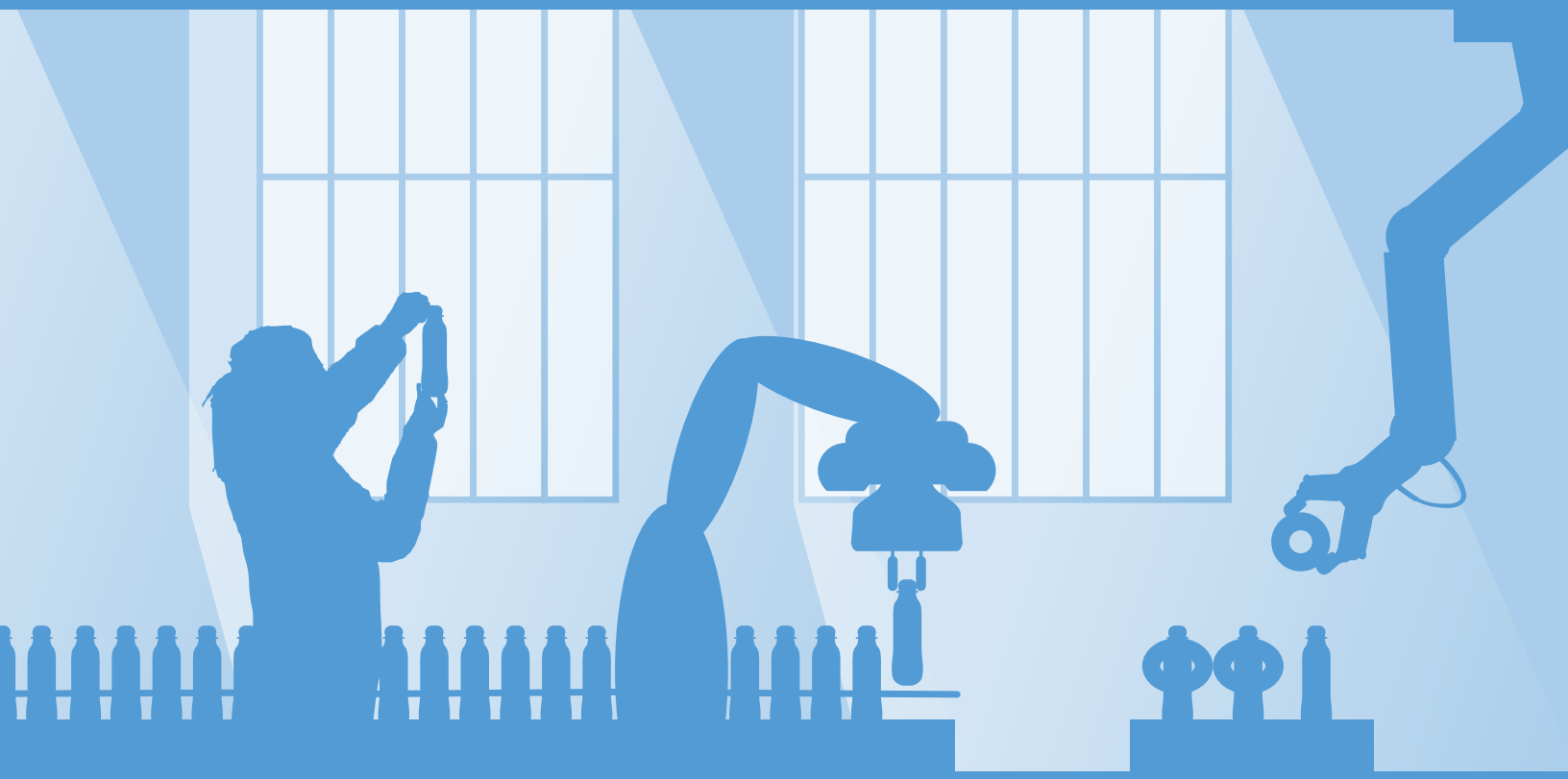
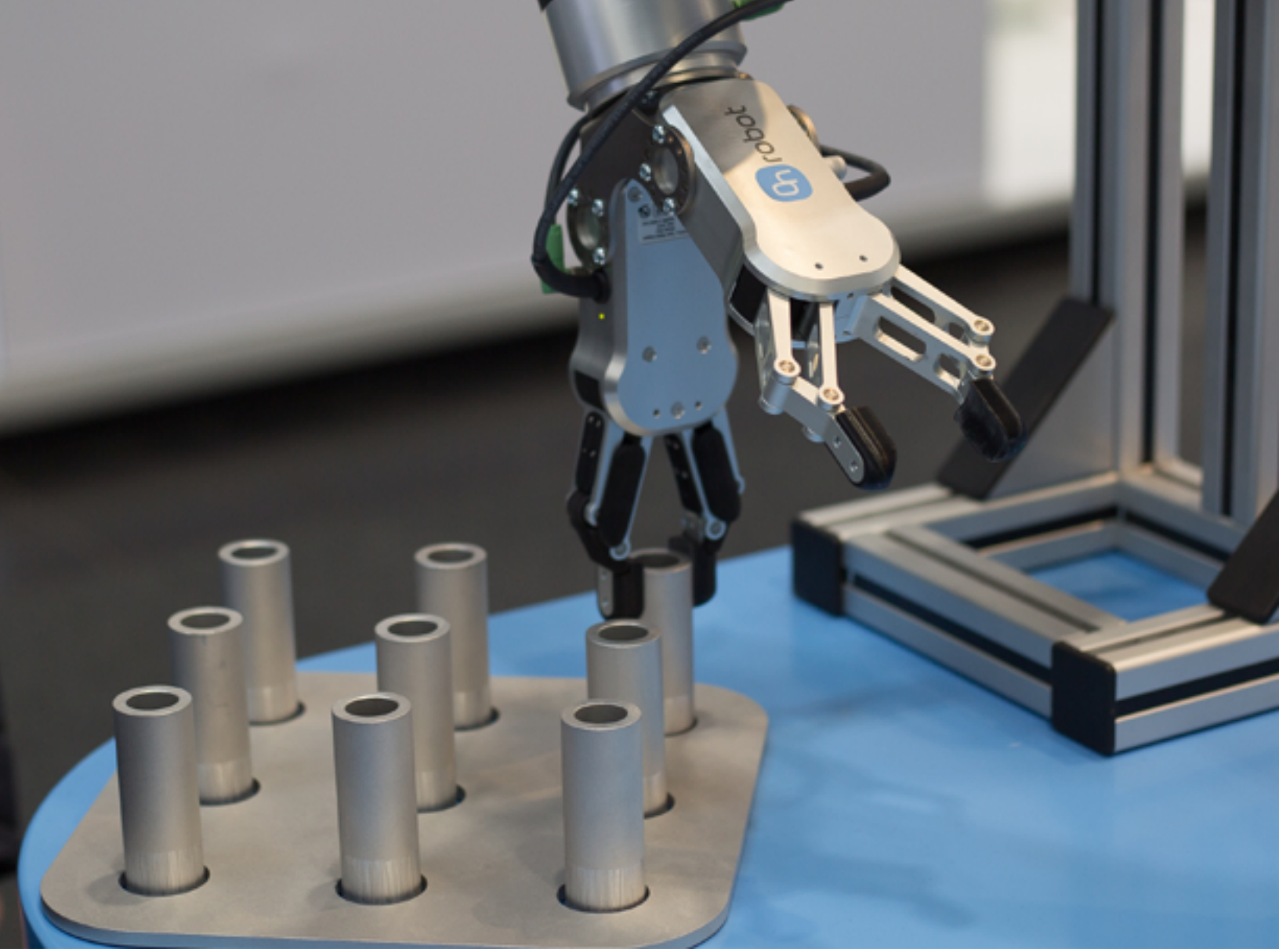
How to Select the Right
End-of-Arm Tool for Collaborative

