

Hand in hand for tomorrow



Robotic Material Removal

Customer presentation

R-EiMENDO



It's time to use the full Potentials!

Benefit of a perfectly harmonized interplay of superior SCHUNK components for clamping & machining, gripping, and in automated handling of your workpieces.



Individual clamping & machining

Toolholding and stationary workholding program & lathe chuck technology



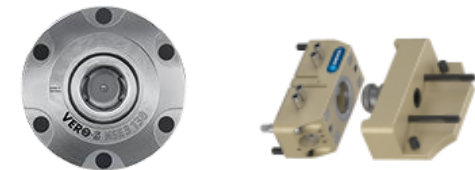
Individual gripping and automation

Gripping technology
Robotic Material Removal
Robot accessories
Linear and rotary axes



Individual loading

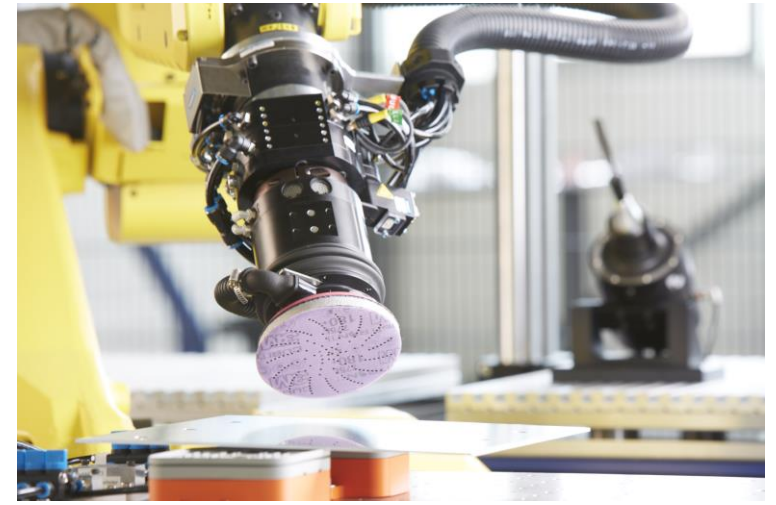
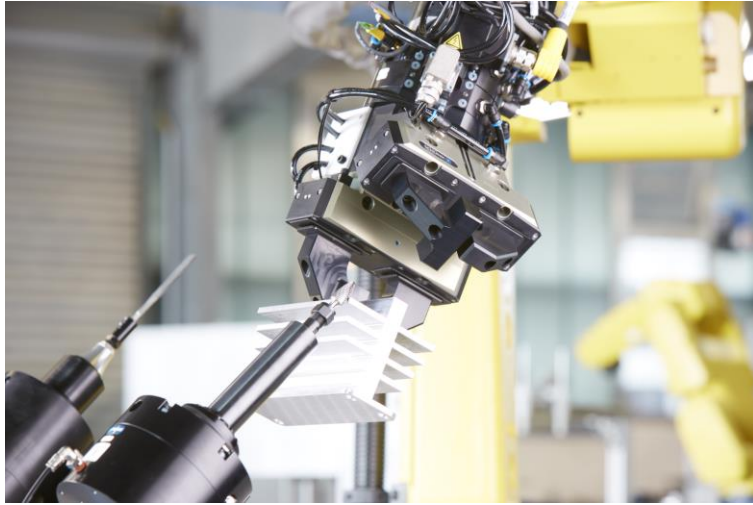
Gripping technology & quick-change pallet systems



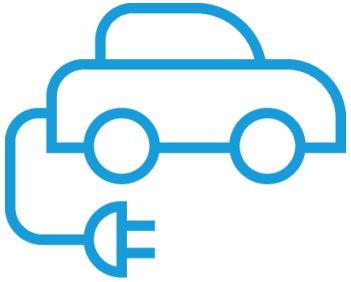
R-EMENDO (robotic + lat. emendo: improve, correct)



Robotic Material Removal – Impressions



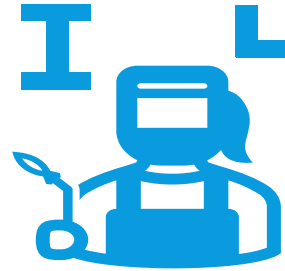
Branches and Applications



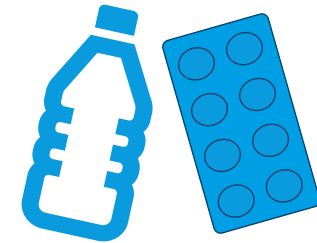
Automotive



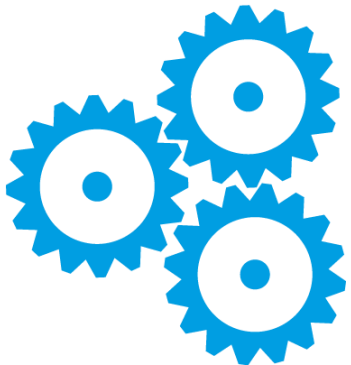
Aerospace



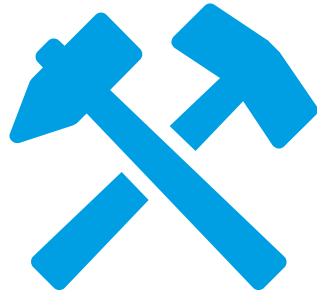
Metalworking



Plastics



Machining



Primary forming



Tool &
mould making



Wood & furniture

Why Robotic Material Removal?



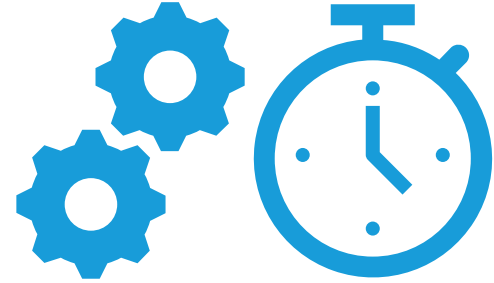
Health



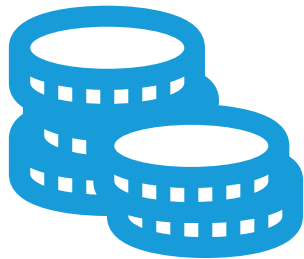
Demography
Ergonomics



Quality



Process optimization

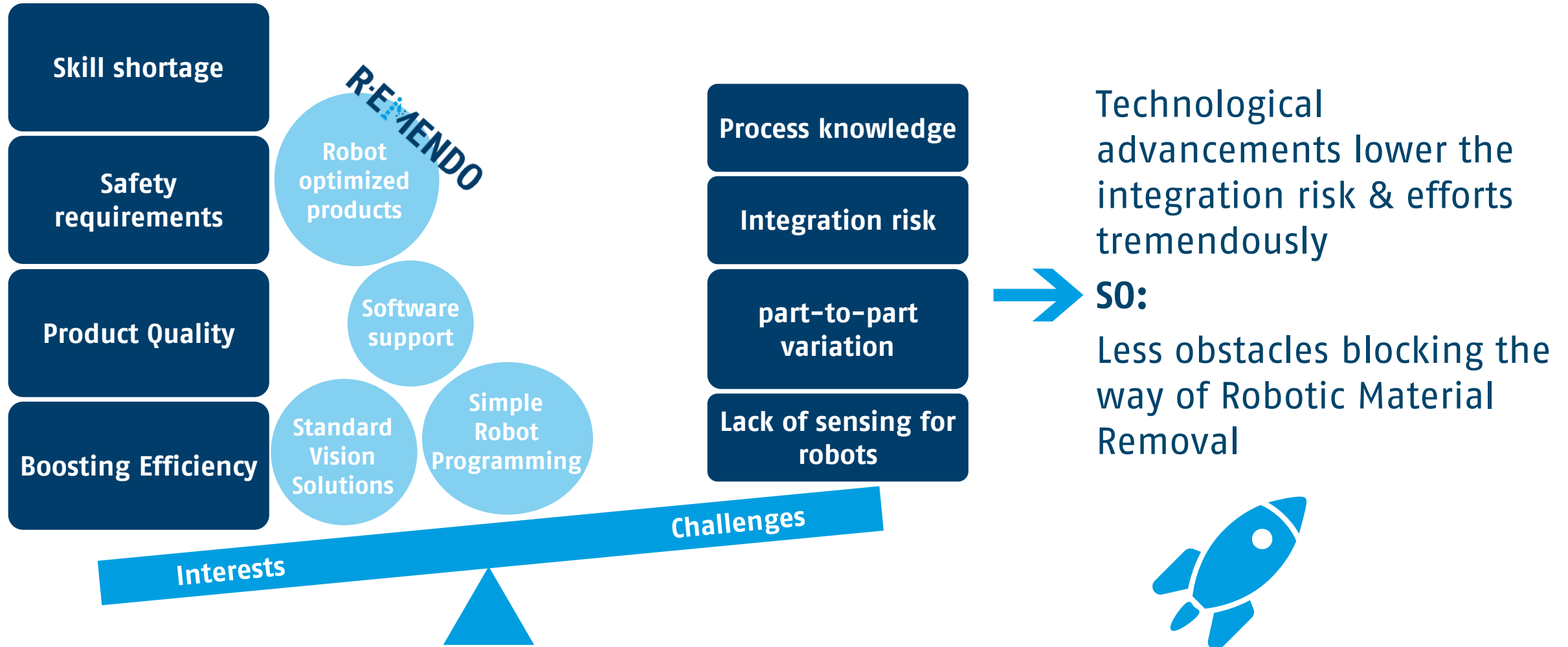


Cost Reduction



Technical Progress

Why Robotic Material Removal?



