



HRC Training HMI 2017

Product Management

April 2017

Superior Clamping and Gripping



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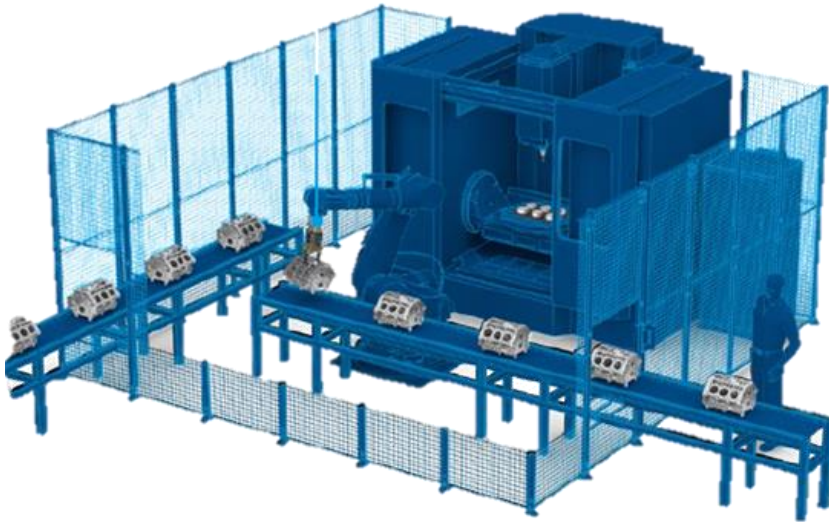
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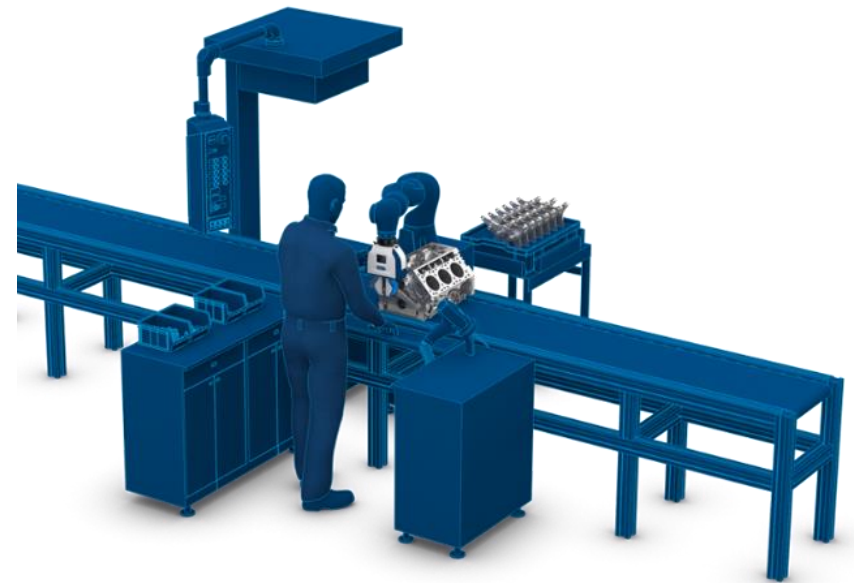
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From complete automation to Human-Robot-Collaboration