PICK & PLACE APPLICATIONS



ROBOT OPTIMIZATION GUIDE

Optimize flexibility, output, and quality for any application



IS COLLABORATIVE PICK & PLACE RIGHT FOR YOU?

Pick & place is a broad term that can apply to automated machine tending, packaging, or assembly applications. The common requirements are the ability to use a robotic arm to accurately pick up and place objects—tasks that are repetitive, injury-prone, and low-value for human workers. Robots can handle these tasks reliably, accurately, and continuously to improve productivity and quality. Today's cost-effective light industrial and collaborative robots ("cobots") have made pick & place automation a viable option even for small and mid-sized manufacturers.

But the robot can't do it alone. End-of-arm tooling (EoAT) such as grippers, sensors, and other automation peripherals are what transform your robot into a powerful, business-optimizing machine.

WHY IS END-OF-ARM TOOLING SO IMPORTANT?

EoAT is the key to gaining greater flexibility, higher output, and improved quality from your application. With the right EoAT, you can automate almost any pick & place task that can benefit from the repeatability, accuracy, and productivity of a robot along with the delicacy and precision of human fingers.

THE IMPACT OF EOAT ON TRADITIONAL VS COLLABORATIVE PICK & PLACE APPLICATIONS

Traditional Applications	Collaborative Applications	EoAT Need
Big batches, little variability Ideal for large companies that manufacture high volumes of the same products for long periods	**Low-volume, high-mix** Designed for low-volume, high-mix production, where the robot is often redeployed for new processes	Flexible, quick-change tooling to eliminate downtime between various processes
Consistent parts Part size, shape, weight, and material stay the same over time	**Variable parts** Product shape, size, weight and material can change as often as needed	Tools that easily adapt to varying sizes, shapes, and conditions of parts
Predictable environment Parts are always in same place and the same orientation	**Uncertain or changing environment** Position and orientation of parts may vary	Force settings that allow tool to adapt to part position
Complex deployment Requires extensive programming skills and takes days or weeks to set up	**Fast and easy deployment** Easy to deploy in minutes, even for inexperienced users	Tooling that is designed for fast and easy programming and deployment
Consistent force and stroke Grip force and stroke are not easily adjusted for different material or parts	**Adaptable force and stroke** Can apply adjustable force and stroke size for different materials and parts	Flexible tooling that can be used for multiple processes

CONSIDER YOUR PICK & PLACE APPLICATION NEEDS

Once you automate one pick & place application, you're likely to see many other automation opportunities. By thinking ahead, you can make tooling decisions that will cost-effectively and efficiently support multiple tasks, giving you the flexibility to increase output in multiple areas of your operation.

Checklist for tooling selection

- How large are the workpieces to be handled?
- How often are new parts introduced?
- Will they always be the same size or will there be a large variation?
- Will the robot always perform the same task or will it need to be moved or used for different processes?
- How stable is the demand?
- What is the likelihood that the robot will need to be retooled?
- How large is the variation in the process and how does the tooling handle it?
- How easily can the gripper be adapted to new parts?
- Can the operator make changes to the program and tooling if needed?

HOW TO SELECT THE RIGHT TOOL FOR PICK & PLACE

RG2 or RG6 Gripper

- Handles different sized parts
- Large stroke adapts to highly variable materials
- Defined force values can be set for specific materials
- Customizable fingertips handle complex parts and specific gripping forces

HEX Force/Torque Sensor

- Searches for position and detects objects to be gripped
- Provides collision detection
- Path recording speeds programming

RG2-FT Gripper

- Detects objects on conveyor belt without vision system
- Adapts to required grip force, even if exact parameters can't be programmed in advance
- Safely handles fragile materials

RG2 or RG6 Dual Gripper

- Handles two products at the same time for increased throughput

Gecko and Gecko SP Gripper

- Handles flat or porous materials such as screens or printed circuit boards
- No external air compressor required
- Grips materials such as glass, stainless steel, or solar panels without marking

VG10 and VGC10 Electric Vacuum Gripper

- No external air compressor required
- Handles variety of objects in different sizes
- Two separate air channels offer productivity advantages of dual gripper

PLACEMENT ORIENTATION

RG2-FT Gripper with Built-In Force/ Torque Sensing

Products:

- Door handles, door knob

Process:

- Placement on holding rod before surface treatment, painting, sand blasting, etc.

