other frozen food handling please contact us!

# Raw foods

### Steak, salmon or strawberry: We help you handle it.

Whether you simply want to package raw food or handle them for further preparation for example marinating, a secure though sensitive grip is essential. And exactly what our vacuum suction cups and gripping solutions can offer.

**In case of** wrapped food, also consider our non-detectable suction cups.



# **Prepared foods**

# Configure ready made menus automatically.

With Piab's solutions that is easily possible. No matter if you prepare a full menu with meat pieces or falafel balls, potatoes and peppers or just need to can fish pieces. Gentle vacuum handling solutions like our piSOFTGRIP® place all items carefully and reliably in the respective container.



#### Recommended suction cups for raw and prepared foods

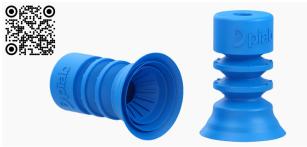
Vegetables	Meat	Fish	Vegan alternatives
Fruit cup – FCX50	piSOFTGRIP®	piSOFTGRIP®	piSOFTGRIP®
piSOFTGRIP®	B-BL	B-BL	B-BL
B-BL	F-BX	F-BX	F-BX
F-BX	F-OB	F-OB	F-OB
F-OB	-	-	-

For any other raw and prepared foods handling please contact us!

# Selection guide



### Fruit Cup – FCX50



Applications Fruit

Vegetables

With its innovative multi-lip design the new fruit suction cup is ideal for handling items with difficult and leaky texture and various shapes. It can pick the thin part of a fruit just as well as its thick part. The flexible bellows allow the lips to adapt, realign and seal tightly even if the suction cup is lowered towards the fruit off axis.

- Multiple lips for handling fruits of different sizes
- Pristine fruits thanks to low vacuum level processes
- Safe hold on rough and leaky surfaces

### piSOFTGRIP® family



Applications

Bread & bakery

Fruit

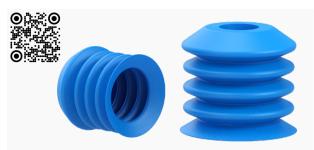
Prepared foods

Raw foods

piSOFTGRIP® has gripping fingers and a vacuum cavity, all made in one piece, resulting in a simple and robust product. As it is vacuum-driven, the gripping force can easily be controlled by simply adjusting the vacuum level. The vacuum cavity is sealed, making it extremely resistant to dust.

- Vacuum-driven soft gripping solution
- Suitable for sensitive and very delicate foods of different shapes and surfaces
- Sealed vacuum cavity, making it very dust resistant and forgiving for the vacuum system

### **B-BL** family

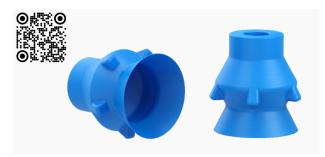


#### Applications

Bread & bakery Uneven products The B-BL family of multibellowed suction cups is ideal for handling challenging products within the food industry. The bellows enable level adjustment in applications where uneven products are handled.

- Perfect fit to handle bakery products with or without seeds
- Works well with low vacuum levels, which reduces the risk of damaging the bakery products
- Additional fitting option: retainer clip for standard belts used for bread depanner

### P-D family



#### Applications

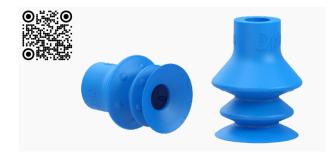
Confectionary & candy

Pralines

The P-D family comprises the so-called pralines cups. Their deep design makes them ideal for handling objects with irregular and curved surfaces such as pralines, filled easter eggs, candies, covered macadamia nuts etc.

- Available with detectable fittings
- Easy to clean with hygienic design no dust/dirt pockets
- Gentle but firm handling of delicious, round shaped items

### F-BX family



#### Applications

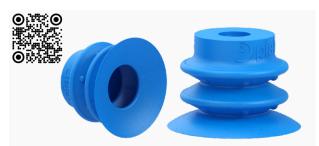
Raw foods

Frozen foods

Irregular shaped food The F-BX suction cups provide excellent grip on food with irregular surfaces and different heights, even at fast speeds and accelerations. With the low vacuum level needed to collapse the bellows, the risk for damaging the handled food product is strongly reduced.

