Hinterkopf
technology partnership

D120

Digital printer for cylindrical hollow bodies

3-IN-1-PRINTER
WORLD INNOVATION!

D120

DIGITAL PRINTER FOR CYLINDRICAL HOLLOW BODIES

THE DIGITAL PRINTER D120 – A REAL WORLD PREMIERE!

The new D120 now enables high quality digital printing for the decoration of cylindrical bodies. Photo-realistic pictures with vibrant and vivid colours and pin sharp texts open up **completely new options of graphic design** **and the marketing of your products.** Also small editions or samples can be produced cost-efficiently at any time since conversions, costs for tooling, etc. are omitted when changing the image.

THE MOST IMPORTANT ADVANTAGES OF THE D120 AT A GLANCE:

// Perfect printing quality and performance

- Resolution of up to 1,200 dpi
- Photo realistic images with millions of colours and subtle shadings
- 360° printing without overlap
- Always perfectly colour calibrated
- Up to 120 parts/min. depending on the resolution and diameter

// High flexibility

- Change-over of image within seconds
- No additional expenditure for samples and small series
- Resolution and speed can be selected for each new print job
- New edition of an image is possible at any time

// Optimum workflow, easy handling

- Complete digital workflow
- Pure digital proof – no colour calibration required
- Change-over of the image by software only
- Intuitive operation on the 42" touch screen or remote by the control center

// High profitability

- Good products only – perfect quality starting even from the 1st copy
- No start-up time and cost for new images
- High availability for production
- Little employment of staff

// Environmentally friendly

- Inks only on the end product
- No misprinting at the start of production
- No cleaning of inking units
- High efficiency by avoiding waste (ink, chemicals and products)

WORLD INNOVATION

**BE CONVINCED BY THE DIGITAL PRINTING QUALITY
MADE BY HINTERKOPF!**

- High resolution of up to 1,200 dpi
- High ink coverage
- Finest gradients and shading
- Optimum edge definition of lines
- Pin sharp texts with font sizes of up to 2 pt (positive)
  and 3 pt (negative)

The application options for your high-quality decorated tubes, aerosol containers, bottles, cartridges and other cylindrical bodies made of aluminum, steel or plastic material are almost unlimited:

