Boost machining production: more throughput, less downtime

Collaborative robots bring profits to the table

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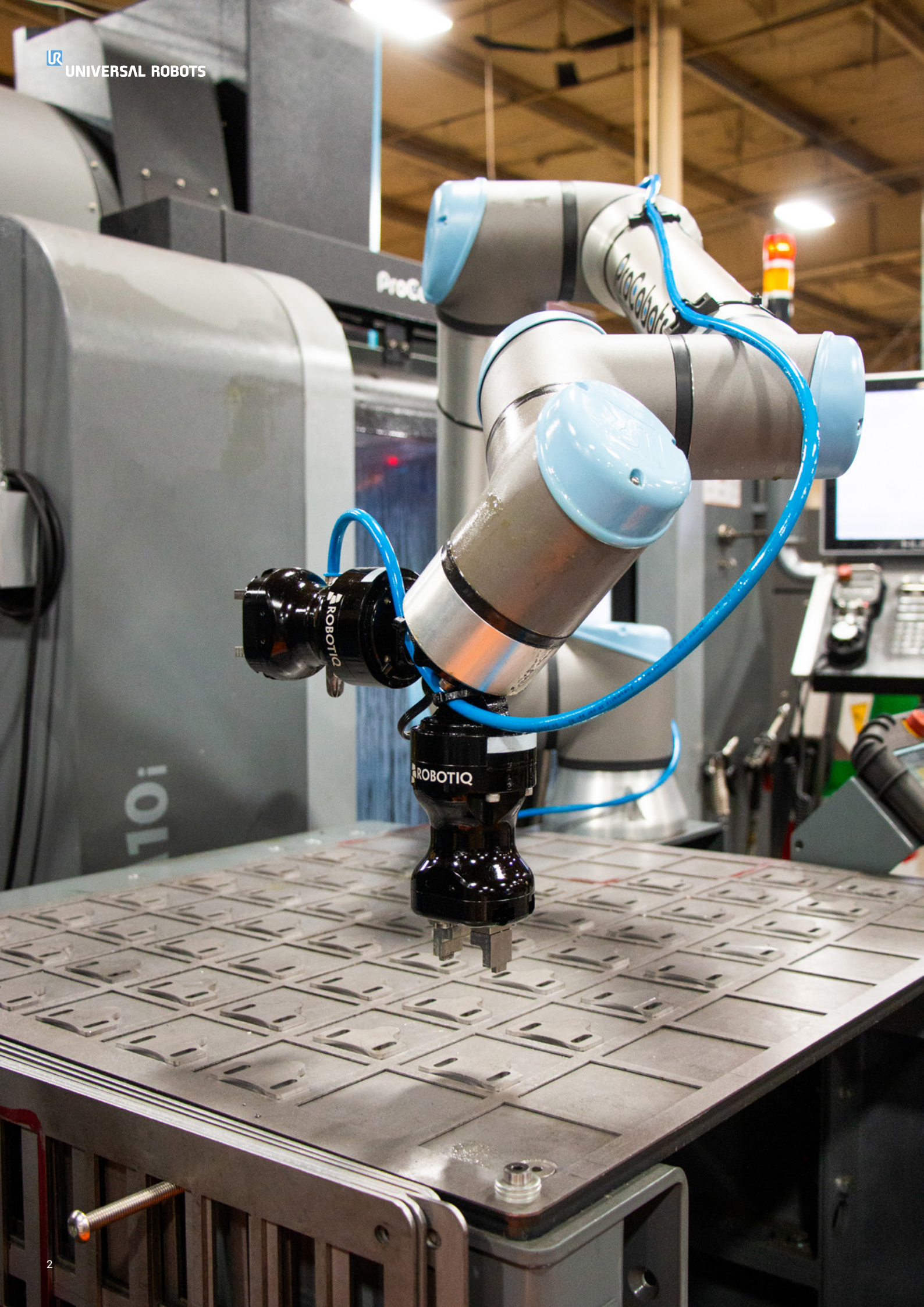
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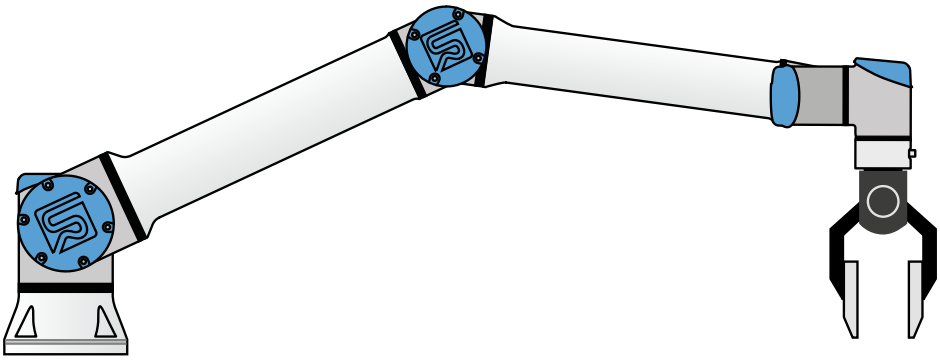


UNIVERSAL ROBOTS

Why machine tending is the perfect task to automate

UR cobots are ideal for loading and unloading parts quickly and accurately into machines such as CNC lathes, mills and presses, reducing downtime and increasing throughput.

For operators, machine tending is repetitive, physically demanding work that can lead to fatigue, injuries and quality issues. For business owners, a source of unexpected events and downtime that can affect production. Keeping this process manual becomes harder for everyone involved as productivity demands and the labor market change.

Machine tending is one of the most popular manufacturing processes to automate. Thousands of businesses all over the world are working with UR cobots in metals, aerospace, plastics, automotive, electronics, and rubber manufacturing. Regardless of how big or small a manufacturing facility is, when CNC equipment is at the heart of it, cobots make a difference.

This document explores the benefits that machine tending cobots bring to the table, best practices and success stories, considerations about integrating the cobot to your CNC machine, how to choose the right cobot and components for your business, and technical details to deploy a system successfully.

A SEAT Components has integrated 11 UR10e cobots to automate the unloading of 18,000 machined gears a day.

A

Unload machine tending challenges one by one

For decades this repetitive, physically demanding job has been performed by human operators. But as competition in the manufacturing sector becomes more fierce, new challenges arise in ensuring business continuity and profitability.

The workflow of placing a raw or blank part into one part of a machine and removing it once the machining process is complete can be automated to ensure essentially no variation and many benefits.

Solve labor and skills shortages

Tending a machine is tedious work. Skilled workers become harder and harder to find. Operators doing this job are aging, and young people are unwilling to take over.

