CARD BODY PRODUCTION TECHNOLOGY

PRODUCT OVERVIEW
MÜHLBAUER GROUP

State-of-the-Art Technologies and Solutions

Cutting-Edge Technologies and Solutions
The Mühlbauer Group is the only single-source technology partner for the production and personalization of cards, passports and RFID applications worldwide. With around 3,000 employees, technology centers in Germany, Malaysia, Slovakia, the USA and Serbia, and a global sales and service network, we are the world’s market leader in innovative systems and software solutions, supporting our customers in project planning, technology transfer including system integration and production support.

Exclusive Manufacturer Service
35 production and service facilities on five continents, worldwide spare parts repositories and individual service and financing concepts enable us to provide a unique service quality, allowing us to react and bring solutions within two hours.

Seeing is Believing
In our global technology centers, such as the ones in Germany, Malaysia, South Africa and the USA, we exhibit our complete range of smart card and ePassport production and personalization products, as well as RFID inlay production and converting processes. Almost any system is available and ready for demonstrations. Additionally the company’s know-how can be experienced in the TECURITY EXPRESS show truck, an unrivaled mobile high-security production center. Convince yourself of the superiority of Mühlbauer technologies.

Technology and Market Leadership
To ensure and expand the technology and market leadership, Mühlbauer continuously invests in innovative products and processes. Our research and development centers with over 400 highly qualified engineers and technicians collaborate closely with customers and research institutions in order to efficiently launch reliable solutions in increasingly shorter development and production cycles.

Open Communication
While aiming to extend our current leading market position in the emerging areas of government security and biometric applications, we ensure strict privacy in all projects and serve as a reliable partner for sophisticated industries. We are committed to provide the highest speed, best quality and strict customer oriented services.

Business Unit TECURITY®
Mühlbauer specializes in innovative one-stop solutions encompassing the production, personalization and issuance of ePassports, ID cards and other card related security documents, and fully automatic border control systems. The business unit TECURITY® bundles the extensive know-how of the development of tailor-made security solutions. In the last 30 years we have been intensively involved in over 300 government related ID projects across the globe.

Business Unit Automation
More than 100 different standard and customized products and intelligent software solutions for data enrollment, border control as well as personalization and production management are the core of the business unit Automation. The division is responsible for the development and manufacturing of Mühlbauer technologies. In addition to systems used for high-quality document production and personalization in high-end security products, we manufacture one-stop turnkey solutions for industrial image processing of cards, coins and bank notes, tubes and other products. Moreover we develop and produce innovative systems such as microchip die sorting, flexible solar cells or carrier tape equipment for specific niche applications in the semiconductor back-end area (semiconductor related products), as well as labeling and marking systems for traceability of electronic components (traceability).

Business Unit Parts & Systems
Mühlbauer’s Parts & Systems segment produces high-precision components both for the manufacturing of Mühlbauer products and as a supplier to security-sensitive industries such as aerospace, motorsports, semiconductor and medical engineering.
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The Mühlbauer Group does not guarantee that the information contained in this catalogue is up-to-date, complete and accurate. The contents are subject to changes. Provided system information is binding only when submitted project-related in the form of official offers and/or official technical data sheets.
Mühlbauer Group is the only global acting single-source provider for end-to-end production of solutions and systems for the smart card, ePassport and semiconductor industry. We incorporate significant competence in providing optimized and state-of-the-art technology as well as customized equipment. Our products merge the main three factors for our customers’ success story:

- In-house development and research
- In-house production and assembly
- In-house training and technology transfer

**Single-Source Technology Partner**

**Comprehensive Competence in End-to-End Systems**

Global headquarters

- Mechanical engineering
- Software & electronic engineering
- System assembly
- Large & special parts manufacturing
- Storage
- Packaging & dispatching

Global service & support
The Mühlbauer Group's core competences in delivering perfected machine products are the manufacturing of the precision parts, the development and constant enhancement of mechanics and electronics, the process and the software solutions. Due to constant investments and a well-trained R&D team, Mühlbauer has grown to be a most innovative technology partner that guarantees optimized systems. We excel in perfectly coordinating every single step of the process, thus ensuring the most efficient and reliable products for our customers.
MB INCAPE/BASIC
Integrated Production & Personalization Management Software

- Streamlined web-based user interfaces with easy localization / internationalization support
- Out-of-the-box support of current Microsoft® operating systems
- Highly automated workflows with less operator interaction
- The only software solution in the world for combined data management, complete production control and material management
- Modular solution to organize the complete production of premium high-secure documents
- Covers the full production control requirements (security industry and EMV standards)
MB INCAPE/BASIC is Mühlbauer’s PMS Solution (Production Management Software) for the personalization of electronic cards and documents (e.g. ID cards, ePassports, driver’s licenses, EMV or GSM cards).