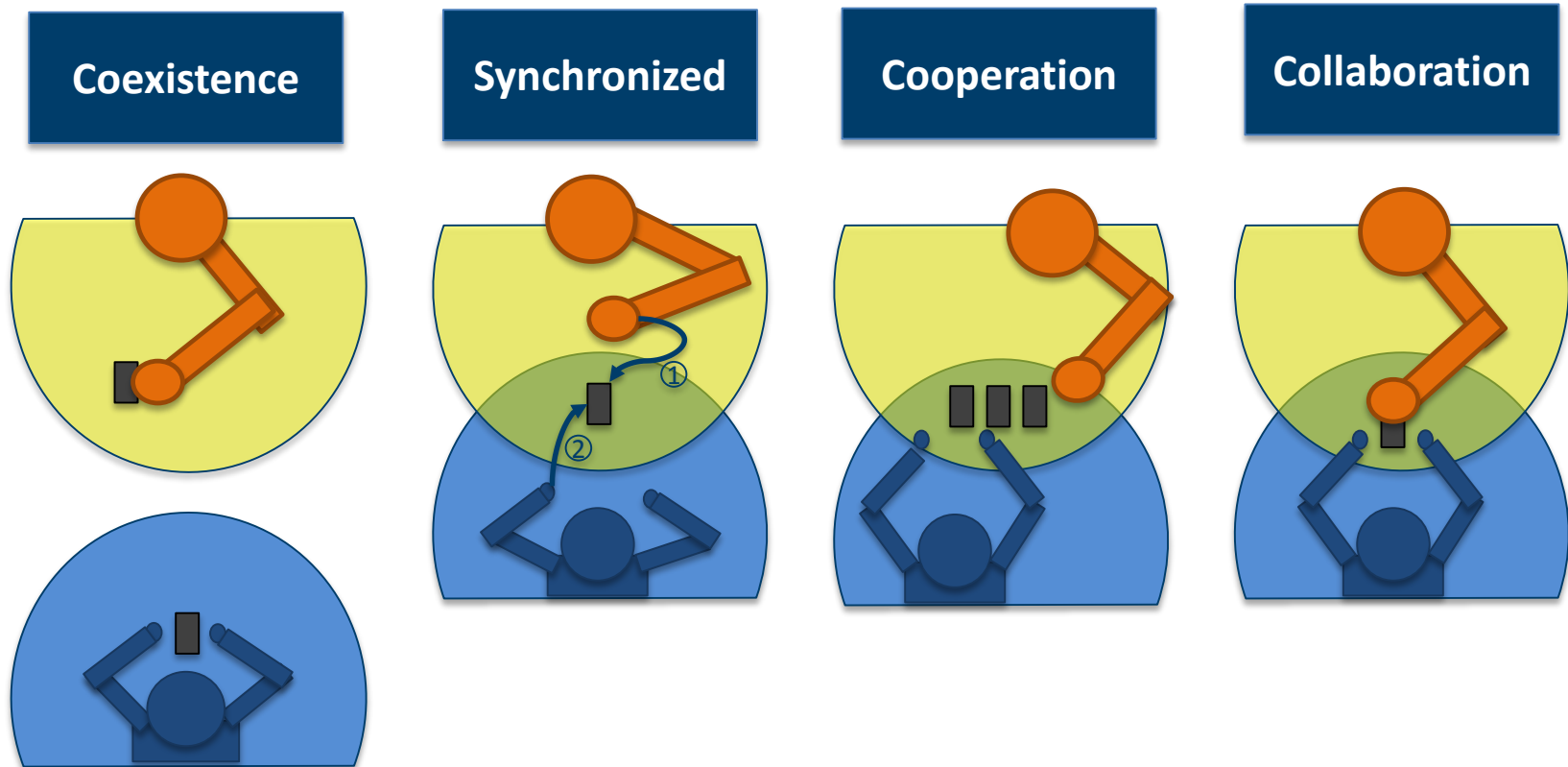


Interaction between an operator (human) and a robot in common machining areas without protective fences

- ✓ Ergonomic relief of the employees
- ✓ Flexibility of work processes
- ✓ Increased efficiency by use of robots
- ✓ Retrofitting and flexibility of logistics, loading, assembly and handling



HRC in the implementation – Distinction by type of collaboration



Quelle: MRK Anwendertag „Einführung 1. Stuttgarter
MRK –Anwendertag“: Fraunhofer – IAO, 2016

