

# 2021

## Main catalog

V:1.09



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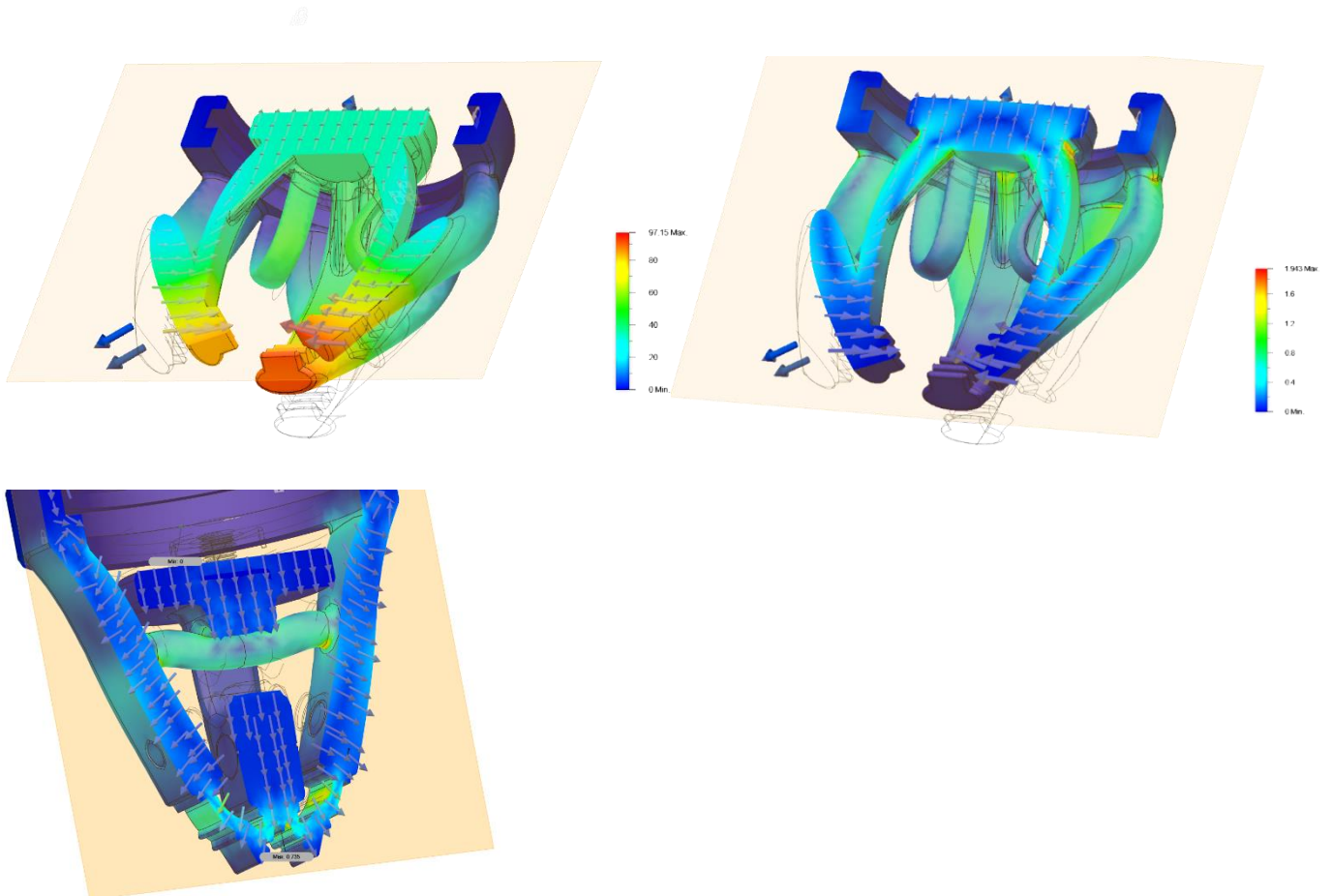
Rev 1.9-April 2021

## Section – Bionic grippers

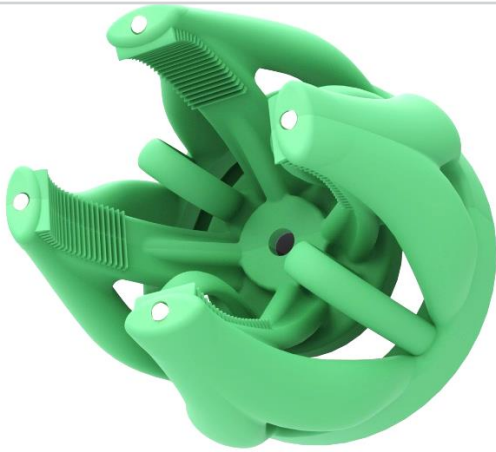
### *Swift yet gentle*

The lip has a built-in self compliance based on principals of biomimicry, which allows it to handle objects, of significantly varying size and shape, in a gentle yet secure and speedy manner. This makes the lip ideal for solving jobs with organic or irregular inputs, such as food manufacturing, agriculture, or parcels sorting.

The compliance originates from a unique structural design of the lip, made of an elastic material, enabling it to stretch and contract in all the right places. Hereby, during a pick-up motion, when the actuator starts to contract, the lip begins to conform around the object at specific points for an optimal grasp. Then, as the piston hits the end, the elastic material is instantly pulled fully together, and the object held firmly in place. Returning the object applies the forces of the bionic compliance in exact reverse order, making it a highly predictable and easily controllable motion. It is possible to either just relax the material or, push the piston all the way to the opposite end and expand the lip outwards. The former option gently drops the object from the grasp of the lip. Whereas the latter actively pushes the object out of the lip and sends it flying or squeezes it into a tight fit. Thus, with careful timing, the placement is done with grace and accuracy



# Gripper Lips



## Four Fingers Lip TGC-SFG-4X-MRIB-XX

- Handles familiar human hand sized products such as stone fruits and greenhouse plant plugs and pots, eggs, meat poultry and even fish. Nonfood items are a piece of cake for this gripper lip. The interface to the Any-Mount allows to be attached to all material handling robots

### Designed for gentle grasp

- Material shore factor optimized to accommodate firm grip though still gentle.
- Fingertips with soft lamellas prevent object point browsing and ensures sliding free grasp. Same fine lamellas ensure no damage to the workpiece surface, even with relative high compression forces.
- Cavity opens so release is controlled ensuring accurate and repetitive release of products despite various size and shape. In most cases, like food items an air cylinder actuation will provide fast and reliable operation. In cases where high level on dexterity is required you may consider the Servo-motor driven actuation. This provides the industry's highest level of force, speed and position controlling.
- Fingers has the option of integrated steel rods enhancing the stiffness of the lower end of the finger that ensures an even impact force onto the workpiece and enhances the saturation forces that can be up on the workpiece. For higher compliance applications and where un-regular interference surfaces are met, it can be have a solid finger.
- In shifted orientation the closed bands alongside the fingers ensures workpieces of varying size and shapes will be evenly secured even with one generic gripper setting, and during release will be gently push downward out of the gripper

### Low clearance requirements

- Products may be presented in a dense collection even in a bin in multiple layers. Also, when placement may often require a thigh-fit the slim design gives you the best options to overcome such requirements.

### Best in class Total cost of ownership, saves up to 90% energy

- Save up to 90% energy compared to your standard suction cup. Make your own consumption savings calculation - [link](#)

### Safely and ease of use and handling

- As our grippers reflects bionic design its intuitively easy to get a basic idea about how our grippers works. The

### High compliance

- Innovative gripper design delivers a unique outstanding level of self-compliance, providing a firm but natural gentleness when conforming around the workpiece.

### Typical workpieces



Apples, Pears, Citrus, peaches Tomatoes. For picking and even harvesting, sorting, and packaging application.



Fish pick and place is a delicate task. this gripper provides the industry's best performing grasp.



Poultry, pork and meat represents a grasping challenge due to the non-rigid non-uniform item shapes. Also, the slippery surfaces are a great challenge for grippers in general. Hence, the Four Fingers Lip is an excellent choice.



fragile objects, like glass-blow are perfect for this gripper's unique features



Plastic, metal and bio-material parts of various shapes and sizes.

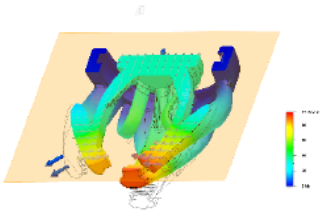
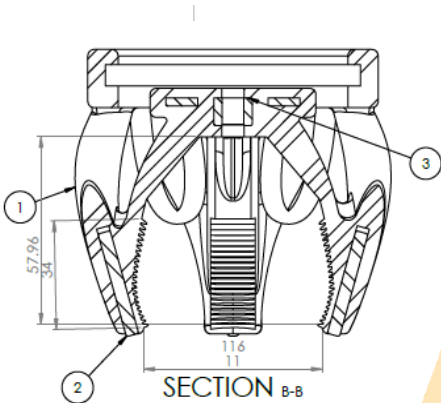
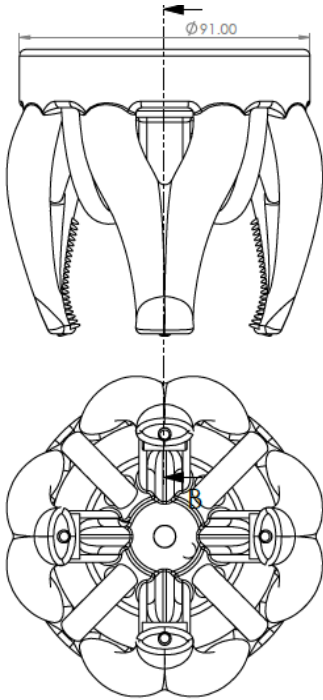
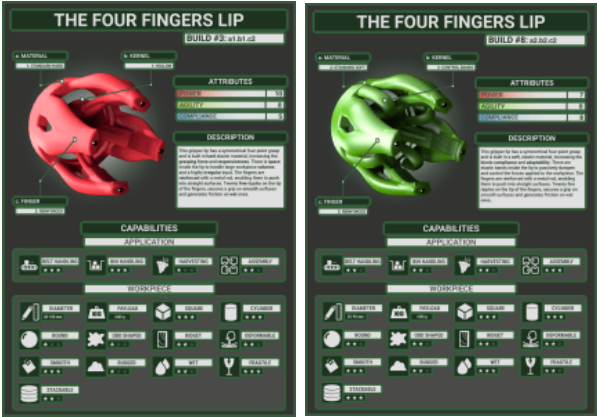


