

## FINISHING MACHINE DLE 1-4/2-W

### Technical Description

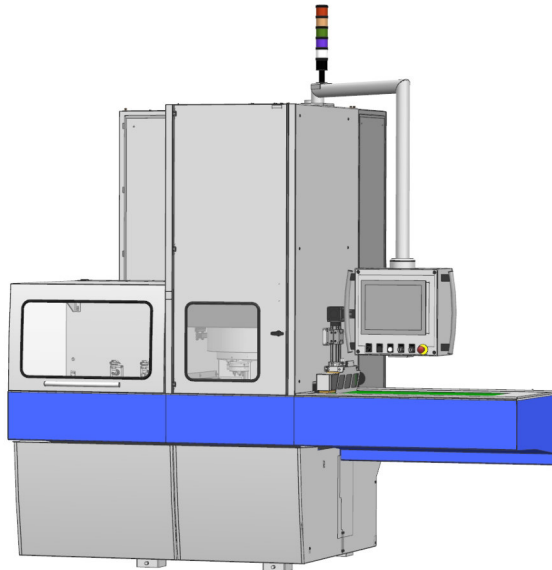


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The flat material processing machine can be used for a wide variety of applications such as deburring flat parts / offset parts, abrasion grinding or finish polishing.

The machine has a modern and stable welded construction.

The drive, control and regulating elements are protected from coolant and abrasive elements that are contained within the processing area by the all-metal separation chamber system.

Power and control cables are mechanically and electrically protected.

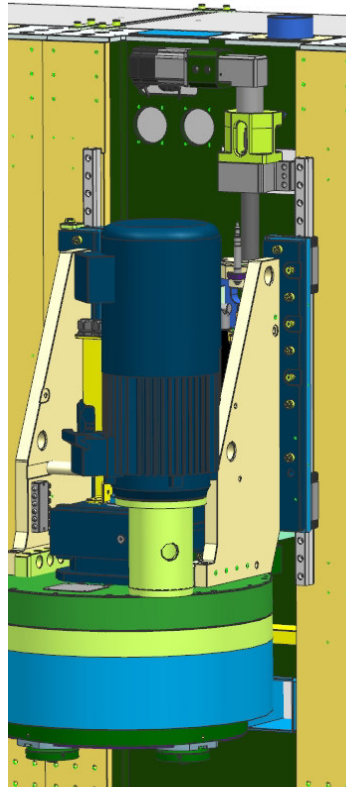
The coolant and suction lines are integrated within the machine chassis.

The process medium tub is made of stainless steel and the machine covers are made of sheet steel. Each unit has a extraction line connection on top of the machine for removal of the process medium vapor. The machine can be connected to an extraction system provided by the customer or an extraction system can be supplied as an option.

The various work areas are equipped with LED lighting as standard for optimal process observation from outside.

The FLAKKO units are always equipped with 2 drives for optimized and powerful speed settings via frequency transformer. This allows the units to be set or programmed with the correct tools and power-optimized speeds for the respective process. Stepless and variable speed adjustments for head and spindles guarantee high productivity.