- Available with detectable fittings
- Easy to clean with hygienic design no dust/dirt pockets
- Safe and hygienic handling

### F-BXT35



Applications

Lasagna plates

Hard bread

Crackers

extra long and extra thin lip provide an optimal grip especially on thin and brittle food items. The combination of 2 ½ funnel-shaped bellows, a low vacuum level to collapse the bellows and a stable body enable a steady hold on products, even at high speed and in quickly accelerating systems.

The F-BXT35 bellows suction cups with their

- Supports applications of a wide range of temperatures
- Also suitable for textured surface like seeded slices of hard bread
- Easy to clean with hygienic design no dust/dirt pockets

### F-OB family



Applications Raw foods

Frozen foods

Oblong shapes The F-OB family of flat, oval, bellowed suction cups are ideal to handle challenging food industry products, such as frozen food and raw food of oblong shape. They have an excellent grip on products with irregular surfaces and different heights, even at fast speeds and accelerations.

- Allows handling oblong food items of different heights
- Low vacuum levels suffice to collapse its bellows, reducing the risk of damaging the handled food product
- Easy to clean with hygienic design no dust/dirt pockets

When detection is not required our non-detectable FDA and EU regulations compliant food suction cups are an appropriate alternative. Made of long lasting high-end silicone material they offer excellent grip on products and easy cleaning.

# Food cups Non-detectable

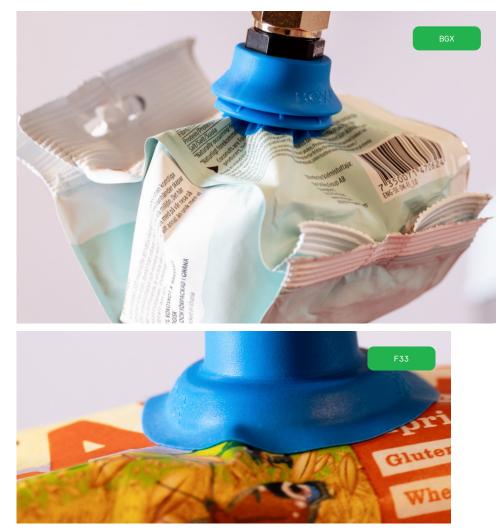


# Non-detectable food cups A strong grip even on difficult surfaces

Independent whether it is raw eggs, uneven biodegradable foil packed items, or thin aluminum covers on yoghurt cups, you can be sure to find a suitable vacuum suction cup solution within Piab's portfolio.

In the food industry a broad variety of packaged and unpackaged food needs to be handled automatically in a hygienic way. In addition to Piab's detectable range of suction cups, its wide range of further FDA and EU regulations approved food cups assists you in handling just about anything. With its latest addition of a specific egg suction cup, customers can handle these sensible products in an automated process steadily and more efficient.

**Particularly, the handling** of flimsy foil or paper packed foodstuffs plays an increasing role in the quest for reduction of waste and more sustainable packaging. To support our customers, Piab has developed the BGX cup, which is particularly suitable for gripping thin, flimsy bags.



# New product! Egg cup – ECX36



Enables high speed applications

**分** Energy efficient

C Easy in-situ cleaning

# Increase the productivity of your egg handling process.

When handling eggs a safe grip to avoid dropping items is mandatory. This has so far been the limitation for high speed automation processes. With Piab's new stable egg cup you can fast-track your process while saving energy. Its multistage actuation makes picking and releasing more predictable, and the stable bellows enable high accelerations.

Thanks to the low vacuum required in the operation, energy is saved. Additionally, egg white seeping out through minor cracks during the handling process is reduced. This lowers the necessity of cleaning and hence machine downtimes.

**The egg-cup is** easy to clean and is longterm resistant to detergents and ultrasonic cleaning.



# Dairy

# Keep your process running with clog free vacuum technology.

**From starch bagging** to cheese block handling, clogging must be prevented. Therefore our suction cups are designed without any dust pockets and can be equipped with filters. Additionally, Piab's vacuum ejectors are neither prone to blockage and keep your system running faultlessly.



#### Recommended suction cups for dairy

Starch filling	Cheese blocks	Cheese slices	Yoghurt cups
F26, F33	piGRIP <sup>®</sup> FXI	piGRIP® FXI	F
U20-2P	В	U	U
piGRIP® BGI	-	F	-

For any other dairy product handling please contact us!