Four Fingers Lip - TGC-SFG-4X-MRIP-XX

SKU	Lip color	Fingertips	Max Pull (N)	Max push [N]	Actuator stroke [mm]	Min/Max. items size <sup>1</sup>	Esp. MTBF [mil]	recyclable	Food Grade
TGC-SFG-4X-MRIB A3 G XX	Green	21xlamels	100	100	30	25/96	3	yes	No
Builds See <a href="#">LINK</a>									
TGC-SFG-4X-MRIB A50 R SS-4x30 GF	Red	21xlamels	80	80	20	20/106	2.5	yes	No
Builds See <a href="#">LINK</a>									
TGC-SFG-FG-4X-MRIB A35 B SS-4x30 GF <sup>2</sup>	Blue	21xlabels	100	100	30	20/96	3	yes	Yes

- 1) Top view Diameter, trials would have to validate the case specific feasibility
- 2) Exp. release Q1 21

SKU	Type	release
TGC-AIM- AIR-S25	Compressed air cylinder	Aug. 2020
	Food compliant	



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	rosaplug35gripperAV2	2K Silicone	1
2	gripfinger steelrod	Stainless steel treaded rods m4x3	4
3	Insert Gripper - Large - Cylinder	Thermoplastic actuator rod anchour	1



# Dual Belt Gripper Lip TGC-DBG-XX [SM/MD/LG]



- The Modular belt gripper, with a series of job-optimized attachable belts is a another ground breaking innovative design, that empowers you to mimic the human two finger delicate grasp of especially small thin items, that just intuitively tends to grasp at the finger-tips of your thumb and forefinger. Even very fractal items like herb cuttings easily get grasped the belt gripper.

## Designed for the “COMPLIANT SEFL-ALIGNING” grasp

The tree belts are all optimized to match a targeted variety of object in respective dimen belt are carefully designed to balance gentleness and firmness of the grasp. The overall natural grasp , hold and release motion that fulfills a number of requirements such as

- Positioning tolerance
- Size- and shape tolerance
- Secure grasp
- Controlled release /placement
- even mounting with self-compliance
- minimum clearance requirements
- longevity and durability, even when crashed unintended

## The release capability

When releasing the grasped item, the gripping process is reversed meaning the time in allowing a very comprehensive placement.

## Low clearance requirements

- Products may be presented in a dense collection even in a bin in multiple layers. Also when placement may often require a thigh-fit the

## Best in class Total cost of ownership, saves up to 90% energy

- Save up to 90% energy compared to your standard suction cup. Make your own consumption savings calculation - link

## Long lifetime

- Save up to 90% energy compared to your standard suction cup. Make your own consumption savings calculation - link

## Safely and ease of use and handling

- As our grippers reflects bionic design its intuitively easy to get a basic idea about how our grippers works. The

## High compliance

- Innovative gripper design delivers a unique outstanding level of self-compliance, providing a firm but natural gentleness when conforming around the workpiece.

### Typical workpieces



Herb cuttings and other similar cutting requires firm gentle grasp



Thin cylindric plastic/glass/matal ( nails, bolts, screws ) intersection inner surface structures of the belts are FEM optimized to ensure a



Nuts and Bolts



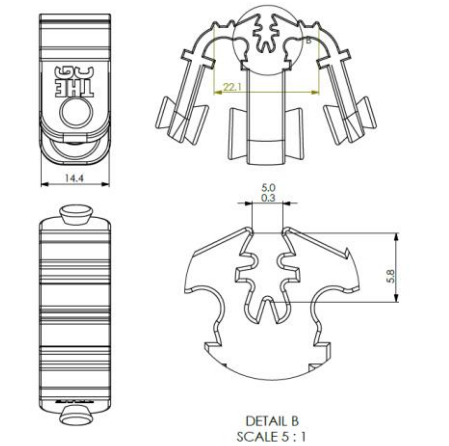
but gently and control roll free of the belts



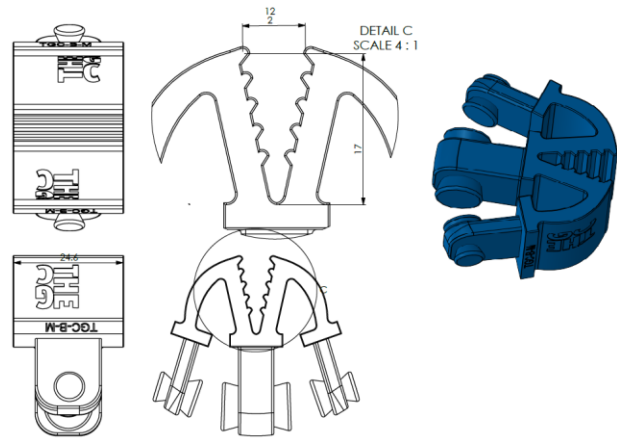
# Dual Belt Gripper Lip

SKU	Lip color	Fingertips	Max Pull (N)	Max push [N]	Actuator stroke [mm]	Min/Max. items size <sup>2</sup>	Esp. MTBF [mill]	weight	Food Grade
TGC-DBG -NON-A3	Green	5 RIPS	80	100	30	13-65	5	142g	Yes
TGC-B-SM-SR	Red	Tiny reps	80	100	20(use blocking)	0.3-5	3	9g	Yes
TGC-B-MD-MR	Blue	Medium reps	80	100	20 ( use blocking)	2-10	3	18g	Yes
TGC-B-MDPI-MR	Blue	Medium reps	80	100	20 ( use blocking)	2-10	3	16g	Yes
TGC-B-LG-SR	Gray	Small reps	80	100	20(use blocking)	4-20	3	25g	Yes

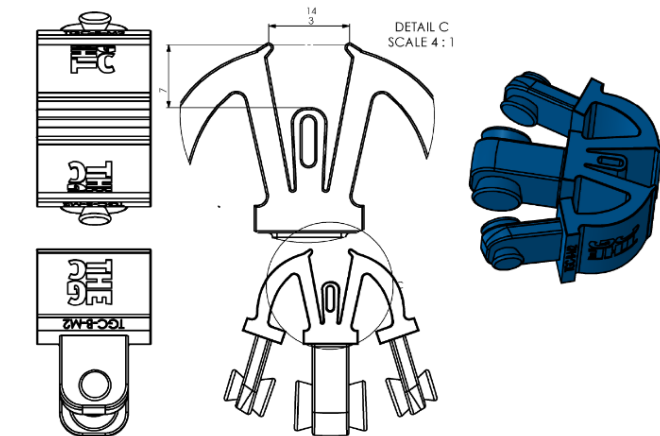
- 3) Diameter, trials would have to validate the case specific feasibility  
 4) Exp. release Jan/21



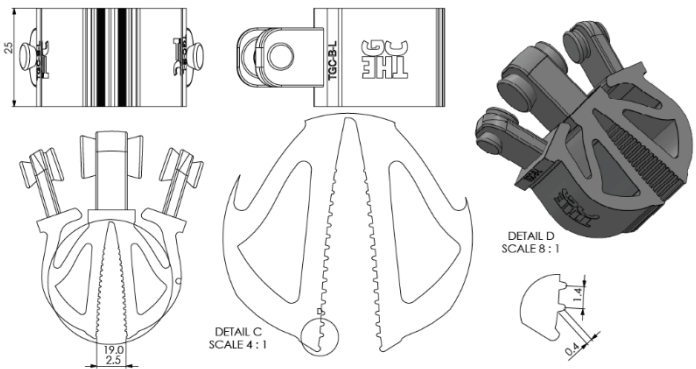
TGC-B-SM-SR



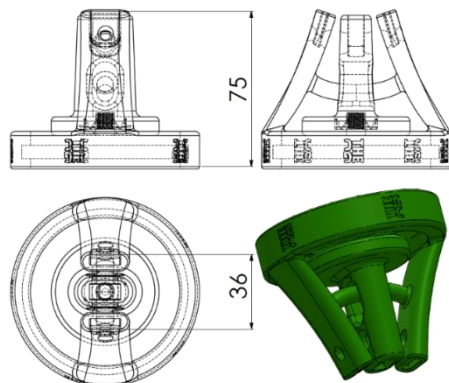
TGC-B-MD:MR



TGC-B-MDPI-SR



TGC-B-LG-SR



TGC-DBG -NON-A3





## TGC-AO-NAIL-xx ( priliminary)



- The Nail AddOn is an empowerment of the Soft finger grippers, that expands and enhances the grasping capability. Think about in the same way you make use of your own nails.

### ***Designed for the impossible pickup – perfectly and reliable***

Just like you know from your human experience nails often plays a important role when smoothly with the surface from where they are to by taken. The AddOn nails empowers up pickup that often otherwise seems impossible.

### ***The release capability***

When releasing the grasped item, the gripping process is reversed meaning the time it allows a very comprehensive placement.

### ***Multi-pick – stacking inside the gripper***

- Products may have to be placed in a tray or insert in stacks. The nails gives a solid way of consistaly picking up saw cookies individually and easily allows a single release for the whole stack.