Features

- Production management
- Data management
- Seamless integration of Mühlbauer materials management

MB INCAPE/BASIC is targeting
- Cost-effective and scalable data, workflow and material management for card and document personalization
- Configurable workflow steps (personalization, quality assurance, mailing)
- Main focus on automated processing (minimum operator intervention except for personalization on machines and manual quality checking)
- Web-based operator clients:
  - UI is customizable (localization, internationalization, branding)
  - ICAO compliant data preparation
- Scalability regarding:
  - Document types
  - Connected machines (up to 20 desktop machines)
  - Personalization offices (up to 10 sites)
- Seamless tracking of document life-cycle inside the personalization with integration of Mühlbauer materials management (MB Warehouse)
- Connection to card or document management systems (e.g. civil register): Via web service, database or file-based interface
- Direct interface to MB personalization machines (integration of 3rd party machines possible)
- Integration of MB User Management

The MB INCAPE architecture consists of a modular concept to fulfil the needed scalability in all kinds of document body production steps as well as in all types of personalization characteristics (e.g. centralized and decentralized processes, various types of personalization machines, application specific data preparation scenarios etc.).}

Concerning hardware and software components the scalability applies to the implementation of all kinds of ID documents, fulfils performance requirements and allows to process customer and application specific production, personalization, quality control and document delivery scenarios with highest solution flexibility.
MAE 12
Tape Layering System

Key Modules
- Reel input
- Foil alignment
- Tape application
- Thermal processing
- Reel output (optional sheet output)

UPH

40,000 50,000 60,000 70,000 80,000 90,000
FEATURES & TECHNICAL DATA

Key Features

- Automatic application of signature stripes and magnetic stripes for bank cards, ID cards, loyalty cards etc.
- High flexibility in terms of sheet size, tape materials, positioning and quantity of tracks
- Cost-efficient solution especially for high-volume production
- Simultaneous processing of two individual heated application units for different applications, 12 stripes each
- 90° deflection of tapes for best and ergonomic access to unwinding system
- Sensor controlled alignment system for overlay referenced to edge
- INCAPE ready

Productivity / Process Units

- Reel-to-reel or reel-to-sheet version available
- Integrated spooling systems for different stripe-substrate
- Up to 2 x 12 parallel tracks possible
- Second individually heated application unit, optional
- Continuously adjustable processing speed and temperature
- Operator friendly and fast adjustment of track positions
- Material buffer for high autonomy
- Availability: Up to 95%
- Yield: Up to 99.7%
- Environment conditions: Room temperature: 23°C; +/-3°C
  Humidity: 50%; +/-10%

Technical Data

- Sheet materials: PVC, PC, ABS, TeCoLas®
  others on request
- Thickness of layers: 40 – 400 µm
- Max. width of foil: 780 mm
- Max. reel diameter: 750 mm
- Height of output stack: 200 mm
- Application pressure / temperature: 30 – 55 N / max. 200°C
- Max. widths of stripes: Up to 16 mm
- Number of application tracks: 12 / 24 optionally
- Application accuracy: +/- 0.15 mm in y-axis
- Distance of tracks: ≥ 57 mm
- Sheet cutting accuracy: +/- 0.5 mm
- Speed: Max. 10 m / min (12-fold format)
- Throughput: 72,000 cards / hour

The MAE 12 tape layer is a flexible solution for applying magnetic and signature stripes as well as security stripes onto sheets. This additional process step completes the card and smart card production from one source series. In the tape layering process, magnetic stripes are transferred onto overlay foils. In one step up to 12 magnetic stripes and, if chosen (option), up-to 12 signature panels can be transferred simultaneously. Using 12 tracks, this machine can produce up to 72,000 cards / hour via processing from reel-to-reel and optionally from reel-to-sheet. This is based on an overlay thickness range of 40 to 400 microns and a width of 780 mm. The magnetic stripes are pressed, using their full width, onto the overlay material. The MAE 12 provides full adhesion to the stripes for safe handling of the sheets and the elimination of any variation of the stripe location during lamination. The MAE 12 is designed to accommodate different stripe widths and spacing. Intuitive operational handling and easy maintenance also maximize the efficiency.
SSH 2008