# Bag opening

### Keep up to the challenge of holding bags open while leaving them mark free.

Automated filling into bags requires a secure grip on each side to keep it open during the process. Piab's suction cups are ideal as their special design prevents sensitive bags from getting sucked in, keeping them undamaged. In general, the chosen suction cup depends heavily on the size / shape of the bag as well as on the set-up of the filling machine. Further information is available in our bag handling brochure.



#### Recommended suction cups for bag opening

Plastic bag opening	Paper bag opening	Aluminum foil bag opening
F26, F33	U	F26, F33
BGX	-	piGRIP® BGI
piGRIP® BGI	_	U

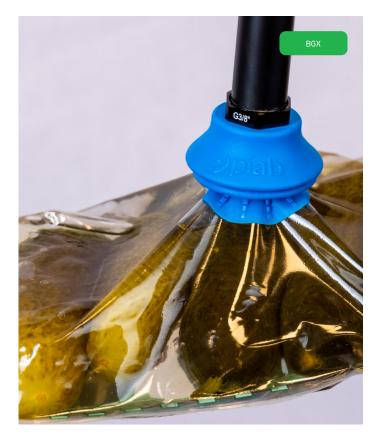
Further information on bag handling applications can be found in our brochure "Select the optimum bag cup". Available for download at the Document Centre on www.piab.com

# Pouch or foil packed food

Fast robot applications thanks to a stable hold.

**For handling food** packaged in flimsy foils, bags filled with liquids or with products of low to high temperatures, deploying high-quality suction cups offer you enormous benefits. These enable fast automated processes by increasing pick rates, thereby boosting process efficiency.

Whether you choose our latest one-piece BGX cup, one of the BL suction cups or the piGRIP® BGI modular bag picker, you can be sure to achieve the best possible hold for your specific application. Thanks to the low vacuum level needed you save energy and prevent marks on the packaging.





#### Recommended suction cups for pouches or foil packed food

Food packed in plastic foil	Food packed in paper bags	Food packed in aluminium foil
BGX	piGRIP® BGI	piGRIP <sup>®</sup> BGI
BL	BGX	BGX
piGRIP® BGI	BL	BL

Further information on bag handling applications can be found in our brochure "Select the optimum bag cup". Available for download at the Document Centre on www.piab.com

# Selection guide

### Egg Cup – ECX36



#### Applications

Handling eggs The ECX36 cup is a round multibellow cup specifically designed to handle eggs. Due to the cups multistage actuation, picking and releasing of eggs can be more predictable. Even at low vacuum levels, the bellows will remain stable which enables you to move eggs safely even at high speeds. Its hygienic design allows for easy cleaning.

- Enables high speed applications due to its stable bellows
- Allows for energy efficient processes as only a low vacuum level is needed
- Generic robust and simple fitting interface Ø5.5 mm hole

### F family



#### Applications

Opening bags Smooth

surface food handling

Handling of containers The F family of soft and pliable round flat vacuum cups provides a stable grip with little inherent movement. Its cleats prevent thin, sensitive objects such as slices of cheese, chocolate or blister packages from being deformed. Available in 9 size options, this suction cup family covers a wide spectrum of applications.

- Suitable for flat surfaces
- Recommended when the lifting force is parallel to the surface of the object
- Suitable to operate at a wide temperature range

### B family





#### Applications

Smooth surfaced sweets

Rounded surfaced products

Handling of containers products with different sizes and varying heights. The B family offers a wide variety of fittings and connections.
Suitable for slightly uneven or curved

The B family of round bellows suction cups are

This family comprises of 6 different materials

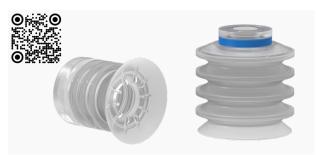
and 18 different sizes. Several units can be

combined to form a lifting device that grips

configurable for specific applications and needs.

- Ideal for handling objects with varying
- heights and sizes
- Perfect solution for level adjustment

### **BL** family



#### Applications

Bag / pouch handling

Bags of liquid contents

Bags of fragile contents The BL family of round multibellows suction cups is perfect for lifting rigid bags in secondary packaging applications. These vacuum cups can be used to automate a packaging line of pouches, stand-up bags and flow packs safely.