### ***Best in class Total cost of ownership, saves up to 90% energy***

- Save up to 90% energy compared to your standard suction cup. Make your own consumption savings calculation - [link](#)

### ***Long lifetime***

- Save up to 90% energy compared to your standard suction cup. Make your own consumption savings calculation - [link](#)

### ***Safely and ease of use and handling***

- As our grippers reflects bionic design its intuitively easy to get a basic idea about how our grippers works. The

### ***High compliance***

- Innovative gripper design delivers a unique outstanding level of self-compliance, providing a firm but natural gentleness when conforming around the workpiece.



### **Typical workpieces**



Stacked Sliced meat, picked from a belt conveyor where the nails ensures that the bottom low lowest slice is always taken.

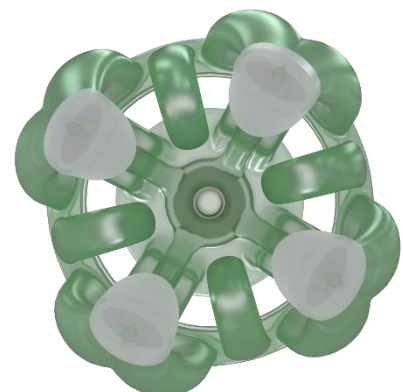


Something. Especially for objects that matches the gripper with the same functionality, and

Cream buns, where the base thin cookie is the solid element for pickup.



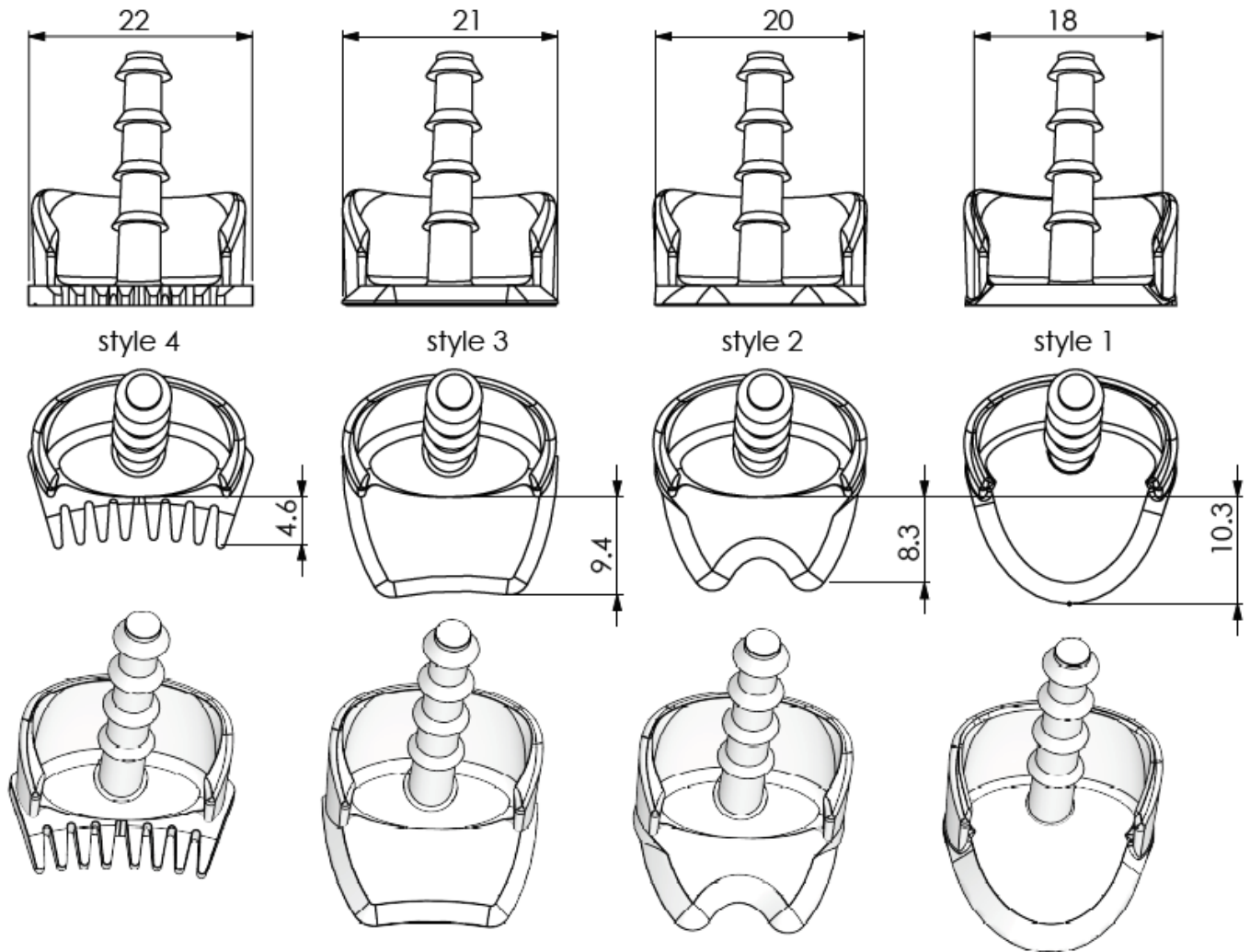
Cookies picked from a belt conveyor, stacked by forceful based but gently and control on free of the belts in one single placement.



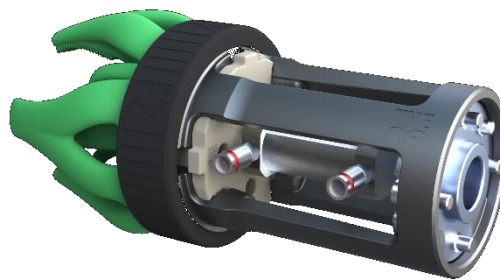
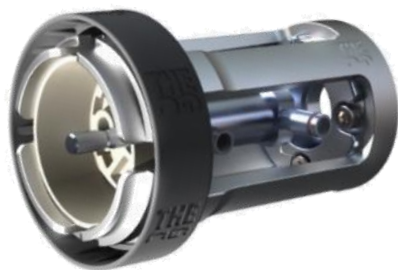
# Finger Nails

SKU	Lip color	Compliant lips	Max Pull (N)	Max push [N]	Length along fingertip [mm]	Min/Max. items size <sup>3</sup>	Esp. MTBF [mill]	weight	Food Grade
TGC-AO-NAIL_SXX-D55-V1 XX 01 = Style 1 XX 02 = style 2 XX 03 = style 3 XX 04 = style 4	Translucent	Four Finger gripper Lips builds with Finger reinforcement mod.  TGC-SFG-4X-MRIP-XX	20	20	12	20/65	3	3g	Yes

- 5) Diameter, trials would have to validate the case specific feasibility  
6) Exp. release Jan/21



# Any-Mount – Mount anything, anywhere



TGC-GA-xx

## Designed for freedom to operate without compromise

- Modular structural design
- Light weight,
- Resilient to mechanical impact, temperature and humidity
- Chemical resistance
- Intuitive assembly sequence
- Unrestricted combinatoric configurations
- Tool-free operation and gripper changeover
- 

## Easy tool-free assembly and gripper changeover

- The user-friendly design facilitates mounting and removal of the specific gripper and actuator-modules, without any need for tools, using only your hands. The mechanical interfaces are “poke joke”. Human hand compliant and give a great feel feedback when working with the assembly – [Video Link](#)

## Accommodates robot vendor specific tool flanges

- Robot tool flange designs and dimensions are vendor specific. But the only thing you must exchange when switching robot is the Tool Flange Adaptor. We supply inserts for a list of the most common robot vendors. In case your robot isn't covered or otherwise, we've shared the CAD data necessary for you to make your own.

## Easy cleaning – resistant to aggressive processes

- All materials are blended to be resistant to cleaning with chemical agents, scrubbing and high pressure wash-down
- Intuitive and tool-free disassembly, eliminating hidden cavities and accommodates inspection.
- Fits into a commercial dishwasher, or even autoclave-based wash and disinfection processes.
- No sharp edges or narrow/hidden cavities enables

### Elements



Mounting Rig serves to interface all variants of vendor specific robot Tool Flange Adaptors at the back end, all actuator inserts and all gripper lips by having the Lock Rings compliant gripper nut treading



The Lock Ring serves to secure the soft gripper lip and actuator insert by simple hand-driven three turn tread maneuver. Stays on when gripper lip is removed and if desired easily removed by hand-based compression of the four fans of the Mounting Rig and pulling the ring over the fan-blades



The Air Actuator Insert serves to hold the gripper actuator. Easily lock in place by squeezing it from below and up with the four guide-nobs aligned into the four slides between the flexible fan-blades. Will automatically lock into position once pushed all the way up until the mechanical interface syncs and the blades spring force clamps back. This is the preferred actuation in hutch work environments. It's also the fastest and lightest solution, so when high dynamics are in play you are recommended to apply this to reach the highest throughput



For convenience we offer Tool Flange Adaptors for a large range of the most popular robot brands see range in the following table or visit [www.thegrippercompany.com](http://www.thegrippercompany.com) for the frequently updated assortment. We also offer 3D CAD download, so you have the interface design for your own Tool Flange module.