New Opportunities & Applications

Deburring

Pre- & Postprocessing of machined, casted or molded workpieces

- Deburring of a wide variety of workpieces, contours & materials



Grinding, Sanding, Brushing & Polishing

Pre- & Postprocessing of machined, casted or molded workpieces

- Grinding, sanding & brushing of surfaces, edges, weld seams & preparation for coating + painting

Postprocessing & Finishing of surfaces

- Polishing of surfaces



Applications of special interest

Main time parallel deburring
for machine tending applications



Automation of manual tasks



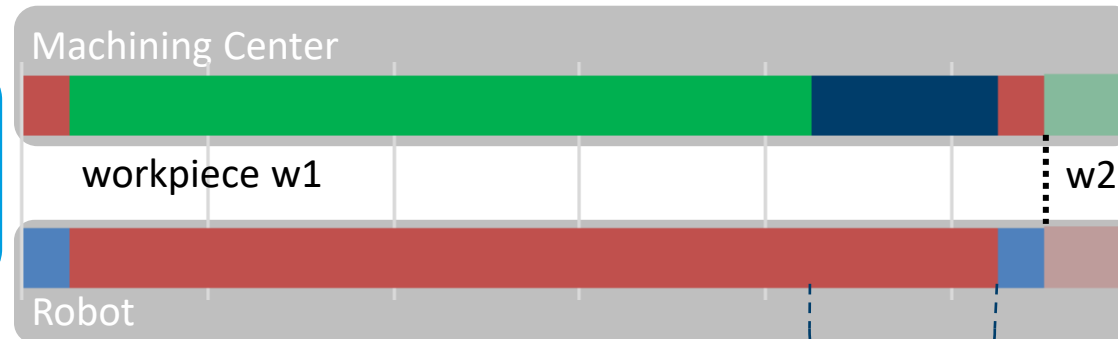
Main time parallel deburring for machine tending applications



Bearbeitung mit dem Roboter parallel zur Maschinenzeit
Machining with robots in parallel to the machine time

Boost your Efficiency!

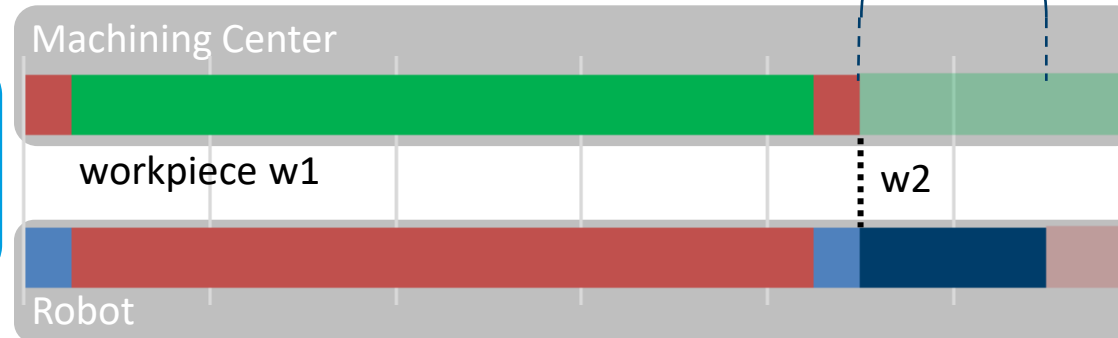
Machine Tending



Decrease idle time & cycle time up to 25%!



Machine Tending with parallel deburring by robot



■ Loading/Unloading Time ■ Machining Time ■ Idle Waiting Time ■ Deburring



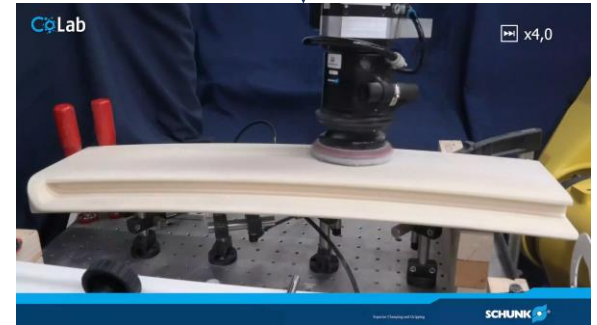
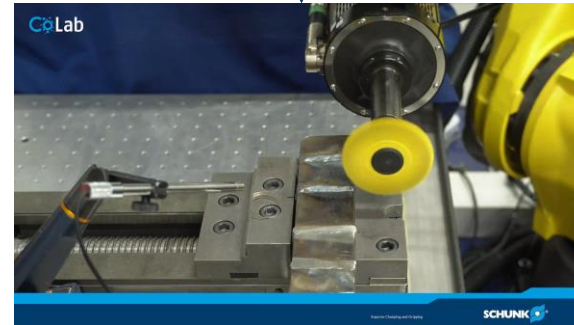
→ Eliminate idle time and utilize machining center more effectively by focusing on value-adding precision tasks – Saving time, money and energy!

Automation of manual tasks



Automatisierung manueller Bearbeitungsprozesse
How to automate manual machining processes

Typical applications



Overview Product Portfolio

		Deburring			Grinding, Polishing, Brushing and Sanding	
		No Drive	Pneumatic	Electric	Pneumatic	Electric
Axial Compliance						
Radial Compliance						

Axially compliant spindles

- **Flexible**
For form- & position tolerances
- **Easy**
To teach & programm

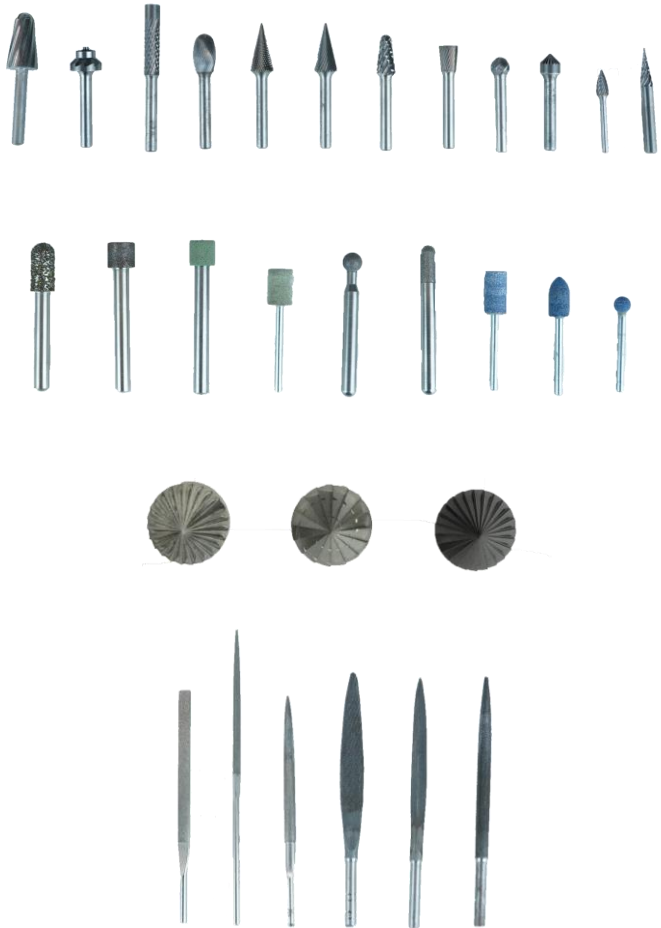


Radially compliant spindles

- **Flexible**
For form- & position tolerances
- **Easy**
To teach & programm



New Opportunities & Applications



Deburring

Pre- & Postprocessing of machined, casted or molded workpieces

- Many opportunities for workpieces made of different materials in a broad range of industries



RCV – Flexible deburring spindle

- 2 sizes with 250 & 490 watts
- Vane motor (lubricated compressed air)
- 30.000 to 40.000 RPM for various rotary burrs & pins
- Radial compensation
- Lock function for the Y-axis for a pendulum motion in the X-axis



RCV – Flexible deburring spindle



RCV – Flexible deburring spindle



FDB – Flexible deburring spindle

- 5 sizes with 150 to 1040 watts (+2 options for 1 size)
- Turbine motor (unlubricated compressed air)
- 25.000 to 65.000 RPM for various rotary burrs & pins
- Radial compensation
- Lock function for the Y-axis for a pendulum motion in the X-axis (not for all sizes)



FDB – Flexible deburring spindle



FDB – Flexible deburring spindle



FDB-AC – Flexible deburring spindle

- 1 size with 250 watts
- Vane motor (lubricated compressed air)
- 30.000 RPM for use with standardized cutters
- Axial compensation → defined angle
- Very small and compact design

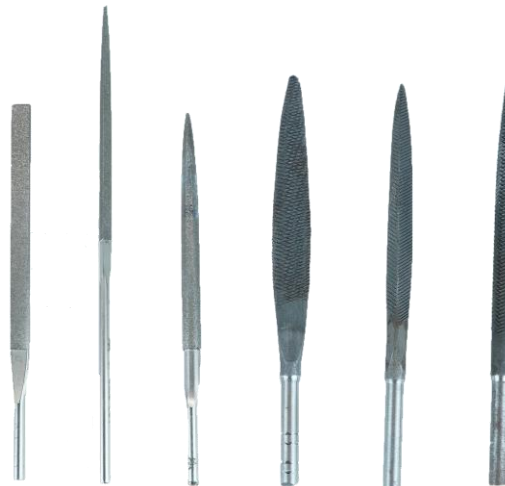


FDB-AC – Flexible axial deburring spindle



CRT – Flexible file tool

- 1 size
- Flatter valve motor (lubricated compressed air)
- Oscillating movement → 12.000 strokes per minute
- Radial compensation
- Lock function for the Y-axis for a pendulum motion in the X-axis