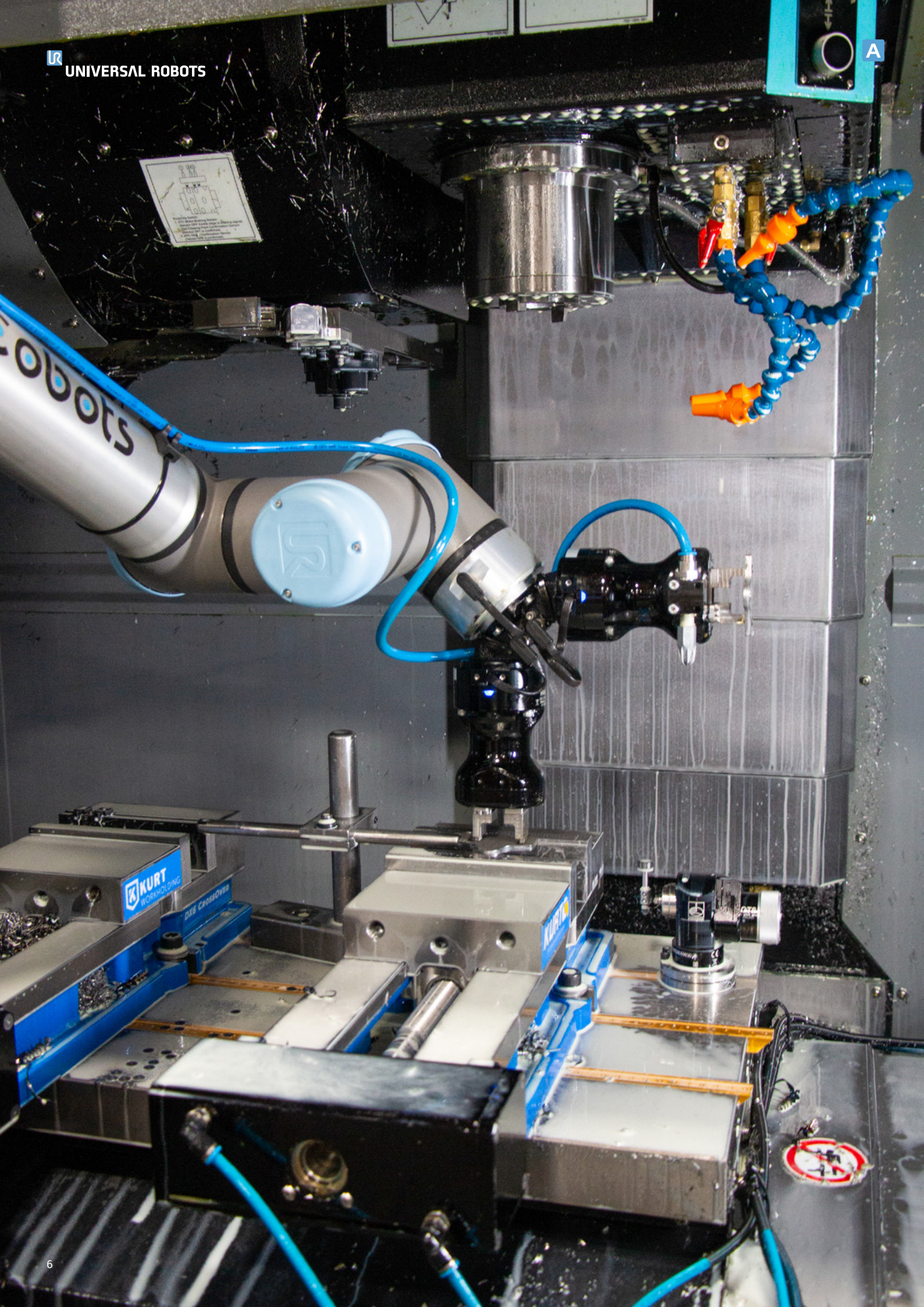
Over the next ten years, over 600,000 machine operator jobs will go unfilled, according to automationworld.com.

Boring, repetitive tasks result in high turnover. A 2021 survey[1)] of frontline manufacturing workers in the United States, Germany, France, Spain, and the United Kingdom revealed that 45% would leave their current employer if given the opportunity to work in a more modern, digital environment. That figure rises to 55% among respondents aged 18-24.

A collaborative automation approach, where operators work alongside cobots, can help **solve the skills and workforce shortage, and retain operators**. Their tasks shift away from loading and unloading parts to operating, programming, and troubleshooting collaborative robots. Upskilling machine operators helps business owners retain their talented teams, since their roles become more valuable, and reduces the need to hire additional staff. For example, with one cobot system, **one operator can run three machines or more with increased uptime at each one**.

B PrecisionForm, a market leader in small custom metal parts from Pennsylvania, US, uses a UR3 to handle the initial piston ring inspection process and a UR5 to load and unload parts in a brake press.

1) Source: The State of the Connected Frontline Manufacturer Worker, 2021, Parsable


A
KURT
WORKHOLDING
DX6 CrossOver

Increase productivity while keeping operators safe

Inefficiencies in manual loading of machine tools create a bottleneck, restricting the amount you can produce per day — directly impacting your bottom line. Compared to humans, cobots can work continuously without needing breaks or recovering time, **increasing throughput significantly and making the loading process faster and more efficient**.

A For example, Raymath, a metal fabricator based in Ohio, boosted CNC machine production by 600% by adding the UR cobot-based ProFeeder machining cells from ProCobots to its two 3- and 5-axis Hurco CNC machines. “We get 24 hours of machining time where we’ve never been able to get that before,” states Greg LeFevre, Raymath CEO and President.

Your workers are your most valuable assets. Automating machine tending lowers the risk of accidents, insurance claims, and absentee costs caused by repetitive stress injuries, injuries caused by human interaction with moving parts like press brakes, and exposure to hazardous moving surfaces and sharp parts. With cobots completing dirty, dull, dangerous tasks, those employees have **more time to spend on higher-value, more impactful, and innovative tasks** — the ones that cannot be completed by robots.

Save production costs

Automating the loading and unloading process can **reduce scrap rates** due to mishandling or inconsistent loading. While operators are available during day shifts to inspect and adjust machine parameters as needed, unattended production runs require automated inspection and machine tool compensation to minimize the risk of producing scrap parts. Cobot-based automation systems can bridge the gap between machine production and the inspection process.

If you want to further increase your cobot utilization, you can incorporate shop floor inspection at the machine. By inspecting parts as they exit the machining process, tooling and other parameters can be adjusted as soon as the next part arrives. This leads to more quality parts and drives down the rate of scrap and rework needed.

With increased production volumes and lower operational costs, you’ll typically see a return on your investment within the first **six to nine months**. And this applies for small, medium and large enterprises.

B A UR cobot tends a complete machine cycle at Dynamic Group in Minnesota. It picks and places “book frames” that hold pieces to be molded into the injection molding machine, transports the units to a trimming fixture, places the part in front of an operator for further handling, and finally pushes a button to activate the cycle again.

Adapt quickly to variable demand

Staying consistent and delivering quality on time can be challenging when product requirements and batch sizes change. While low-mix /high-volume production is easier to manage, manufacturing businesses are more and more operating in **high-mix, low-volume production to stay competitive**. The supply chain disruptions experienced during the pandemic made companies turn to local manufacturers for the products they need. This can be a great opportunity for machine shops as long as they can meet the demand and the requirements for the parts – small, large, and various shapes – while keeping costs under control.