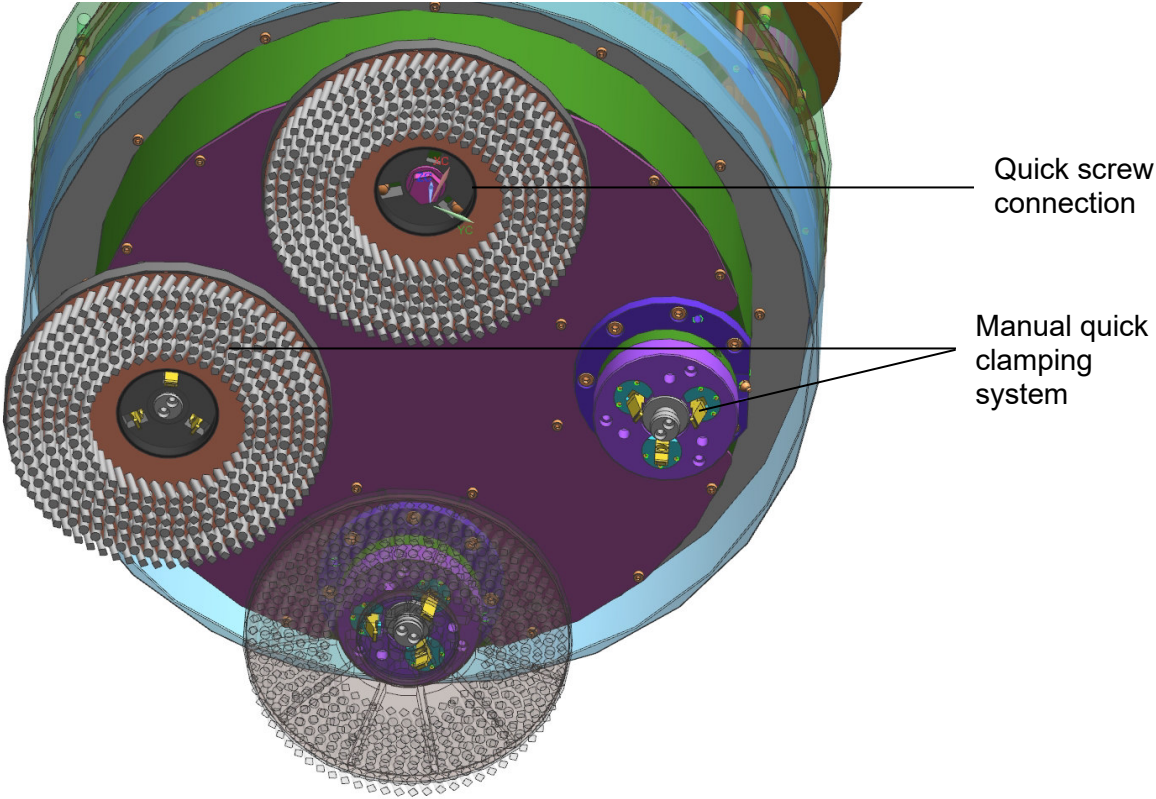
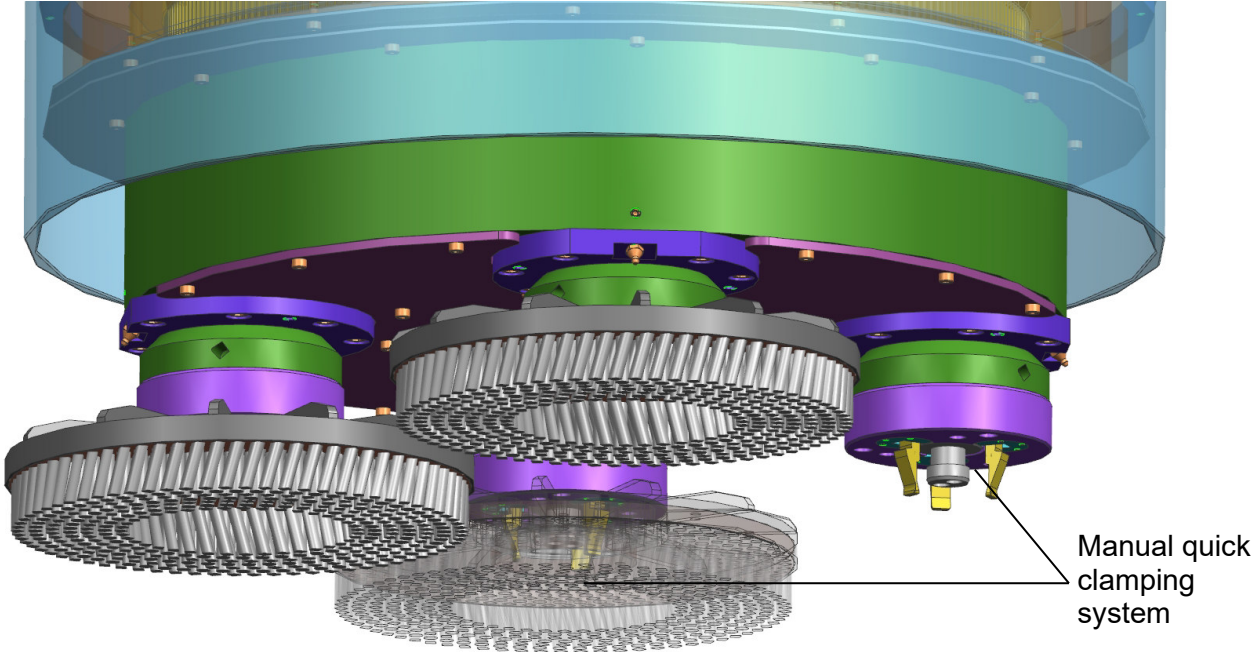
## FLAKKO-Unit