Safety principles of a HRC-gripper

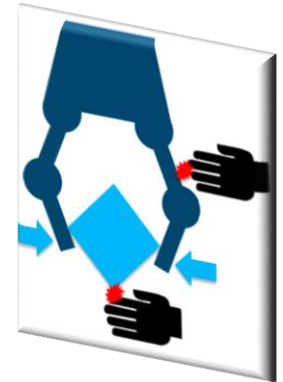
1. Grippers never loses a work piece

- Gripping force maintained in case of power loss or emergency stop



2. Grippers always detects human contact

- Wrapping of the gripper and the gripper fingers, e.g. with capacitive sensors
- Recognition of the work piece by prior programming



3. Grippers never causes injuries

- Limitation of the gripping force in the collaborative operation to uncritical value



Current status

– Gripper for the collaborative use

Basic condition: Customer (mechanical engineer, systems integrator or end customer) is responsible for the safety of the complete machine and therefore also responsible for the acceptance / certification of it.

Present method:

- Customer will receive a SCHUNK gripper including housing on request
- The Customer himself is responsible for the certification or acceptance of the gripper

Objective:

- Customer will receive a gripper for collaborative use from our standard portfolio
- In context of the safety appraisal the customer can obtain a certificate from the DGUV (German Social Accident Insurance Institution) for the gripper

Examples of application

Quelle: pddnet.com



Quelle: KUKA AG



Quelle: www.press.bmwgroup.com



Quelle: Fanuc

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The NEW SCHUNK technology carrier for collaborative gripping

- Capacitive sensors
- Touchscreen
- Integrated camera
- Parallel grip and angular grip
- Tactile sensors
- Optical feedback

Application at the HMI 2017

The various technologies installed in the gripper are demonstrated by means of a showcase.



Technology carrier Co-act JL1 gripper



Improvement 2017

- Slim enclosure
- Larger display
- Improved tactile electronics



Touchscreen

enables communication with the gripper as well as teaching or switching to various operating modes.



Parallel grip and angular grip

Two types of gripping for gripping any geometry.



Optical feedback

Via LED luminaires, the Co-act gripper JL1 informs the operator about the status of the gripper and the identification of the work pieces.



Capacitive sensor

for the prevention of collisions.



Camera

mounted between the fingers for detecting the surroundings, differentiating and searching for objects.



Tactile sensor

for in time detection and differentiation of work pieces and humans.



Application at the HMI 2017

The robot with Co-act gripper EGP leads a motor adapter to a motor block, positions it and holds it in position during screwing. The fine adjustment and screwing is carried out by the employee by hand.



Application at the HMI 2017

The robot with the Co-act gripper EGN acts as an „intelligent load lifter“ during the rim handling. The operator leads the gripper to the wheel rim with the help of the hand control function and positions it in the wheel arch. After positioning the rim is fixed by the operator.



Application at the HMI 2017

The robot with the Co-act gripper MPG-plus precisely inserts electronic components into a housing. The final assembly and functional test is carried out by the employee.