TGC-GA-xx

SKU	Mounting Rig	Lock Ring	Tool Flange Adaptor	Actuator insert	Weight.	Drive system
						Excl.
TGC-GA-AIR- <b>ABB</b> - 001	TGC-CMS-01	TGC-LIN- 01	TGC-RTFA- ABB	TGC-AIM- AIR-S25	320g	Solenoid air valve
TGC-GA-AIR- <b>ADEPT</b> - 001	TGC-CMS-01	TGC-LIN- 01	TGC-RTFA- ADEPT	TGC-AIM- AIR-S25	320g	Solenoid air valve
TGC-GA-AIR- <b>COBOT</b> - 001	TGC-CMS-01	TGC-LIN- 01	TGC-RTFA- COBOT	TGC-AIM- AIR-S25	320g	Solenoid air valve
TGC-GA-AIR- <b>non</b> - 001	TGC-CMS-01	TGC-LIN- 01	-	TGC-AIM- AIR-S25	282g	Solenoid air valve

Elements

SKU	Gripper adaptor Items	Material	Shore factors	Quantity Per Pack	Dim	Net Weight (Item)
TGC-SFG-4X-xx	All 4 soft finger gripper	Silicone	A35-A50	1	165xø90	138- 150g
TGC--RTFA-COBOTS	Tool Flange Adaptor item	PU-Resign	MINT-GREEN	1	Ø63x16	0.038 kg
TGC—RTFA-ADEPT	Tool Flange Adaptor item	PU-Resign	BLUE	1	Ø63x16	0.038 kg
TGC--RTFA-ABB	Tool Flange Adaptor item	PU-Resign	RED	1	Ø63x16	0.038 kg



## Any-Mount - compact – Qucik Mount anything, anywhere

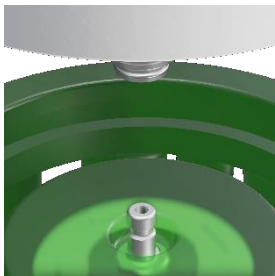


TGC-GAC-xx

### Designed for freedom to operate without compromise.

- Lip Quick Connect with through-hole
- Modular structural design
- Light weight, and highly compact design
- Resilient to mechanical impact, temperature, and humidity
- Chemical resistance
- Intuitive assembly sequence
- Unrestricted combinatoric configurations
- Tool-free operation and gripper changeover

### Easy tool-free assembly and gripper changeover- NEW Quick Connect



- The user-friendly design facilitates mounting and removal of the specific gripper and actuator-modules, without any need for tools, using only your hands. The mechanical interfaces are “poke joke”. Human hand compliant and give a great feel feedback when working with the assembly – [Video Link](#)

### Accommodates robot vendor specific tool flanges

- Robot tool flange designs and dimensions are vendor specific. But the only thing you must exchange when switching robot is the Tool Flange Adaptor. We supply inserts for a list of the most common robot vendors. In case your robot isn't covered or otherwise, we've shared the CAD data necessary for you to make your own.

### Easy cleaning – resistant to aggressive processes

- All materials are blended to be resistant to cleaning with chemical agents, scrubbing and high pressure wash down.
- Intuitive and tool-free disassembly, eliminating hidden cavities and accommodates inspection.
- Fits into a commercial dishwasher, or even autoclave-based wash and disinfection processes.
- No sharp edges or narrow/hidden cavities – well suited for washdown and high sanitary application requirements

#### Elements



Mounting Rig Compact serves to interface all variants of vendor specific robot Tool Flange Adaptors at the back end, all actuator inserts and all gripper lips by having the Lock Rings compliant gripper nut treading



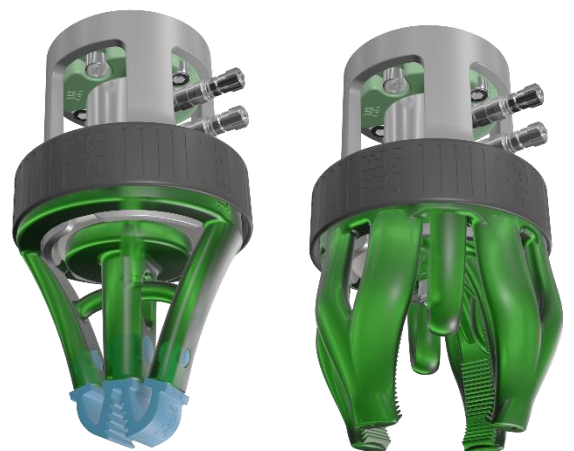
The Lock Ring serves to secure the soft gripper lip and actuator insert by simple hand-driven three turn tread maneuver. Stays on when gripper lip is removed and if desired easily removed by hand-based compression of the four fans of the Mounting Rig and pulling the ring over the fan-blades



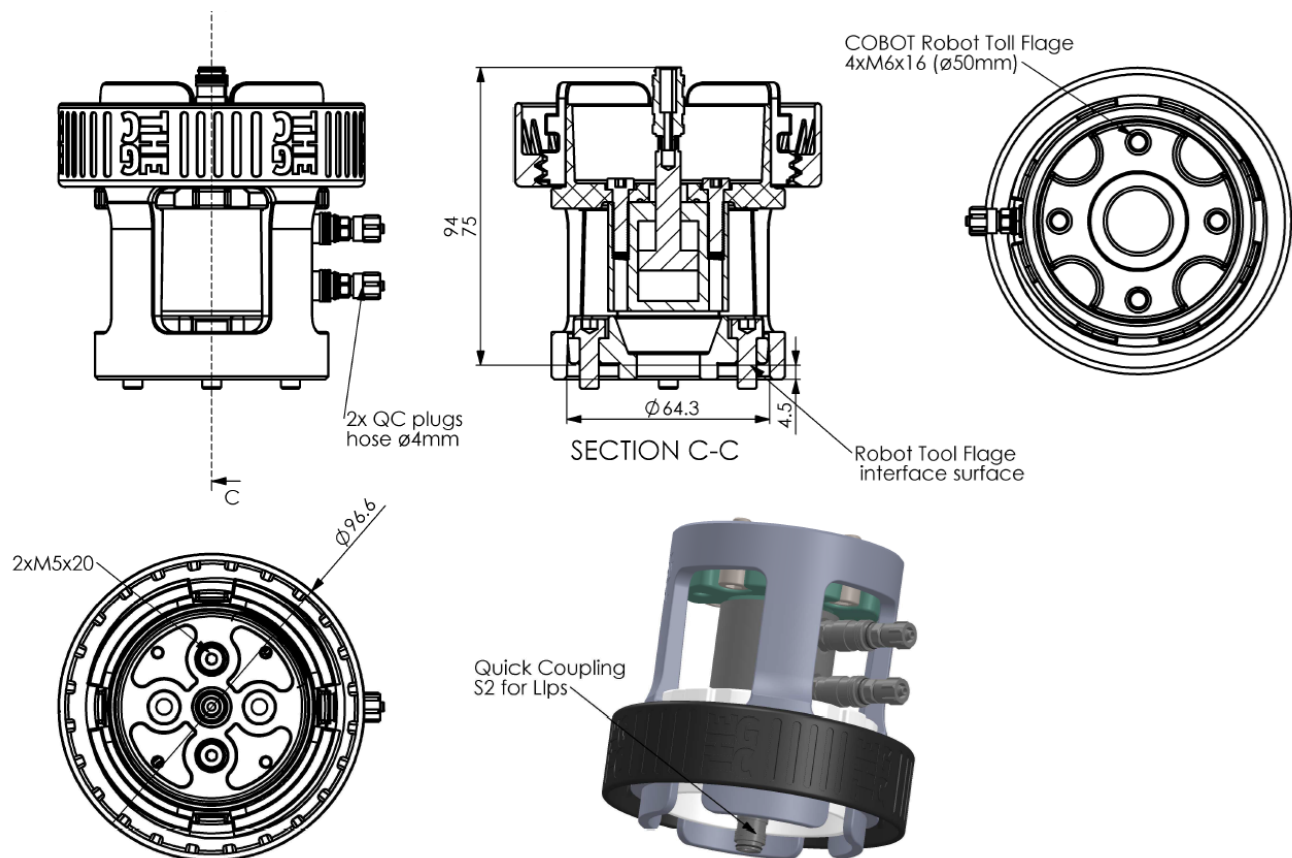
The Air Actuator Insert serves to hold the gripper actuator. Easily lock in place by squeezing it from below and up with the four guide-nobs aligned into the four slides between the flexible fan-blades. Will automatically lock into position once pushed all the way up until the mechanical interface syncs and the blades spring force clamps back. This is the preferred actuation in hutch work environments. It's also the fastest and lightest solution, so when high dynamics are in play you are recommended to apply this to reach the highest throughput.



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## TGC-GAC-xx

SKU	Mounting Rig	Lock Ring	Tool Flange Adaptor	Actuator insert	Weight.	Drive system Excl.
TGC-GAC-AIR- <b>ABB</b> - 001	TGC-CMS-01	TGC-LIN- 01	TGC-RTFA- ABB	TGC-AIM- AIR-S25	320g	Solenoid air valve
TGC-GAC-AIR- <b>ADEPT</b> - 001	TGC-CMS-01	TGC-LIN- 01	TGC-RTFA- ADEPT	TGC-AIM- AIR-S25	320g	Solenoid air valve
TGC-GAC-AIR- <b>COBOT</b> - 001	TGC-CMS-01	TGC-LIN- 01	TGC-RTFA- COBOT	TGC-AIM- AIR-S25	320g	Solenoid air valve
TGC-GAC-AIR- <b>non</b> - 001	TGC-CMS-01	TGC-LIN- 01	-	TGC-AIM- AIR-S25	282g	Solenoid air valve

## Accessories and spare parts

SKU	Gripper adaptor Items	Material	Shore factors	Quantity Per Pack	Dim	Net Weight (Item)
TGC-SFGC-4X-xx	All 4F soft finger gripper	Silicone	A35-A50	1	165xØ90	138- 150g
TGC-BDC--xx	All dual belt gripper	Silicone	A35-A50	1	134xØ90	138- 150g
TGC--RTFA-COBOTS	Tool Flange Adaptor item	PU-Resign	MINT-GREEN	1	Ø63x16	0.038 kg
TGC--RTFA-ADEPT	Tool Flange Adaptor item	PU-Resign	BLUE	1	Ø63x16	0.038 kg
TGC--RTFA-ABB	Tool Flange Adaptor item	PU-Resign	RED	1	Ø63x16	0.038 kg



## Lock Ring - hands-only operation

TGC-LIN



### ***Designed for open innovation and full range interfacing***

- The Lock Ring serves to secure the full range of gripper lips by a familiar nut tightening by your bare hands.
- No tools required – exchange of both actuator and gripper lips.
- Disassembly – simply un-turn the ring, and both the gripper lip and the Actuator of choice can be exchanged in seconds.
- Stay in place on the Mounting Rig when no gripper and actuator is attached
- Can be taken off simply by squeezing the Mounting Rig fan-blades and pull it off, i.e. for cleaning.