CRT – Flexible file tool



CRT – Flexible file tool



CDB – Flexible deburring tool

- 1 size (+1 option)
- No drive
- Radial & axial compensation
- Lock function for the Y-axis for a pendulum motion in the X-axis
- Typical applications for previously manually operated deburring tools → Use of known hand tools



CDB – Flexible deburring tool

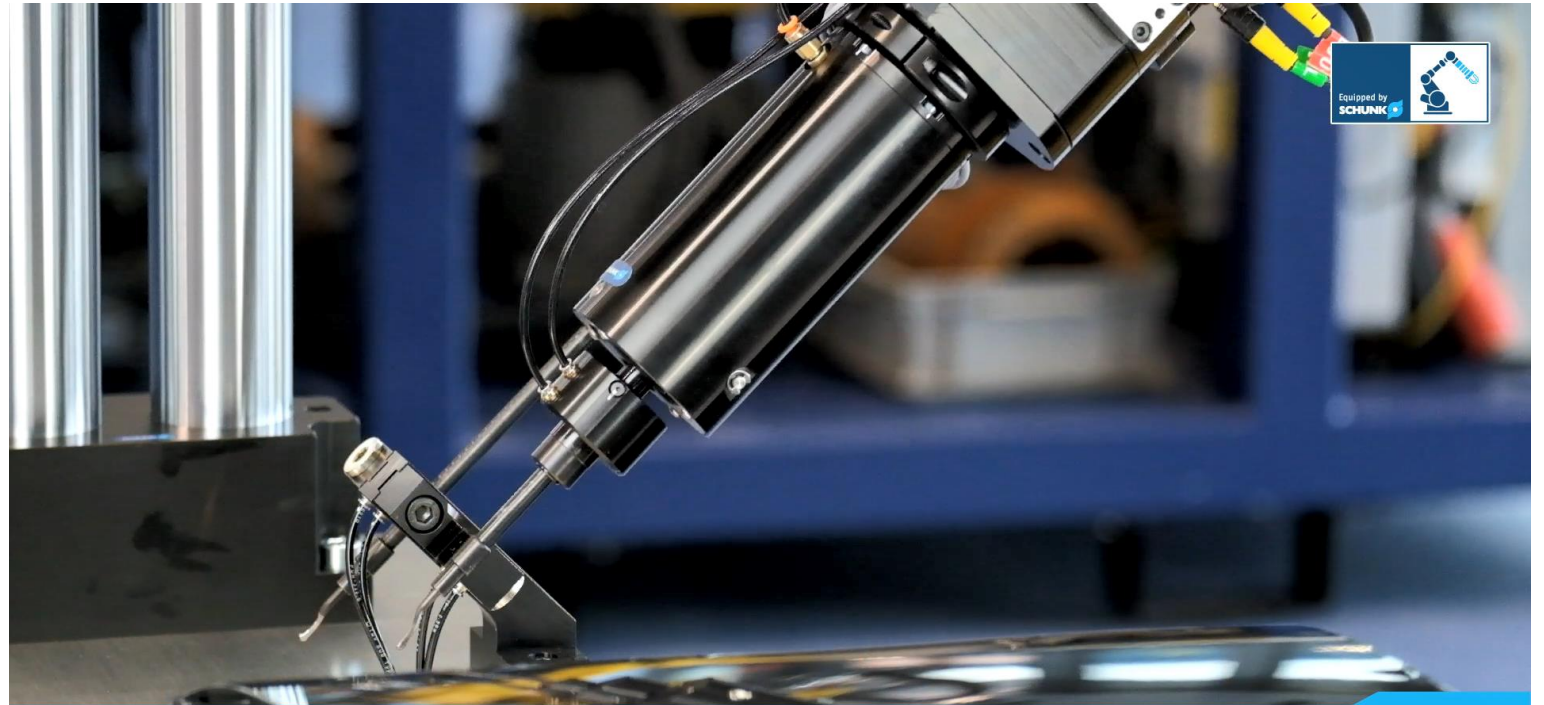
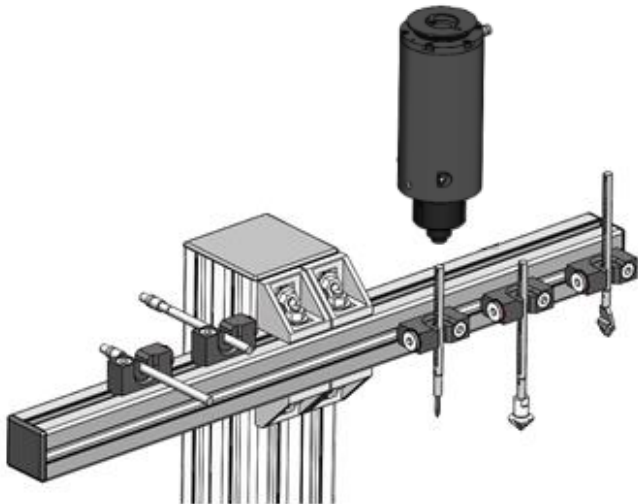


CDB – Flexible deburring tool



CDB with automatic tool changer

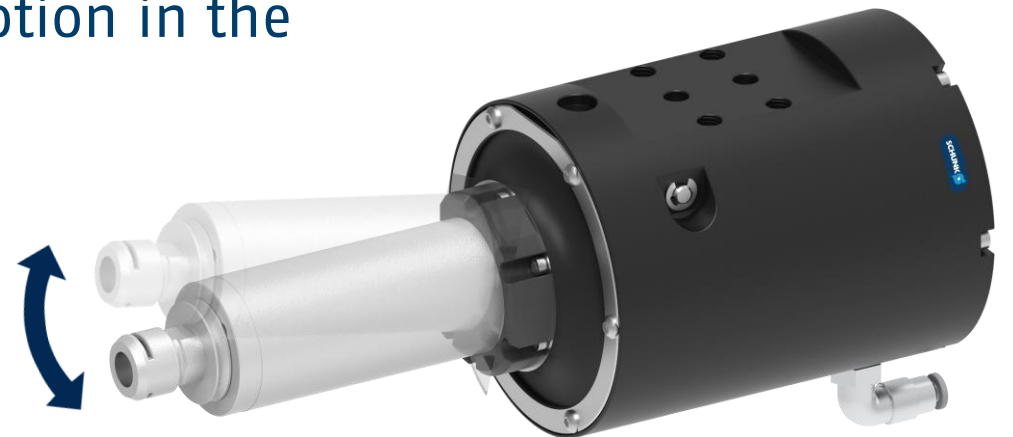
- Change tools automatically
- Pneumatically operated
- Use of various tools
- Replacement of worn tools



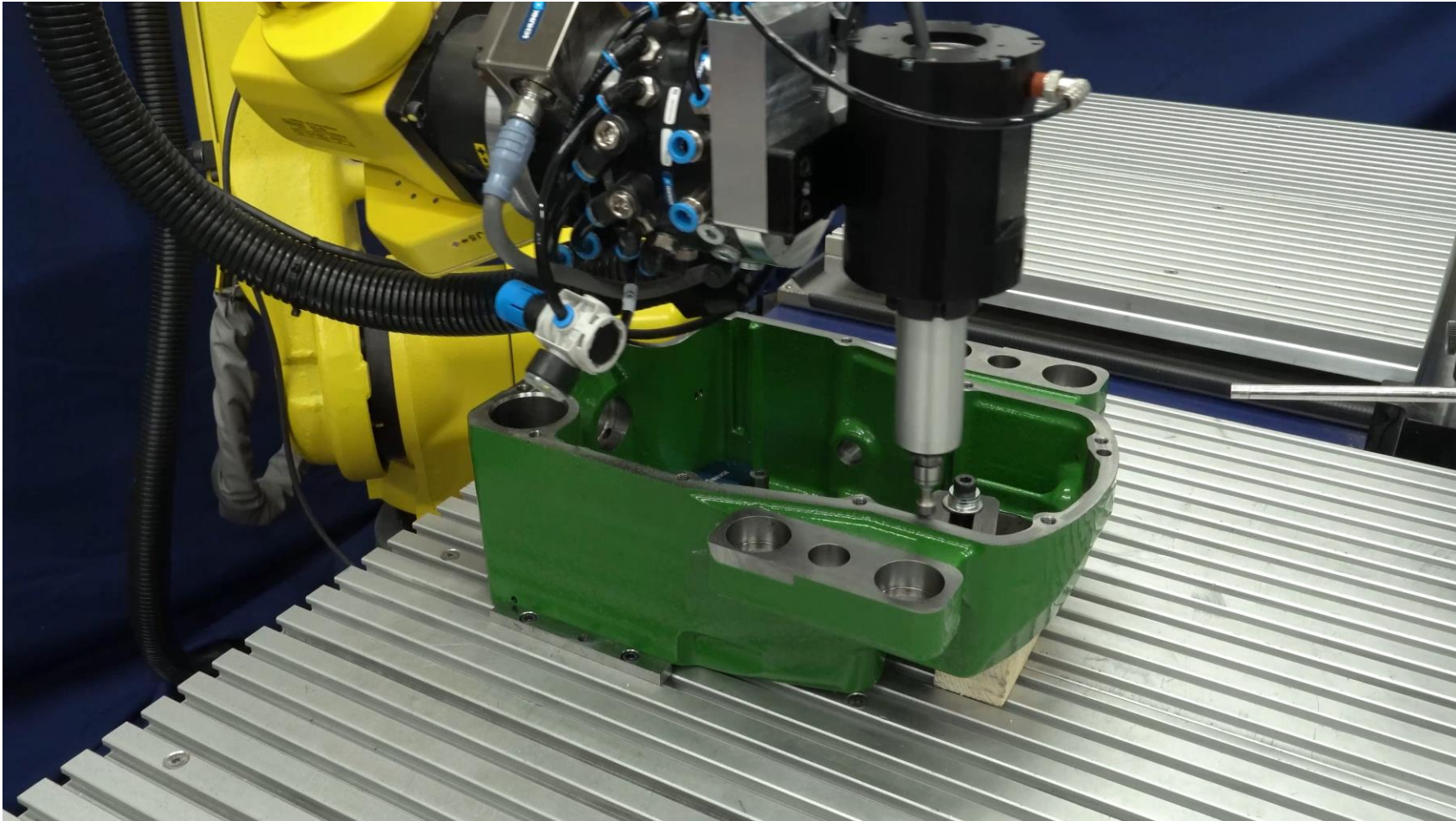
Automatisierter Wechsel von bewährten Entgratklängen aus Handwerkzeugen
Automated change of proven deburring blades from tools