UR cobot can be reprogrammed to handle multiple part numbers, shapes, processes, and workflows in just a few minutes, giving you the **flexibility to deal with any order**.

A For Go Fast Campers, UR cobots' flexibility and ease of integration and programming mean they can run 20 to 25 jobs across four machining centers each day, with changeovers taking only 10 to 15 minutes. The machine cells produce just the quantities needed for that day—whether that's 15 or 500 pieces.

B AIM Processing (Colorado, US) produces over 1300 different parts for more than 100 different customers in a variety of industries. Since the company's first cobot deployment, AIM Processing has launched more than a dozen specific applications, having the UR5e tend injection molding machines, stack trays, and pick parts off conveyors.

The 3 telltale signs that it's time for you to automate your machines

Cobots can perform all or parts of the typical CNC tool process tending steps: placing material in the machine, closing the door, activating the machine, opening the door when the machining is complete, and removing the finished machined part.

Here are a few signs it's time to switch to automation.

01 You want to maximize your machine's output.

A cobot increases the utilization of your CNC machines and reduces the costly downtime when they are not running. It can be set to operate consistently without human intervention needed for the feeding and unloading of materials.

02 You need to keep production costs under control.

A robot is precise and reliable and will always do its tasks with no variation which is exactly what you need for your parts to meet your customer's specifications and tolerances. Automating the loading and unloading process reduces scrap rates due to mishandling or inconsistent loading, giving your workers extra time to complete more value-added tasks.

03 You plan to run lights out.

Do you need machines to keep running without supervision after everyone else goes home? A cobot can load/unload that extra batch of parts, work those 2-3 extra hours, take an extra shift or the night shift, so you can meet production deadlines.

A few hours extra every day (or night) means you can make those large orders much more reliably. And grow your business further.

C Of the 11 CNC machines operating at Bernacki (Poland), as many as seven are adapted to operate with cobots. Three Universal Robots UR10e collaborative robots are deployed in three-shift operation at the machine park, increasing its efficiency and ensuring that the components are manufactured precisely.

Stay on the cutting edge of machining with UR cobots

Whether your business needs help tending a CNC, press brake, injection molding machine, or 3D printers, cobots help. The robotic arms are not just strong but can extend to the exact lengths you need, and are compatible with a broad range of tools, end effectors, and machine communication protocols, making the loading and unloading much easier. UR cobots are recognized as the best option when retrofitting a robot onto a legacy CNC machine.

Good value for money. Compared to industrial robots, cobots have lower purchase and maintenance costs. You can know these costs upfront, and you can calculate the ROI of your project. The investment will gradually translate into significant cost savings.

Compact cobot cells. We know floor space is a premium in any shop, and for UR cobots you don't have to move your current machines

A

B Tomenson Machine Works in Chicago has deployed a UR3 cobot with a UR+ certified gripper RG6 from OnRobot to feed a pin stamping machine (engraving).

“We needed a flexible automation solution that could be used for 10 different production cycles. Since I only have 6 feet (0,55 m²) of space in front of the brake press, it was important that I could run this application without safety caging around it.”

Jean Francois Rousseau,
Plant Engineer, Etalex

or change your layout to accommodate them. UR cobots can be strategically placed above or between two or more machines, allowing them to tend multiple machines simultaneously. Compared to traditional robots, Universal Robots deliver arms with a very small base, leading to smaller space required (up to 75% smaller robot base). They are lightweight, space-saving, and easy to redeploy for various tasks.

Fast deployment. Universal Robots has revolutionized cobot setup, reducing typical robotic deployment measured in weeks to a matter of hours. We have also eliminated the need for complex custom programming when setting up the communication between the cobot and the machine. UR Cobots can even directly interface with CNC controllers, synchronizing with vises, chucks, other work-holding devices, and automatic doors.

Straightforward programming.

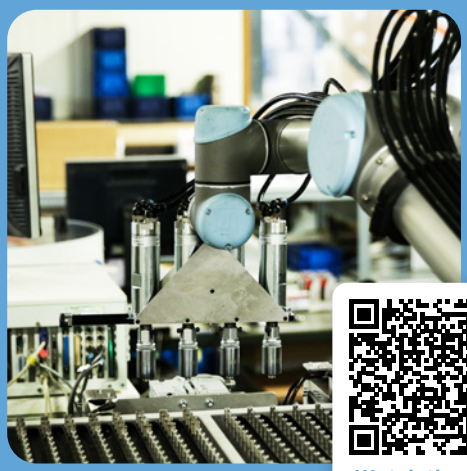
Cobot programming and controls can be managed from one intuitive screen. Prior to deployment, UR expert partners can train somebody from your team to become your in-house person for programming the cobot. Operators with no previous experience can program the robot to perform a task, re-use previously set programs to speed redeployment, and continue to evolve the solution after initial install.

Designed to work safely alongside your staff. UR cobots can work alongside skilled operators thanks to their built-in safety functions. The power and force limited control system mean the cobot access doesn’t need to be restricted by typical, permanent safety fences. However, every application needs a detailed risk assessment prior to deployment.

A Etalex automated the loading and unloading of their press brakes.

Machine tending cobots in action. Success stories from our customers

Fluidics Instruments increased production to 1,000 nozzles per hour



Watch the full story here

The Dutch manufacturer of oil burner components faced the challenges of high mix/low volume production and the lack of skilled workers. The attempt to outsource production has not resulted in the desired product quality. Two UR5 models and one UR10 were mounted onto mobile workstations. Seven UR3s fully automate the assembly of an oil nozzle consisting of eight individual small parts, producing 1,000 nozzles per hour, which is significantly faster than if the assembly was carried out manually.

"With the help of our 12 UR robots we are able to offer our customers the usual quality 'Made in the Netherlands' and increase our production both in terms of batch size and product range."

Huward Wijnen, Owner and Director, Fluidics Instruments

Zero-fault production and output boosted by 11% in 12 months

Watch the full story here

Jenny | Waltle GmbH, an Austrian company that produces aluminum, metal and plastic parts, proved its strengths in the most challenging discipline of automation "bin picking". Two UR5 cobots pick randomly oriented parts from a box and feed a CNC mill, increasing quality of parts and efficiency. The cobots handle up to 2,400 aluminum parts per day and can be converted to feed the CNC machine with new parts in less than an hour. In addition to a zero-fault production, the supplier has been able to boost output in the application area by 11 percent within twelve months.

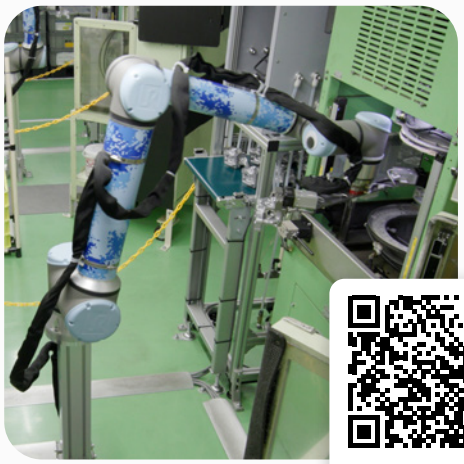
"The quality increase we have achieved thanks to the Universal Robots cobots is incredible. We haven't had a bad part since we started using them. This enables us to guarantee our customers high-quality products, now and in the future."