Semiautomatic Sheet Hot Stamping System

KEY MODULES

- x/y sheet table
- Hot stamping unit
- DOVID application

UPH

500 750 1,000 1,250 1,500 1,750
The semiautomatic sheet hot stamping system SSH 2008 is used for applying security features on overlay or core sheets. Prior to the sheet lamination process, the hologram is embedded inside the document. This is a cost-efficient, economical and easy to operate solution that provides high-quality security features for different applications including ID documents like ID cards and passport data pages etc. DOViD are processed from the reel and transferred directly to the core or overlay sheet. This is achieved through freely programmable parameters such as time, pressure and temperature. The carrier material is rewound onto the reel saving space and reducing changeover time. An integrated vacuum system ensures smooth handling without damaging the sheets and guarantees a highly accurate placement of the hologram. This system can be flexibly integrated into any production environment making the SSH 2008 extremely versatile.
FP 201
Foil Punching System

KEY MODULES

- Manual foil input
- Foil punching unit
- Automatic waste output
- Manual foil output

UPH
50 100 150 200 250 300 350
Mühlbauer’s FP 201 is a semiautomatic system to punch thin plastic material. It is the ideal solution for low-cost punching of compensation layers, as well as for contactless cards, hybrid cards and RFID tickets.

Additionally, the FP 201 can be used for the production of windows in e-cover inlays. As you can place more foils in one cycle, a throughput up to 300 foils/hour can be achieved.

### FEATURES & TECHNICAL DATA

**Key Features**

- Manual input of foils
- Punching in one stroke with highest accuracy
- Manual output of foils
- In-house tool manufacturing assuring highest flexibility of tools
- Special / customized tool design
- Fast in-house regrinding service
- Most proven punching system for various materials

**Productivity / Process Units**

- Pneumatic driven punching system (direct drive)
- No electronic, easiest operation and maintenance
- Availability: Up to 95%
- Yield: Up to 99.7%
- Environment conditions: Room temperature: 23°C; +/-3°C
- Humidity: 50%; +/-10%

**Technical Data**

- Sheet materials: PVC, PC, ABS, PET; others on request
- Sheet size max.: 350 mm x 500 mm
- Sheet thickness: 50 µm - 300 µm
- Punch drive: Pneumatic driven (air pressure connection 6 bar)
- Punching accuracy tool: +/- 0.02 mm
- Punching accuracy position: +/- 0.1 mm
ITH 540 - IT 50

Inlay Test Handling & Inlay Testing Systems

**KEY MODULES**

- Y-axis sheet table
- Contactless test station
- Reject marking

**UPH**

- 500
- 750
- 1,000
- 1,250
- 1,500
- 1,750
### FEATURES & ADVANTAGES

#### Key Features
- **ITH 540**
  - Realization of testing and pre-personalization
  - High flexibility regarding materials and different sheet layouts
  - Operator friendly easy operation
  - Automatic reject marking
  - Automatic counting of functional and rejected antennas
- **IT 50**
  - Manual inlay testing device
  - Test based on ATS (Answer To Select) test of antennas
  - Configuration is adjustable to customer requirements according to ISO 14443 A or ISO 14443 B

#### Productivity / Process Units
- **ITH 540**
  - Y-axis sheet table
  - Contactless testing station
  - Reject marking
  - Availability: Up to 95%
  - Yield: Up to 99.7%
  - Environment conditions:
    - Room temperature: 23°C; +/- 3°C
    - Humidity: 50%; +/- 10%

#### Technical Data
- **Max. sheet size**: 800 x 800 mm
- **Sheet thickness**: 0.10 to 1.00 mm (others on request)
- **Configuration**: Adjustable to customer requirements according to ISO 14443 A or B
- **Throughput**: Up to 1,000 sheets / hour; depending on material and test parameters as well as on operator speed

The inlay test handler ITH 540 is a semiautomatic machine for the testing of transponders integrated in sheets. The system is well-proven, easy to operate and has the possibility to freely program different sheet layouts. Testing and pre-personalization of RFID pre-laminated sheets, collated sheets, laminated sheets and inlay sheets have never been so simple. The integrated ETS-surface for ergonomic operations guarantees convenient functionality for operators and the maintenance friendly, long lifetime construction reduces running costs.