- Cosmetics
- Pharmaceutical industry
- Food & Beverage
- Technical products
- and many more
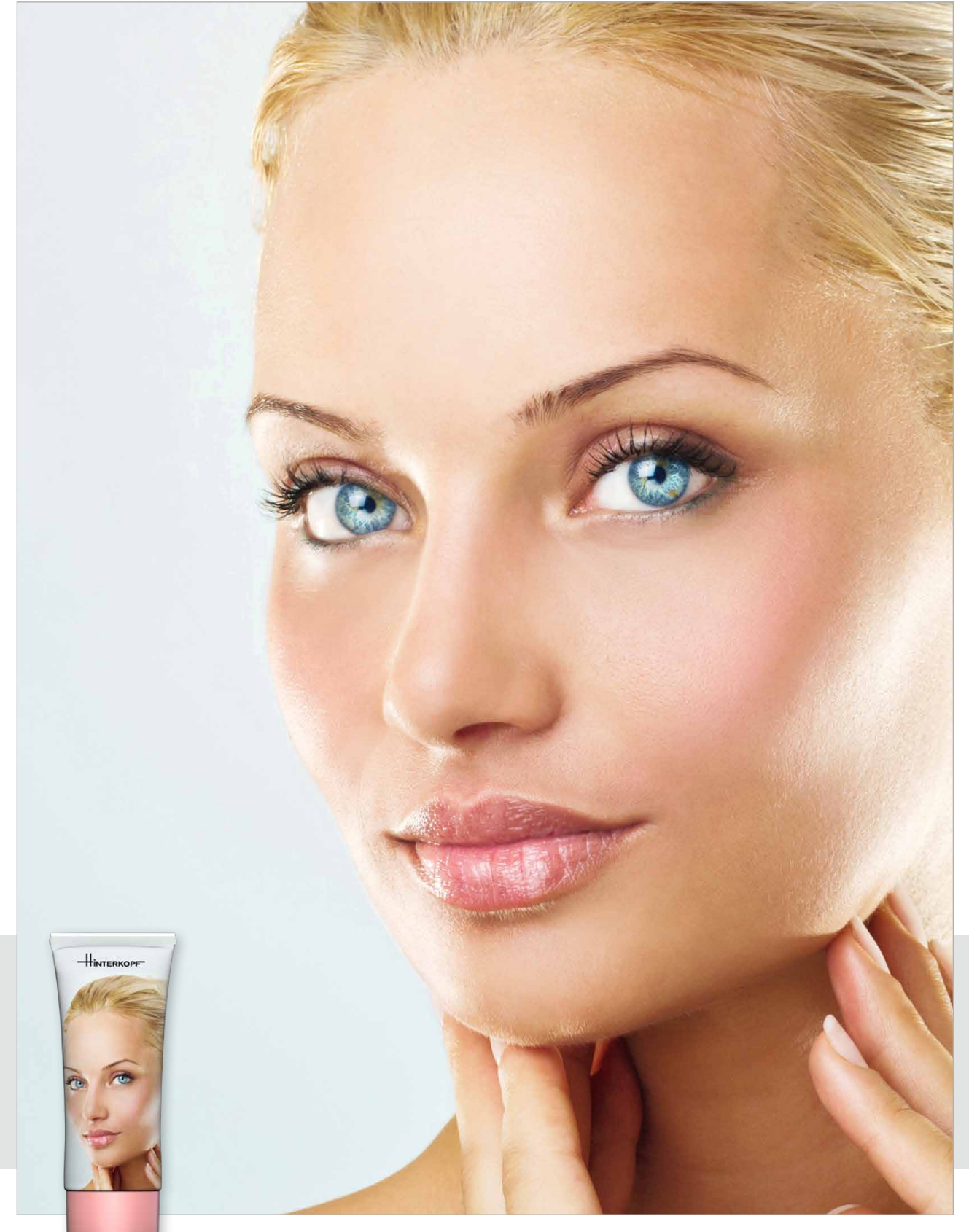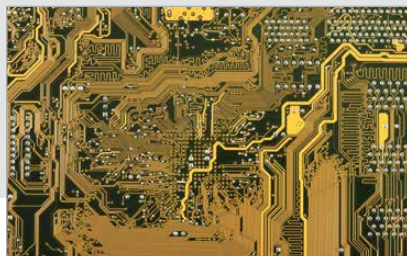
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PURELY DIGITAL WORKFLOW, MAXIMIZED PRODUCTION TIME – WITH THE D120 DIGITAL PRINTING

The workflow of the digital printing technique offers distinct advantages compared with conventional printing methods (see also graph on page 14): When changing the image at offset, screen or flexo printing, including printing plates, colour exchanges and machine adjustments, misprints – unusable products – cannot be avoided. Furthermore the whole change-over procedure up to "good" products often takes one to two hours of valuable production time.

Such intermediate steps are omitted when using the D120 due to the completely digital workflow: The selected image is directly printed on the cylindrical body – in perfect quality starting even from the first product.

The change-over of the of the printing – the image itself, the image length and even the adaptation to the product length – is performed at the push of a button. Also a colour calibration is not required thanks to the digital proof. Thus, using the D120, the real productive time is very high and a considerable cost advantage can be achieved. The printing on the D120 is generally made with four colours (CMYK). By using up to eight colours in total, special effects such as spot coating or the use of the hexachrome colour system is possible.

The result is a perfect image with sharp edges, clear text and three-dimensional look of surfaces made of millions of possible colours.

THE 3-IN-1-PRINTER

The digital printer D120 combines the advantages of all classical printing methods in one machine only – and therefore in many cases is the ideal solution for the high-quality decoration of tubes, aerosol containers, bottles, cartridges or cups.

Flexo printing
- Photo-realistic pictures

Screen printing
- High ink coverage
- Haptic surfaces

Offset printing
- High edge definition

Digital direct printing

D120

3-IN-1-PRINTER WORLD INNOVATION!