Challenges:

- Position is uncertain if work-holding rod moves
- Tight fit required

Solution:

- RG2-FT or HEX with F/T Insert Part or F/T Control Similar processes in:

Customers and Uses:

- Door and window handles: Assa Abloy, AMIG (ES), Prime-line (US), Hoppe (DE), Wright Products (US), Dormakaba
- Taps: (Teka, Grohe (DE, PT, TH), Kludi
- Car mirrors and plastic chassis parts

BOX PACKAGING

VG10 and VGC10
Electric Vacuum Gripper

Products:

- Anything that is sold in individual boxes

Process:

- Part picked up from conveyor or tray and placed in a box
- Product box placed in outer cardboard for the packaging of multiple products

Challenges:

- Monotonous task
- Fast, frequent product changeovers

Solution:

- RG2/RG6 provide flexible, customizable gripping for multiple sizes and shapes

Options:

- VG10 provides dependable gripping with fewer but larger suction cups
- Gecko grips delicate and porous materials without marking

Uses:

- Consumer products such as pharmaceuticals, toys, hand tools, kitchen utensils, lightbulbs, hardware, ceramics, car accessories, cosmetics

HIGH-VOLUME PACKAGING

Products:

- Anything packaged in high volume

Process:

- Feeding a box-erector machine or placing boxes on a pallet

Challenges:

- Height of the stack can vary
- Frequent, fast changeovers

Solution:

- VG10 provides dependable gripping with fewer but larger suction cups

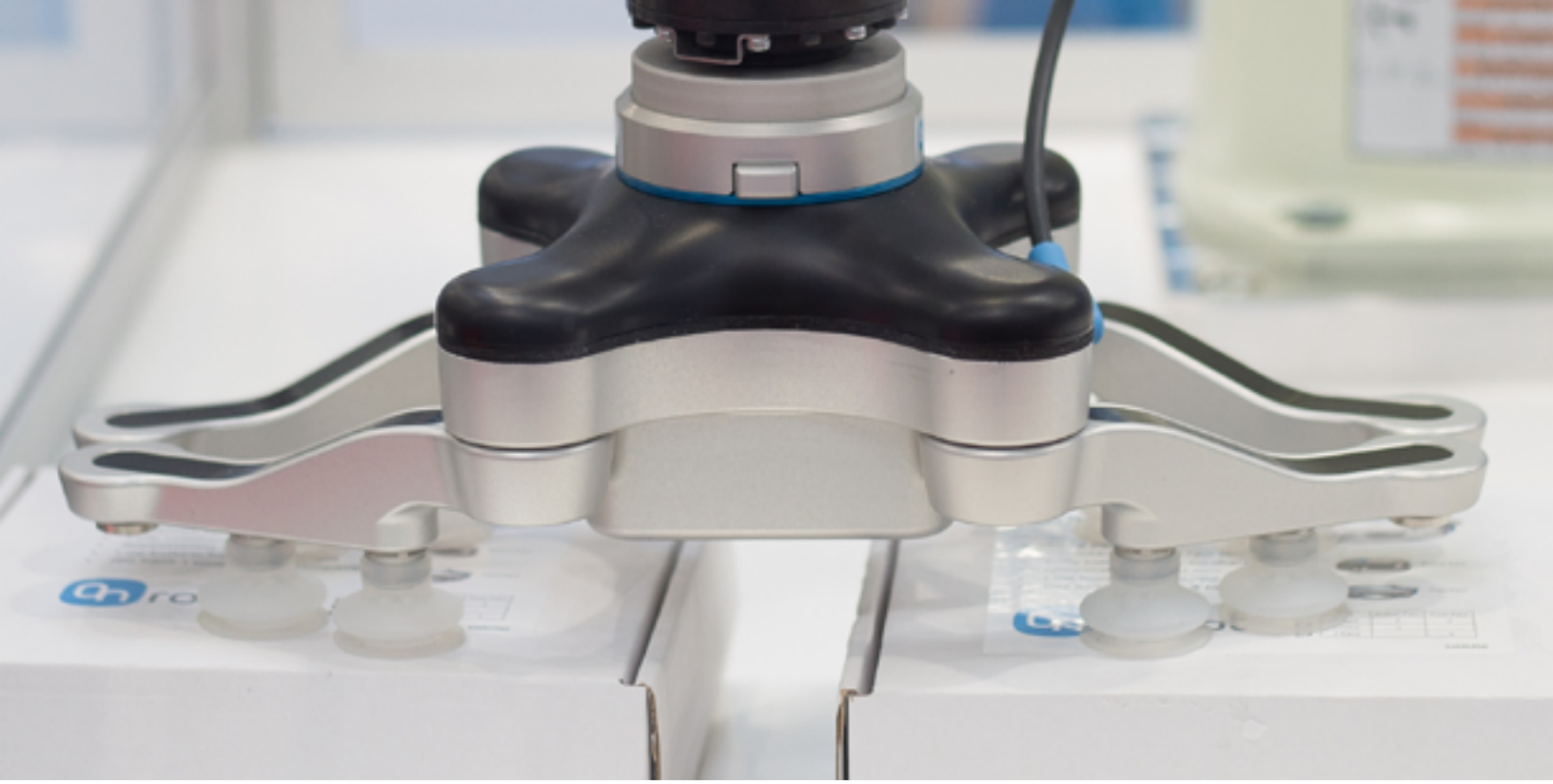
Options:

