HINTERKOPF
technology partnership

K200

Combi-Machine

K200

K200 COMBI-MACHINE

The K200 is a compact machine for the decoration of plastic collapsible tubes or plastic sleeves with UV printing inks, UV lacquers or conventional lacquers.

On this combined machine a multitude of production steps can be carried out for which otherwise a far greater installation would be required.

The most important working steps are:

- Transfer to the working stations.
- Printing with up to 9 UV inks with the printing unit, type DW12, DW16 and DW20.
- Polymerization of the inks in an integrated UV drier.
- Varnishing with either UV varnishes or conventional lacquers on the built-in coating unit.
- Transfer to the following machines.

If combined with an UV curing oven or an oven with air circulation for drying the varnish, and with a Hinterkopf capping machine, the K200 itself is a high-performance production line for the decoration of plastic collapsible tubes of superior quality.

CHARACTERISTIC FEATURES OF THE K200:

- Minimum required floor space due to the compact construction.
- Rapid change-over due to a small number of easily exchangeable size parts.
- Variable pre-treatment of the tube´s surface with the corona or gas.
- Positioning of the print relative to a visual mark or the thread position.
- 6- to 9-colour printing unit.
- Touchscreen for central process data input and data monitoring.

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FUNCTIONING

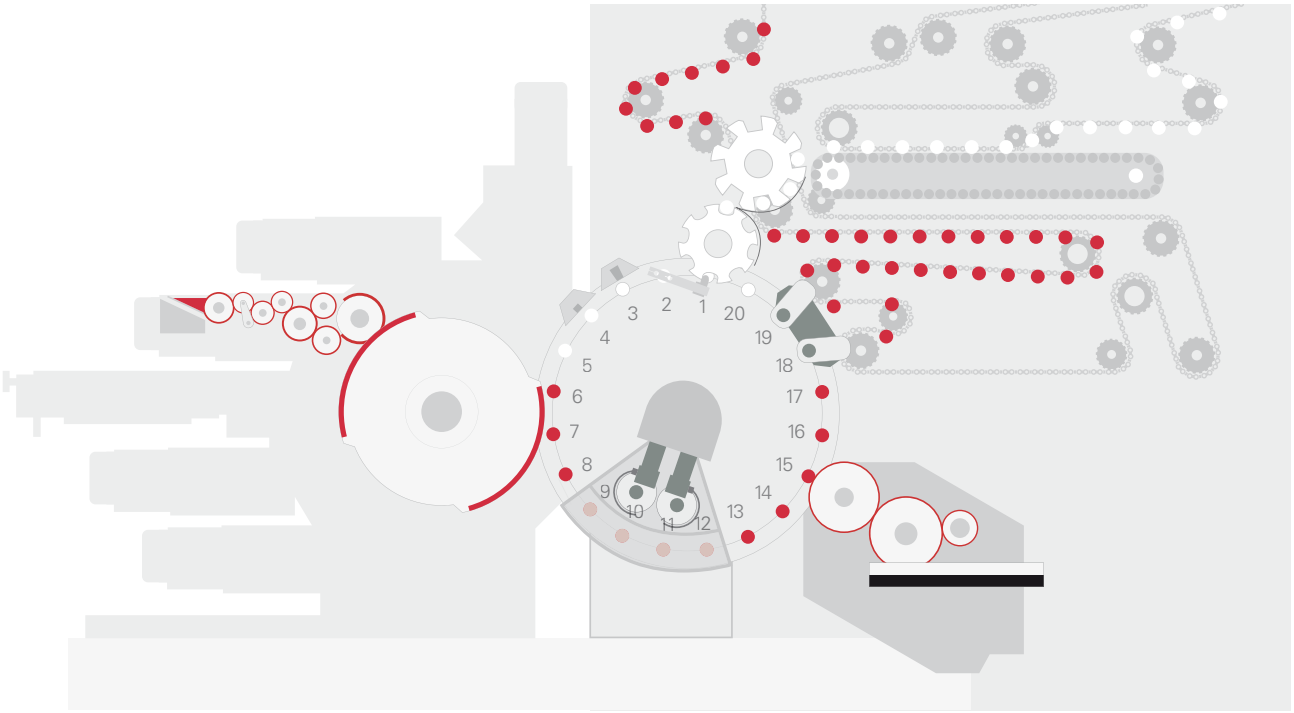
The tubes are drawn off the pins of the feeding chain by an angled feeding conveyor.