FEATURES AND BENEFITS OF DIGITAL PRINTING WITH THE D120 COMPARED TO OTHER PRINTING METHODS

Feature	Digital printing D120	Offset printing	Screen printing	Flexo printing
Best printing quality (on the product, in the lines/cm)	> 100/cm (> 1,200 dpi)	max. 48/cm	30 – 40/cm	max. 48/cm
Minimum text size (positive/negative)	++ 2 pt/3 pt	++ 2 pt/4 pt	O 3 pt/5 pt	++ 2 pt/3 pt
Photo-quality printing (variety of colours, finest shading, 3-D effect)	++	o	o	+
Edge definition	++	++	o	o
Ink coverage/colour saturation	+	+	++	o
Change-over time for • Image change + length change • Format change	0 min. 20 – 30 min.	30 – 60 min. 60 – 120 min.	30 – 45 min. 60 – 90 min.	> 60 min. > 60 min.
Rejects at production start-up (misprints)	++ No reject	o	o	–
Production speed (at comparable quality)	o/+ Depending on the format	++	+	o
Cost for printing preparation (draft, hardware)	++	o	o	–
Production of small orders, samples	++	o	o	–
360° printing without overlap	++	–	–	–
Spot coating at defined positions (without any additional machines)	++	o	o	o
Colour gamut/colour space Number of colours	++ Millions	+ Thousands	+ Thousands	++ Ten thousands
Counterfeit protection	++	–	–	–
Flexibility/Adaptation to current printing requirements	++	o	–	–

- ++ Very advantageous
- + Advantageous
- o Neutral
- – Negative

D120

Advanced machine concept for maximum success!

ADVANCED MODULAR MACHINE CONCEPT

The D120 digital printer is based on a modern control and software concept with direct drives which is already successfully used in lots of other machines made by HINTERKOPF. The concept was consequently enhanced for the digital printing applications. The precision rotary indexing machine is equipped with 16 single mandrel working stations, which can be configured according to the customer´s requirement.

- In-line-capable machines
- Loading and unloading of the products via conveyor systems or chains
- Modular precision servo drives
- Air conditioned, enclosed interior
- Integrated electrical switch cabinet
- Machine operation and printing job management via touch panel

// Compact main machine

- Separate loading and unloading stations
- Product presence detection and position alignment
- Surface treatment (mainly for plastic materials)
- Up to eight ink/printing stations
- High power final drying
- Optical print image control
- Removal control of cans/tubes