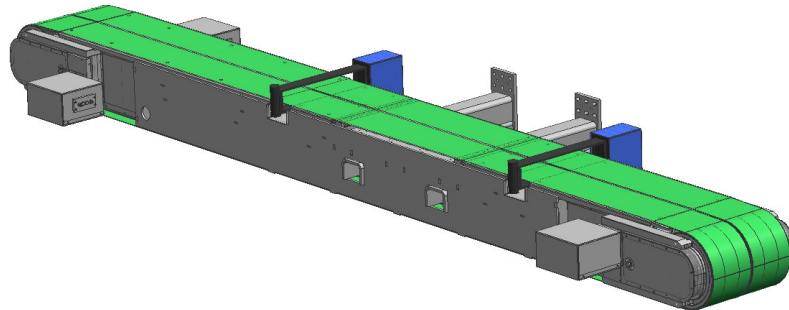
Center power drive	7,5 kW FLAKKO unit
Outer power drive	7,5 kW FLAKKO unit
Spindle speed	50 – 1'800 U/min
Head speed	20 - 220 U/min
Servo driven height adjustment axle	1 per FLAKKO unit
Mechanical quick tool change system	2 minutes for 4 tools
Tools per FLAKKO unit	4 pieces with $\varnothing 270\text{mm}$ (through 3 machining steps in one tool as well as the machining of parts with offsets plus and minus approx. 5mm is possible)
Power FLAKKO unit	The FLAKKO unit has 4 tools $\varnothing 270\text{ mm}$ and has a much higher output of approx. $F=2.5$ compared to conventional tools per FLAKKO.

**Tool clamping**

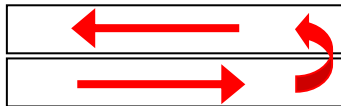
The tool clamping can be done with quick screw connection or via a manual quick clamping system. The tool diameter is 270 mm.



## Workpiece main transport



Versatility of the new machine concept:



double-sided processing via turn-over,  
2 x 180mm wide (1- to 2-stage)

Running direction:

Track 1 from left to right  
Track 2 from right to left

Transport width:

2 x 180 mm

Workpiece main transport with magnetic plates:  
Conveyor belt cleaning:  
Rinsing via wet processing:  
Conveyor belt tensioning:  
Infeed and outfeed extension with support table:  
Transport passage height:  
Magnetic plates sealed all around:  
Main conveyor belt in PROFIN standard:

Built-in  
Built-in  
Built-in  
pneumatic  
Built-in  
50 mm  
High tension force  
1.9 mm

### **Magnetic plates with permanent voltage**

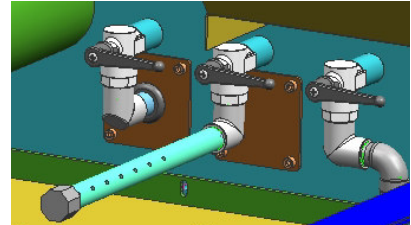
Magnetic plate thickness:  
Magnetic plate length:  
Clamping force, very high with :  
Magnetic plate:

48 mm  
800 mm / station  
over 4'500 Gaus  
permanently energized

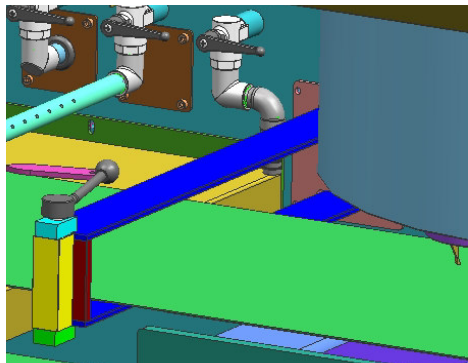
The magnetic plates are completely enclosed, sealed and screwed with stainless steel sheeting at the bottom.

## Wet processing

Consisting of pumping station in stainless steel housing and pipes the process cooling systems rinses off the conveyor belts and process area. If required an optional corresponding filter system can be installed. A flow sensor and a shutoff valve is installed where the process medium is connected to the machine. The machine can be operated with emulsions or grinding oil.