Daniel Waltle, Managing Director, Jenny | Waltle GmbH

Watch more cobot machine tending case studies
universal-robots.com/case-stories

Machine tending applications
universal-robots.com/applications/machine-tending

Cobots doubled productivity in three years



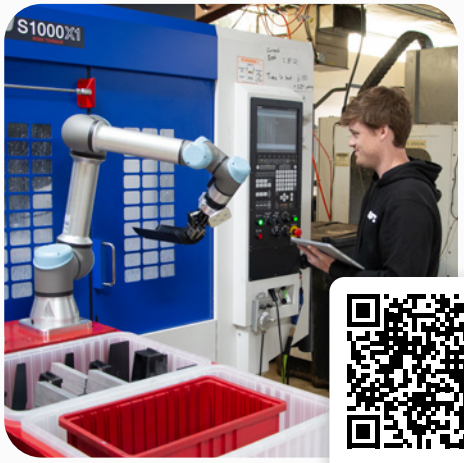
Watch the full story here

Aido Industry, a Japanese OEM manufacturer of automotive parts using aluminum die-casting and cutting processes, was facing a chronic shortage of workers. Labor costs, such as salaries for temporary workers, were high, and even if sales increased, profits did not. Since Aido Industry first discovered Universal Robots, the company has deployed 40 UR cobots. Some of them are in charge of machine tending for a series of processes involving UR machines: picking a workpiece from the conveyor, performing two leak tests, cleaning, and placing the workpiece on the finished product conveyor after air blowing.

"Before, I was working in food industry, managing a restaurant, so I had no knowledge of robots. With the help of a distributor, Sangen Corporation, I was able to achieve what I wanted to get the cobot in operation."

Yoshiyasu Ogawa, Manager of the Maintenance and Die Casting Engineering Office

6 hours of unmanned tending every day



Watch the full story here

Go Fast Campers (Montana, USA) produces 174 unique parts—from bolts to connectors to hinges— for its customized pop-up truck campers. A line of four UR5 cobots are fully integrated with Haas CNC machines, offering 22 hours of productivity per day, including 6 hours of unmanned, lights-out manufacturing. The robots all use the same robot program, so any cell can run any of the company's parts in any volume to meet each day's assembly requirements. Changeover takes around 10- to 15-minute.

"Had we not built the entire company around the concept of automation, our 65 employees wouldn't have those jobs at all. And the products we make—if we were able to form a company around it—would only be affordable to a very tiny portion of people."

Wiley Davis, CEO and co-founder Go Fast Campers

Steps to a seamless tending

01 Identify processes to automate

Monitor your current cell, analyze your human operator's machine tending process and list out repetitive, dangerous tasks, or those requiring a high level of precision. These are the types of tasks that are suitable for automation with cobots.

Your unique processes will determine the necessary components and tools to pair with your cobot.

- How many and what type of parts do you want to tend?
- What are you aiming to obtain regarding productivity, quality, or output capacity?
- Do you need to run lights out?

Each application requires customization to unlock the full potential value.

02 Decide your path for deployment

A UR expert can advise you on the optimal path for you, based on your project, specific needs, timeline, and in-house resources. Following a preliminary assessment, they will typically suggest two routes.

Turnkey solution

The turnkey solution path is ideal if you want a solution with low risk, predictable costs, short delivery time, and on-site installation.

Following this path means that first, we'll put you in touch with a solution partner who can walk you through the proposal stages with a plant visit and demo. The partner also talks you through how you prepare for your machine tending cobot cell and the performance you can expect. These cobot solution partners make deployment easy and effective, helping you to reduce complexity and save time and resources.

Demo - See it in action

Some of our partners have simulation software that can create a digital twin of your proposed machine tending cobot so you can see it in an accurate approximation of real life. Then you can see the actual machine tending cobot in action. Other partners have cobot cell demo units, and many of these are transportable, so they can bring one to your shop floor for a demo.

cobot integration

Do It Yourself (DIY)

If you have adequate in-house expertise, you can choose a more independent route to build your machine-tending solution. Support will still be available, but ultimately you take ownership of the project.

The DIY path entails the following steps:

Procure your cobot from one of your distribution partners

Distribution partners for UR cobots are spread all over the world, ready to answer your questions and get you the right cobot for your tending solution.

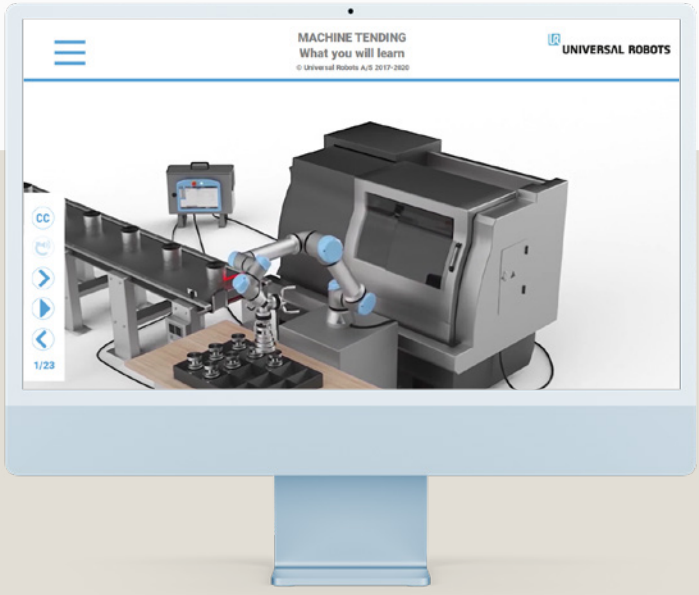
Select the right product(s) in the UR+ platform

Choosing the right end-of-arm tools and accessories required for your tending application is crucial for the success of your project. Browsing through the UR+ showroom, you can find the tools and peripherals you need to create your own system, from a variety of grippers, axis, sensors, vision systems, part feeders to application kits and compact modular robot cells.

Deploy your tending cobot cell

Once the cobot and all components arrive at your location, it is time to build your tending robotic cell. Before getting your hands on it, we recommend you sign up for the UR Academy and go through our free e-Learning modules. Hands-on classes for beginners to advanced users are also available in our Authorized Training Centers all over the world.

They will provide you with basic knowledge about how to deploy, program, and set up a UR cobot for optimal performance.



03 Select the right cobot

Choose the cobot with the correct payload and reach for your workspace, products, and requirements. Any model is perfectly adaptable to high-mix productions and variable workflows. UR cobots are quicker to install and simpler to operate than traditional robots, and our cobots can interface directly with CNC controllers. Some end effectors even allow you to switch grippers and tools multiple times per day.