The IT 50 inlay tester is used to manually check the functionality of the transponders integrated into sheets. The simple device offers highest flexibility as it can be transported to any location and allows an operator to quickly determine if the antenna is faulty. Two LEDs indicate the test results; green indicating a functional antenna and red indicating a fault. Faulty antennas can then be marked to ensure all antennas used in production are fully functional.
SSC 2502 - SSC 2502/1

Semiautomatic Sheet Collating Systems

KEY MODULES

- Thermal welding unit
- Adjustable stop pins
- Parameter control (SSC 2502)
- Illumination (SSC 2502/1)
- Swivel mounted table

UPH 50 100 150 200 250 300 350
The semiautomatic operated sheet collating system SSC 2502 is designed for the gathering and prefixing of plastic foils into sheets ready for lamination. Distinguished by its high flexibility the SSC 2502 is versatile and easy to handle. A swivel table along with a vertically adjustable frame and foot switch operation method make the equipment easy to use for any operator. Adjustable edge guides and additional thermal welding units allow for the collation of a wide variety of products including sheet sets containing contactless inlets.

The manually operated sheet collating system SSC 2502/1 is also designed for collating and welding of plastic foils into sheets ready for lamination. The system is flexibly adjustable in height and table position for operator friendliness. The layers are manually aligned to reference edges and prefixed manually with an ultrasonic welding unit. This allows prefixing of a complete set simultaneously in less than one second and setting a random number of spots. After the collating process the prefixed sheets are removed manually by the operator.
SSC 2700

Semiautomatic Sheet Collating System

**KEY MODULES**

- Sheet storage
- Vision
- Two welding units
- Vacuum table
- Parameter control

**UPH**

- 50
- 100
- 150
- 200
- 250
- 300
- 350
FEATURES & TECHNICAL DATA

Key Features
- Semiautomatic collating system for individual sheet layers and security layers
- Suitable for standard collating tasks as well as for security applications required of the vision controlled positioning process
- Most precise vision controlled alignment of the sheet layers
- Smallest footprint requirements and easy operation
- Each single layer parameter is individually programmable (correct sequence)
- Optional thickness measurements to avoid double sheets
- Material shelf for ergonomic supply of sheets (optional)
- Integrated register punch for lamination of CLI / MLI feature (optional)
- INCAPE ready

Productivity / Process Units
- Vision system for high-precise sheet alignment of front and back side print
- Alignment teachable to print marks, antenna pads, security features or other visible features on the layers
- Optional UV-illumination system available to check presence of UV-print
- Up to three independent alignment camera systems
- Two thermal welding units from top, optionally from top and bottom
- Programmable welding position, time and temperature
- Thickness measurement unit available as option
- Alignment sensor of magnetic stripe foils
- Register hole punching system optionally available
- Availability: Up to 95%
- Yield: Up to 99.7%
- Environment conditions: Room temperature: 23°C; +/-3°C
  Humidity: 50%; +/-10%

Technical Data
- Sheet materials: PVC, PC, ABS, TeCoLas*; others on request
- Sheet size min. / max.: 290 x 290 mm / 750 x 750 mm
- Sheet thickness min. / max.: 50 - 400 µm
- Max. collating thickness: Up to 1 mm
- Max. welding temperature: Up to 400°C
- Welding time / force: 0 – 10 sec / 78 – 188 N
- Throughput: Up to 100 sheets / hour; depending on material and operator

The semiautomatic sheet collating system SSC 2700 is designed for the gathering and pre-fixing of plastic foils into sheets ready for lamination. Besides being versatile, the SSC 2700 is distinguished by its precision and accuracy. An integrated vision system ensures that only sheets that are perfectly aligned to the print marks are collated. Additional thermal welding units and vision systems allow for the collation of a wide variety of products including sheet sets containing contactless inlets and / or magnetic stripes.
SSC 200

Semiautomatic Sheet Collating System

KEY MODULES

- Manual sheet alignment table
- Automatic overlay spooling unit
- Adjustable welding unit
- Parameter control
- Cutting unit
- Sheet stacker

UPH

100 150 200 250 300 350 400
## FEATURES & TECHNICAL DATA

### Key Features
- Semiautomatic collating system based on reel-to-sheet process
- Automatic feeding and positioning for overlay from reel
- Automatic transport and cutting system
- Manual feeding and alignment to reference edges of core layers in sheet format
- Easy handling and maintenance
- INCAPE ready