- RG2/RG6 provide flexible, customizable gripping for multiple sizes and shapes
- HEX sensor detects position
- Gecko grips delicate and porous materials without marking

Users:

- Consumer products such as pharmaceuticals, toys, hand tools, kitchen equipment, lightbulbs, hardware, ceramics, car accessories, cosmetics

VG10 and VGC10
Electric Vacuum Gripper



CONTRACT PACKAGING

Products:

- Fast-moving consumer goods (FMCG), pharmaceuticals

Process:

- Building in-store displays
- Packaging in mid- and lower volume

Challenges:

- Short production cycles (few thousand pieces)
- Robot needs to be moved

Solution:

- VG10 provides dependable gripping with fewer but larger suction cups

VG10 and VGC10
Electric Vacuum Gripper

Options:

- RG2/RG6 provide flexible, customizable gripping for multiple sizes and shapes
- HEX sensor detects position
- Gecko grips delicate and porous materials without marking

Customers:

- Contract packagers (copackers)

PRINTED CIRCUIT BOARD (PCB) HANDLING

Products:

- Any electronic product

Process:

- Handling unpopulated PCBs

Challenges:

- Holes in PCBs make them harder to grip

Solution:

- Unique Gecko technology grips porous materials without marking

Options:

- VG10 provides dependable gripping with fewer but larger suction cups

Customers:

- Electronic contract manufacturers and prototyping services

Gecko and Gecko SP Gripper

GLASS OR DISPLAY HANDLING

Products:

- Phones
- Computer and TV displays
- Radios, household appliances

Process:

- Picking a display and placing it in position

Challenges:

- Handling glass without leaving a mark, which requires additional cleaning step

Solution:

- Unique Gecko technology grips materials without marking

Options:

- VG10 provides dependable gripping with fewer but larger suction cups
- HEX sensor detects alignment

Customers:

- Display manufacturers
- White goods manufacturers
- Automotive electronics manufacturers
- Electronics contract manufacturers

Gecko and Gecko SP Gripper

GET YOUR GAME-CHANGING ADVANTAGE

Innovative end-of-arm tooling changes the game for collaborative automation. Find out how you can gain new advantages for your specific application.

FIND A **DISTRIBUTOR** IN YOUR AREA

REQUEST A **QUOTE** FOR ONROBOT PRODUCTS

About OnRobot
OnRobot provides innovative plug & produce end-of-arm tools that help manufacturers take full advantage of collaborative automation: ease of use, cost-effectiveness, and safety alongside human workers. OnRobot tools work with any collaborative or light industrial robot arm and are available through a worldwide network of over **100 distributors** in more than **40 countries**.

For more information visit: www.onrobot.com
Or contact us: sales@onrobot.com