A transfer wheel then transfers the tubes into an unloading vacuum wheel. From there a loading rod pushes them onto the working mandrels in two steps.

Low pressure is used to draw the tubes to and hold them on the mandrels.

The 20-spindle mandrel plate is fitted with quick-exchange mandrels, step-by-step motion is effected with a roller indexing mechanism.

The drive of the combi-machine is effected by independent three-phase servomotors. They allow the K200 to accommodate to varying requirements by offering convenient conditions during the set-up and production modes.



The machine speed, the speeds for the pre-treatment, the printing, the coating and the drying operations are pre-selected and displayed digitally.

Suction cups or grippers, which are fitted to double rotating heads, transfer the tubes from the mandrels onto the chain pins.

A control panel with a touchscreen on the front of the machine ensures an optimum of operation convenience. This touchscreen and a PLC allow to set the correct timing of the functions.

The K200 can be set up for the production of collapsible tubes or of plastic sleeves alternatively.

The machine complies with the safety regulations that are effective in Germany and with the CE rules. The machine´s encapsulation helps to keep the emission and noise values at a minimum level. Furthermore, the closed construction provides an almost dust-free production area.

Due to its transparency and its good accessibility this encapsulation facilitates the monitoring and the handling of the machine.

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COMPONENTS

// Printing Unit DW

The printing unit is driven by its own adjustable three-phase servomotor.

Axial and radial adjustment of the plate cylinders is effected from the front side of the printing unit. This adjustment can be made during the machine run also. The set data is displayed.

The printing pressure at the mandrel tip is adjusted using a worm gearbox. When the penetration depth of the plate into the blanket is adjusted. The application rollers automatically move towards the former position.

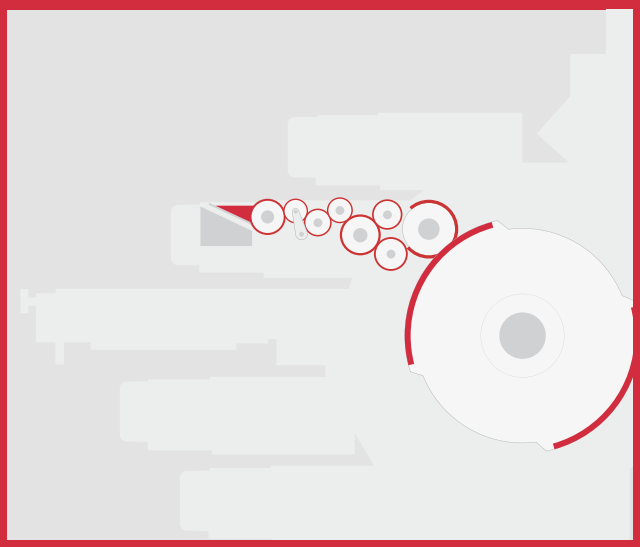
Each of the swivel-mounted ink units is equipped with its own drive thus allowing the inking and cleaning of the ink rollers. The inking units can be connected individually.