RCE 230 – Flexible deburring spindle

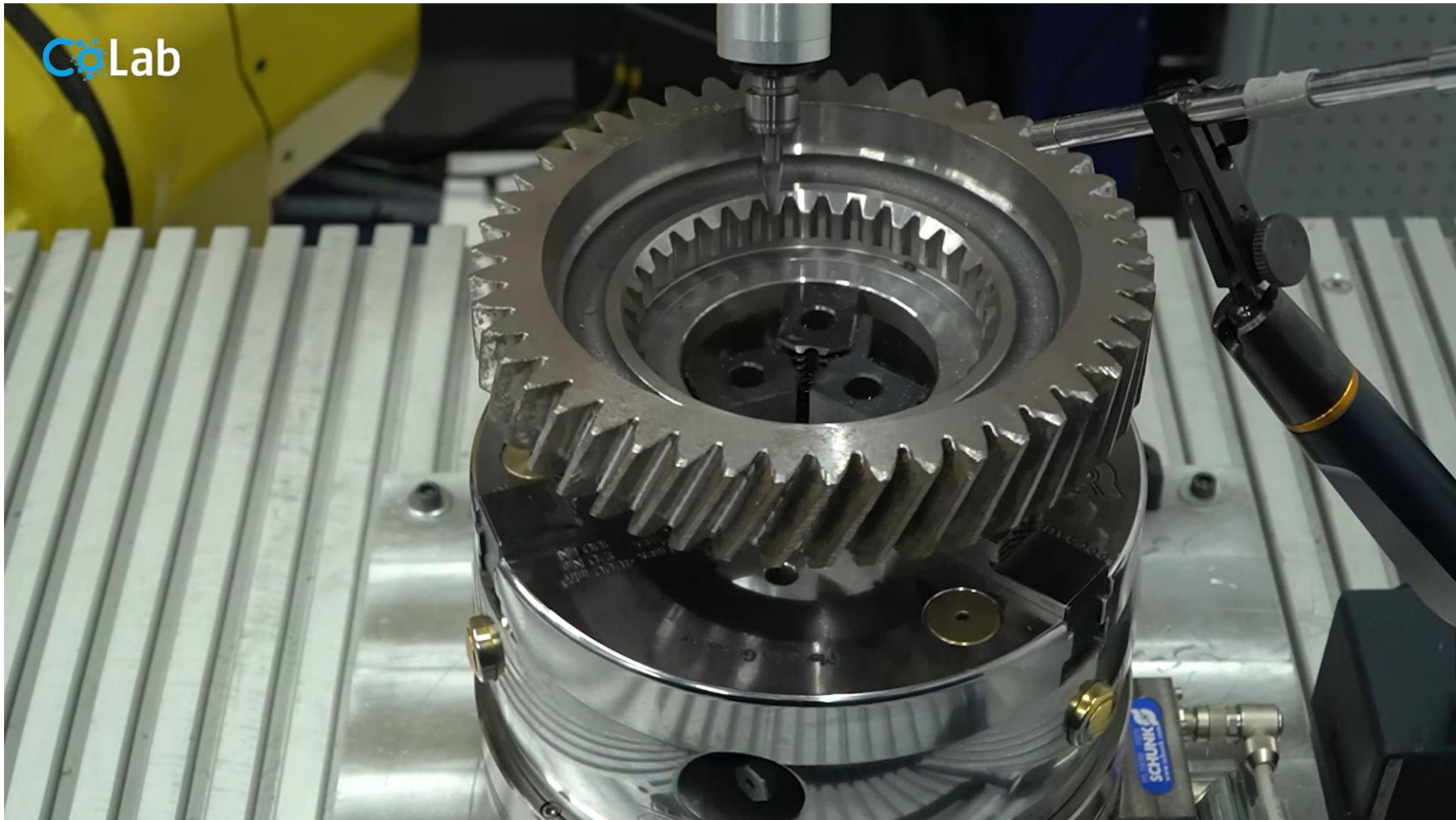
- 1 size with 230 watts
- Brushless electric motor
- Variable Speed from 5.000 to 50.000 RPM for various rotary burrs, pins & brushes
- Radial compensation
- Lock function for the Y-axis for a pendulum motion in the X-axis



RCE 230 – Flexible deburring spindle



RCE 230 – Flexible deburring spindle



New Opportunities & Applications



Sanding, Grinding & Brushing

Pre- & Postprocessing of machined, casted or welded workpieces

- New applications by expanding tasks of welding robots & easy solutions for different industries

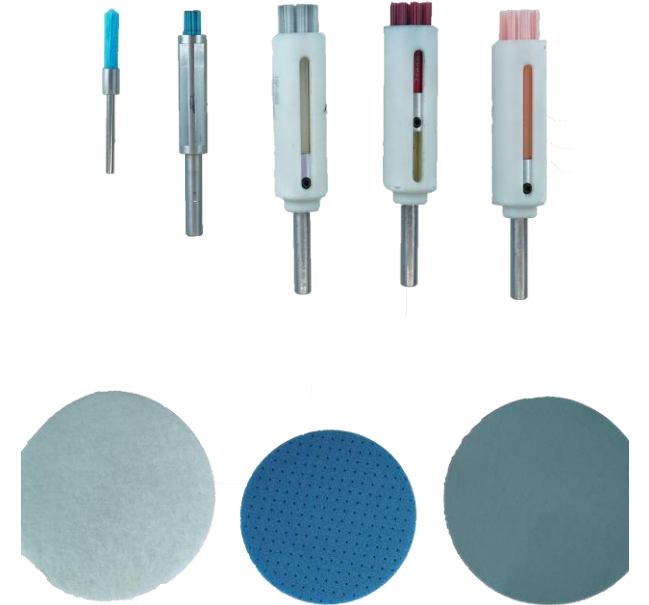


New Opportunities & Applications

Polishing

Postprocessing & Finishing of surfaces

- New possibilities for automotive, aerospace & other industries



RCE 710 – Flexible deburring spindle

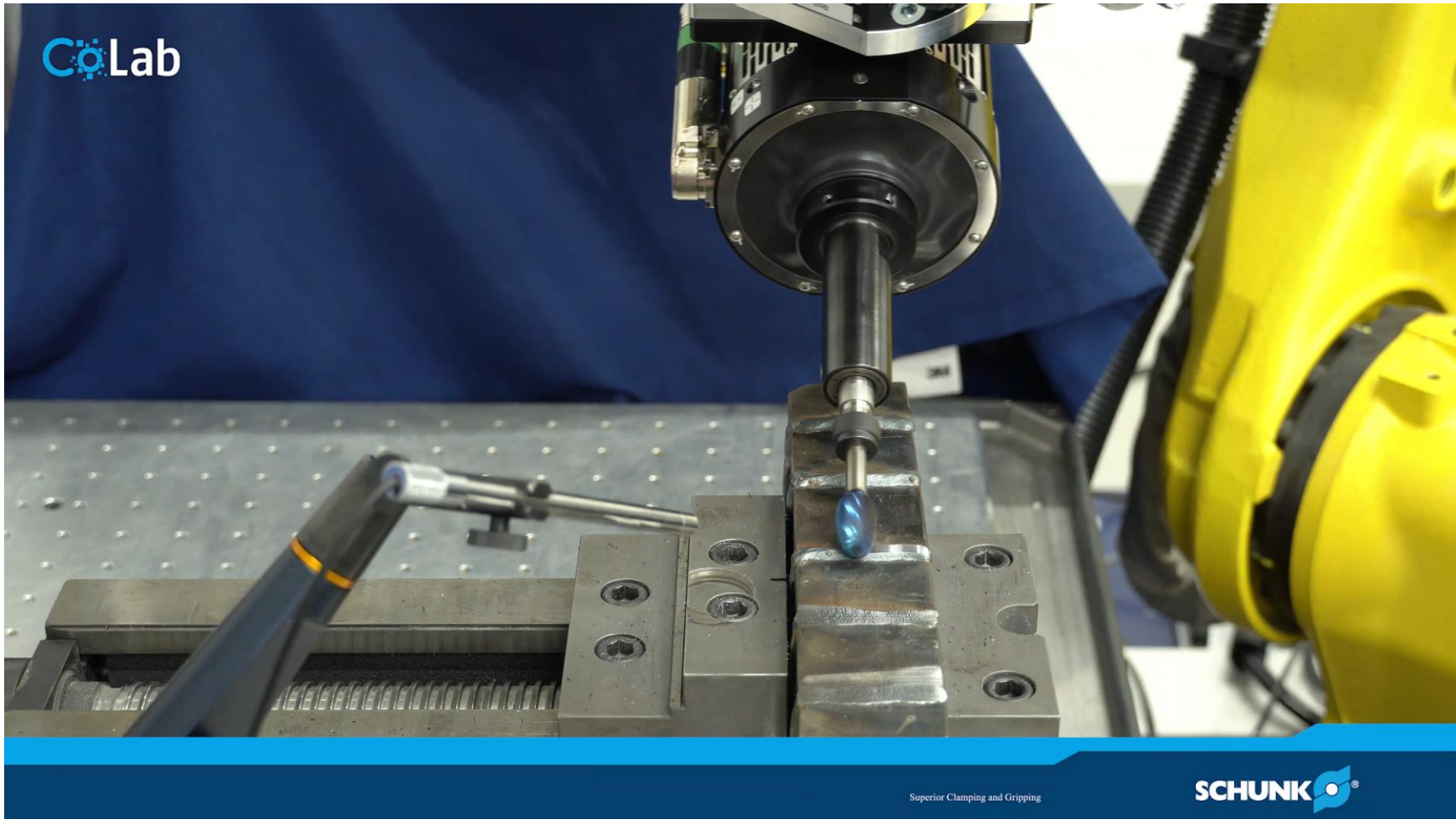
- 1 size with 710 watts
- Brushless electric motor
- Variable Speed from 1.000 – 13.000 RPM for various bigger rotary burrs, pins & brushes
- Radial compensation
- Lock function for the Y-axis for a pendulum motion in the X-axis