## Demagnetisation

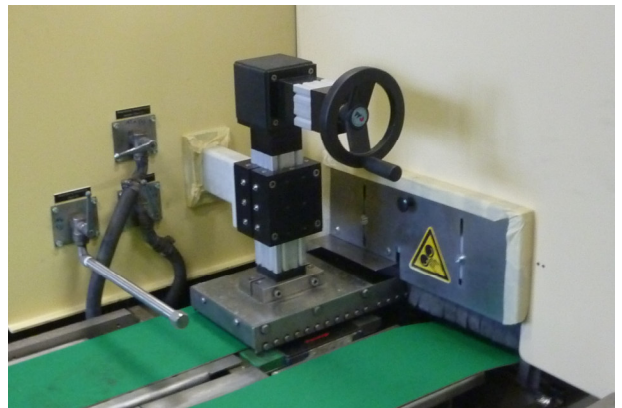


Installation of bracket demagnetizers:  
Reaching around the conveyor belt  
Quick-release shackle for fast conveyor belt replacement  
Passage height: 70 mm

Alternatively, plate demagnetizers can also be installed.

The demagnetization is located at the machine outlet and inlet.

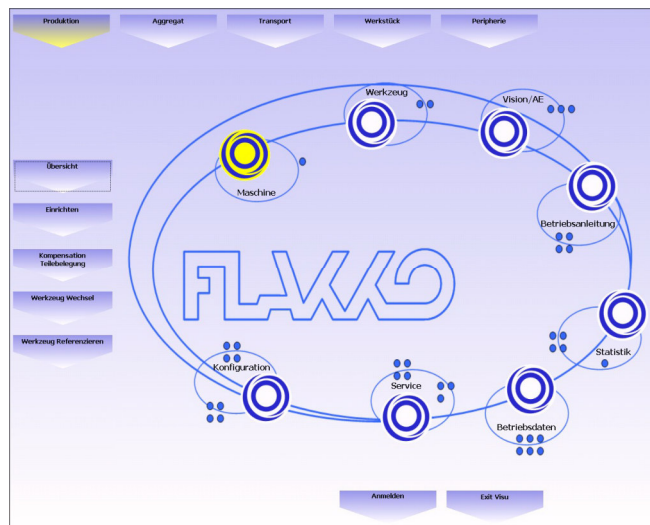
## Machine infeed and outfeed



## Control

### PLC control Siemens S7 with 15" touch screen (monitor)

- Operating modes automatic, manual and revision
- Communication capability with 2 external production line components or plant sections (digital data traffic)
- Operator-guided machine program
- Program storage with process and setting data
- Reset function for the actual position of the FLAKKO servo axes.
- Part- and performance-oriented compensation control for process and quality assurance. This ensures the automatic readjustment as tool wear.
- Quick raising of the FLAKKO units in case of process interruption (no reject parts).
- Restart function automatically after production interruption or after a quick stop.
- Creation of machining programs in the teach-in process.
- Aggregate correction via input of part thickness.
- Program-supported management with visual display of the transport setting values.
- Program-supported FLAKKO head positioning during tool change.
- Error display on the operating panel.
- Remote maintenance is integrated in the control as standard.
- Connection of the control for data backup to a customer network or external printer.
- Language switching (optional, depending on the language)



#### Remarks on the control system:

The software is stored as a machine program in a pluggable flash and on DVD and is delivered with the machine.

In addition, the documented machine program is handed over to the customer on CD-ROM for data backup and recovery in case of malfunction. The source codes remain the property of the machine manufacturer and are not handed over to the customer (data protection / know-how protection).