- Suitable to operate at a wide temperature range
- Able to lift a broad range of products
- Perfect solution for level adjustment

### D family



#### Applications

Round shaped products

Smooth surfaced products

Rounded Containers The D family of deep suction cups is designed for handling objects with round shaped and curved surfaces in the food industry. Thanks to its relatively thick lip it is extremely durable. The D family cups can pick food directly or handle items packaged in stiff plastic packaging.

- Grips around corners and edges
- Ideal for handling items with a concave smooth surface
- Minimizes downtimes for cup exchange thanks to its long durability

### piGRIP®



Applications

Textured surfaces Irregular

surfaces Bag handling The piGRIP® is a unique modular suction cup concept with individually optimized parts for gripping, lifting and height compensation. Different lip types are available for food and bag handling. A large selection of fittings makes it ready to fit new machines and easy to retrofit existing cups.

- Firm/stable bellows allows for high machine speeds
- The FXI lip has extra ordinary sealing and lifting capabilities on leaking, irregularly shaped surfaces
- The BGI lip and the high flow retainer allow damage free handling of many bag types

### U family



#### Applications

Smooth surfaced products

Container handling

Bag opening

- The U family of flat suction cups are perfect for handling materials and objects with slightly curved or irregular surfaces. They provide a solid grip on stiffer objects. These cups are chosen if a limited height compensation is needed.
  - Universal cup ideal for just slightly bend surfaces
  - Minimizing downtimes for cup exchange thanks to their high durability

### **BGX** family



#### Applications

Flimsy bags Direct food

contact

Secondary food handling BGX cups are specially developed to pick thin and flimsy bags. Their thin lips seal outstandingly even at lower vacuum levels. Produced in one piece, the BGX cups support a safe and stable hold of the product in fast/ semi-fast robot applications. With two bellows different heights and uneven surfaces can be compensated for.

- Suitable for low and high temperatures
- Configurable to individual requirements
- Available in 3 sizes and 6 aluminum push-in fittings

Complementing the suction cup portfolio, Piab offers a range of additional gripping tools that support the food industry. From special cobot and robot grippers, to complete EOAT, to high performance vacuum pumps. Check out how we can further support your quest for getting the maximum out of your robotic system.

# Other products



# Selection guide

### piCOMPACT® SMART





Dindustry 4.0 capable

Enables predictive maintenance

**↔** Energy efficient

- Piab's piCOMPACT® SMART vacuum pump series supports Industry 4.0 functionality. With connectivity between devices through IO-Link and additional sensors to collect valuable process information, piCOMPACT® SMART can analyse with integrated intelligence to make vacuum handling smarter and safer. Predictive mantenance increases system lifetime.
  - Configurable vacuum ejector based on COAX<sup>®</sup> multistage technology
  - Contains additional energy saving functions
  - Ideal for medium to larger vacuum systems, such as palletizing

### Champagne cup (OBL 40x90S)



S Bottle and frozen product handling

♣Energy efficient

Wear resistant

The champagne cup was developed to help in the process of production by allowing to handle the bottle from the side and move it into an angle by which the residues of the fermentation process move to the neck, which is then frozen so that the residues can be removed. Additionally, it suitable for handling packaged frozen items, it is also great for ice cream handling or handling bags filled with liquid, e.g. mozzarella cheese bags.

- Rectangular oval cup made of silicone
- Reinforcement plates give stability to the suction cups
- Suitable for long narrow and bent items down to -40°C

### piCOBOT®





Safe for human-robot collaboration

**Ç** Automatic tool

...

changer

For cobots and small industrial robots

The piCOBOT® is based on Piab's powerful vacuum technology. By creating a maximum vacuum flow it is a reliable and faster solution than any other cobot gripper. Equipped with its automatic tool changer and docking station it changes its gripper units automatically enabling uninterrupted processes.

- Enables high speed applications thanks to the newest COAX<sup>®</sup> ejectors
- Automatic tool change without interruption of the process
- High uptime in harsh environments due to its IP65 compliant roboust body

### KVGL-CJ



Hultiple unit picking

**H** Modular design

✓
✓
High process
efficiency

The Kenos® Vacuum Gripper Layer-Cans/Jars (KVGL-CJ) is suitable for handling complete layers of cans and jars that can be open or covered on the gripping area. Additionally, it can also be used for handling different kinds of boxes, wrap around packaging and primary packing solutions.