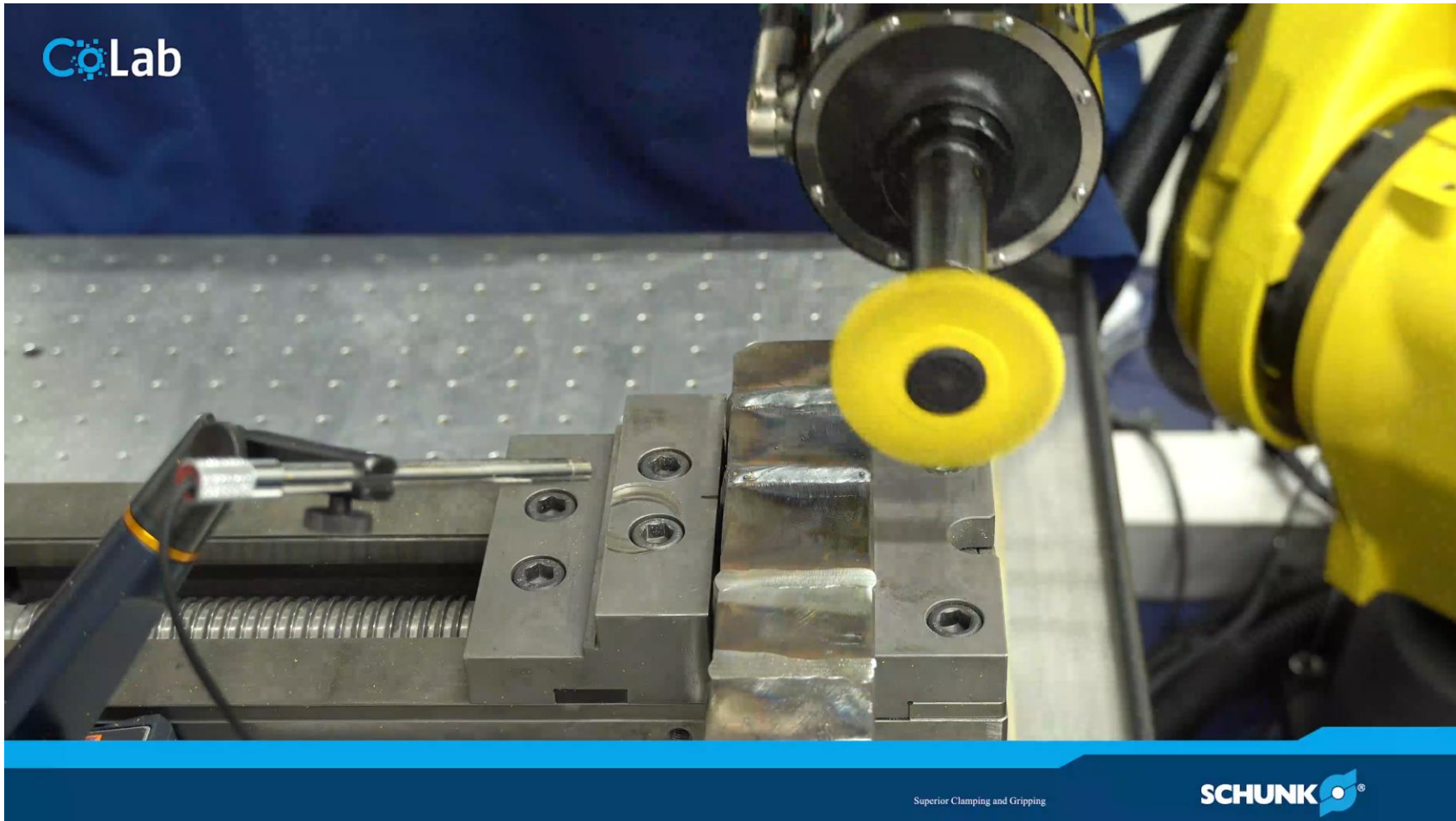
Deburring, Brushing, Grinding & Polishing



RCE 710 – Flexible deburring spindle

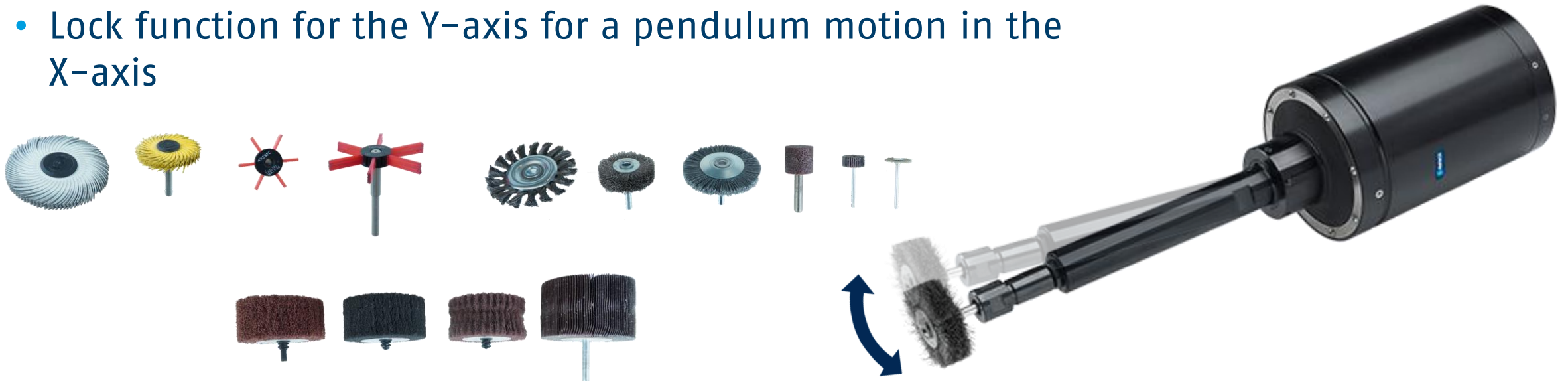
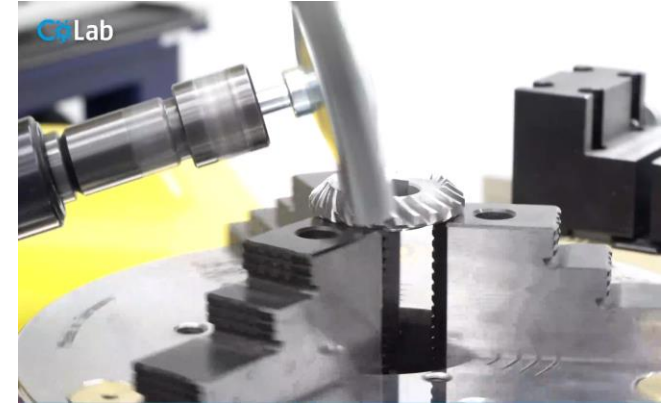


RCE 710 – Flexible deburring spindle



MFT-R 390 – Flexible brushing spindle

- 1 size with 390 watts
- Vane motor (lubricated compressed air)
- 5.600 RPM for various radial brushes
- Radial compensation
- Lock function for the Y-axis for a pendulum motion in the X-axis



