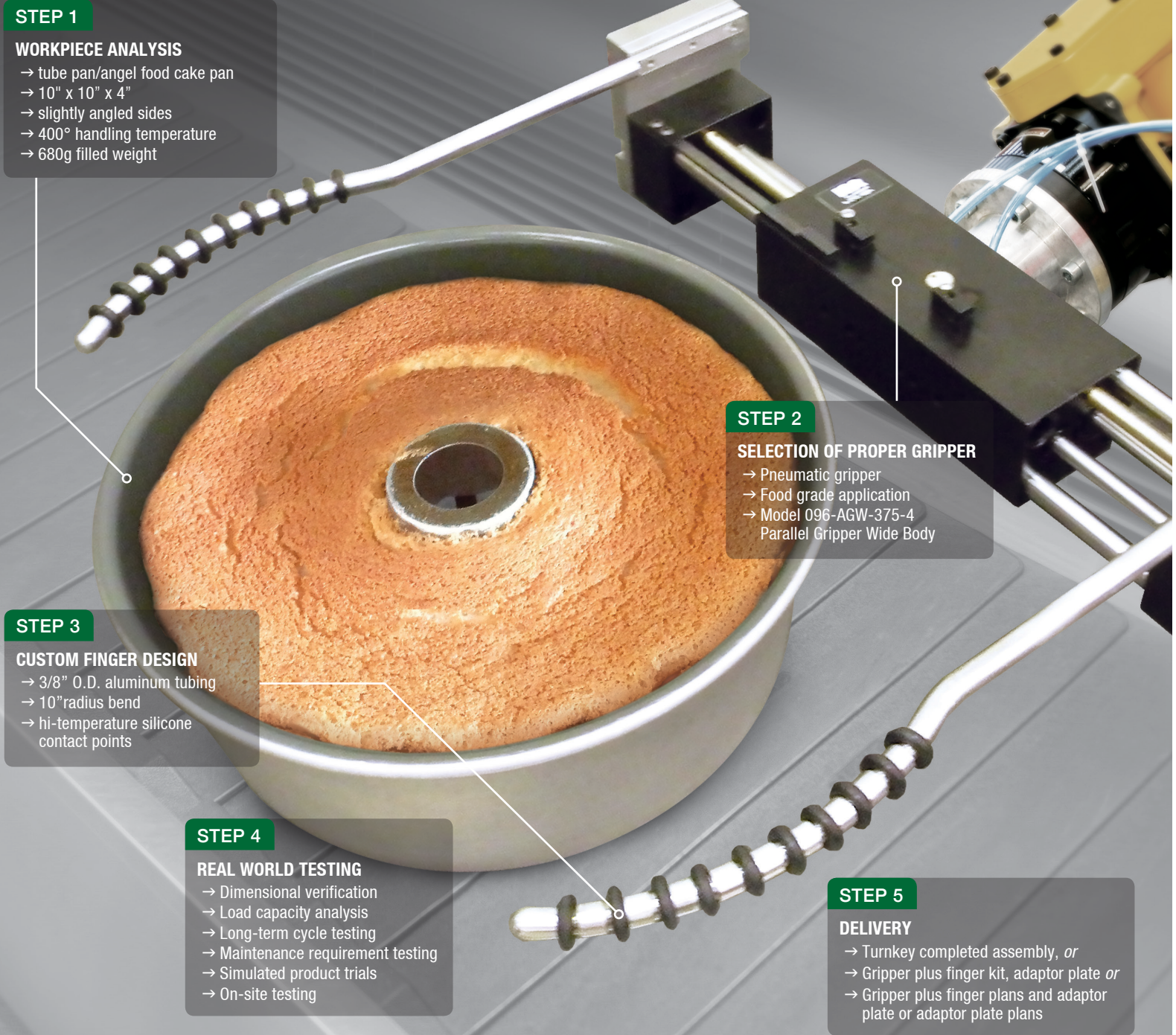


From off-the-shelf to full custom — use our expert knowledge in selecting and designing successful handling solutions.