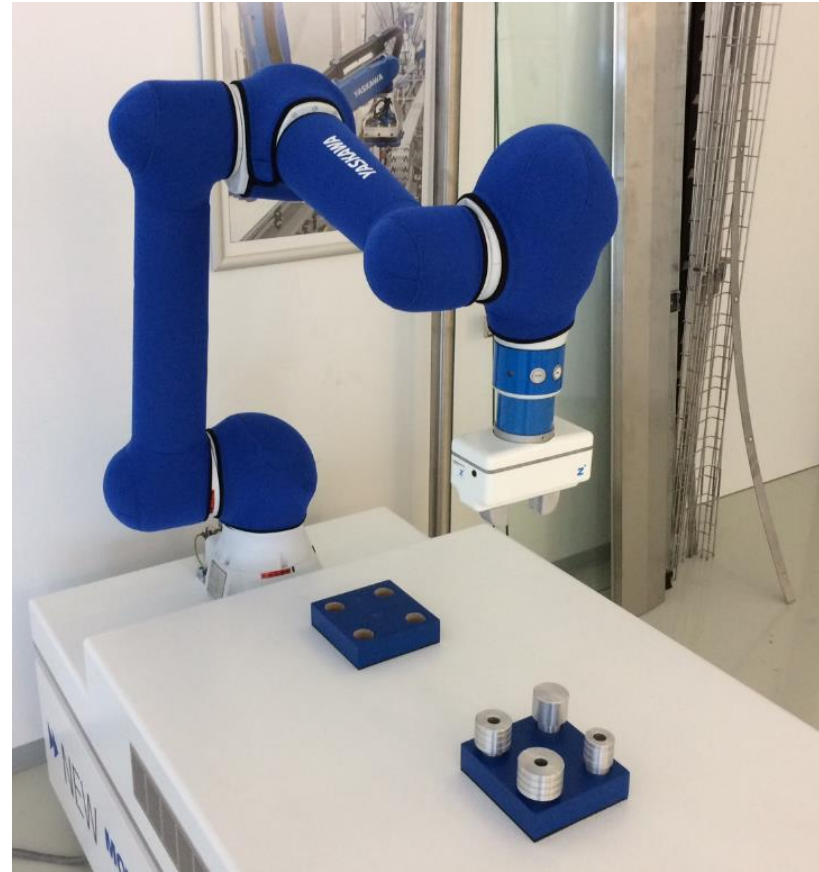
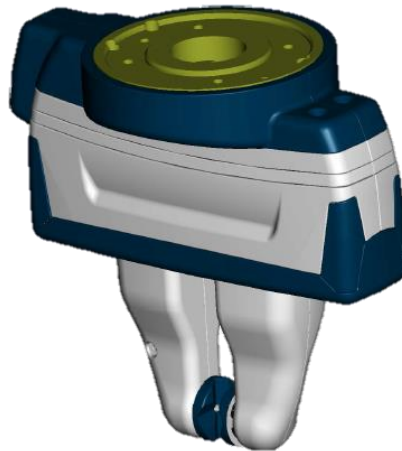


Yaskawa HC10 with Co-act WSG

New application

- Exhibit is borrowed from Yaskawa
- By this provision we have exchanged the Zimmer gripper
- Application is a simple pick and place of work pieces