### Productivity / Process Units
- Integrated spooling systems for overlay foil
- Sensor controlled alignment of overlay to edge or magstripe
- Two adjustable ultrasonic welding units
- Automatic welding parameter control
- Adjustable stop pins
- UV-illumination system optionally available
- Thickness measurement system optionally available to avoid double sheets
- Cutting unit after welding position
- Sensor controlled overlay alignment to edge or magstripe position
- Upgradeable to ASC 200 – fully automatic system
- Easy set-up and maintenance
- Availability: Up to 95%
- Yield: Up to 99.7%
- Environment conditions: Room temperature: 23°C; +/-3°C
- Humidity: 50%; +/-10%

### Technical Data
- Sheet materials: PVC, PC, ABS, TeCoLas*
- Overlay thickness: 40 – 300 µm
- Width of overlay reel: Max. 720 mm
- Reel diameter / core diameter: Max. 750 mm / 70 mm
- Center layers min. / max. sheet size: 290 x 290 mm / 720 x 720 mm
- Center layers min. / max. thickness: 45 - 600 µm
- Alignment accuracy: +/- 250 µm
- Throughput: Up to 400 sheets / hour; depending on material and operator

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The SSC 200 machine concept is as simple as it is ingenious. Only one operator gathers the core sheets before aligning them manually at the adjustable stop pins. The machine works completely independently from material and thickness. Depending on requirements, overlays from top and bottom are delivered from reel.

The manually collated core sheets are securely fixed to the automatic fed overlay by two ultrasonic welding systems before the complete set is cut and transferred to the output stacker. The SSC 200 is controlled by one operating panel which also stores pre-set production configurations.
ASC 200
Automatic Sheet Collating System

KEY MODULES

- Automatic input sheet feeder
- Automatic overlay spooling unit
- Ultrasonic welding unit
- Cutting unit
- Output stacker

UPH
300 400 500 600 700 800
FEATURES & TECHNICAL DATA

Key Features
- Automatic sheet collating system for individual sheet layers and security layers
- Reel-to-sheet handling system for overlay foils
- Sheet-to-sheet handling system for core layers
- Output stacker for collated and prefixed sheet sets
- Modular design for flexible individual configuration of collating-units, on-site upgrade / extensions possible
- Easy set-up and maintenance
- INCAPE ready

Productivity / Process Units
- Spooling system for two overlay foils on reels
- Up to three core-layer-sheet feeding systems
- Alignment of core layers based on the cutting edge of the sheet
- Automatic overlay alignment according to cutting edge or magstripe position
- Thickness measurement unit available as option to avoid double sheets
- Programmable welding parameters (time, pressure, position)
- Availability: Up to 95%
- Yield: Up to 99.7%
- Environment conditions: Room temperature: 23°C; +/-3°C
  Humidity: 50%; +/-10%

Technical Data
- Sheet materials: PVC, PC, ABS, TeCoLas*; others on request
- Overlay thickness: 50 – 300 µm
- Reel diameter / core diameter: Max. 750 mm / 70 mm
- Width of overlay: Max. 720 mm
- Sheet size min. / max.: 290 x 290 mm / 720 x 720 mm
- Sheet thickness min. / max.: 100 - 600 µm
- Max. collating thickness: Up to 1 mm
- Alignment accuracy: +/- 250 µm
- Throughput: Up to 400 sheets / hour; depending on material and layout

The fully automatic sheet collating system ASC 200 is designed for the collating and welding of sheets for the lamination process. The ASC 200 is highly flexible using ultrasonic welding units from the bottom. The different core layers are automatically inserted and aligned to edge before welding the complete set. Configurations of up to three core layers and two overlays from reel are possible. Overlay alignment according to edge or magstripe is possible. The fully collated and welded set is transferred to the output stacker.
ASC 2800/PM

Automatic Sheet Collating System

Key Modules

- Automatic sheet feeding system
- Automatic overlay feeding system
- Movable control panel
- Vision system for print mark alignment
- Ultrasonic foil welding
- Cutting unit
- Sheet stacker

UPH

300 400 500 600 700 800
The ASC 2800/PM is a fully automatic, completely flexible sheet collating system, unrivaled in the market. It serves standard as well as highly specific production requirements. Due to its high-precision optical collating process this machine is suitable for contactless, dual interface and other high-level cards, such as ID or EMV applications. This fully automated system offers a throughput of up to 600 sheets / hour. Despite the complete automation it still allows flexible usage for the producer. The easy change-over between different materials and the handling of up to five core layers enable a variety of product configurations. The system can push you forward and increase the efficiency of your production intensively keeping quality and precision.
LP 5570/E

Full Size Sheet Lamination System – TWIN STACK

Automatic loading and unloading basket
Automatic loading and unloading table
Lamination press
Press force reduction
Free programmable process parameter