### ***Light weight – though robust and resistant***

- The careful material selection features an extraordinary light weight, servicing high dynamic of pick and place operations not affected by heavy dead-weight of the gripper nor gripper attachment elements. Still the design and materials are selectively chosen to accommodate the required mechanical durability and resistance to environment impact in terms of temperature, humidity, UV light and chemical hostility.

### ***Ergonomics***

- The other tough rim of the nut has been carefully surface structure design the provide a balanced grip that ensures excellent friction with your fingertips just enough, but too much ,so you can tighten /loosen the nut when fixing the lip in context. It provides a good feel for when the nut is sufficiently tightened. .

### ***Compact – featuring tight fit requirements***

- The Lock Ring obtains minimum space features dense circumstances during both picking and placing. Often packaging and assembly tasks offers limited access spacing to fulfillment of the job. The TCG Mounting Rig has taken decades of hand-on experience and knowhow into account to comply with such requirements. No clearance space is waisted, so the gripper assembly is capable to fit into even the tightest settings.



### **Features**



Featuring ribs on the interfacing inner surface to interact with the all-around gripper lip upper ring. When turned by hand for tightening, it secures the soft-material of the gripper lip by squeezing it against the Mounting Rigs cavities . Tolerances and material properties are carefully optimized to achieve such "human touch" feeling. The absence need for any tools is highly deliberate to avoid undesired down-time and to secure agile operation.



Interfaces the Mounting Rig fan-blade treading to by hand turned to secure both the actuator and gripper lip of choice. The cavity rim of the gripper lips is pull over the fan-blades convex rim. This secures a poke-joke intuitive initial mount of the lip. Once in place, the Lock Ring is turned to tighten around the outer ring surface where the inner ribs of the nut will compress the soft lips and ensure a robust fixation even under repetitive dynamic impact of gripper operation reflecting lips stress and deflection.



The Mounting Rig treading interface is located in line with the clamping structure for the Actuator Insert in such a way that once the ring is turned it forces the insert to be tight-fit into position and hold steady while the actuator pushes and pulls onto the gripper lip.



Slim-fit design to minimize clearance space featuring thigh-fit operations. This is especially beneficial during placement in tight scape requirement scenarios.



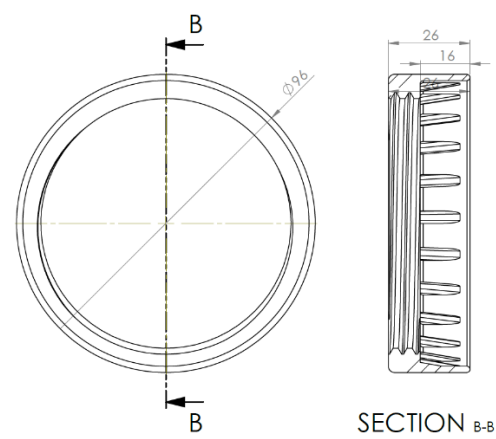
Resist highly aggressive cleaning agents. Including chloride solution. For further information [LINK](#)



TGC-LIN-xx

SKU	color	Weight	Material (See table)	Chemical resistance	recyclable	Food Grade
TGC-LIN- 01	Dark gray	38g	Reinforce PU	yes1)	yes	Yes2)
1) <a href="#">Chemical Resistance Table</a>						
2) <a href="#">Food Compliance US</a> , <a href="#">Food compliance EU</a>						

Accessories



Material technical overview

Shore D Hardness	70
Ultimate Tensile,	35.8 MPa
Tensile Modulus	1006 MPa
Elongation @ Break	4%
Flexural Strength,	42.7 MPa
Flexural Modulus	1258 MPa
Compressive Strength	38.4 MPa
Heat Deflection Temp	72 °C
Compressive Modulus	44.8 MPa

## Mounting Rig – *slim open configurable design*



TGC-CMS- [L/C]-01 (long/Compact)

### **Designed for open innovation and full range interfacing**

- Mechanical interfaces for vendor specific Tool Flange Adaptors, Actuator Inserts, Lock Ring and gripper lips.
- Features numerous combinatoric assemblies accomplished through hand-only exchange of both actuators and gripper lips.

### **Light weight – though robust and resistant**

- The careful material selection features an extraordinary light weight, servicing high dynamic of pick and place operations not affected by heavy dead-weight of the gripper nor gripper attachment elements seen in other designs. Still the design and materials are selective chosen to accommodate the required mechanical durability and resistance to environment impact in terms of temperature, humidity UV light and chemical hostility.

### **Future expansion ready**

- This universal element – the Mounting Rig – is locked down from an interface design perspective so you can earn on the benefits of our future expansion of the portfolio of both gripper lips and actuator options.

### **Compact – featuring tight fit requirements**

- The Mounting Rig obtains minimum space features dense circumstances during both picking and placing. Often packaging and assembly tasks offers limited access spacing to fulfillment of the job. The TCG Mounting Rig has taken decades of hand-on experience and knowhow into account to comply with such requirements. No clearance space is waisted, so the gripper assembly is able to fit into even the tightest settings.

### **Topologic optimized 4x flexible fan-blades**

- To accommodate the ambition of tool-free – human-hand-only design criteria the flexible fan-blades play a central role allowing that both actuator inserts and gripper lips to be mounted/dismounted fast and intuitively. The design gives a “human touch” user experience, that by the mechanical response alone “tells” the user that things are correctly in place.

#### Features



Generic top end interface for vendor specific Tool Flange Adaptor. Comprised of three back-lock knobs to catch and align the Tool Flange Adaptor elements.



The Lock Ring treading on all four flexible fan-blades is dimensionally designed to fit for hands-only operations fast and with “human-touch” force-feedback giving a natural feeling of needed and sufficient applied forces. The flexible blades allow to be squeezed so the Lock Ring can be pull on and off.



The Actuator Insert element fixing structure self-alignment and click-lock interface. The insert has an extended knob that matches the gob/slid between fan-blades. This serves to give an easy (poke-joke) assembly process, so when the blades are spread by pushing it in from below, the guides leads the way while pushing it further up until the tensioned blades will clamp-in once the insert reaches the interfacing structure. [LINK VIDEO](#)



Slim-fit design to serve tight-fit pick and place operations.



Resist highly aggressive cleaning agents. Including chloride solution. For further information [LINK](#)

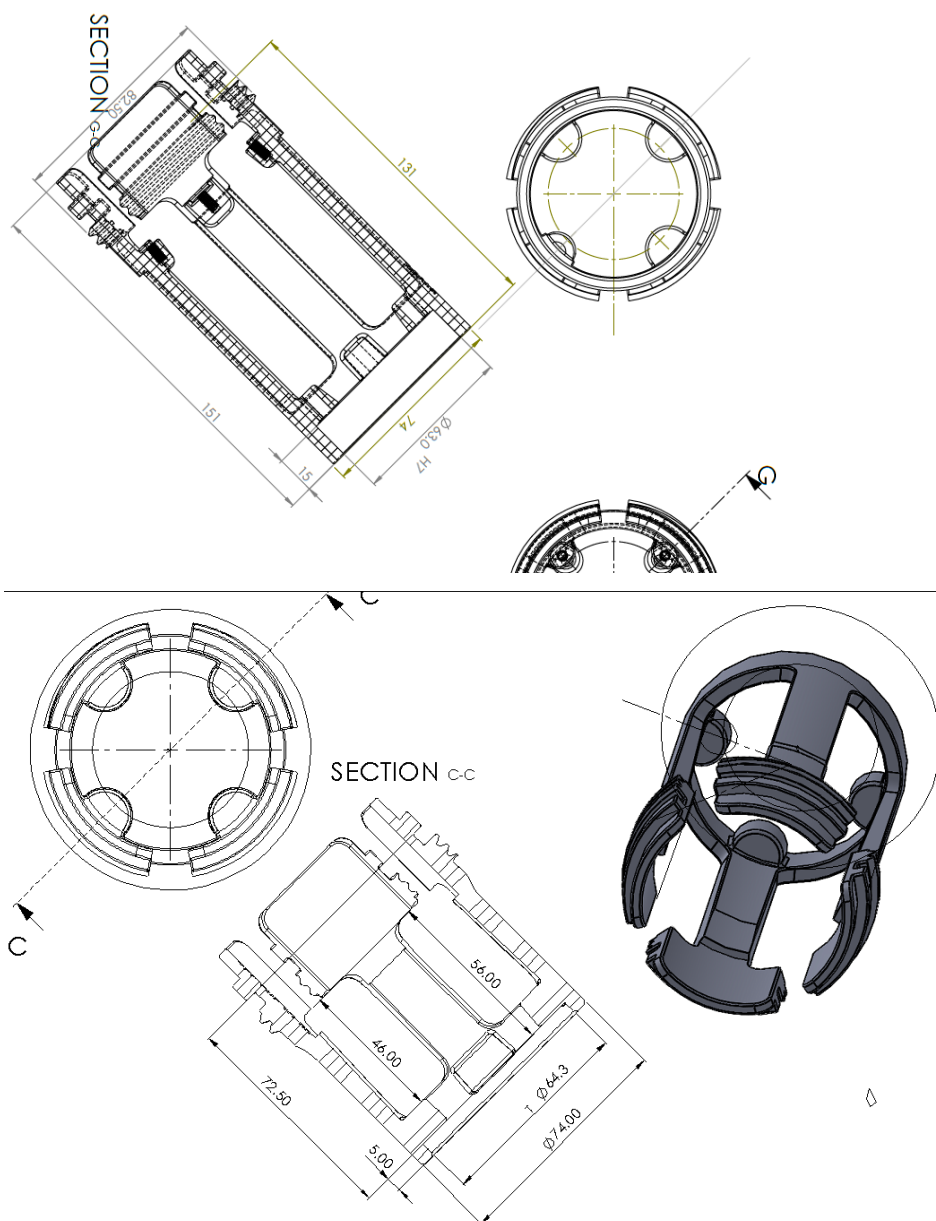


## TGC-CMS-xx

SKU	color	Weight	Material (See table)	Chemical resistance	recyclable	Food Grade
TGC-CMS-L- 01	Gray	110g	Reinforce PU	yes <sup>1)</sup>	yes	Yes <sup>2)</sup>
TGC-CMS-C- 01	Gray	90g	Reinforce PU	yes <sup>1)</sup>	yes	Yes <sup>2)</sup>