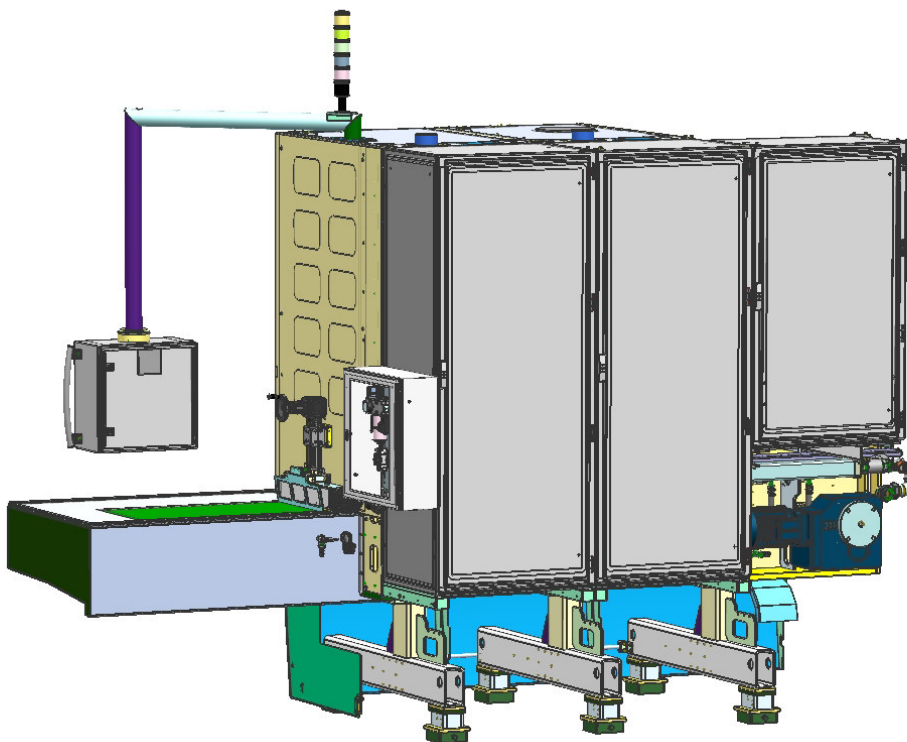
## Remote maintenance/teleservice

The machine is equipped with remote maintenance connection as standard. A permanent or temporary connection must be provided for by the customer on site.



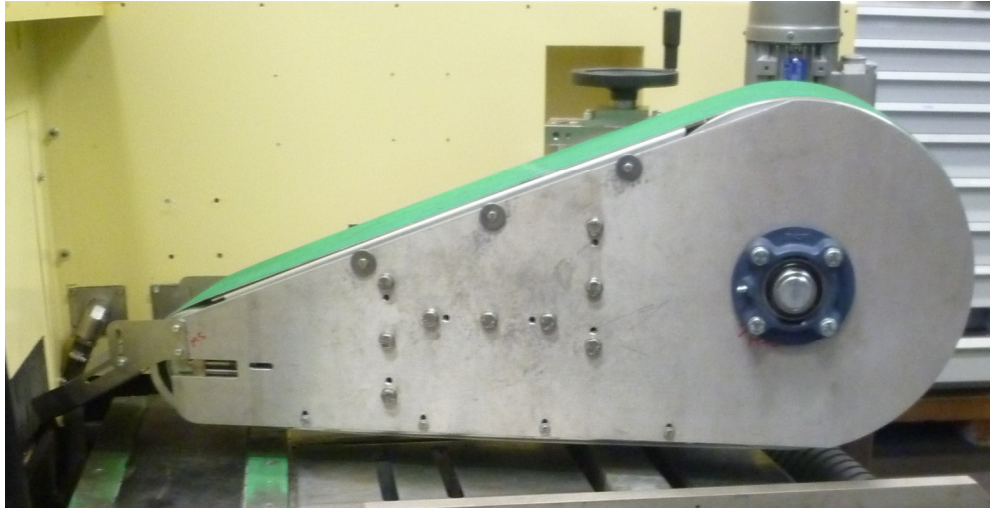
## Attached control cabinet at the rear of the machine

The control cabinets are equipped with air conditioning units and are mounted on the back of the machine (optionally with compressor or air-water heat exchanger). The cabling is routed in a protected manner. The cable ducts into the control cabinets are completely sealed. The entire control system is designed with single-wire numbering and complies with the European Machinery Directives.

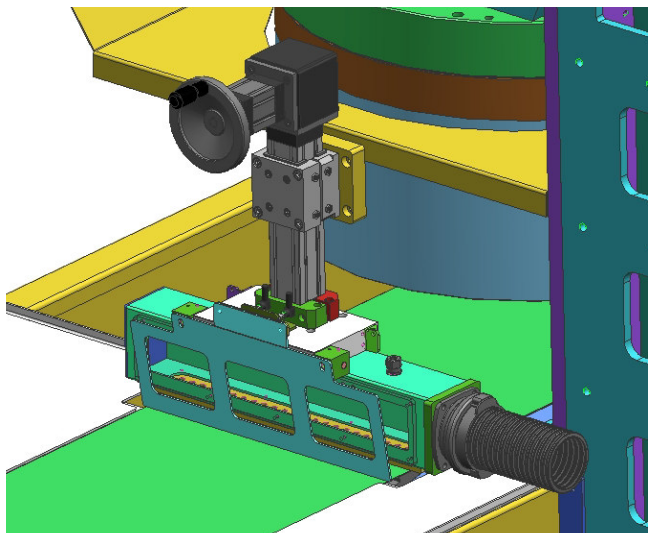


## Parts turn over module with mechanical height adjustment

The parts are picked up from the 1st transport belt, turned over 180° by the magnetic roller and transferred to the 2nd transport belt.