Deburring, Brushing, Grinding & Polishing

MFT-R-390 – Flexible brushing spindle



Deburring, Brushing, Grinding & Polishing

MFT-R-390 – Flexible brushing spindle



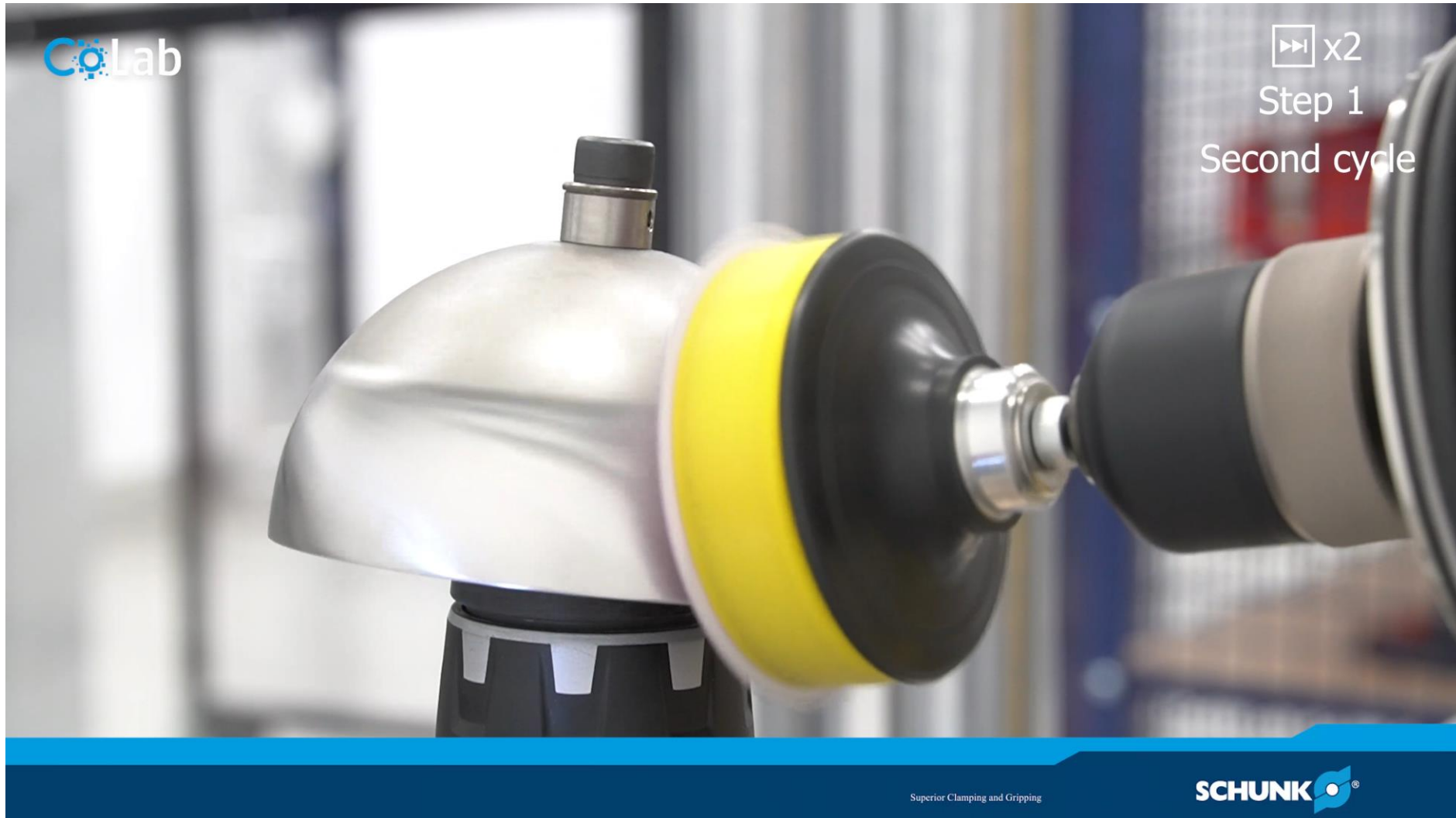
MFT – Flexible brushing spindle

- 1 size with 390 watts
- Vane motor (lubricated compressed air)
- 5.600 RPM for various axial brushes & grinding discs
- Axial compensation
- Sensor system for retracted & extended stroke



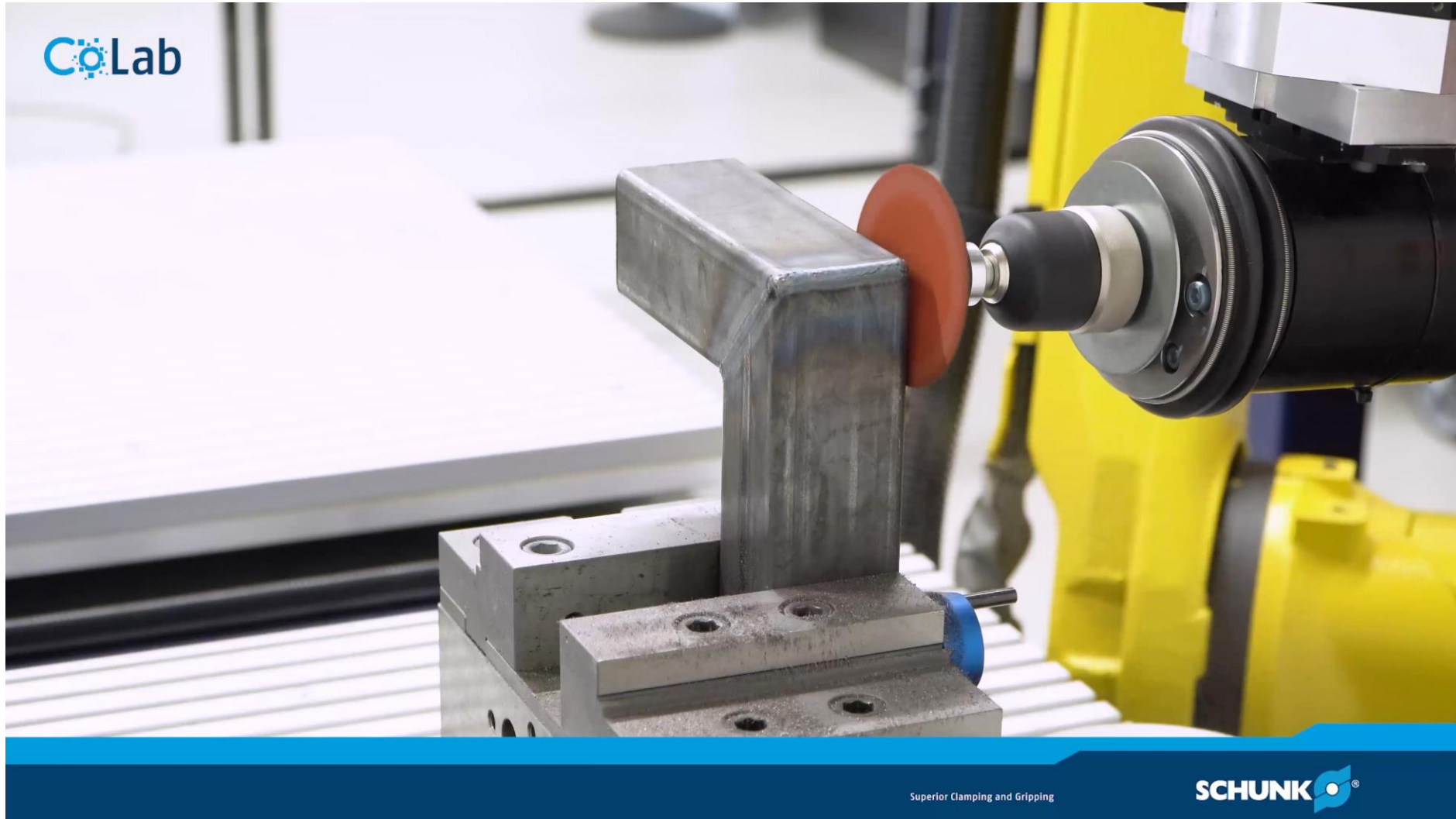
Deburring, Brushing, Grinding & Polishing

MFT – Flexible brushing spindle



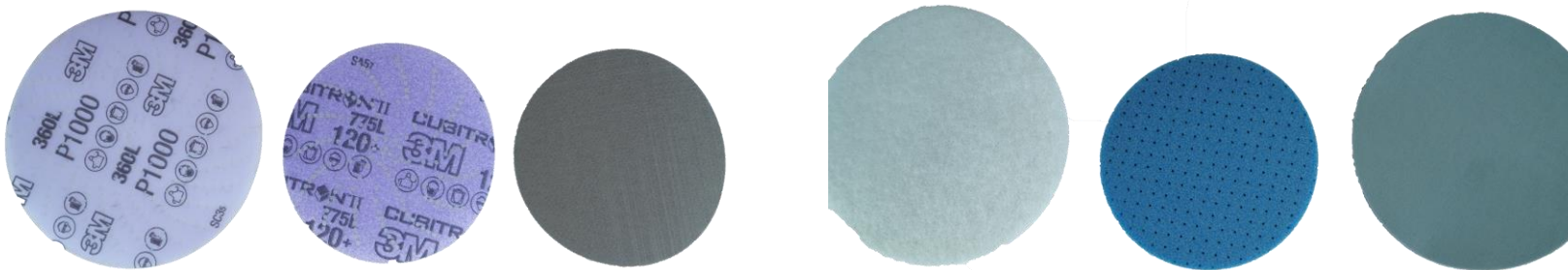
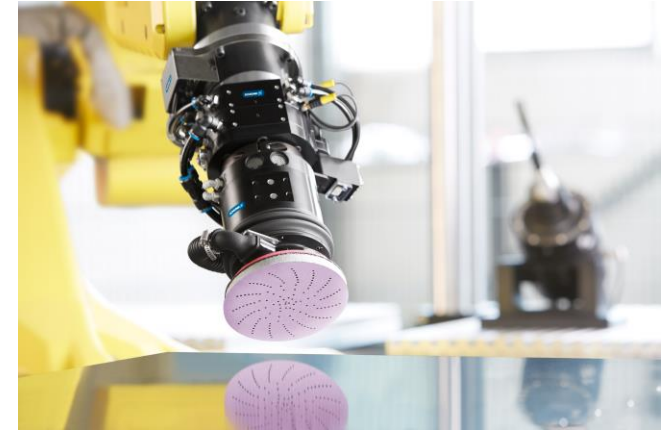
Deburring, Brushing, Grinding & Polishing