1) [Chemical Resistance Table](#)

2) [Food Compliance US](#) , [Food compliance EU](#)



### Material technical overview

Shore D Hardness	70
Ultimate Tensile,	35.8 MPa
Tensile Modulus	1006 MPa
Elongation @ Break	4%
Flexural Strength,	42.7 MPa
Flexural Modulus	1258 MPa
Compressive Strength	38.4 MPa
Heat Deflection Temp	72 °C
Compressive Modulus	44.8 MPa

## Air Actuator Insert– interchangeable actuation



TGC-AIM [L/C]-XX

### Designed with an eye for flexible actuation

- The Air Actuator Insert carries fast compressed air operated actuator.
- Features numerous combinatoric assemblies accomplishments.
- Hand-only – no tools required to mount/remove of the actuator insert
- POKEJOKE – meaning it simply clicks in-place

### Light weight – though robust and resistant

- The careful material selection features an extraordinary light weight, servicing high dynamic of pick and place operations not affected by heavy dead-weight of the gripper nor gripper attachment elements. Still the design and materials are selectively chosen to accommodate the required mechanical durability and resistance to environment impact in terms of temperature, humidity UV light and chemical hostility.

### Future expansion ready – combinatoric freedom

- The Actuator Insert element is locked down from an interface design perspective so you can earn on the benefits of our future expansion of the portfolio of both grippers and actuator options.

### Compact – featuring tight fit requirements

- The four-bladed Mounting Rig inherits a universal mechanical interface that secures the actuator insert in correct assembly position, and has a vertical enclosed cylindrical cavity space the surround the insert. The connections of the air-hose are openly exposed for easy access.

### Stream cleaning option

- The Quick-connect fittings (that includes contra valve balls in the two connectors fixed to the cylinder) lets you avoid dust and moist getting into the cylinder during cleaning, even stream / autoclaving cleaning.

#### Features



Optional Quick-m/f connectors with contra-valve sealing while dismounted.



The insert is topologically optimized for durability of repetitive dynamic load from actuations and static stiffness while obtaining minimum mass.



Actuator Insert element fixing structure has self-alignment and click-lock interface. Note the insert has an extended knob that matches the gob/slid between fan-blades. This serves to give an easy (poke joke) assembly process, so when the blades are spread by pushing the insert in from below, the guides leads the way while pushing it further up until the tensioned blades will clamp-in and the insert reaches the interfacing structure. [LINK VIDEO](#)



Slim-fit design to serve tight-fit pick and place operations.



Resist highly aggressive cleaning agents. Including chloride solution. For further information [LINK](#)



TGC-AIM-XX

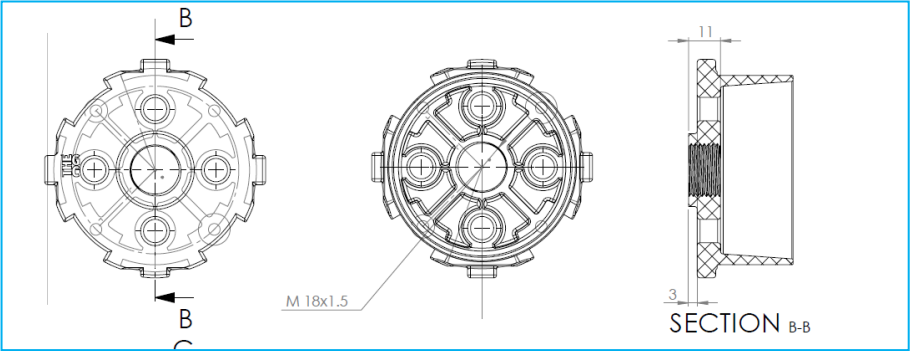
SKU	color	Weight	Material (See table)	Chemical resistance	Actuator spec	recyclable	Food Grade
TGC-AIM- AIR-S30	Light beige	143g 38g + actuator	Reinforce PU	yes1)	See TGC-AIR-S30	Yes	Yes <sup>2)</sup>

Accessories

SKU	Items	Performance	Material	Weight	Quantity Per Pack	Drive system	Release
TGC-AIR-S25	Compressed Cylinder	Air Air Cylinder Stroke 25mm Max. force 120N <sup>3)</sup> Pull/push time <30ms Air consumption <sup>4)</sup> 0.002 NI/operation	Anodized ANSI 316  Silicone sealed contra valve push-in connectors	Alu-SS 110g	1	Solenoid Valve for compressed air	aug. 2020

- 1) [Chemical Resistance Table](#)
- 2) [Food Compliance US](#) , [Food compliance EU](#) , Wash Down IP65/IP69K, for futher info on the attached cylinder by [SMC pneumatics](#)
- 3) @6 bar
- 4) Link air consumption calc.
- 5) Longitunal /cross axial

TGC\_AIM\_L (long )

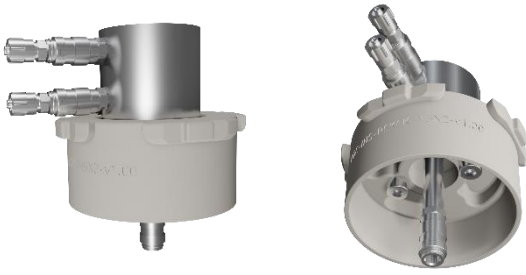


Material technical overview  
(PU actuator insert adaptor)

Shore D Hardness	70
Ultimate Tensile,	35.8 MPa
Tensile Modulus	1006 MPa
Elongation @ Break	4%
Flexural Strength,	42.7 MPa
Flexural Modulus	1258 MPa
Compressive Strength	38.4 MPa
Heat Deflection Temp	72 °C
Compressive Modulus	44.8 MPa



## Compact Air Actuator Insert– interchangeable actuation



TGC-AIMC-XX

### Designed with an eye for flexible actuation

- The Air Actuator Insert carries fast compressed air operated actuator.
- Features numerous combinatoric assemblies accomplishments.
- Hand-only – no tools required to mount/remove of the actuator insert
- POKEJOKE – meaning it simply clicks in-place

### Light weight – though robust and resistant

- The careful material selection features an extraordinary light weight, servicing high dynamic of pick and place operations not affected by heavy dead-weight of the gripper nor gripper attachment elements. Still the design and materials are selectively chosen to accommodate the required mechanical durability and resistance to environment impact in terms of temperature, humidity UV light and chemical hostility.

### Future expansion ready – combinatoric freedom

- The Actuator Insert element is locked down from an interface design perspective so you can earn on the benefits of our future expansion of the portfolio of both grippers and actuator options.

### Compact – featuring tight fit requirements

- The four-bladed Mounting Rig inherits a universal mechanical interface that secures the actuator insert in correct assembly position, and has a vertical enclosed cylindrical cavity space the surround the insert. The connections of the air-hose are openly exposed for easy access.

### Stream cleaning option

- The Quick-connect fittings (that includes contra valve balls in the two connectors fixed to the cylinder) lets you avoid dust and moist getting into the cylinder during cleaning, even stream / autoclaving cleaning.

#### Features



Optional Quick-m/f connectors with contra-valve sealing while dismounted.



The insert is topologically optimized for durability of repetitive dynamic load from actuations and static stiffness while obtaining minimum mass.

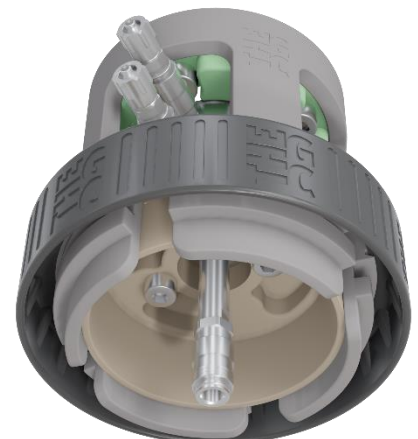
Actuator Insert element fixing structure has self-alignment and click-lock interface. Note the insert has an extended knob that matches the gob/slid between fan-blades. This serves to give an easy (poke joke) assembly process, so when the blades are spread by pushing the insert in from below, the guides leads the way while pushing it further up until the tensioned blades will clamp-in and the insert reaches the interfacing structure. [LINK VIDEO](#)



Slim-fit design to serve tight-fit pick and place operations.