// ink/print stations

- Special UV printing inks made by HINTERKOPF
- "Low migration" inks for plastic material
- Integrated pinning of each colour
- Up to eight colours, can be freely configured e.g.
  - 1 x White (base coat)
  - 4 x CMYK (Cyan + Magenta + Yellow + Key/Black) or hexachrome (six-colour system)
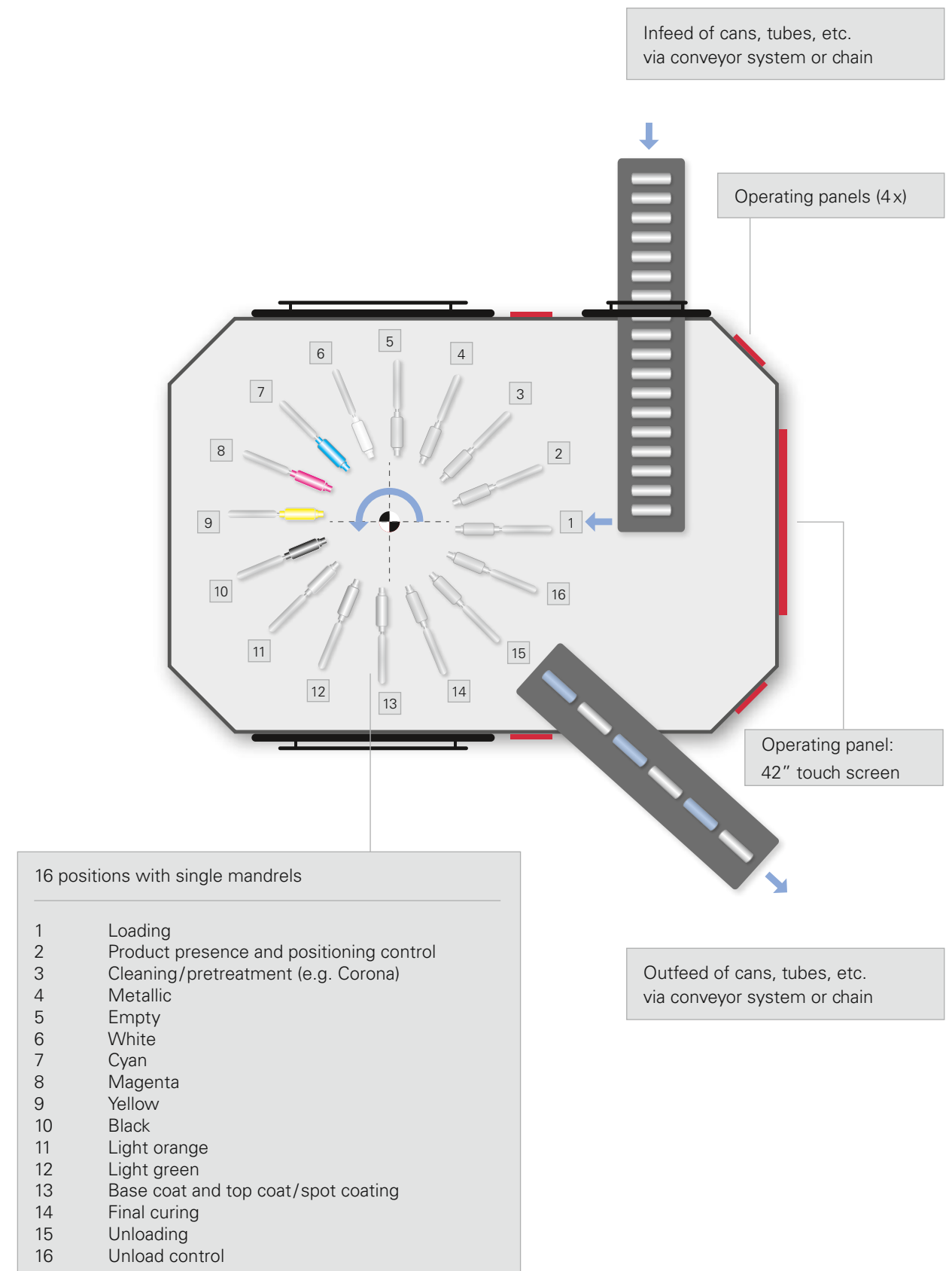 - 2 x Special colours
  - 1 x Top coat/Spot coating

// Service-friendly concept

- Automatic ink supply
- Stand-by operation during longer standstills
- Automatic printing head cleaning
- Automatic diagnosis functions
- Good access to all function parts
- Convenient access to transfer areas (for format change)
- Remote maintenance via VPN is possible
- Update service for software
- Low-wear components
- No lubrication of components required

// Format conversion

- Length: 0 minutes per software, "at the push of a button"
- Diameter: about 20 minutes

Infeed of cans, tubes, etc. via conveyor system or chain

Operating panels (4 x)

Operating panel: 42" touch screen

Outfeed of cans, tubes, etc. via conveyor system or chain

16 positions with single mandrels

|	
1	Loading
2	Product presence and positioning control
3	Cleaning/pretreatment (e.g. Corona)
4	Metallic
5	Empty
6	White
7	Cyan
8	Magenta
9	Yellow
10	Black
11	Light orange
12	Light green
13	Base coat and top coat/spot coating
14	Final curing
15	Unloading
16	Unload control

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EASY AND INTUITIVE OPERATION

The D120 is intuitive and very easy to use – quite similar to smartphones. The machine is equipped with an innovative interface with a high quality 42˝ touch panel which was specially chosen for the industrial environment and is exceptionally durable.