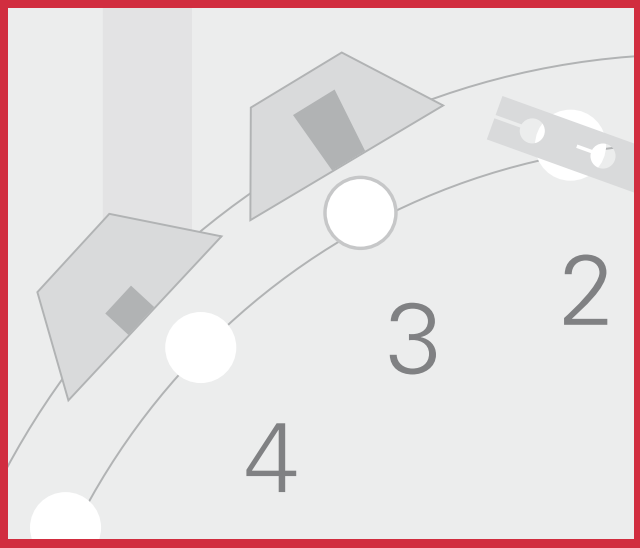
The ink quantity is controlled by PLC, by means of a touchscreen.

The "no tube – no print" control comes into action by hydraulically moving away the printing unit. At the same time the ink flow is interrupted thus avoiding an excessive ink built-up on the printing plate.

A mobile control unit facilitates the setting-up of the printing unit.

For more detailed information about the Hinterkopf printing units, and in particular on the ink control, please refer to our special brochure "Printing technique".





// Surface Pre-treatment

Before the tubes are printed or lacquered they undergo a pre-treatment with gas and/or corona. This improves the adhesion of inks and lacquers on the plastic surfaces. This treatment is imperative, as a major part of the used plastics and covalent materials that show no or only a very low tendency to combine with lacquers or inks.

Therefore, where such materials are used, an activation of the respective surfaces is required in order to achieve a sufficient wettability and hence a good adhesion on the surface.

// Dip Coater Unit / Roller Coating Unit

The installed coating unit is a three-roller dip coater unit.

The exact adjustment to accommodate the respective tube diameter is infinitely variable by means of a position indication.

The coating roller can be shifted axially on its shaft. With a fine-tuning equipment it can be set precisely relative to the tube´s back coat margin.

The coater roller speed is infinitely adjustable. The actually set value is digitally displayed on the control panel.

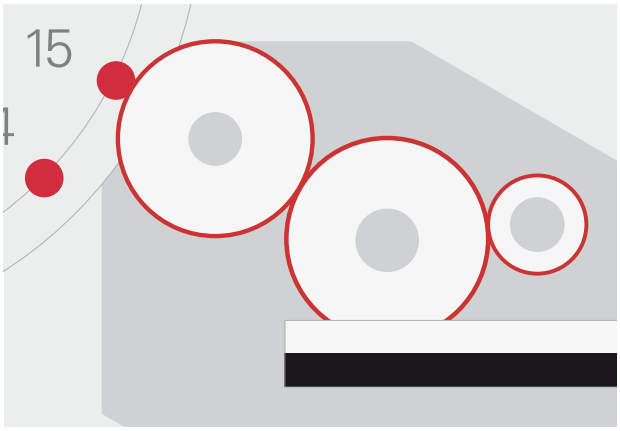
A doctor roller allows variations of the coat layer thickness.

The lacquer supply is in a tray that is located beneath the coating rollers.

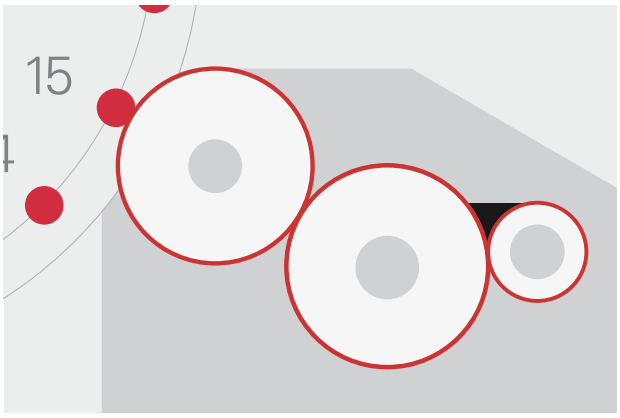
In the roller coating unit, the coating reservoir is maintained between fountain roller and metering roller.