At Applied Robotics we don't just sell grippers — we expertly design and manufacture them. Think of us as a trusted technical resource and extension of your engineering team.



STEP 1
WORKPIECE ANALYSIS
→ tube pan/angel food cake pan
→ 10" x 10" x 4"
→ slightly angled sides
→ 400° handling temperature
→ 680g filled weight

STEP 2
SELECTION OF PROPER GRIPPER
→ Pneumatic gripper
→ Food grade application
→ Model 096-AGW-375-4
Parallel Gripper Wide Body

STEP 3
CUSTOM FINGER DESIGN
→ 3/8" O.D. aluminum tubing
→ 10" radius bend
→ hi-temperature silicone contact points

STEP 4
REAL WORLD TESTING
→ Dimensional verification
→ Load capacity analysis
→ Long-term cycle testing
→ Maintenance requirement testing
→ Simulated product trials
→ On-site testing

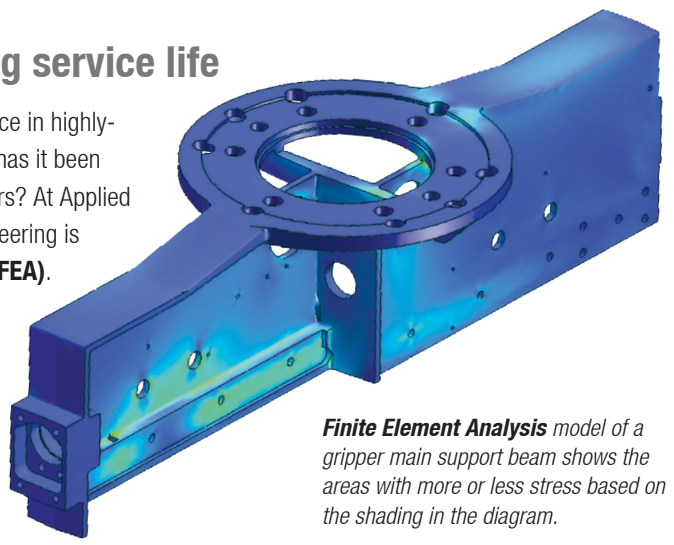
STEP 5
DELIVERY
→ Turnkey completed assembly, or
→ Gripper plus finger kit, adaptor plate or
→ Gripper plus finger plans and adaptor plate or adaptor plate plans

WE ARE THE GRIPPER EXPERTS

- Expert resource for selecting off-the-shelf solutions
- Expert engineering for custom-designed solutions
- Finite Element Analysis plus real-world testing for reliable solutions
- Depth of product line and true one-stop-shopping

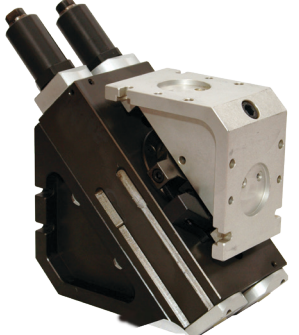
Engineering and testing for performance and long service life

We specialize in custom end-of-arm robotic tools that are engineered for years of service in highly-repetitive factory environments. While a tool can be configured to grip the work piece, has it been designed with the structural integrity necessary to perform the task for the next 10 years? At Applied Robotics, part of how we ensure the quality, and cost- and time-efficiency of our engineering is through **finite element method (FEM)** also referred to as **finite element analysis (FEA)**. FEA is a numerical method for solving problems of engineering and mathematical physics. It can be applied to perform structural analysis on tooling to verify it will support the loads and forces expected during use. This provides a valuable resource by eliminating the time and costs associated with creating and testing multiple rounds of hard prototypes.