MFT – Flexible brushing spindle



A0V – Flexible random orbital sander

- 2 sizes (125mm/5" & 150mm/6") with 450 watts
- Vane motor (lubricated compressed air)
- 10.000 RPM for various sanding & polishing discs
- Axial compensation
- Compensation can be adjusted by double-acting cylinder
→ Retract & Extend
- Optional connection for suction for reduced dust



A0V – Flexible random orbital sander

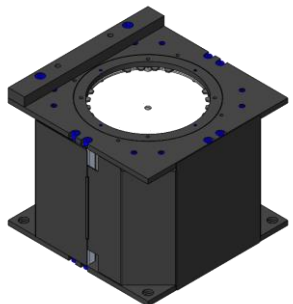


A0V – Flexible random orbital sander

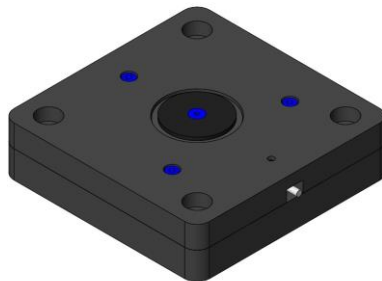


A0V – Media Changer

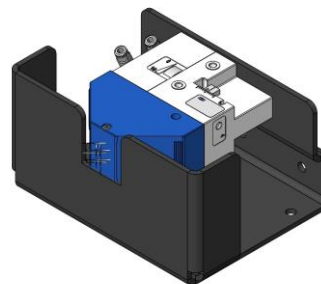
- Automatic exchange of worn discs
- Usage of multiple feeders for different types of media
- Long operating time without manual intervention
- Modular design with three components



Media Feeder



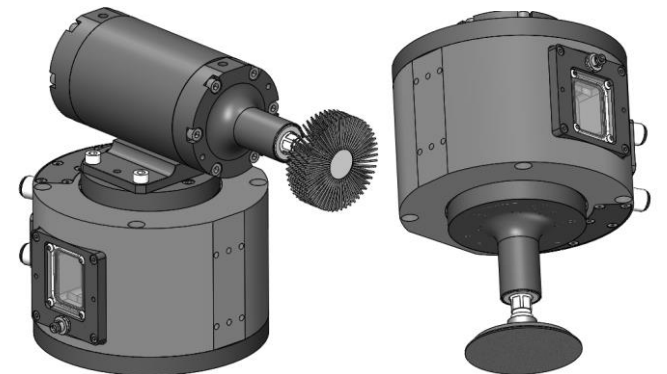
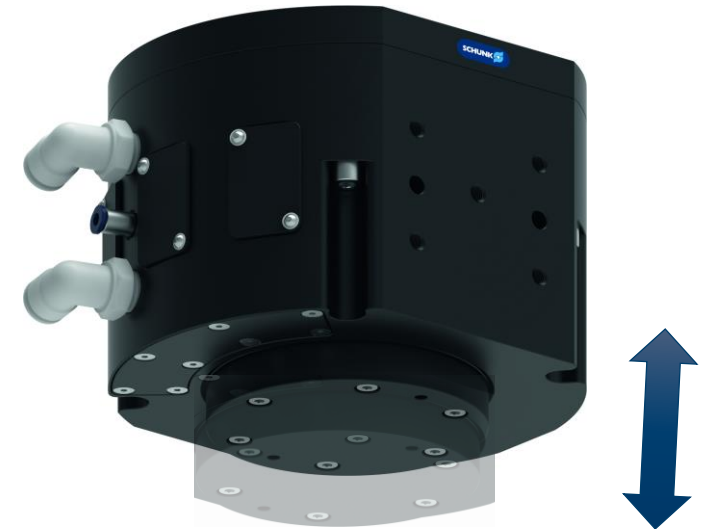
Media Checker



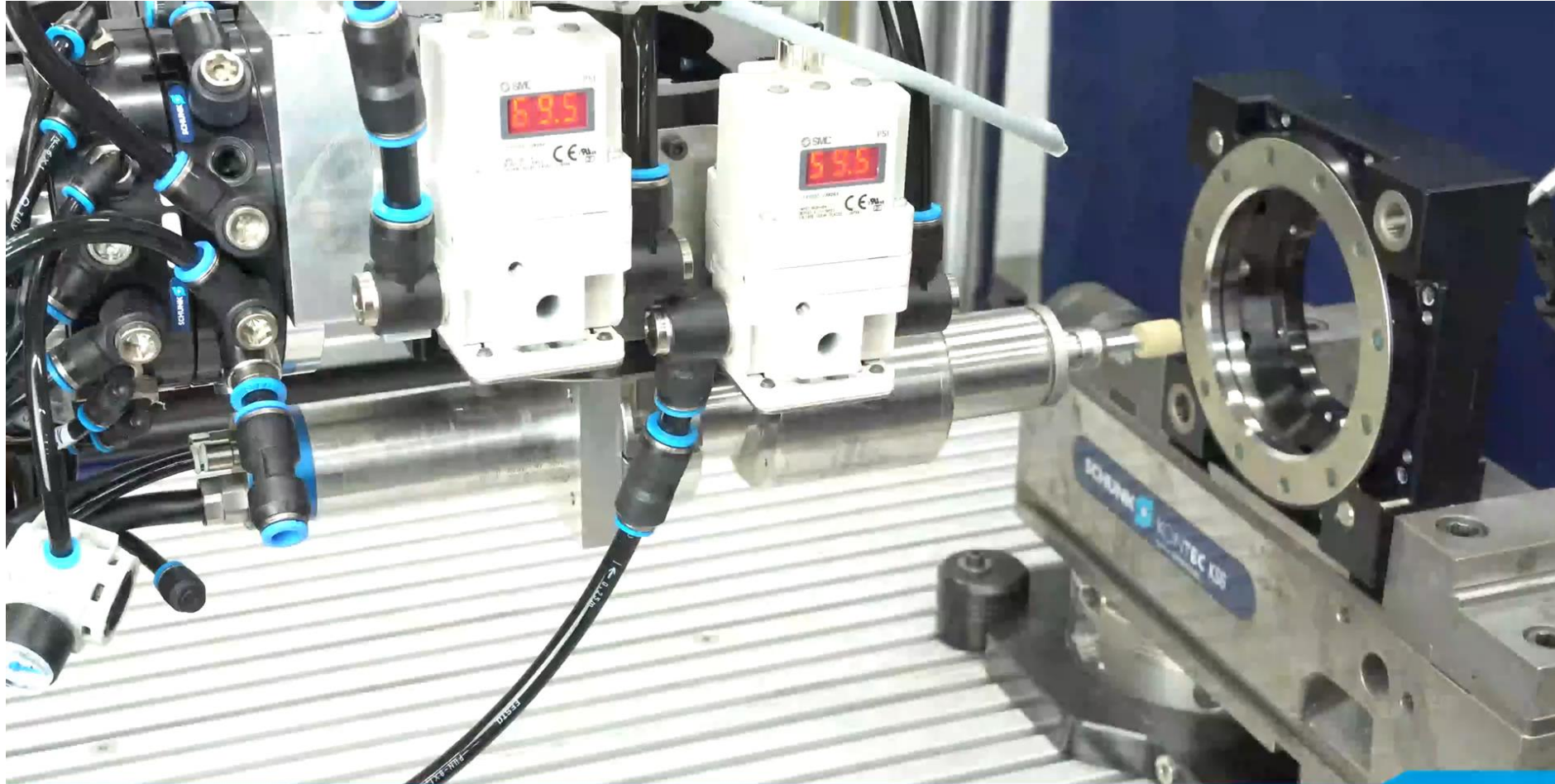
Media Remover

PCFC – Axial compensation unit

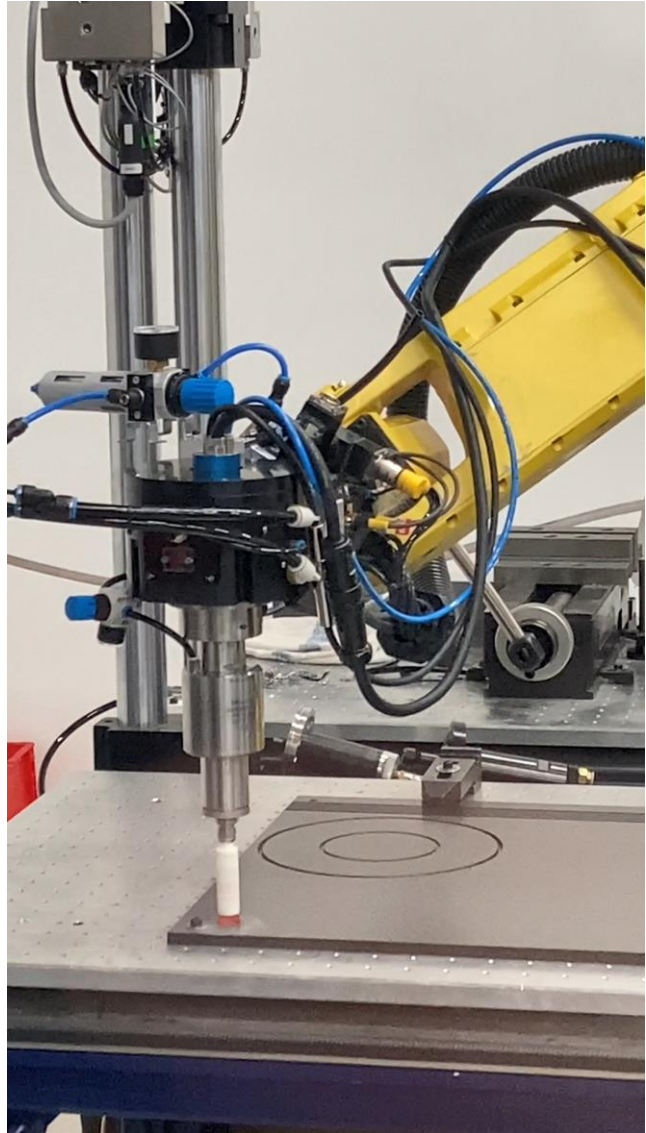
- 3 sizes
- Versatile usage by mounting customer's own tools
- Axial compensation
- Compensation can be adjusted by double-acting cylinder
→ Retract & Extend
- Optional integrated measuring system for monitoring & control of the process (stroke)
- Optional gravity compensation for equal compliance force in every position