The coater unit can be swung to the front to facilitate an exchange of the rollers as well as cleaning and serving work.

A protection cover with an extraction device prevents the emission of solvent vapours during the coating operations.



Dip Coater Unit



Roller Coating Unit

// Technical Data of the Coating Units LW64, LW66, LW70, LW72

Axial fine adjustment of the coating roller:
30 mm

Max. width of the dipping and the doctor rollers:
290 mm

Diameter of the coating roller:
200/180 mm

Width of the coating roller:
220 mm

Thickness of cover of the coating roller:
25 mm

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COMPONENTS

// Integrated UV Radiation Curing System

This drier consists of a solid aluminium housing which is installed between the printing and the following coating unit. The inks are dried by the UV-lamp unit which lies within the mandrel plate. The cooling is done by water. In case of a stop the capacity is automatically reduced to the basic load level. At the same time the tubes are protected from a direct exposure to rays thus avoiding an excessive heating up of both tubes and the mandrels.

When the drier is restarted after a stop its pre-selected capacity is reached within the shortest time. As soon as the cause for the stop has been removed, the radiation head goes back to the pre-selected rated load. The drier is equipped with a temperature-controlled cooling system for the radiator and an ozone and heat suction plant.

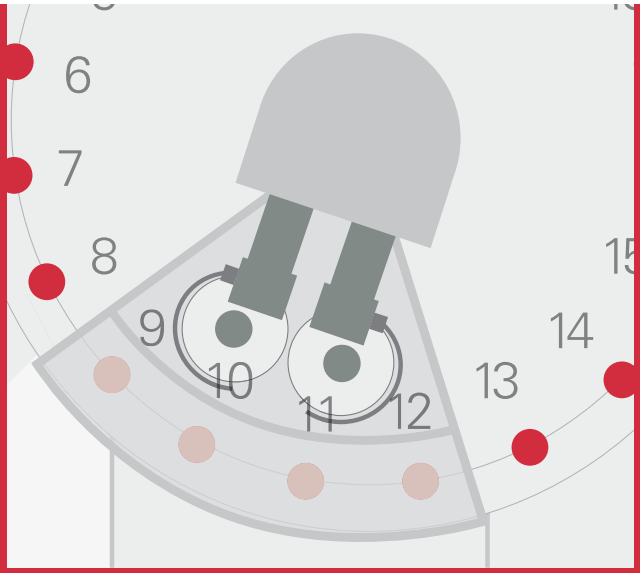
If required, the drying system can be retrofitted with a second radiator unit.