The available masks allow to directly view and call up different operating states or the next printing jobs conveniently. Thus time-consuming training sessions to be able to use the machine, as well as operating errors, are reduced to an absolute minimum. Install and start off!
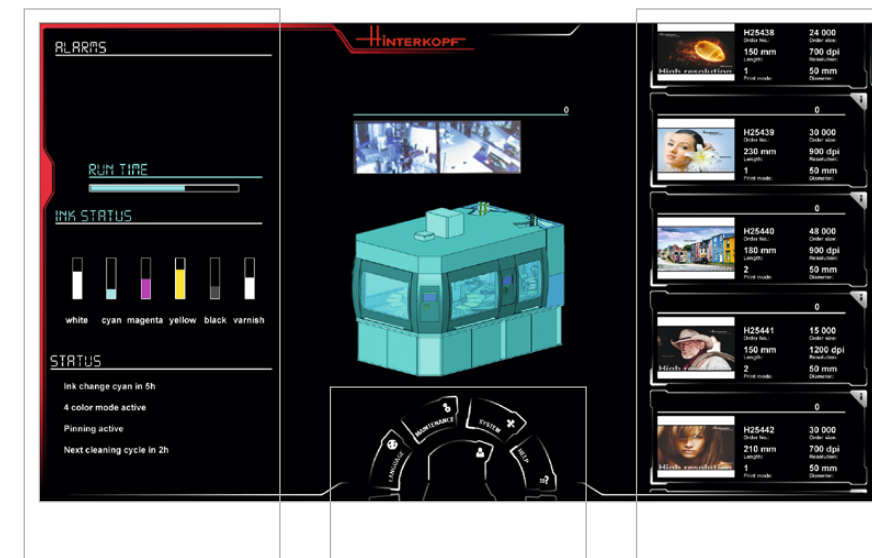
// Start screen

Overview and control of the machine. Additional screens can be selected by touching the corresponding area of the touch screen. Information regarding the print order and the ink supply are represented on the right and left side of this screen.
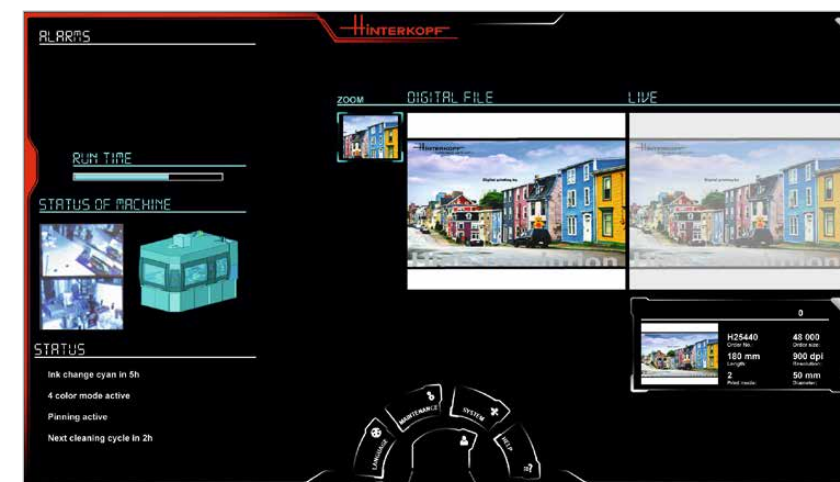
Printing / colours
- Colour status
- Colour mode
- Printing head status
- Order runtime
- etc.

Selection menu
- Basic machine
- Maintenance
- Help
- Language selection
- etc.

Selection print job
- Print order No.
- Resolution
- Order size
- Diameter
- etc.

// Screen "Print job"

Presentation of detailed information regarding the current print job. The live image and the saved data image are compared, deviations are displayed and are processed accordingly (good/bad selection).

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LEAN AND GREEN

The new D120 digital printer combines new options of image selection and high efficiency with a comprehensive environmental concept – on the whole, this results in an economical use of natural resources.