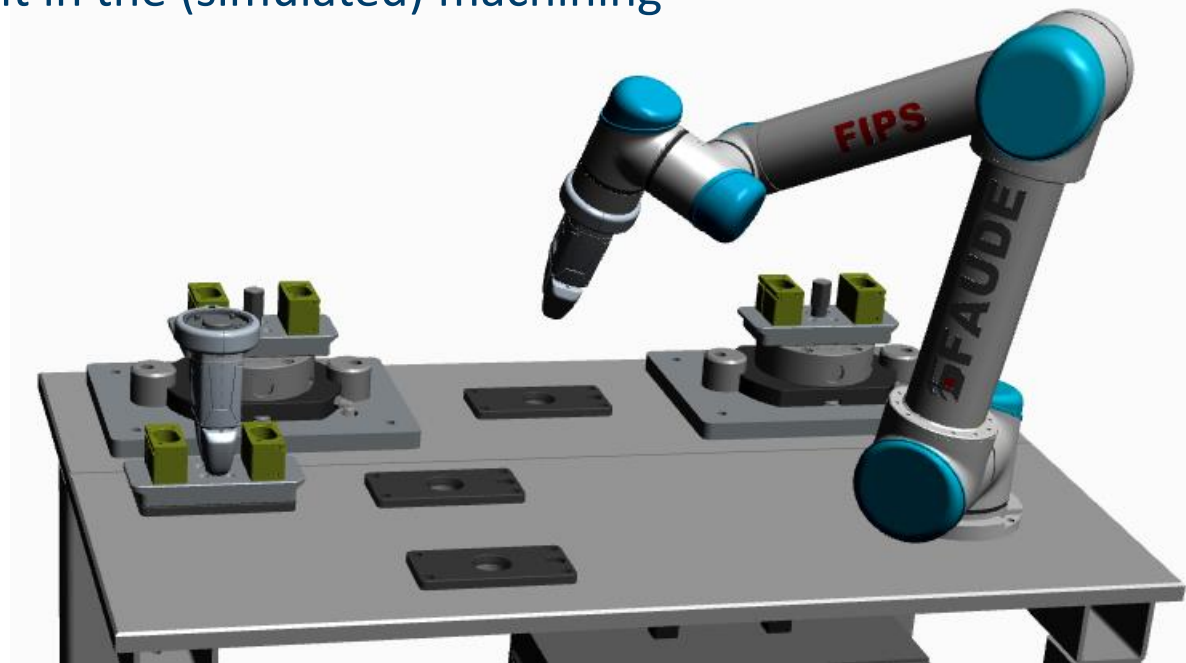
Co-act gripper
WSG



UR with Co-act EGP

New application

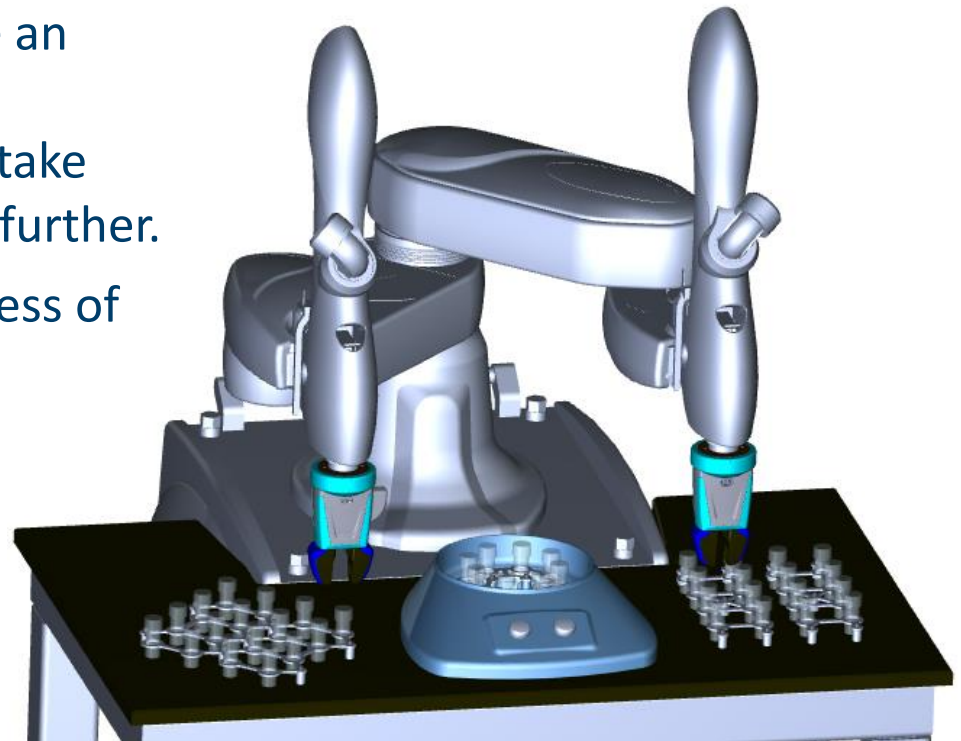
The exhibit shows a direct clamping (2nd sided machining) with the Vero-S system. In this case, the operator places the MPG-plus housing on the workpiece carrier with the VERO-S pins and the robot places it in the (simulated) machining center.



Kawasaki with Co-act EGP & Co-act MPG-plus

New application

Centrifuge tubes with different liquids are placed in the (simulated) centrifuge and sorted according to the separation procedure. Then the worker would take the sorted tubes and process them further. The robot practically takes the process of sorting the tubes.



Humanoid robot with SCHUNK gripper Kawada NEXTAGE

**Kawada NEXTAGE Robot at the HMI.
Exclusively by SCHUNK!**

The industrial assistance robot is equipped with two electric SCHUNK grippers. The grippers have integrated a camera each.