Resist highly aggressive cleaning agents. Including chloride solution. For further information [LINK](#)



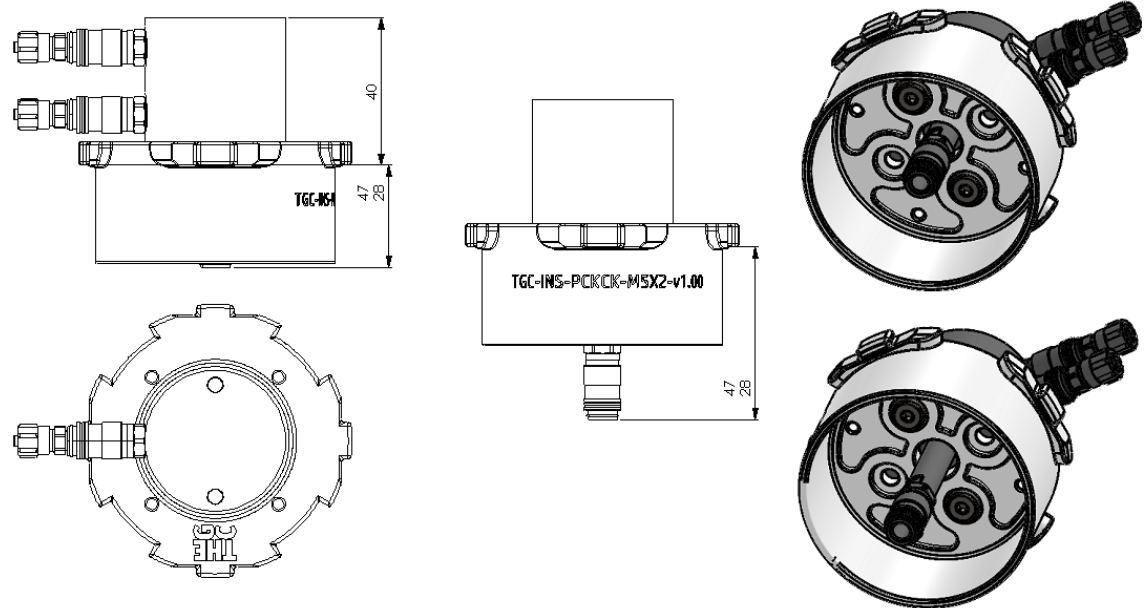
TGC-AIMC-XX

SKU	color	Weight	Material (See table)	Chemical resistance	Actuator spec	recyclable	Food Grade
TGC-AIMC- AIR-S19	Light beige	175g 38g + actuator	Reinforce PU	yes1)	See TGC-PK-2020	Yes	Yes <sup>2)</sup>

Accessories

SKU	Items	Performance	Material	Weight	Quantity Per Pack	Drive system	Release
TGC-AIR-S25	Compressed Cylinder	Air Cylinder Stroke 25mm Max. force 120N <sup>3)</sup> Pull/push time <30ms Air consumption <sup>4)</sup> 0.002 NI/operation	Anodized ANSI 316  Silicone sealed contra valve push-in connectors	Alu-SS 110g	1	Solenoid Valve for compressed air	aug. 2020

- 6) [Chemical Resistance Table](#)
- 7) [Food Compliance US](#) , [Food compliance EU](#) , Wash Down IP65/IP69K, for futher info on the attached cylinder by [SMC pneumatics](#)
- 8) @6 bar
- 9) Link air consumption calc.
- 10) Longitunal /cross axial



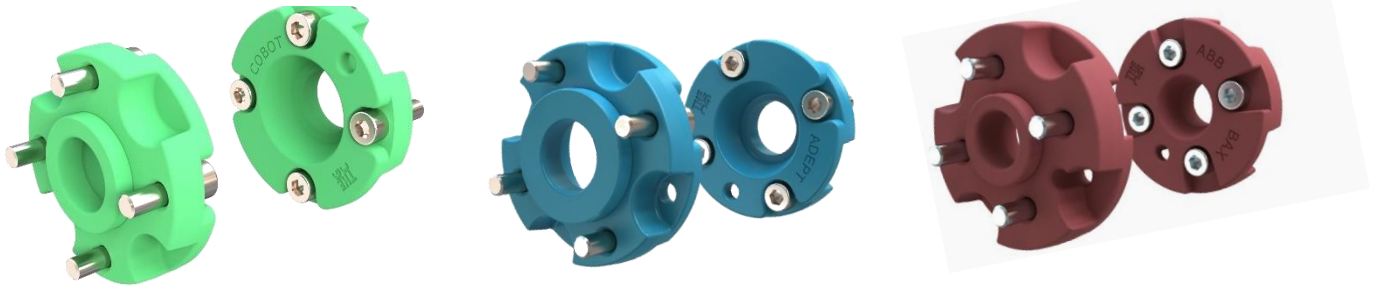
Material

technical overview  
(PU actuator insert adaptor)

hore D Hardness	70
Ultimate Tensile,	35.8 MPa
Tensile Modulus	1006 MPa
Elongation @ Break	4%
Flexural Strength,	42.7 MPa
Flexural Modulus	1258 MPa
Compressive Strength	38.4 MPa
Heat Deflection Temp	72 °C
Compressive Modulus	44.8 MPa

# Tool Flange Adaptor – Your robot of choice

TGC-RTFA-XX



## Designed for market wide robot interfacing

- We have distilled a mechanical interface that satisfies requirements of adaptability to the broad spectra of robot vendor specific tool flange dimensions.
- Besides the collection of Tool Flange Adaptors in our portfolio, we offer you an open-ended 3D CAD model for your self-made custom fit

## Light weight – though robust and resistant

- The careful material selection features an extraordinary light weight, servicing high dynamic of pick and place operations not affected by heavy dead-weight of the gripper nor gripper attachment elements. Still the design and materials are selectively chosen to accommodate the required mechanical durability and resistance to environment impact in terms of temperature, humidity, UV light and chemical hostility.

## Future expansion ready

- The portfolio of the robot vendor specific tool flange adaptor is continuously expanded. And we offer 3D CAD model for customer self-made adaptors

## Topologic optimized

- The Tool Flange Adaptor implies a one-time operation to bolt the top of the Mounting Rig to the specific robot tool flange. Here by you have the quick and hands-free premises of in seconds to exchange either gripper lip and/or actuator insert for shifting jobs that requires a new setting.

### Features



Generic top end interface for vendor specific Tool Flange Adaptor. Comprised of three back-lock knobs to catch and align the Tool Flange Adaptor elements.

For convenience we offer a large range of the most popular robot brands, see range in the following table or visit [www.thegrippercompany.com](http://www.thegrippercompany.com) for the frequently updated assortment. We also offer 3D CAD download, so you have the interface design for your own Tool Flange Adaptor



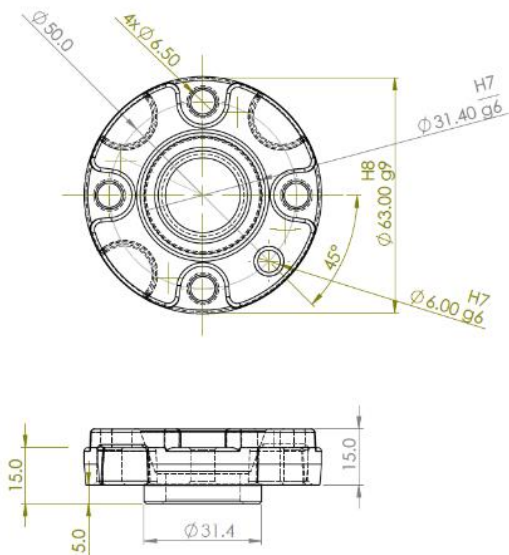
Resist highly aggressive cleaning agents. Including chloride solution. For further information [LINK](#)



TGC-RTFA-XX

SKU	color	Weight	Material (See table )	Chemical resistance	recyclable	Food Grade
TGC-RTFA- ADEPT <sup>3)</sup>	Light blue	40g accessories	+ Reinforce PU	yes <sup>1)</sup>	yes	Yes <sup>2)</sup>
TGC-RTFA- COBOT <sup>3)</sup>	Light Green	40g accessories	+ Reinforce PU	yes <sup>1)</sup>	yes	Yes <sup>2)</sup>
TGC-RTFA- ABB <sup>3)</sup>	Light Red	40g accessories	+ Reinforce PU	yes <sup>1)</sup>	yes	Yes <sup>2)</sup>

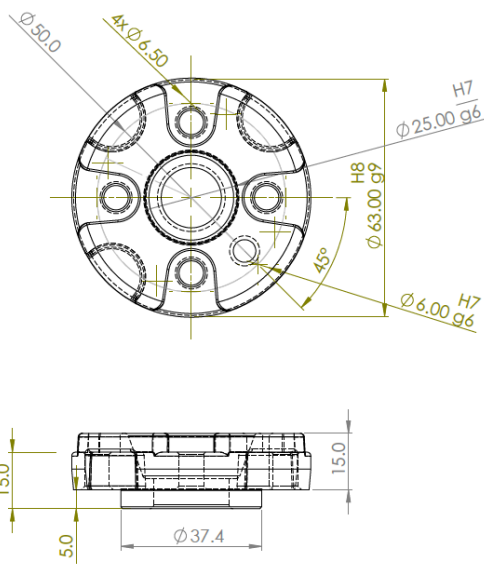
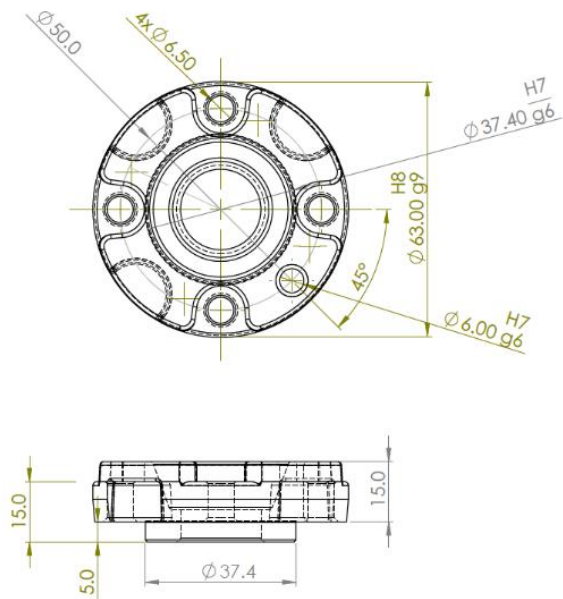
- 1) [Chemical Resistance Table](#)  
2) [Food Compliance US](#) , [Food compliance EU](#)  
3) Incl 4x M6x20 A2 hexagonal bolts 1x parallel pin ø6x20 h7