1 The UR5e - Complements any production setup

The UR5e flexible robot fits greats with smaller machines and lighter parts with payloads of up to 5 kg.

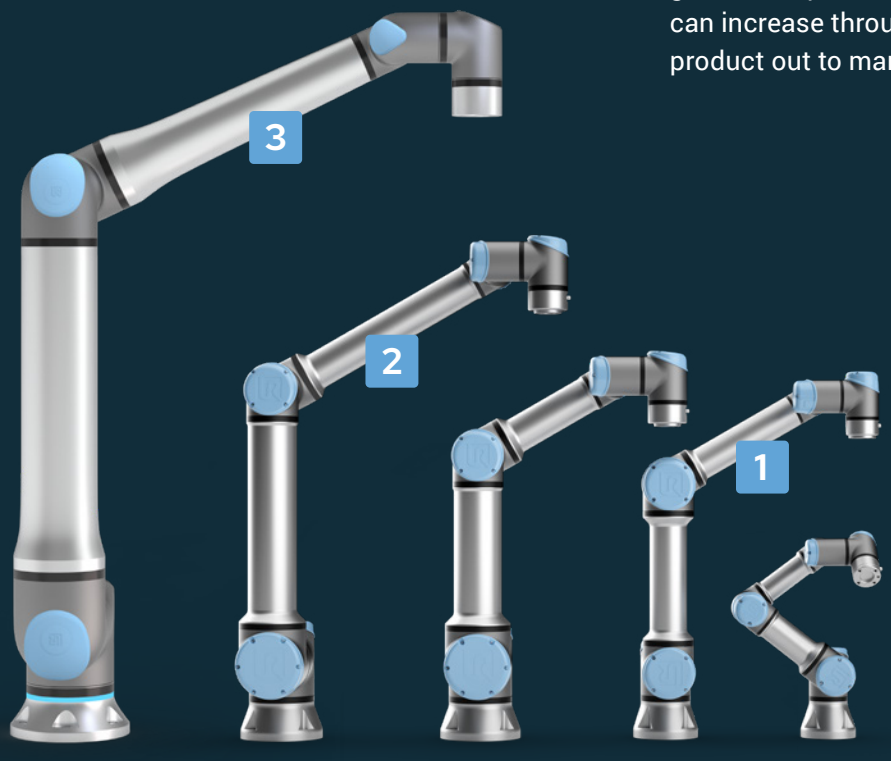
2 The UR10e - The workhorse in the machine tending

The UR10e can pick heavy and unwieldy components of up to 12,5kg. If necessary, it can be easily moved with a lift truck and redeployed.

3 The UR20 - This is the cobot. Redefined

UR20 has a 20 kg payload, 1750 mm reach and 30% more speed and torque when compared to other UR cobots. The base and shoulder have a maximum speed of 120˚/s, while the elbow can move up to 150˚/s. The three wrist joints can move up to ± 210˚/s.

UR20 handles more tasks, fits more applications, and assists in more environments than ever before. Every detail, from the software to the end caps, has been strategically architected to deliver next-generation performance and quality so that you can increase throughput, uptime, and get more product out to market faster than ever before.



04 Anatomy of a machine tending cobot

Although manufacturers design countless unique system configurations for their machine tending cobot systems, a successful work cell will typically include the following components:

1 Collaborative robot

Popular cobot models include UR5e, UR10e and UR20. See page 16 for details.

2 Parts feeder system

It can be a tray, drawer, or bulk feeder. This presents parts to the cobot to be loaded into the machine. Once machined, the parts are either placed where they came from, or onto another location for the next process.

3 Operator panel

UR cobots come with a powerful, intuitive-to-use software that anyone can learn in only a few hours.

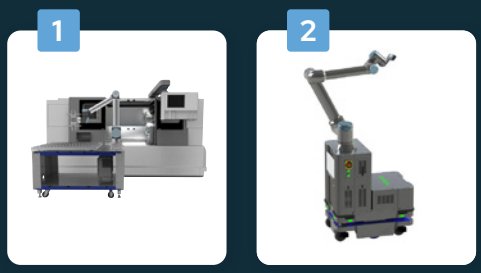
4 Gripping tools

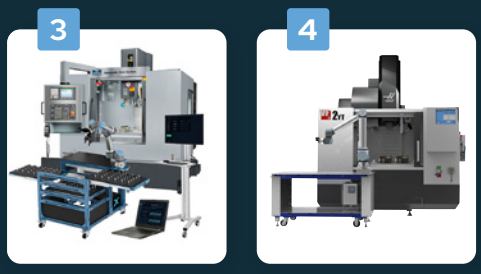
These can be pre-integrated tools from UR+ partners, or custom-built by integrators to transfer your parts into and out of a machine.

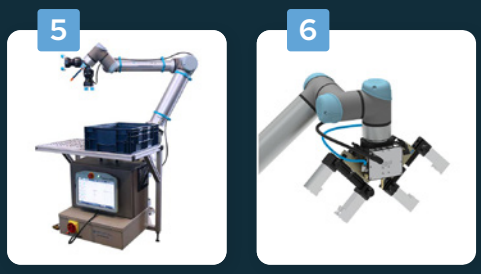
5 Machine tool interface

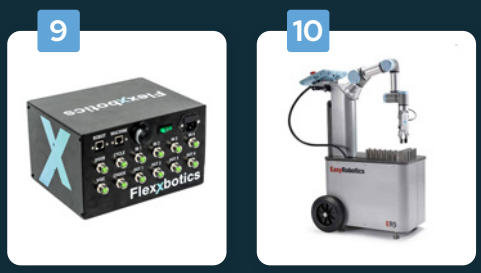
UR cobots can interface directly with many machine tools through communication protocols like Modbus, Ethernet IP, and ProfiSAFE, in addition to the I/Os in the cobot controller.

05 Here are some products for your machine tending cell









Solutions

1 **Versabuilt Lathe & Mill Automation Systems**
This is a standard automation system that requires no robot expertise or robot programming to use. Changing between jobs takes just minutes, maximizing equipment and operator productivity.

2 **Nonead nCobot**
nCobot is featured in rapid deployment, smooth integration, intuitive programming, safety and reliability without changing production layout.

3 **Flexxbotics FlexxTend Solution**
FlexxTendTM The complete automated machine tending solution: design, integration, validation and training offer.

4 **Mill Automation System**
The Mill Automation System is a complete pre-programmed and pre-integrated automation solution optimized for high-mix manufacturing. Automate multiple operations and virtually any part geometry with this flexible solution.

Application kits

5 **Cobox – Machine tending specialist**
A solution for quick integration with CNC machine tools. The workstation has been developed for trouble-free mounting of blanks in machine tool chucks and for removing machined workpieces. It is ideally suited for operating milling machines and turret lathes.

6 **Schunk MTB**
The MTB application kits enable quick and easy implementation of automated machine loading. They seamlessly fit into the machine environment. The single gripper kit, the double gripper kit or the clamping force block kit are available.