## Height monitoring at the machine infeed



If the permissible part thickness is exceeded, a QUICK STOP signal is triggered on the machine and the FLAKKO unit is automatically lifted by the program-supported value.

### Re-start to control system

In the event of a transport stop (not an emergency stop but a production interruption or quick stop), the FLAKKO unit is lifted off quickly. When restarting, the units are immediately returned to their original working position. This means that no errors occur and it is no longer necessary to remove the parts from the transport. This function is an important part of quality assurance and reduces production costs in the long term.



## **Machine paint**

The machine is primed and top-coated in high-quality 2-component paint.

Machine paint finish Exterior view

Standard exterior colour

RAL 7035 (light grey)

Optional exterior colour

according to customer specifications

Interior colour

Basalt grey

## **Technical machine acceptance (factory acceptance test - FAT)**

A factory acceptance test will be carried out free of charge by the customer at our factory before delivery of the machine. The object of the factory acceptance is the inspection of the scope of delivery and the agreed function on the basis of the specifications or the order confirmation and the sample parts provided by the customer in advance. In the case of a machine acceptance under production conditions, the expenses will be charged separately depending on the scope.

## Operating instructions / documentation

The documentation is structured according to PROFIN standard design.



The German version and edition of the documentation is always legally binding!

The documentation is delivered in the following scope:

- 1 time in paper form in 7 federal folders including the instructions for the purchased components.
- 1 time in machine control - industry - PC in electronic form without a bill of materials. The documentation is directly accessible with password access on the HMI (operator interface).
- 1 time in electronic form on DVD without instructions for the purchased components.

After commissioning and handover at the customer's factory, the machine software is saved on CD in compiled form without comments and with the process programs existing at that time and handed over as a documentation copy with delivery receipt. In addition, a backup of the PLC and visualisation is stored on the IPC. After completed commissioning at the customer's site, an image of the hard disk is also created.

All electronically stored documentation is in PDF format.

Further additional documentation in paper form, as well as in other languages, can be ordered for an additional charge without a bill of materials.

## Options: Compensation control (2 x 180)

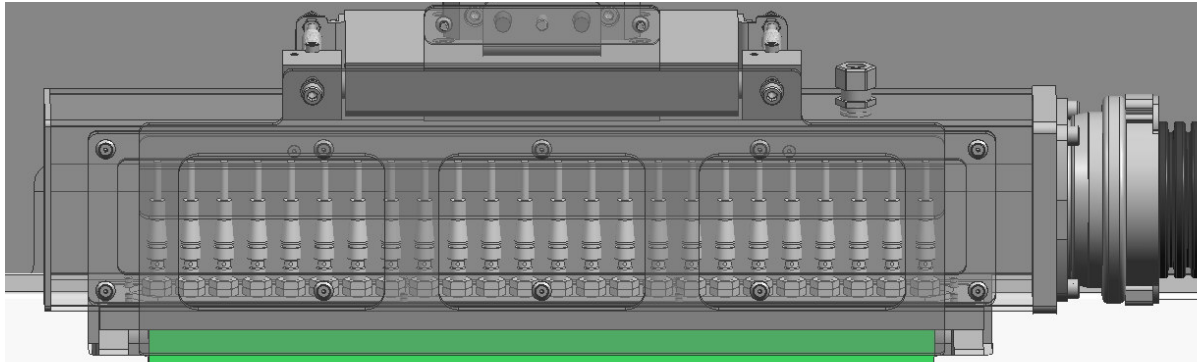


Figure 1: Area sensors for part detection, each adapted to the transport width

Tool wear compensation includes non-contact workpiece scanning with sensor technology for surface value calculation with power determination and comparison calculation with the programmed setpoints. The programming of the set values is done via teach-in value and the associated software. New programs can be created within 5-15 minutes.

### Function:

- Power-dependent control with area calculation
- Programming in teach-in procedure
- Fine interval adjustment of the FLAKKO unit
- Automatic readjustment of tools as they wear
- Scanning width 2 x 180 mm

## Outfeed transfer conveyor

The magnetic transfer belt is 200 mm wide. The length is approx. 1000 mm and is adapted to the requirements of the linkage. The magnetic transfer belt at the machine outlet is manually adjustable to the part thickness via a height adjustment.