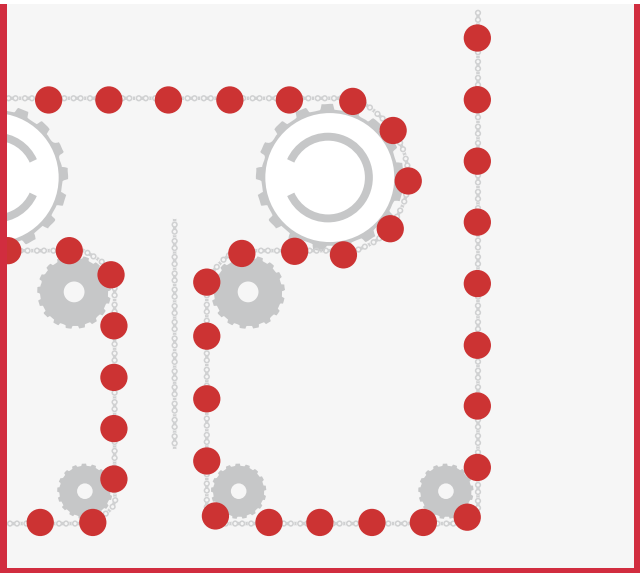
// External UV Radiation Curing System

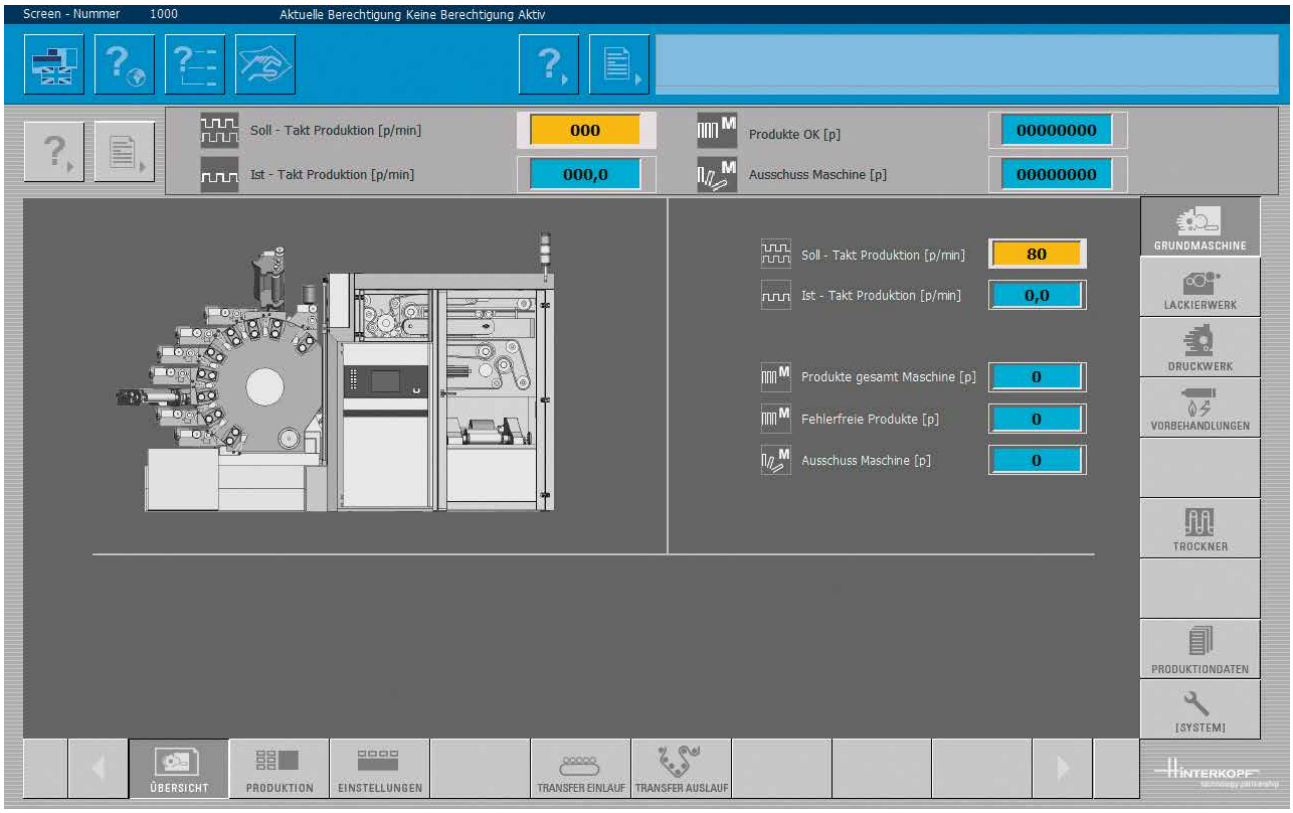
The tubes are conveyed on the transportation chain through the generously dimensioned curing oven. The optimized geometrical chain path leads the tubes past one or two UV lamps. Reflectors which are calculated specifically ensure a long exposure to the UV rays and a largely even curing of the lacquer over the whole length of the tube.

The radiation capacity is adjustable infinitely or in several steps from 40 to 100 % during the drier´s operation. As soon as the drier stops, the capacity is automatically reduced to the basic load. At the same time the tubes are protected from a direct exposure to the rays, thus avoiding a discolouring of the lacquer and a heating up of the tubes. As soon as the drier is started again, the radiation head goes back to the pre-selected rated load.