Some key points which are having a positive effect on the environment while using the digital printing techniques are:

// Print on demand

No surplus production "on stock" is required. With conventional printing methods, often additional tubes, cans and bottles have to be produced and stocked due to the requirement to be able to supply on short notice. Thus, **about 5 % of all produced containers will never be filled!** In contrast, any supplementary order can be rapidly printed "on demand" with the D120, saving large parts of this "surplus capacity". Projected world-wide, this corresponds to a **saving potential of about 600 million cans and tubes!**

// No printing plates and no ink rollers

Direct printing on the product without transfer media. No ink waste and almost no cleaning agents!

// No misprinting

At the beginning of each standard order the misprinting amounts to a few percent of the order quantity – depending on the order size. This unusable "additional production" is also omitted and protects the environment.

DO NOT ONLY TALK ABOUT ENVIRONMENTAL PROTECTION – GET ACTIVE! USING THE D120 MADE BY HINTERKOPF.

1,200 DPI
SMALL SERIES
HIGH EFFICIENCY
TOP-LOGISTICS
PROTOTYPES   LARGE SERIES
FLEXIBILITY
INDIVIDUALITY
PRINT ON DEMAND
MAXIMUM PRECISION
NO MISPRINTING 1 MILLION
VPN INTERFACE   ALL-ELECTRIC
MODULAR
PURELY DIGITAL WORKFLOW
ENVIRONMENTALLY FRIENDLY

D120

The D120 – economic operation is being guaranteed!"

ECONOMICS OF DIGITAL PRINTING

Whereas the production speed to manufacture tubes and cans has continuously increased, the order sizes on average have become considerably smaller. For aerosol deodorants, for instance, there are more and more variations for different countries, new fragrances, etc. Therefore the change-over between different decorations of the packaging – in this case of a can – has to be performed with minimum time and effort.

Using the digital printing method and the D120 due account is taken in an ideal way: The change-over of the image is done by software only, no hardware interference at all is required.