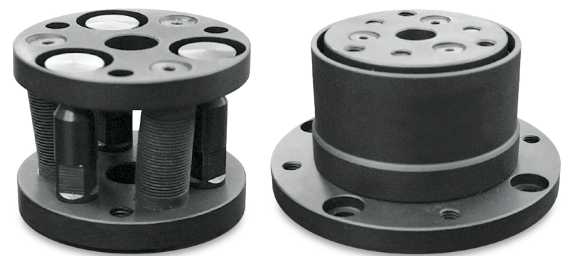


Finite Element Analysis model of a gripper main support beam shows the areas with more or less stress based on the shading in the diagram.

Complimentary Products

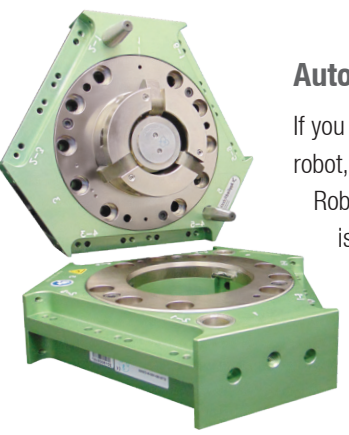
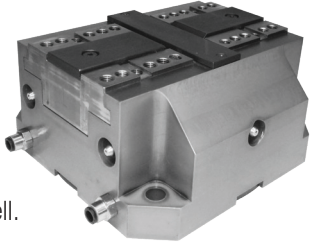


Rotary Actuators
For applications such as assembly machines where grippers may need to be fixed mounted but also handle parts and pass them between processes, a Rotary Actuator which supports two grippers can be implemented. For robotic applications a similar type of mounting device without the rotation feature is available and referred to as a Dual Gripper Support.



Holding Fixtures

Sometimes a gripper needs to put a work piece down to readjust positioning or complete some other process. This is called "work holding" and it's where the pneumatic power vice comes into play. Power vices come in many sizes and are a perfect compliment to a gripper system in your work cell.



Automatic Tool Changers
If you need to switch between more than two devices on the robot, then you need an automatic tool changer. Applied Robotics invented the automatic tool changer and there is a separate brochure dedicated to them. Ask your representative for a copy.

Compliance Devices

A compliance device can be implemented in applications like automated assembly where part alignments have a tight tolerance. The design allows "give" or compliancy within the fixture to compensate for slight misalignments, minor part variances and positioning errors which could potentially lead to down time.