The drier is equipped with a controlled cooling system for the radiator and an ozone and heat suction device. A measuring station for the acquisition of the relative radiator capacity in stand-by operation can be integrated. To ensure the operators´ safety the infeed and outfeed tunnels of the chain are designed in a way that the emission of UV rays or ozone vapours is avoided.







// Electrical Control, Touchscreen

The basic machine functions are selected by graphically marked buttons.

The data for the machine control and monitoring are fed by means of a touchscreen.

Any malfunctions are displayed in a machine outline in the main menu.

From the main menu further menus can be called:

- Keyboard field "Machine functions"
- Machine parameters
- Ink unit adjustment
- Collection of operational data
- Time-hour meter
- Selection if language
- Help menu

From these menus a great number of input and monitoring functions can be selected, they allow to operate the machine with great ease.

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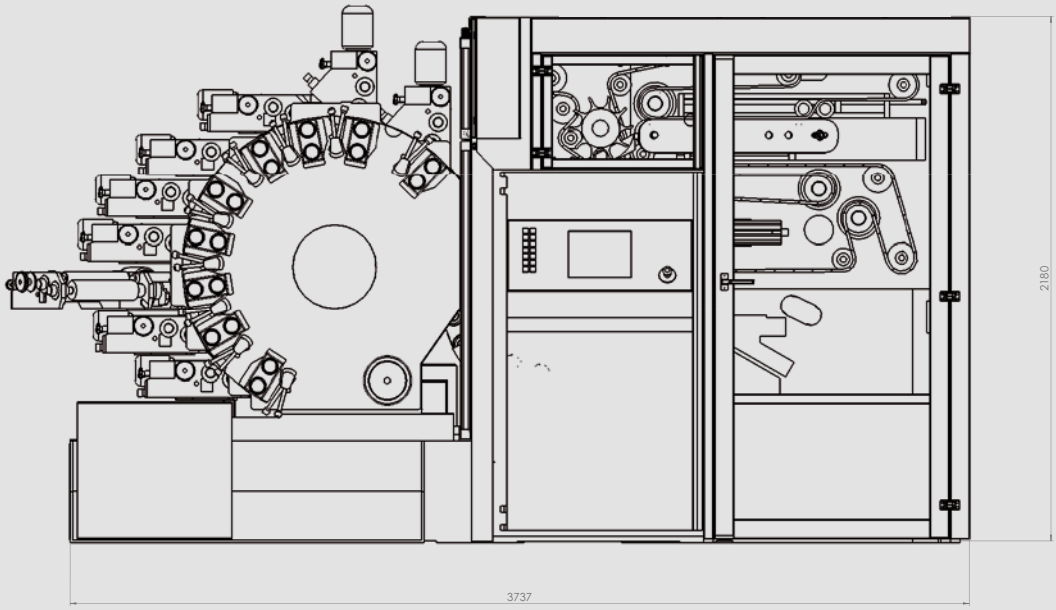
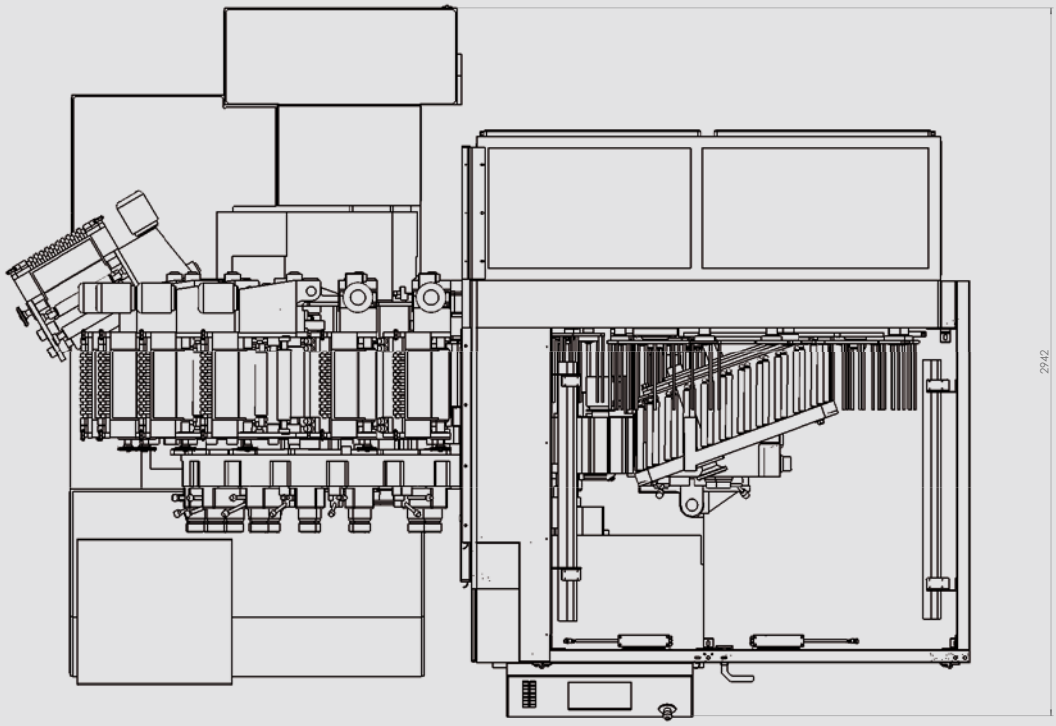
VERSIONS