7 **Robotiq CNC Machine Tending**
Robotiq Machine Tending Kit takes less than two hours to deploy and machine your first part—no coding experience required.

Components

8 **2FG7**
OnRobot's 2FG7 is a complete, low-cost, off-the-shelf electric parallel gripper that can be deployed within minutes and requires no custom engineering for installation, programming, or maintenance.

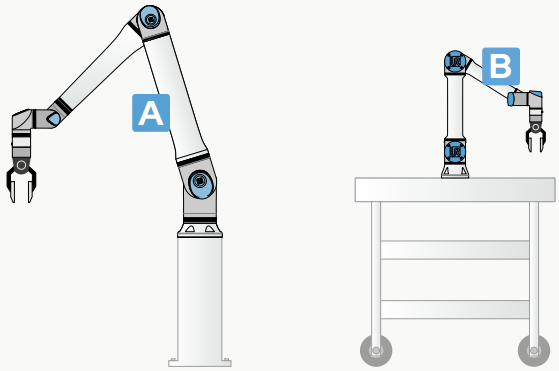
9 **FlexxCNC Interface**
The Flexx CNC Interface is a standardized middleware and URCap designed to make a Universal Robot easily communicate with multiple CNC machines.

10 **EasyWork**
One of the unique features of EasyWork mobile platform is that one person easily can move the workstation, with a complete and fully installed Universal Robot, like pulling a suitcase.

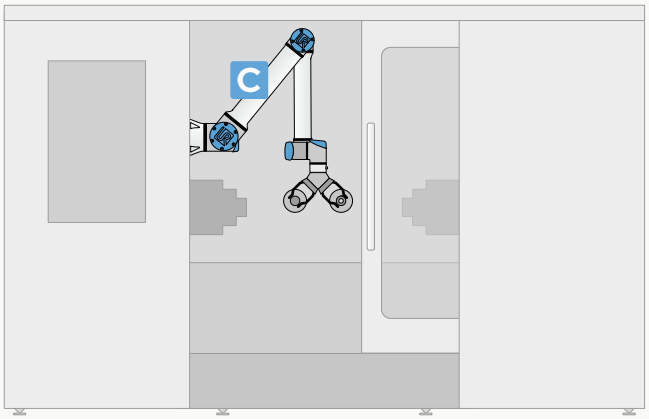
In addition to our partners' cobot machine tending solutions, our UR+ platform validates products to integrate seamlessly with UR cobots. See more at: universal-robots.com/plus/products

06 Mounting configurations

Cobots from Universal Robots are known for being versatile, with users automating multiple part numbers and even multiple processes with the same cobot. One reason for this versatility is the variety of mounting configurations that allow cobots to get close to their tasks – even in tight spaces that humans could not safely reach.

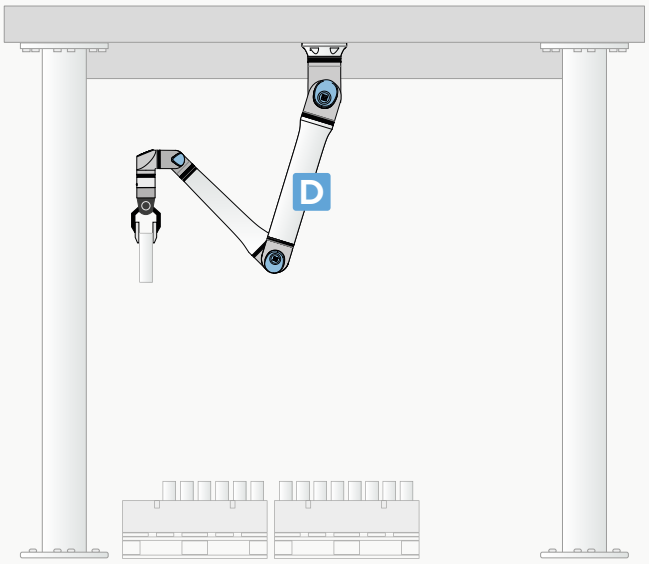


A Pedestal/floor mounted. (stationary, including tilting) The cobot is in a fixed position, and the rest of the work cell is built around it. It is an easy-to-deploy option suitable for repeatable tending operations in and around the machine. Mounting the cobot on an incline or tilt increases the stability of the system.



B Cart mounted (mobile platform). When mounted on a cart or platform, the cobot can easily be moved by personnel to different machines to perform various tasks. It has a stable base to operate on, and the feed and outfeed stations should remain in the same location relative to the cobot.

C Machine mounted. Mounting the cobot directly to the machine tool is a flexible, compact solution for solving floor space problems. This configuration is suitable for tighter work cells that minimize cobot movements when machining times are fast.



D Inverted mounted (including on rail). The cobot moves into the machine from above, reducing the required floor space, and allowing for unimpeded operator access to the front of the machine. You can extend the cobot's range and use it to tend multiple machines by mounting it on a rail or external axis.

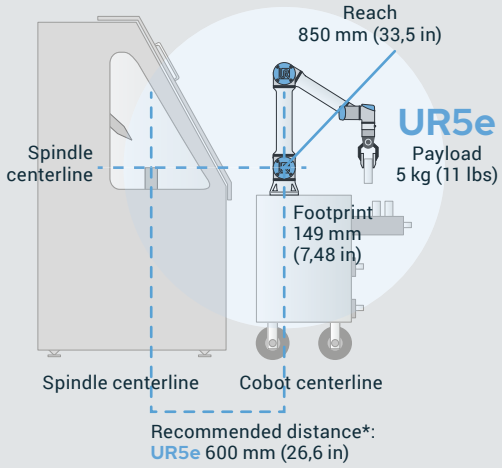
07 Layout of UR5e, UR10e and UR20

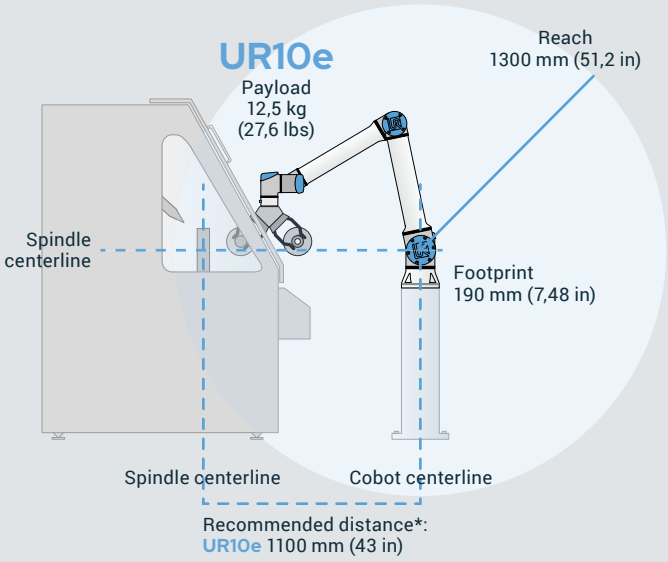
The layout of the machine tending workcell is a vital piece to increasing the machines utilization.