- Flexible gripping solution
- Reduces number of EOATs needed thereby decreasing tooling cost and time for tool changes
- Foam gripping surface enables fast operations even if cans are not optimally aligned

# **Custom-Line Solutions**

Special challenges require specific solutions.

**Piab's Custom-Line Solutions** – tailormade for your needs – are the answer, when you need a solution or product that is specifically designed to your needs. Solutions presented here are developed for unique customer projects. As our designs are usually modular and parametric based, they allow flexible adjustment. Hence, a Custom-Line Solution optimized to your requirements is just a click away.

### $\square$

#### Get in touch!

If you need a tailormade solution for your application, Piab engineers are happy to assist you at <a href="mailto:custom-line@piab.com">custom-line@piab.com</a>

### Cobot Palletizing Tool (CPT)



### Safe for human-robot

Enables predictive maintenance

**O** Smart functionality The Cobot Palletizing Tool (CPT) helps to get more pallets out per day. The flexible picking zone of the CPT enables multiple carton handling in every cycle at high speed. Thereby, the CPT allows to palletize more boxes, ultimately leading to more pallets readily prepared for shipment each day.

- Suction plate variants enable easy adjustments to different configurations
- Longer cobot lifetime thanks to less moves and low gripper weight
- IO-Link ready piSMART<sup>®</sup> valve unit offers Industry 4.0 capabilities

### Mini Cobot Gripper (MCG)





Safe for human-robot collaboration

**@** Weighs just 270g

**4** Energy efficient Small is powerful. Weighing just 270 grams, the Mini Cobot Gripper (MCG) is probably the lightest cobot gripper in the world. It lifts parts up to 5 kilograms in weight and can be flexibly equipped with a wide variety of suction units.

- Allows using the smallest cobot size by enabling usage of the maximum payload
- Flexible for use in many different applications with various gripper plates
- Quick-Click Tool Changer in plug & play design for high machine uptime

### Six pack gripper



**+†** Special adaptable suction cup design

\$ Cost effective solution

#### **S** Efficient

packaging and palletizing

With this gripper, six-packs with thin cardboard wrapping can be handled automatically, gently and without leaving any marks. The gripper is manufactured using a 3D printing process and can therefore be easily adapted to different six-pack sizes.

- Prevents drawing in of cardboard into its rectangular suction cups thanks to the integrated load support in each cup
- Leaving the aluminum or paper banderole flawless
- Stable hold due to decentralized COAX<sup>®</sup> cartridges for each suction cup



# Evolving around the world

#### EUROPE

#### France

Lagny sur Marne +33 (0)16-430 82 67 info-france@piab.com

#### Germany

Butzbach +49 (0)6033 7960 0 info-germany@piab.com

#### Italy

Torino +39 (0)11-226 36 66 info-italy@piab.com

#### Poland

Gdansk +48 58 785 08 50 info-poland@piab.com

#### Spain

Barcelona +34 (0)93-633 38 76 info-spain@piab.com

#### Sweden

Danderyd (HQ) +46 (0)8-630 25 00 info-sweden@piab.com

Helsingborg +46 042-400 45 80 se-sales@piab.com

Karlstad +46 054 55 80 90 se-sales@piab.com

Täby +46 544 409 00 se-sales@piab.com

Mullsjö +46 392 497 85 sales@avac.se

#### United Kingdom

Loughborough +44 (0)15-098 570 10 info-uk@piab.com

#### AMERICAS

Brazil

Sao Paulo +55 (0)11-449 290 50 info-brasil@piab.com

#### Canada

Toronto (ON) Lifting Automation +1 (0)905-881 16 33 eh.ca.info@piab.com

Hingham (MA, US) +1 800 321 7422 info-usa@piab.com

Mexico Hingham MA (US) +1 781 337 7309 info-mxca@piab.com

#### USA

Hingham (MA) +1 800 321 7422 info-usa@piab.com

Xenia (OH) Robotic Gripping +1 888 727 3628 info-usa@piab.com

#### ASIA

#### China

Shanghai +86 21 5237 6545 info-china@piab.com

#### India

Pune +91 8939 15 11 69 info-india@piab.com

#### Japan

Tokyo +81 3 6662 8118 info-japan@piab.com

#### Singapore

Singapore +65 6455 7006 info-singapore@piab.com