LEARN MORE

Contact our sales department at
+1 (518) 384-1000 or
info@appliedrobotics.com



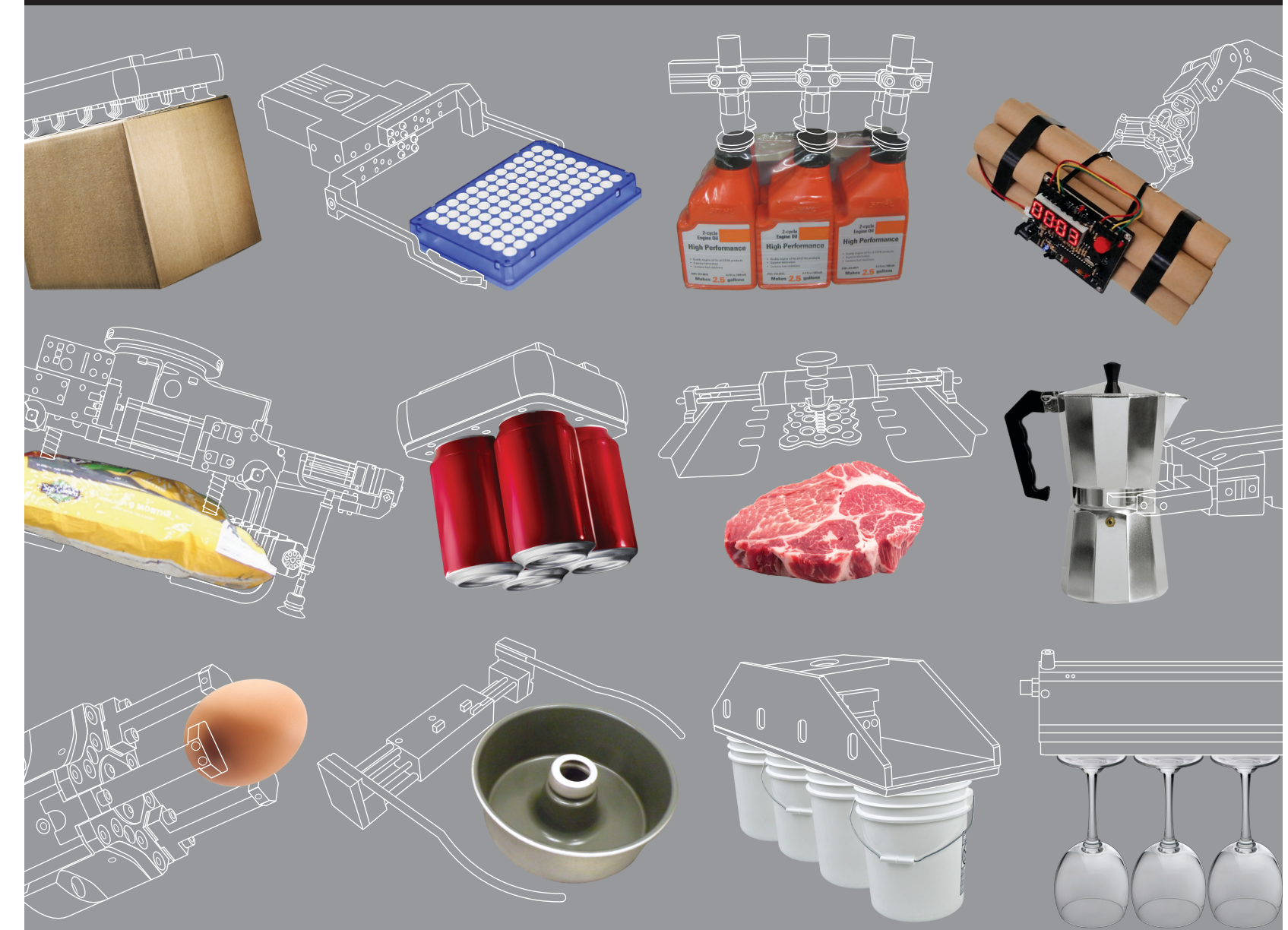
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Precision Robotic Gripping



We can help you handle just about anything

Precision Robotic Gripping Solutions

It all begins with your application... and each application is unique.

There seems to be just as many gripper choices as there are applications — let our expertise guide you through the selection process. We partner with you to examine your work piece and gripping requirements to select a precision tool that provides the performance you need and exceptional service life. Robotic grippers are an integral part of manufacturing today. They provide, among other things, very different gripping strengths and handling dexterity for manipulating objects of various sizes, weights, and fragility levels. Call +1 (518) 384-1000 to discuss your specific application with one of our automation professionals.

There are many factors to consider when choosing a gripper:

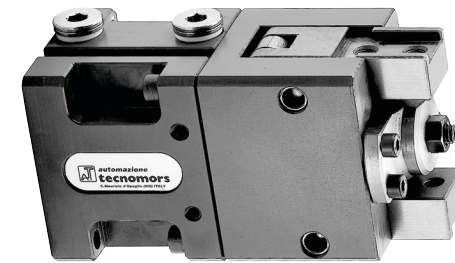
- **What is the purpose of the work cell** — Machine tending? Material handling? Assembling items? Testing products? Welding?
- **How much flexibility and control are necessary to perform the task** — Does it need to pick up the same part from the same location or pick random parts from several locations? Are there space constraints?
- **How much weight needs to be lifted** — and how fast does the robot need to move to achieve the throughput requirements?
- **What type of environment is the equipment operating in** — harsh/heavy industrial, food processing, clean room, or a hazardous environment requiring an intrinsically safe device?