Product temperature measurement
Cooling unit
Weight compensation
Thermal oil heating

KEY MODULES
FEATURES & ADVANTAGES

Key Features
- Automatic TWIN STACK sheet lamination system
- Features the most accurate heating technology worldwide
- Suitable for PVC volume production and for PC
- Wide range of programmable process parameters
- Intuitive human interface ensuring easy and efficient system and process handling
- Optimized energy management system for environment friendly and cost-saving operation
- Uniquely designed heating plates for perfect homogenous temperature conditions
- Fully modular system design
- INCAPE ready

Productivity / Process Units
- Eight or ten openings
- Weight compensation system
- Average heat variation on heating plates +/- 1°C
- Average heat variation overall heating plates +/- 3°C
- Special temperature management
- Programmable cycle time, lamination pressure, lamination temperature
- New product-parameter teach / set-up in just five minutes
- Heating and cooling in both presses possible
- Availability: Up to 95%
- Yield: Up to 99.7%
- Environment conditions: Room temperature: 23°C; +/-3°C
  Humidity: 50%; +/-10%

Technical data
- Sheet materials: PVC, PC, ABS, TeCoLas*; others on request
- Sheet sizes: 530 x 680 mm (other size on request)
- Openings: 8 / 10
- Lamination force / hot press: 25 – 630 kN
- Lamination force / cooling press: 50 – 1,250 kN
- Repeat accuracy: +/- 0.5%
- Temperature tolerance: +/- 1°C
- Surface finish (ground): ≤ 1.2 µm
- Throughput: Up to 350 sheets / hour; depending on material and layout

The Mühlbauer lamination system LP 5570/E is designed to laminate pre-lams, holderpages and similar products such as plastic cards, smartcards and contactless cards. The system is in compliance with the latest demands regarding economics, environment as well as product and process quality. All important process parameters such as temperature, pressure and cycle time are controlled continuously and individually. These features make it possible to laminate under optimal conditions with all current card materials such as ABS, PVC, PC, PET, PETG, PS, PE and PP. An available option is the weight compensation for the hot press, which allows for the lamination of plastic cards. The LP 5570/E can be configured with eight or ten openings and both systems are capable of holding between six and twelve layers per opening depending on production material.
LP 5570
Full Size Sheet Lamination System - SINGLE or TWIN STACK

Key Modules:
- Automatic loading and unloading basket
- Automatic loading and unloading table
- Lamination press
- Press force reduction
- Free programmable process parameter
- Product temperature measurement
- Vacuum
- Cooling unit
- Weight compensation
- Thermal oil heating

UPH

SINGLE STACK

TWIN STACK

50 100 150 200 250 300 350
The Mühlbauer Lamination system LP 5570 is designed to laminate pre-lams, plastic cards, smartcards and contactless cards. The system is in compliance with the latest demands regarding economics, environment as well as product and process quality. All important process parameters such as temperature, pressure and cycle time are controlled continuously and individually. These features make it possible to laminate under optional conditions with all current card materials such as ABS, PVC PC, PET, PETG, PS, PE, TeCoLas® and PP. Available options are weight compensation and vacuum chamber for the hot press, which allows for the lamination of more complex cards. The LP 5570 can be configured with four, six or eight openings and each system is capable of holding between six and twelve layers per opening depending on production material.
CP 2007/A - CP 2007/M

Card Punching Systems

KEY MODULES

- Sheet input
- Sheet cutter (optional)
- Sheet alignment
- Punching unit
- Automatic skeleton ejection
- Magazine card output

UPH

5,000 10,000 15,000 20,000 25,000 30,000 35,000
Mühlbauer’s fully- and semiautomatic card punching systems CP 2007/A and CP2007/M are designed for punching of plastic cards from sheets. The systems enable high-quality and high-volume production of standard material ID-1 cards or special shaped cards (depending on tool design). The powerful hydraulic punching systems ensure continuous precision with alignment to print mark and the tools are well proven with an extremely long life-cycle. The possibility of up to 6-fold punching layouts offer flexibility and the optimized design allows for a quick and easy change over times. Depending on configuration and material these systems are able to reach a throughput of up to 35,000 cards / hour.
CP 202
Card Punching System