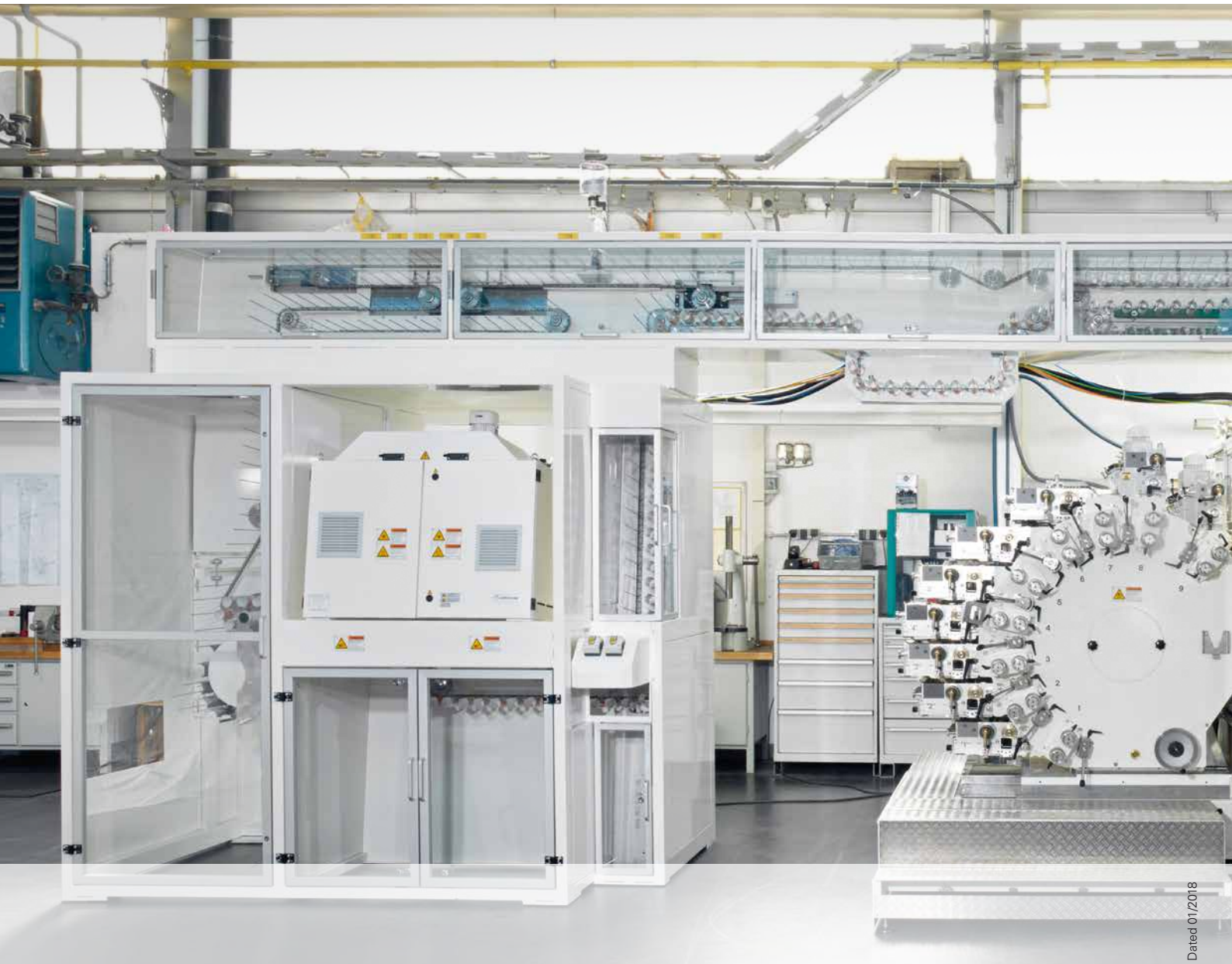


TECHNICAL DATA

// Technical Data, Characteristics, Operative range K200

- Material:
  Plastic collapsible tubes or plastic sleeves
- Diameter ranges:
  13,5 – 25 mm | 19,0 – 50 mm
- Tube wall length:
  60 – 270 mm
- Mechanical speed:
  200 pieces/min.
- Production speed:
  180 pieces/min.
- Weight:
  ca. 8000 kg

	Technical Data of Printer Unit DW12/4 to 6	Technical Data of Printer Unit DW14/4 to 6	Technical Data of Printer Unit DW16/6 to 7	Technical Data of Printer Unit DW20/9 to 9
Number of ink units:	can be extended from 4 to 6	can be extended from 4 to 6	can be extended from 6 to 7	can be extended from 8 to 9
Printing length (wall):	max. 260 mm	max. 160 mm	max. 260 mm	max. 260 mm
Number of segments:	2 or 4	2 or 4	3 or 6	4 or 8
Plate cylinder arc length:	212 mm	212 mm/160 mm	212 mm	212 mm
Plate length:	270 mm	270 mm/220 mm	270 mm	270 mm
Plate thickness:	0,73 mm	0,73 mm	0,73 mm	0,73 mm
Plate mounting:	clamped pin suspension magnetic clamping	clamped pin suspension magnetic clamping	clamped pin suspension magnetic clamping	clamped pin suspension magnetic clamping
Blanket mounting:	clamped glued	clamped glued	clamped glued	clamped glued
Blanket thickness:	1,9 mm	1,9 mm	1,9 mm	1,9 mm
Rubber roller cover:	for UV-inks	for UV-inks	for UV-inks	for UV-inks
Extra rollers:	Inking unit 1 to 6: 2 rollers, each	Inking unit 1 to 6: 2 rollers, each	Inking unit 1 to 7: 2 rollers, each	Inking unit 1 to 9: 2 rollers, each
Rider Rolls:	2 in inking unit 2 and 3, each	2 in inking unit 2 and 3, each	2 in inking unit 2 and 3, each	2 in inking unit 2 and 3, each
Printing unit pull back if tube is missing:	3 mm	3 mm	3 mm	3 mm
Hydraulic printer unit pull back for cleaning:	250 mm	250 mm	250 mm	250 mm
Axial printer unit adjustment:	50 mm	50 mm	50 mm	50 mm



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