No matter what you need to pick up, we have a gripper to do it.

THE FOLLOWING OUTLINES the various types and styles of grippers available. There are as many grippers as there are applications — too many to cover here, but this overview breaks down the numerous variations available. One of our automation professionals can discuss your specific gripping needs with you.

Pneumatic Finger Grippers

Pneumatic-actuated grippers are driven by compressed air that pushes a piston linked to the gripper's "fingers". These versatile grippers are the most common type and are available in either two or three finger designs in many sizes and capacities. Once the proper gripper is selected, the next step is finger design. This will usually require a sample of the product that needs to be gripped. Applied Robotics gripper engineers will design a finger set specific to the work piece ensuring a proper fit and retention while

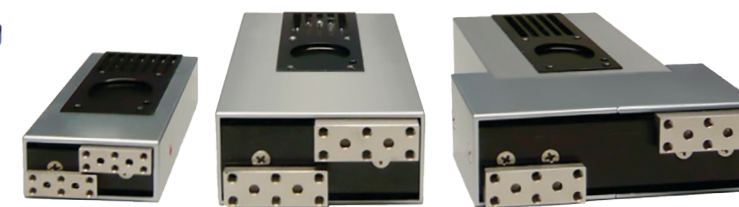
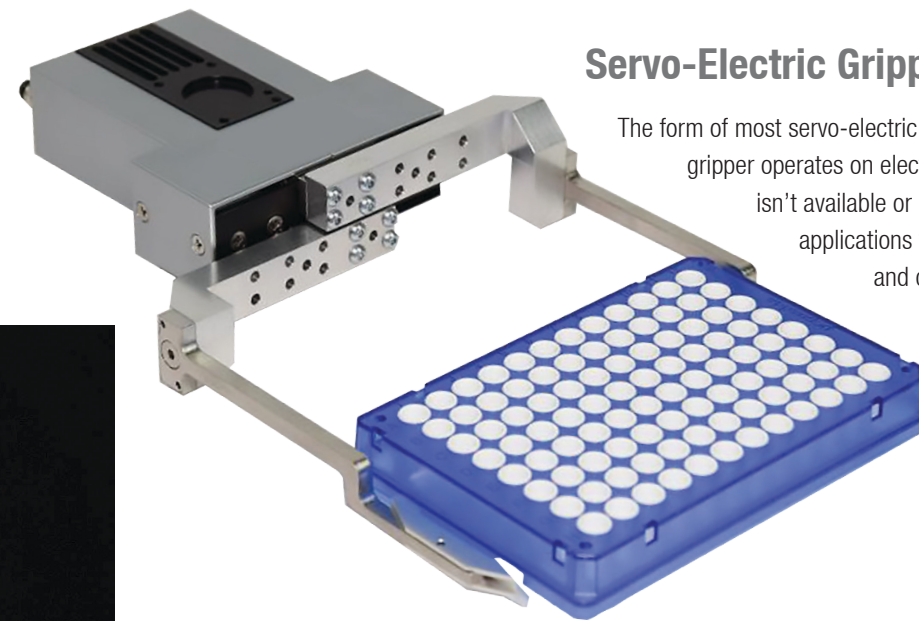


the robot is in motion. We can either deliver a completed finger set with the gripper or finger designs can be manufactured by the

user. Pneumatic finger grippers are available for harsh environments, food applications, clean rooms, and some even meet requirements for intrinsically safe environments. All are high precision with extremely long service life and are also rebuildable. Other specialty designs include o-ring grippers, needle grippers for fabrics, and inflatable bladder grippers for bottles.