In particular for small order sizes the advantages are obvious since frequent **unproductive change-overs are omitted,** resulting in a **considerably higher production capacity.** Even for a switch of the diameter the change-over times of the D120 are considerably reduced due to the good accessibility.
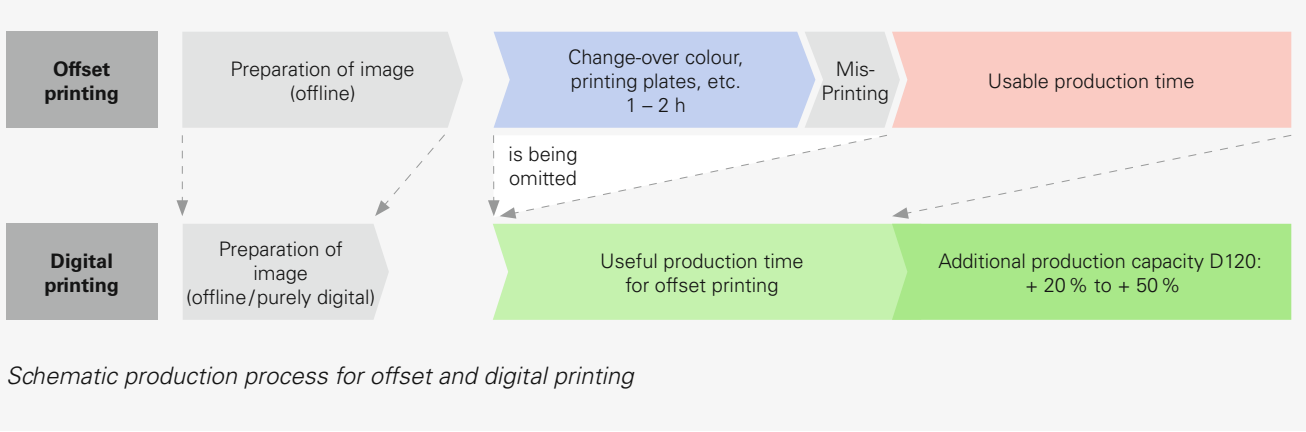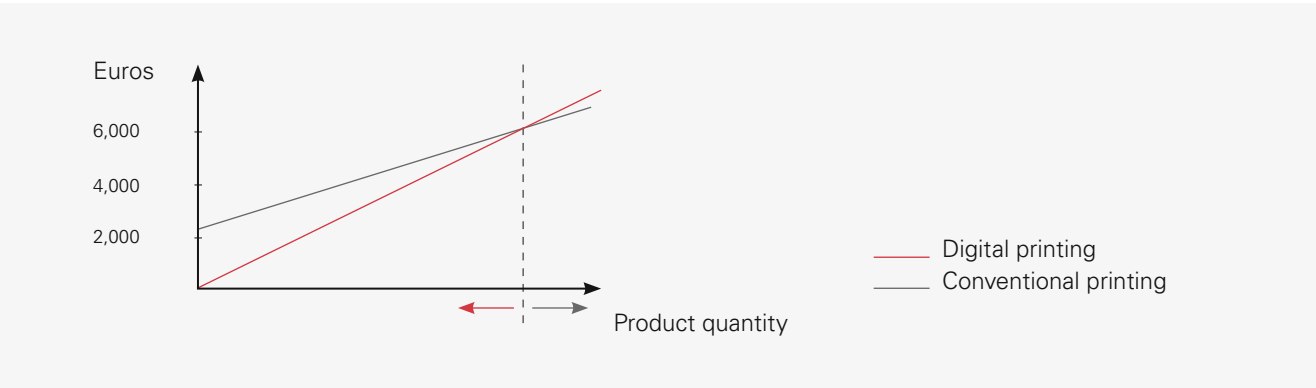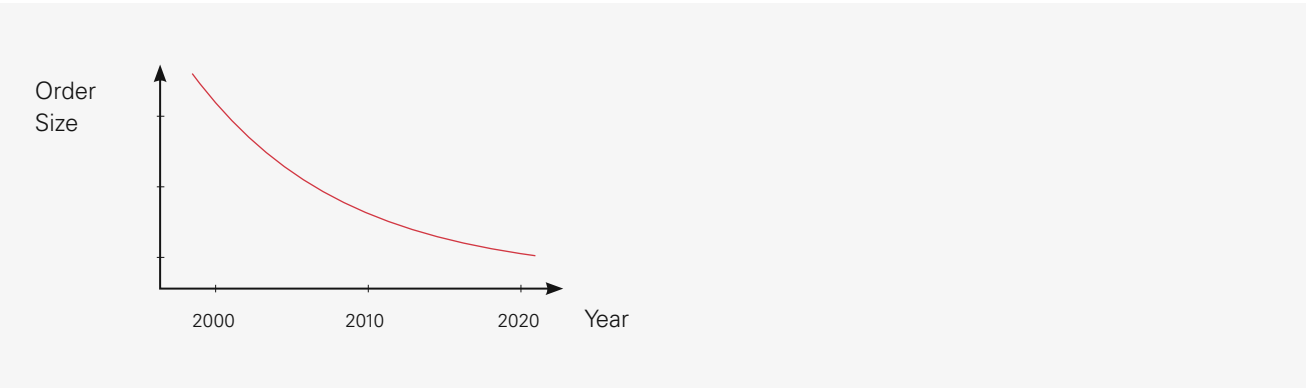
ECONOMIC EFFICIENCY ANALYSIS: COMPARISON OF DIGITAL AND CONVENTIONAL PRINTING

When producing with the D120 there are no basic costs for printing a new image (no "set-up costs"). Thus the **digital printing** mainly provides for a pure **linear cost structure** i.e. **without basic cost** and without machine standstill when starting production. The total cost per product remain identical, e.g. for 5,000 pieces the cost are only amounting to 1/10 of the production of 50,000 pieces. In this way also small orders and samples can be produced efficiently.