KEY MODULES

Sheet input
Sheet alignment
Punching unit

Automatic skeleton ejection
Magazine card output

UPH

10,000  15,000  20,000  25,000  30,000  35,000
Mühlbauer’s fully-automatic card punching system CP 202 is designed for the punching of plastic cards from sheets. The system is designed for medium to high-volume production of standard ID-1 cards. The electric driven punching system ensures continuous precision with alignment to print mark and the tools are well proven with an extremely long life cycle. The possibility of 3-up or 4-up punching layouts offers flexibility while the optimized design allows for a quick and easy change over time. Depending on configuration and material this system is able to reach a throughput of up to 15,000 cards / hour.
CP 2021/A - CP 2021/M

Card Punching Systems

**KEY MODULES**

- Sheet input
- Sheet cutter (optional)
- Sheet alignment
- Punching unit
- Automatic skeleton ejection
- Magazine card output

**UPH**

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**CP 2021/A**

**CP 2021/M**
FEATURES & TECHNICAL DATA

Key Features

- Automatic card punching system
- Manual / automatic sheet feeding system
- Optical sheet alignment and positioning system ensuring highest punching accuracy
- In-house tool manufacturing assuring highest life-cycle of tools
- Special / customized tool designs
- Fast in-house regrinding service
- Upgradable modular system design – on-site upgrade to automatic system
- Most proven punching system for polycarbonate cards in the market

Productivity / Process Units

- CP 2021/M based on manual sheet feeding
- CP 2021/A with automatic sheet feeding from sheet stacker
- Hydraulic driven punching system (direct drive)
- Programmable punching speed
- Optical sensor system top / bottom for sheet alignment and positioning in punching position
- 1- to 5-up punching tools for ID-1 cards
- Automatic card stacking system to standard Mühlbauer card magazines
- Magazine changer / buffers: CH 2021/3; CH 2021/B; CH 2021/LS
- Availability: Up to 95%
- Yield: Up to 99.7%
- Environment conditions: Room temperature: 23°C; +/-3°C
  Humidity: 50%; +/-10%

Technical Data

- Sheet materials: PVC, PC, ABS, TeCoLas®, paper; others on request
- Sheet size min. / max.: 210 x 330 mm / 810 x 760 mm
- Sheet thickness: 500 – 1,000 µm
- Punching speed / pressure: 25 – 200 mm/s / 100 kN (programmable)
- Punching tools: 1- to 5-up
- Product size: ID-1; others on request
- Punching accuracy: +/- 100 µm
- Throughput: Up to 31,000 cards / hour; depending on material and layout (with 5-up tool)

Mühlbauer’s fully- and semiautomatic card punching systems CP 2021/A and CP 2021/M are designed for punching of smart cards from sheets. The systems enable high-quality and high-volume production of ID-1 cards with capability of punching a wide range of materials, including polycarbonate (PC). The powerful hydraulic punching systems ensures continuous precision with alignment to print mark and the tools are well proven with an extremely long life time. The possibility of 1-, 2-, 3-, 4- or 5-fold punching layouts offer flexibility and the optimized design allows for a quick and easy change over times. Depending on configuration and material these systems are able to reach a throughput of up to 31,000 cards / hour.
CI 200
Card Inspection System

KEY MODULES

- Card input feeder
- Cleaning module
- Print inspection
- Surface inspection
- Card turning
- Print inspection
- Surface inspection
- Output trays
- Card sorting

UPH

15,000 20,000 25,000 30,000 35,000 40,000
**FEATURES & TECHNICAL DATA**

**Key Features**
- Automatic card inspection system
- Card feeding from input-card stacker / card output to multiple card output conveyor
- Wide range adjustable and programmable optical inspection parameters
- Independent optical systems for print inspection and surface inspection
- Software allowing visualization of each individual inspection station
- Statistic and reporting features; counting and sorting
- Customized extended statistic features optional
- Customized inspection algorithm development possible
- Advanced teach mode by reference card (golden template)
- INCAPE ready

**Productivity / Process Units**
- Input card stacker with automatic card separation
- Surface inspection system for card front side / back side system optional
- Print inspection system for card front side / back side system optional
- Optional inspection features
  - UV / Microtext inspection
  - Format inspection
  - Customized inspection features
- Sorting system 2-/ 4-/ 6-fold optionally available
- Magazine based card feeding optionally available
- Availability: Up to 95%
- Yield: Up to 99.7%
- Environment conditions:
  - Room temperature: 23°C; +/-3°C
  - Humidity: 50%; +/-10%