Servo-Electric Grippers

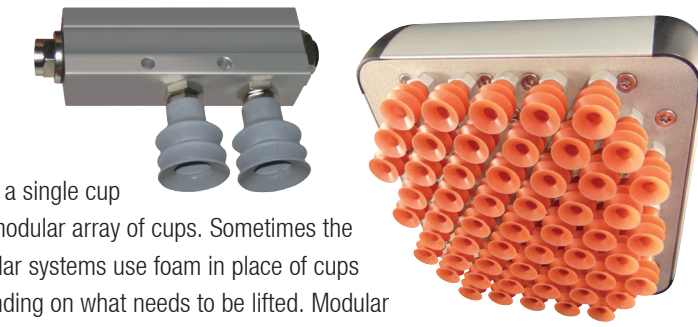
The form of most servo-electric grippers is much like that of a two finger pneumatic gripper. However a servo gripper operates on electric power rather than compressed air. For applications where compressed air isn't available or allowed, a servo gripper is the answer. They are also ideal in high precision applications where specific force is required. Also unlike a pneumatic gripper that opens and closes the same amount every time, a servo gripper can be programmed with multiple stop points enabling the handling of multiple sized objects on the fly.



Vacuum Grippers

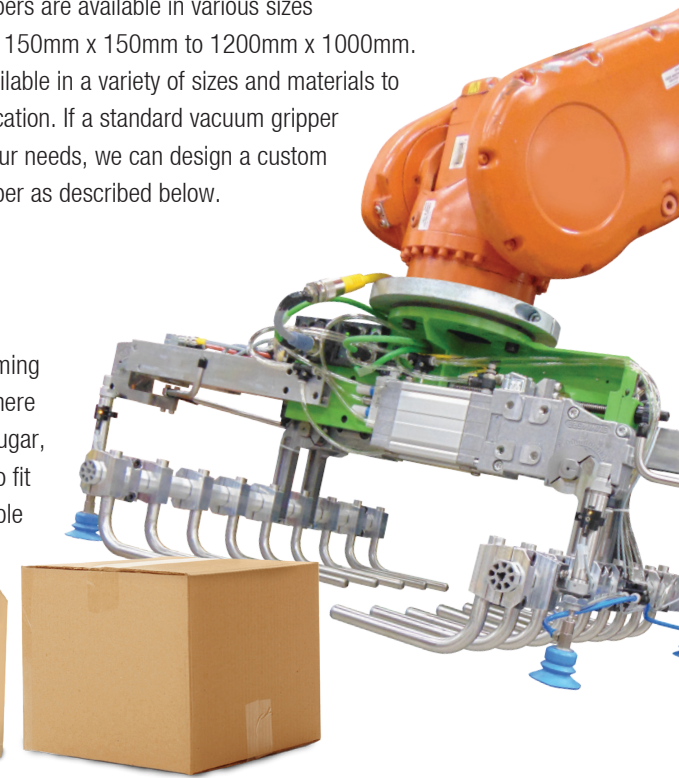
Vacuum grippers use foam or suction cups driven by compressed air that runs through a vacuum generator. They are popular in many applications including stacking, palletizing, and bin picking. They can lift a variety of profiles such as flexible packages, odd shaped objects, boxes, cans, and even groups of objects simultaneously for packaging applications. The variety of items a vacuum gripper can lift are limitless. Many vacuum applications use

either a single cup or a modular array of cups. Sometimes the modular systems use foam in place of cups depending on what needs to be lifted. Modular vacuum grippers are available in various sizes ranging from 150mm x 150mm to 1200mm x 1000mm. Cups are available in a variety of sizes and materials to fit your application. If a standard vacuum gripper doesn't fit your needs, we can design a custom vacuum gripper as described below.