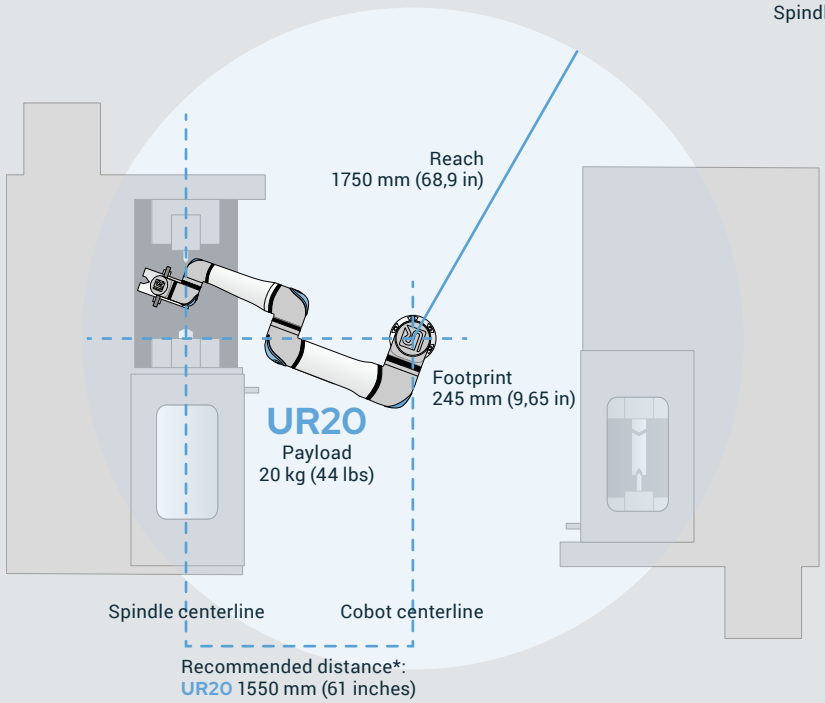
The ideal layout is one in which the part change out time is reduced to minimum, while allowing machine operators to access the machining area and control panel to make program adjustments or attend to machine issues.

In addition, an optimized layout allows you to capture more value in the part process by taking on secondary operations like part cleaning, deburring, inspection, while the machine is running.

The UR5e and UR10e are by far the most popular models for handling small and medium sized parts. The new UR20's long reach and increased payload enables tending of multiple machines with one cobot and handling workholding changes in addition to larger parts.







*) Overall distance varies depending on the overall setup.

08 Safety

UR cobots lead the market in available safety functions and features.

Our e-Series cobots are built with 17 customizable safety functions and certified to EN ISO 13849- 1 and EN ISO 10218-1 by TÜV Nord.

Operators can share a workspace with the cobot system. If the machine tending robot comes into contact with a person or other object, our power force limiting technology causes the robot to slightly rebound and stop moving until an operator tells it to resume.

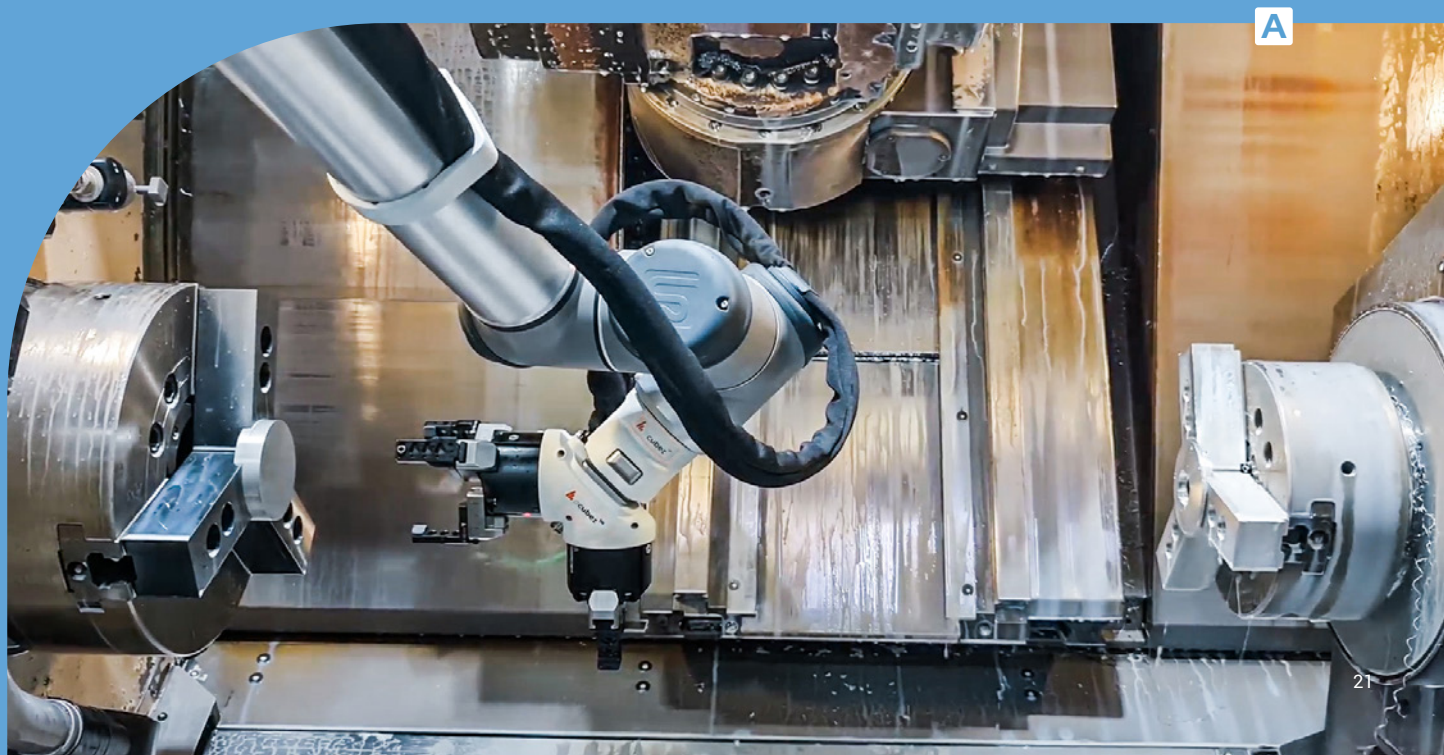
However, a thorough risk assessment is always required. In the case of machine tending, special consideration needs to be given to moving heavy parts with sharp edges, operators performing repetitive movements and exposure to hazardous processes such as presses or hazardous chemicals.

UR robot arms are IP54 rated which means they are protected against water splashed from all directions and protected against contamination from limited amounts of dust and other particles.

This specification is only against water and not coolants or cutting fluids and are only protected against ingress and not how the exterior will react against various substances. Therefore, we always recommend using a protective suit if a robot will be operating in an environment where it will be exposed to other substances.