In contrast, the **conventional printing methods show considerable basic cost** with each change-over. This includes cost for printing plates, inks, cleaning, machine downtimes during change-over and also misprints at

each start of production. Such basic cost may vary significantly from case to case but typically amount to several thousands of Euros. **These printing methods** therefore, **starting from a high value, have a degressive cost structure,** i.e. the total cost of each "good" product decreases when the order size increases.
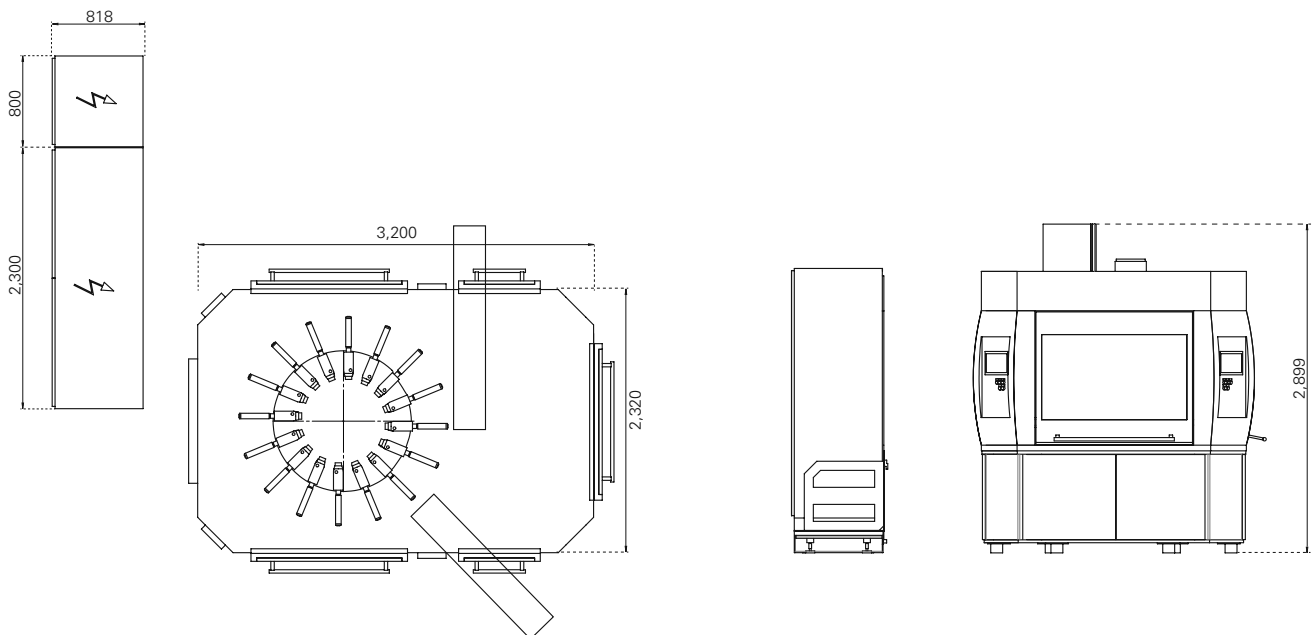
Depending on the order sizes, the product mix, the ink costs and the resulting overall productivity of the corresponding printing method, many cases do exist with an **economically favorable scenario for digital printing** with the D120 – and this at a considerably increased flexibility.

Schematic production process for offset and digital printing

	Digital printing	Conventional printing
Basic cost	0 Euro	About 2,000 – 4,000 Euros
Cost structure	Linear	Degressive, incl. basic cost
Starting cost for new images	No	• Printing plates about 1,000 Euros • Reference sample: clear / dark / good • Colour mixture proof • Downtime of production line
Change-over time	None	• Cleaning and commissioning of the Printing Unit • Production of misprints

TECHNICAL DATA
DIGITAL PRINTER D120

Performance	Mechanical transfer of up to 120 parts/min.
Performance of production	About 60 – 120 parts/min. depending on the printing resolution and diameter of the cylindrical body
Diameter and printing length areas	Ø 10 – 74 mm, L up to 240 mm
Transportation	Chain to chain, chain to conveyor, conveyor to chain, conveyor to conveyor
Range	Printing up to 1,200 dpi, variable 360° print 2 pt/3 pt fonts (positive/negative) 2-D colour gradients
Colours	UV colours/pinning and final curing in the machine, thermal or UV top coating in a separate lacquering machine
Material of the products	Aluminum, Steel, PE, PP, PET
Dimensions (L x W x H)	About 3,200 x 2,400 x 2,900 mm
Weight	About 12 t

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