Palletization Grippers

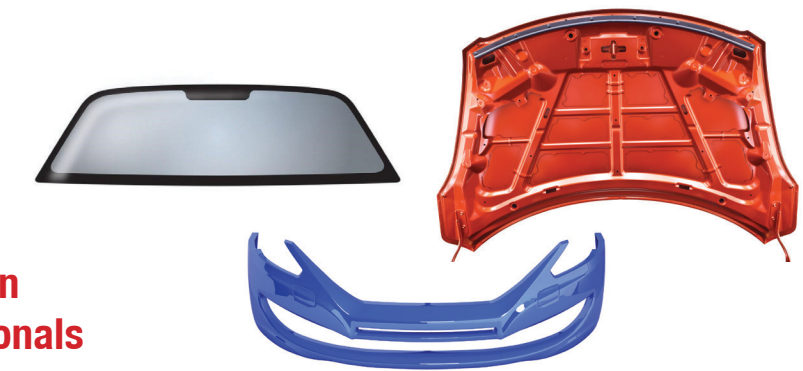
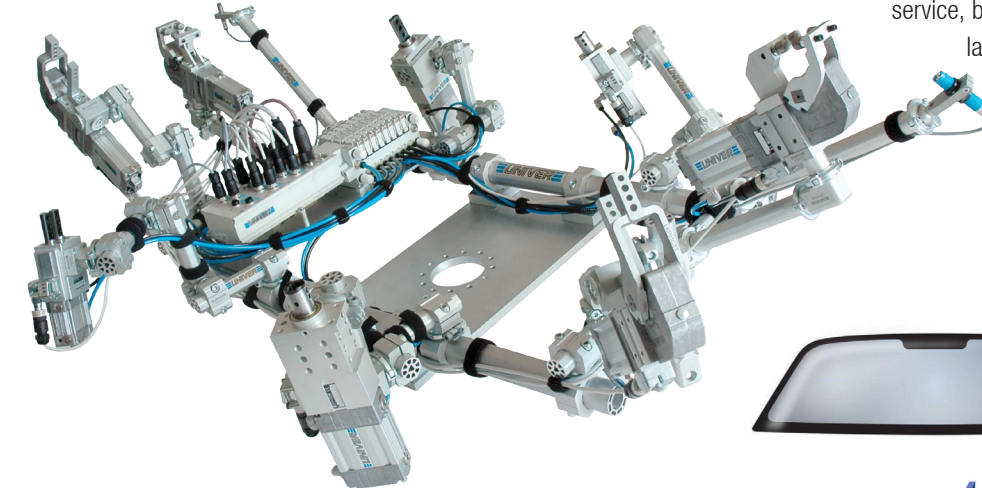
Palletization grippers are used to neatly stack outgoing product on a skid or to off-load incoming product from a skid. Bags or boxes usually come out of production on a conveyor system where the robot lifts them off and stacks them on a pallet. From various sized boxes, 5lb bags of sugar, 40lb bags of wood pellets, or even 100lb bags of cement — we have a palletizing gripper to fit the application. The Applied Robotics Palletizing Gripper (ARPG) is available in three adjustable sizes, the ARPG Mini, ARPG 50 and ARPG 100 and can be configured with either tines for bag use or paddles for box applications. All are ready to start stacking bags and boxes to give your packing crew's backs a well-deserved rest.



Custom Grippers

Sometimes nothing off the shelf fits the application — especially for large, cumbersome, or odd-shaped objects like automotive body panels, glass, or chassis components. Applied Robotics designs customized gripping systems that are engineered for the forces the tool will be subjected to through movement of the robot while under load. Custom gripping systems

are usually constructed using structured aluminum framing to position the contact points (clamping or vacuum) in the optimum locations. Torque, moment, and forces applied to the tool by an emergency hard stop from full speed are examined using finite element analysis. This guarantees not only that the tooling holds together and provides a lifetime of dependable service, but that the tooling retains the work piece without launching it across your production facility. Whether the custom gripping tool is based on mechanical clamping or vacuum cups, the design will be robust and reliable.



Discuss your gripping application with one of our automation professionals at +1 (518) 384-1000