Recommendations for protective suits can be found on our website under UR+ Products: universal-robots.com/plus/products.

A UR10 cobot arm is working uninterrupted – even during weekends, with a mill-tunning CNC machine at EMI Integrated Systems (Israel).



09 Retrofitting and compatibility

Retrofitting in machine tending refers to upgrading an existing machine or production line with new robotic systems and automation technologies. It allows you to improve the efficiency, productivity, and safety of the production process, while reducing operating costs and minimizing downtime.

The benefits of retrofitting include:

- **Increased productivity:** Retrofitting existing machines with robotics can improve production throughput and reduce cycle times, resulting in increased productivity and higher output.
- **Improved quality:** Machine tending can improve the consistency and accuracy of machining processes, leading to higher quality products and reduced scrap rates.
- **Reduced labor costs:** By automating machine tending tasks, you can supplement your human operators, which lowers labor costs and improves the bottom line.
- **Increased safety:** By removing workers from potentially hazardous areas, robotic machine tending can improve workplace safety and reduce the risk of accidents.
- **Flexibility:** Retrofitting machines with robotic systems can increase flexibility in production processes, allowing you to quickly adapt to changes in demand and product design.
- **Better data collection and analysis:** Sensors and other monitoring technologies provide real-time data on machine performance, enabling better analysis of production efficiency and identifying areas for improvement.

UR cobots are compatible with all major machine tool brands. These include CNC machines, as well as control systems, which provide the programming that runs the machinery.

UR cobots can work with all CNC machine types (depending on their size) and options to work within interfaces to communicate with control systems are available through UR+ partners and other developers.

Control systems

SIEMENS

HEIDENHAIN

FANUC

MITSUBISHI ELECTRIC

Machine Tools

OKUMA

MAKINO

DMG MORI

Mazak

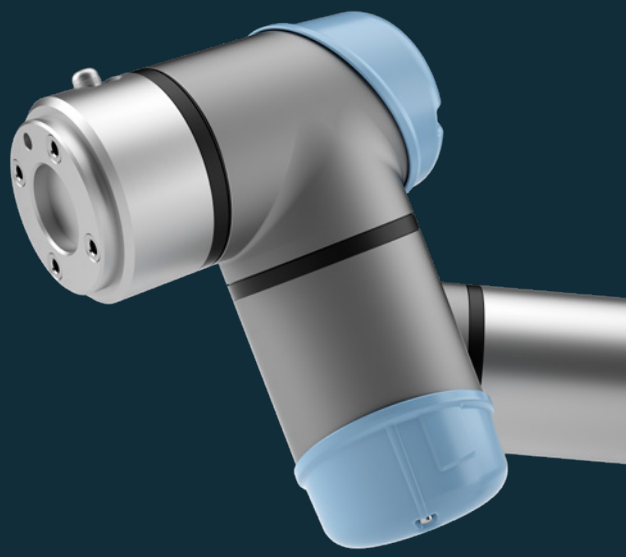
brother

DN SOLUTIONS

HAAS

GROB

TRUMPF



Ready to talk machine tending?

We are here to help. At Universal Robots, we have a team of application experts in every region of the world, ready to provide help and guidance with important engineering questions. Our Global "Center of Excellence" has equipment available for test, proof of concept development, feasibility studies, and simulated robot solutions. We are ready to support you.

Based on your application needs, we will recommend and connect you with our machine tending solution partners close to you.

Want to learn more about automated machining tasks?

Keep exploring the benefits of automated machine tending and learn how businesses from different industries use collaborative robots to tackle their tending tasks:
Visit: universal-robots.com/applications/machine-tending

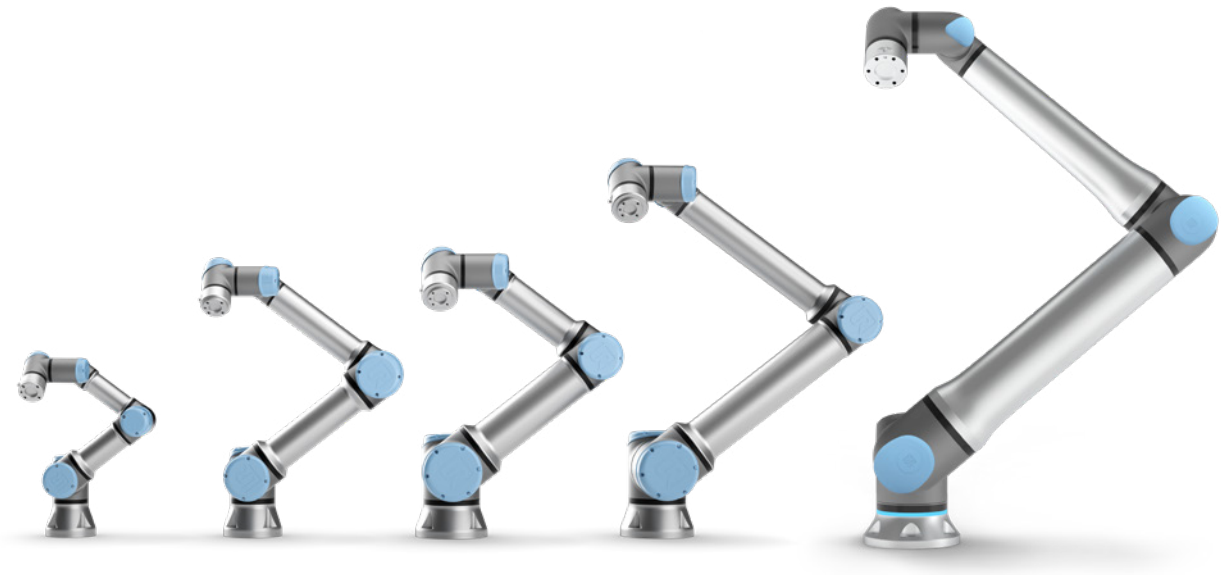
Take the next step to automate your machine processes

Whether you have technical questions about using one of our cobots in machine tending application or you are ready to automate a loading and unloading system, there's someone ready to help you.

Talk to one of Universal Robots' experts today:
Visit: universal-robots.com/get-started/

UNIVERSAL ROBOTS

Discover our cobot family



	UR3e	UR5e	UR16e	UR10e	UR20
Reach	500 mm 19.7 in	850 mm 33.5 in	900 mm 35.4 in	1300 mm 51.2 in	1750 mm 68.9 in
Payload	3 kg 6.6 lbs	5 kg 11 lbs	16 kg 35.3 lbs	12.5 kg 27.55 lbs	20 kg 44.1 lbs
Footprint	Ø 128 mm	Ø 149 mm	Ø 190 mm	Ø 190 mm	Ø 245 mm
Weight	11.2 kg 24.7 lbs	20.6 kg 45.4 lbs	33.1 kg 73 lbs	33.5 kg 73.9 lbs	64 kg 141.1 lbs

Compare all robots at www.universal-robots.com/media/1827367/04_2023_collective_data-sheet.pdf

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