The application is the assembly and function test of a Tinker Bots construction kit



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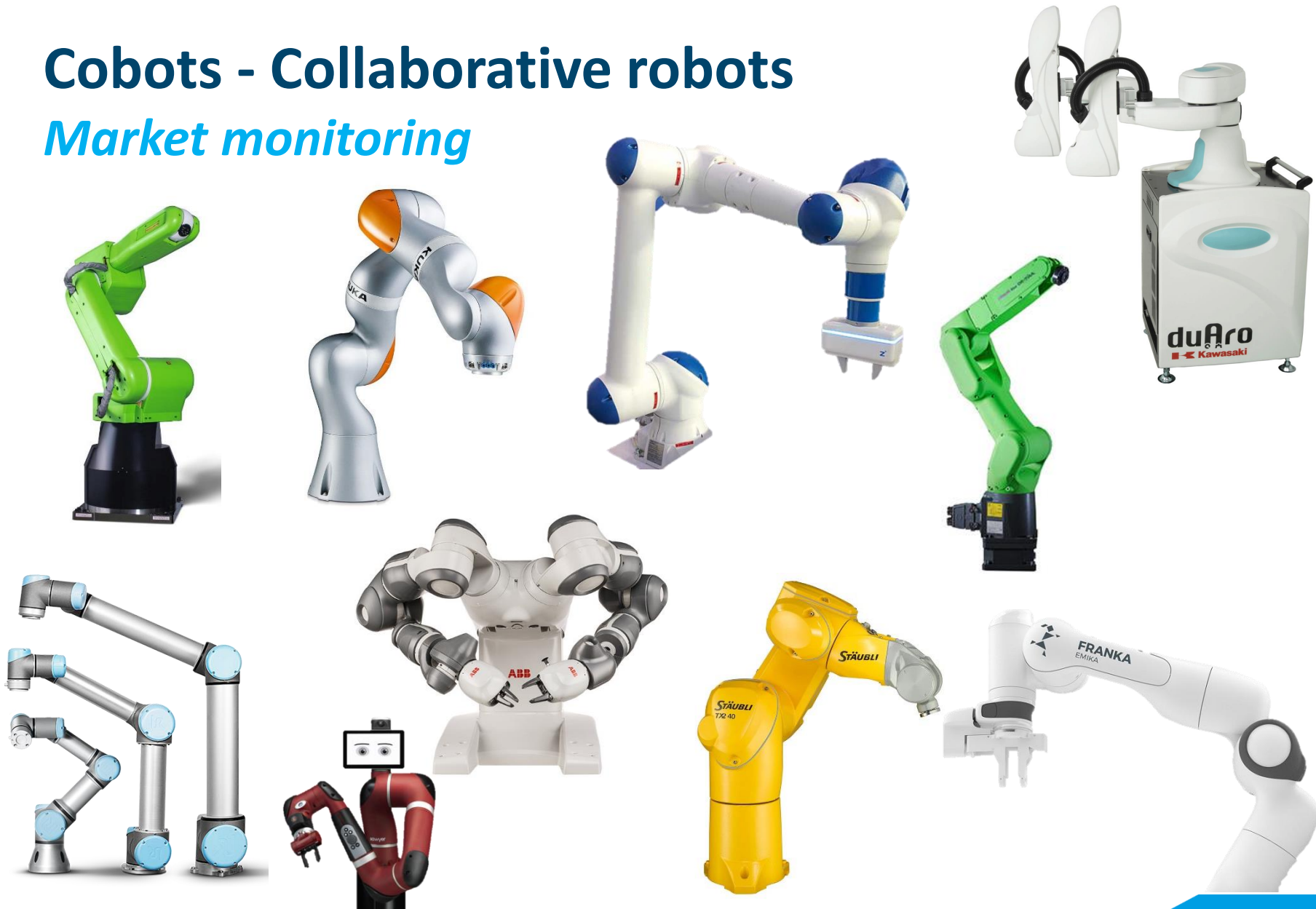
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Cobots - Collaborative robots