Material technical overview

Shore D Hardness	70
Ultimate Tensile,	35.8 MPa
Tensile Modulus	1006 MPa
Elongation @ Break	4%
Flexural Strength,	42.7 MPa
Flexural Modulus	1258 MPa
Compressive Strength	38.4 MPa
Heat Deflection Temp	72 °C
Compressive Modulus	44.8 MPa

TGC-RTFA-COBOT Cobots incl. KUKA, AUBO, UR, KINOVA more



TGC-RTFA-IRB-RTH – ABB IRB360, Rethink BAXTER, SAWYOR



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- Certain statements contained herein, regarding matters that are not historical facts, may be forward-looking statements (as defined in Section 27A of the United States Securities Act of 1933, as amended, and Section 21E of the United States Securities Exchange Act of 1934, as amended). We intend such forward-looking statements to be covered by the safe harbor provisions for forward-looking statements contained in the Private Securities Litigation Reform Act of 1995 and include this statement for purposes of complying with the safe harbor provisions. Such forward-looking statements include statements regarding management's intentions, plans, beliefs, expectations or forecasts for the future. The words such as "may," "will," "could," "should," "expect," "plan," "anticipate," "intend," "believe," "estimate," "continue," and similar words are intended to identify estimates and forward-looking statements.
- Such forward-looking statements are based on the expectations of TGC Pharmaceuticals, Inc. ("our" or the "Company") and involve risks and uncertainties; consequently, actual results may differ materially from those expressed or implied in the statements. Such risks and uncertainties include, but are not limited to (i) our ability to integrate the operations of TGC Pharmaceuticals LLC ("TGC") and Impax Laboratories, Inc. ("Impax") pursuant to the transactions (the "Combination") contemplated by that certain Business Combination Agreement dated as of October 17, 2017 by and among the Company, TGC, Impax and K2 Merger Sub Corporation as amended by Amendment No. 1, dated November 21, 2017 and Amendment No. 2 dated December 16, 2017 and our ability to realize the anticipated synergies and other benefits of the Combination, (ii) the fact that certain of our stockholders holding over a majority of our shares (the "TGC Group Members") may have interests different from those of our other stockholders, (iii) the transaction costs related to the Combination, (iv) results from the public unaudited pro forma financial information of Impax and TGC may not be indicative of the Company's future operating performance, (v) business issues faced by either TGC or Impax may be imputed to the operations of the Company, (vi) the impact of a separation of Impax or TGC as a subsidiary of the Company, (vii) the change of control or early termination rights in certain of Impax's or TGC's contracts that may be implicated by the Combination, (viii) payments required by the Company's Tax Receivables Agreement, (ix) the impact of global economic conditions, (x) our ability to successfully develop or commercialize new products, (xi) our ability to obtain exclusive marketing rights for our products or to introduce products on a timely basis, (xii) the competition we face in the pharmaceutical industry from brand and generic drug product companies, (xiii) our ability to manage our growth, (xiv) the impact of competition, (xv) the illegal distribution and sale by third parties of counterfeit versions of our products or of stolen products, (xvi) market perceptions of us and the safety and quality of our products, (xvii) the substantial portion of our total revenues derived from sales of a limited number of products, (xviii) our ability to develop, license or acquire and introduce new products on a timely basis, (xix) the ability of our approved products to achieve expected levels of market acceptance, (xx) the risk that we may discontinue the manufacture and distribution of certain existing products, (xxi) the impact of manufacturing or quality control problems, (xxii) product liability risks, (xxiii) risks



related to changes in the regulatory environment, including United States federal and state laws related to healthcare fraud abuse and health information privacy and security and changes in such laws, (xxiv) changes to FDA product approval requirements, (xxv) risks related to federal regulation of arrangements between manufacturers of branded and generic products, (xxvi) the impact of healthcare reform, (xxvii) business interruptions at one of our few locations that produce the majority of our products, (xxviii) relationships with our major customers, (xxix) the continuing trend of consolidation of certain customer groups, (xxx) our reliance on certain licenses to proprietary technologies, (xxxi) our dependence on third party suppliers and distributors for raw materials for our products, (xxxii) the time necessary to develop generic and branded drug products, (xxxiii) our dependence on third parties for testing required for regulatory approval of our products, (xxxiv) our dependence on third party agreements for a portion of our product offerings, (xxxv) our ability to make acquisitions of or investments in complementary businesses and products, (xxvi) regulatory oversight in international markets, (xxxvii) our increased exposure to tax liabilities and the impact of recent United State tax legislation, (xxxviii) third parties' infringement of our intellectual property rights, (xxxix) our involvement in various legal proceedings, (xl) increased government scrutiny related to our agreements to settle patent litigation, (xli) the impact of legal, regulatory and legislative strategies by our brand competitors, (xlii) the significant amount of resources we expend on research and development, (xliii) our substantial amount of indebtedness, (xliv) risks inherent in conducting clinical trials, (xlv) our reporting and payment obligations under the Medicaid and other government rebate programs, (xlvi) fluctuations in our operating results, (xlvii) adjustments to our reserves based on price adjustments and sales allowances, (xlviii) impact of impairment on our goodwill and other intangible assets, (xlix) investigations and litigation concerning the calculation of average wholesale prices, (l) cybersecurity and data leakage risks, (li) our ability to attract and retain talented employees and consultants, (lii) uncertainties involved in the preparation of our financial statements, (liii) impact of terrorist attacks and other acts of violence, (liv) expansion of social media platforms, (lv) our need to raise additional funds in the future, (lvi) the restrictions imposed by the terms of our credit agreement, (lvii) our ability to generate sufficient cash to service our indebtedness in the future and (lviii) such other factors as may be set forth in the Company's public filings with the Securities and Exchange Commission.

- Forward-looking statements included herein speak only as of the date hereof and we undertake no obligation to revise or update such statements to reflect events or circumstances after the date hereof or to reflect the occurrence of unanticipated events or circumstances.

## **Prices and Product Specifications**

- Prices shown are list prices and are subject to trade discount and to change without notice. Prices may also be changed without notice due to unforeseen cost increases of imported products, raw materials, or currency fluctuations. We carefully check pricing and product specifications, but occasionally errors can occur, therefore we reserve the right to change both without notice. We are not responsible for customer pricing errors. Some variations between picture and product may occur. Some products listed may be non-stock items.

## **Terms**

- Full payment is due net cash. Accepted payment methods include NETS easy, Paypal, Payment by Visa, MasterCard are accepted for prepayments. Accounts without terms are subject to payment in advance, until credit approval has been granted and accepted. All products, F.O.B. Aalborg Denmark.
- International orders accepted against Pre-payment only.

## **Tax**

- As required by law.

## **Returns**

- Returns will not be accepted unless approved in writing. Minimum return amount of €50.00 list. Returned goods must be received within 10 days of purchase. To obtain a return authorization, please sales@thegrippercompany.com. All authorized returns must be shipped FREIGHT PREPAID. A restocking charge of 20% may apply to unused products in their original packaging. Return of used products are subject to inspection and a restocking charge of 50% or more may apply. Special order, clearance, or non-standard items are not returnable.

## **Claims**

- TGC has no recourse for damaged products that were shipped collect or third party. In the event of shortage or if damage is detected, in a collect, or third-party shipment, notify the delivering carrier at once to request an inspection and file a claim promptly. Any delay may cause you a loss. Shortage or damage in shipment does not excuse the buyer from timely payment of the invoice. We cannot reimburse claims for shortages or delays caused by the carrier responsible. If in the event that shortages or damages are detected in a shipment delivered by an TGC carrier, please note it on the bill of lading before accepting the delivery and contact TGC immediately so that we may initiate a claim. Please keep all packaging for inspection purposes. Apparent packing errors must be reported to us within 3 business days of receipt. Order Placement All general orders must meet or exceed a €100.00 net minimum. Parts orders must meet or exceed a €25.00 net minimum. A €20.00 handling charge will automatically be added to any order if it does not meet the requirements set out above. We require written confirmation of all verbal orders. Please fax or email them to us. We are not responsible for verbal misunderstandings or mistakes.
- Back orders are shipped when available unless we are advised to cancel. Special order items will not be back ordered on prepaid freight orders. If early shipment is requested, then freight charges become the customer's responsibility. On prepaid shipments, TGC retains the right to choose the carrier. Split shipments are not allowed on prepaid orders. Should the customer request a split shipment, then freight charges become the customer's responsibility.

## **Packaging**

- TGC reserves the right to package items in what it deems to be the most suitable and economic manner. Warranty TGC provides warranty for all the products that we sell. Our manufacturers provide warranties against all defects of material and manufacturing, as well as for defective assembling. Though we are bound by our manufacturers' guarantees, we will always provide you with our best in correcting a matter of warranty. As such, TGC will provide a one-year bench-warranty on all electrically powered products and a six-month bench-warranty on manually operated products. Bench-warranty means that the product must be sent to us, or to one of our authorized service centers, freight prepaid, for warranty evaluation. We will not accept C.O.D. or collect shipments. Please do not replace a customer's product at no charge until you receive written authorization from FMA. Individual items with weights in excess of 10kg each, will carry a limited on-site warranty. Geographic location, proximity to major urban centers, and product type, govern our limited on-site warranty. Geographic location may limit guarantee to a parts-only warranty. TGC reserves the right to either repair or replace product at our discretion. This guarantee does not apply to abuse, willful or accidental damage, or to products used for other than their intended purposes. Any tampering or modifications to any product automatically cancels the guarantee. Items not covered by our guarantee include electrical components, which are subject to natural wear and tear. TGC denies liability for any damage or injury caused by operator neglect, carelessness, or inadvertence.