PCFC – Axial compensation unit



PCFC – Axial compensation unit

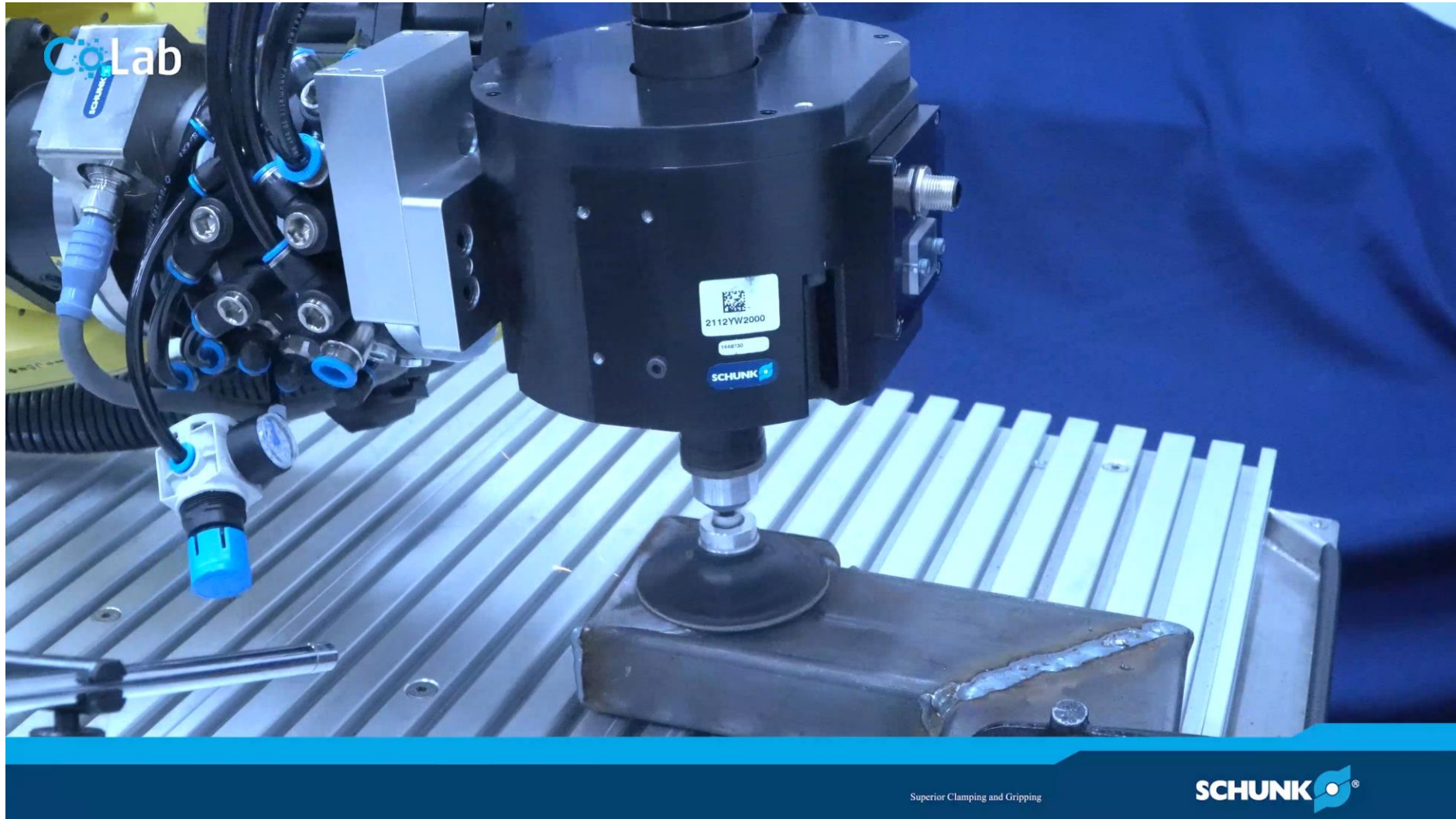


PCFC Motor-Kit – Flexible motor kit

- 1 size with 750 watts
- Vane motor (lubricated compressed air)
- 15.000 RPM for various grinding discs & brushes
→ Speed is matched to 50mm and 75mm consumables
- Advantages of the PCFC can be used
- Available as an assembly or retrofit kit



PCFC Motor-Kit – Flexible motor kit

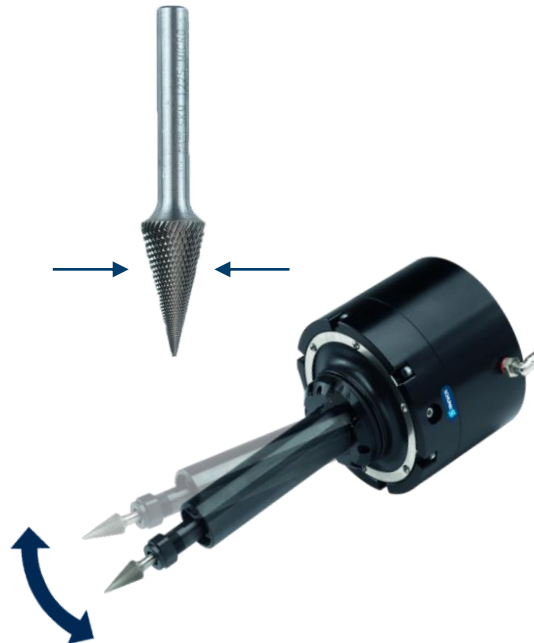


PCFC Motor-Kit – Flexible motor kit



How to choose SCHUNK product?

1. Which process & which requirements?
2. Current process?
3. Consumables?
4. Direction of load?
5. Speed & Power?



SCHUNK R-EMENDO Highlights



[SCHUNK R-EMENDO Highlights – 2021](#)



[SCHUNK R-EMENDO Highlights – 1st half year 2022](#)



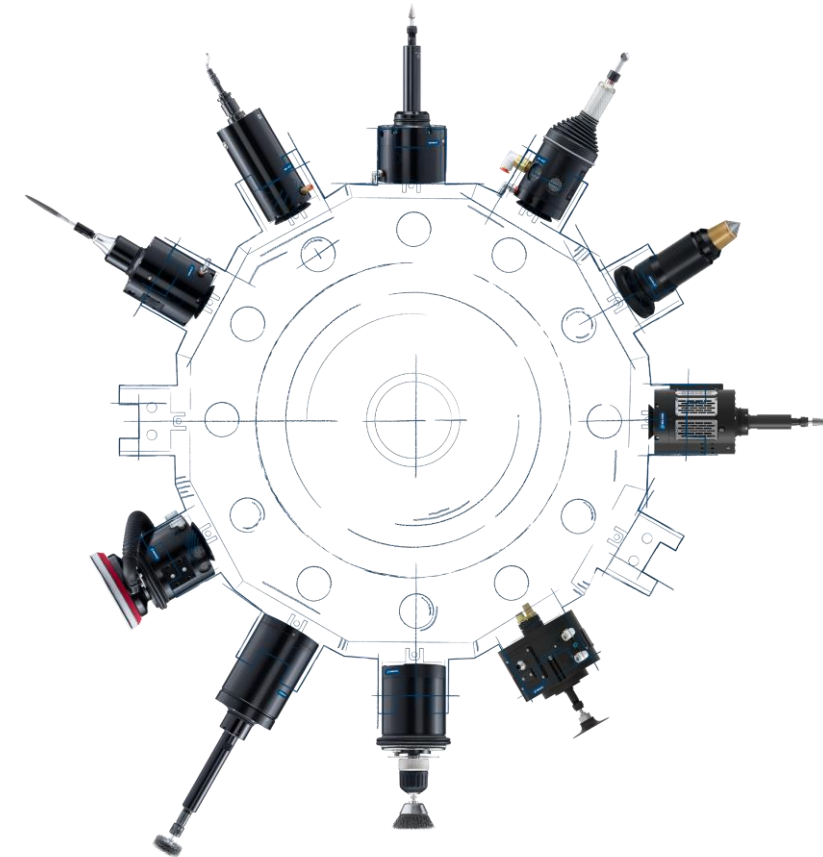
[SCHUNK R-EMENDO Highlights – 2nd half year 2022](#)



[R-EMENDO ➡ We automate your process | SCHUNK](#)



[R-EMENDO Product portfolio – \(schunk.com\)](#)



Mailbox & Contact for Inquiries
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Who we are

CoLabs validate applications worldwide

8

locations around
the world

Over **275**
visits and workshops

- + Feasibility check and documentation of application experts
- + Live demonstration and customer training

Over **800**
validated applications

The Test Cell for R-EMENDO applications offers:

- Trails with your workpiece and our products & know how
- Minimization of risk: Evaluate your processes early
- Reduced effort: Safe time & money at your process start-up
- Demonstration of your Process on site in CoLab or online

➔ You bring the workpiece – SCHUNK offers a solution!





Hand in hand for tomorrow

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