Market monitoring



Development project: HRC gripper 10 kg

Status: Under development – do not communicate

Objective:

- MRK gripper without limitation of force
- For up on 10 kg workpiece weight (force-fit connection)
- integrated sensors (position measurement system)

Sales release planned:

End of 2018

EGP with protective cover for UR

Status: Completed

Objective:

- EGP with collision protective cover with integrated inductive sensors
- Adapted for UR 3, UR 5 and UR 10
- Plug & Play mechanical und electrical with UR robot
- Website UR+
<https://www.universal-robots.com/plus/>
- Optional with gripper fingers in Contact design



Certified modular system of collaborative gripper

Use of standard grippers with a small force range



EGP / MPG+ / KGG

Adapter plate and collision protective cover



Test/Certification of the inherent safety by the DGUV

For example through force measurements and collision measurements, during production through appropriate Q-tests



Inherent safety /
With a certification from the DGUV

DGUV = German Social Accident Insurance Institution

Certified modular system of collaborative gripper

Status: Under development

Planned grippers:

- EGP 25,40,50,64
- KGG 60-20,80-30
- MPG+ 25,32,40,50,64

Compatible with:

- UR 3,5,10
- KUKA 7, 14
- Fanuc
- ABB

Features:

- Certification from the DGUV
- Integrated sensors
- Standard fingers optionally
- Lighting optionally

Timetable:

Completion in 2017

Overview of realized projects

Various grippers have already been realized for collaborative applications:

JGP, PGN+, EGA, WSG, MPG+

For the following robot types:

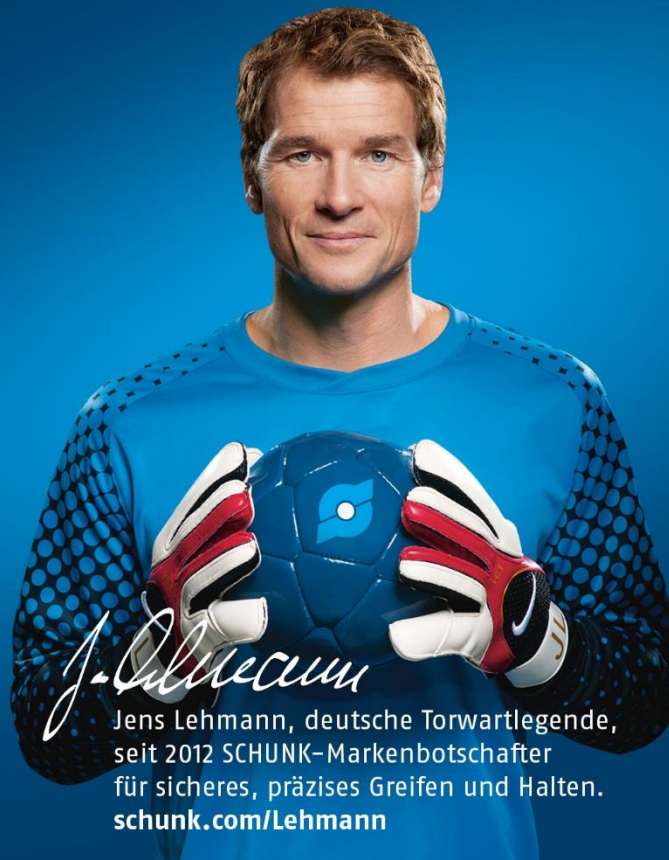
KUKA, UR, Fanuc, ABB

Please use the checklist in the STB and send it to our Co-act team:

Co-act-team@de.schunk.com



Superior Clamping and Gripping



Jens Lehmann, deutsche Torwartlegende,
seit 2012 SCHUNK-Markenbotschafter
für sicheres, präzises Greifen und Halten.
schunk.com/Lehmann