**Technical Data**
- Card materials: PVC, PC, ABS, TeCoLas®; others on request
- Card size / thickness: ID-1 / 350 – 1,000 µm
- Resolution print inspection: 75 µm / Pixel
- Resolution surface inspection: 75 µm / Pixel
- Optical system surface inspection: Greyscale matrix camera
- Optical system print inspection: Color matrix camera
- Throughput: Up to 20,000 cards / hour; depending on process parameters

The CI 200 is an economic automatic inspection system for plastic cards according to format ID-1 in compact design. The basic system inspects the surface and prints on one side of the card. It provides automated 100% inspection of every card with a throughput of up to 20,000 cards / hour. The system is able to detect print and surface deviations of plastic cards on the fly. This inspection system is extremely versatile with a variety of options allowing for customer specific configurations. These include double sided print and surface inspection as well as one additional inspection station per side, for example UV, micro text or format inspection. Furthermore output sorting is available in 2-fold, 4-fold or 6-fold with free definable tray allocations.
CI 36050
Card Inspection System

KEY MODULES

Card input feeder
Cleaning module
Print inspection
Surface inspection
Card turning
Print inspection
Surface inspection
Output trays
Card sorting

UPH
15,000 20,000 25,000 30,000 35,000 40,000
FEATU RES & TECHNICAL DATA

Key Features

- Automatic card inspection system
- Adjustable and programmable optical inspection parameters
- Precise optical systems for print inspection and surface inspection
- Software allowing visualization of each individual inspection station
- Statistic and reporting features; counting and sorting
- Customized extended statistic features optional
- Customized inspection algorithm development possible
- Advanced teach mode by reference card (golden template)
- INCAPE ready

Productivity / Process Units

- Input card stacker with automatic card separation
- Surface inspection of card front side; back side system optional
- Print inspection of card front side; back side system optional
- Optional inspection features
  - UV / microtext / DOVID inspection
  - Format inspection
  - Foil card inspection (highly reflective)
  - Transparent card inspection
  - Customized inspection features
- Sorting system 2- / 4- / 6-fold optionally available
- Auto-teach function
- Magazine based card feeding optionally available
- Availability: Up to 95%
- Yield: Up to 99.7%
- Environment conditions: Room temperature: 23°C; +/-3°C
  Humidity: 50%; +/-10%

Technical Data

- Card materials: PVC, PC, ABS, TeCoLas*; others on request
- Card size / thickness: ID-1 / 350 – 1,000 µm
- Resolution print inspection: 75 µm / pixel
- Resolution surface inspection: 75 µm / pixel
- Optical system surface inspection: Greyscale matrix camera
- Optical system print inspection: Color matrix camera
- Throughput: 36,000 cards / hour

The CI 36050 is a fully automatic high-speed inspection system for plastic cards according to format ID-1. The base system provides automated 100% inspection of every card with a throughput of 36,000 cards / hour for almost all inspection applications. The system is able to detect print and surface deviations of plastic cards on the fly. This inspection system is extremely versatile with a variety of options allowing for customer specific configurations. These include double sided print and surface inspection and up to 3 additional inspection stations per side, for example UV, micro text, format, DOVID, foil card or transparent card inspection. Furthermore output sorting is available in 2-fold, 4-fold or 6-fold with free definable tray allocations.
CHS 200
Card Hot Stamping System

KEY MODULES

- Card input feeder
- Hot stamping (second stamping unit optional)
- Reject bin (additional)
- Output conveyor

UPH

3,000 3,500 4,000 4,500 5,000 5,500
FEATuRES & tECHniCAl DaTa

Key Features

- Automatic card hot stamping system for holograms, signature panels etc.
- Quick change tools, direct stamp-application from top
- Easy adjustable stamping position
- Upgradeable to twin-head system / in-line – stand-alone
- In-house tool manufacturing and customization
- Highly accurate stamping positioning system
- Operator friendly teaching and operation
- INCAPE ready

Productivity / Process Units

- Automatic card feeding / stacking
- Adjustable stamping position in x/y
- Control system for stamping pressure
- Control system for stamping temperature
- One hot stamping unit, extension to two stamping units on request
- Output conveyor
- Inline connection for backside or second front side application (optional)
- Availability: Up to 95%
- Yield: Up to 99.7%
- Environment conditions: Room temperature: 23°C; +/-3°C
  Humidity: 50%; +/-10%

Technical Data

- Card format / materials: ID-1 / PVC, PC, ABS, TeCoLas®; others on request
- Foil specification
  - Core diameter: 1”, 3”
  - Max. outer diameter: 200 mm
  - Width: 10 – 85 mm
  - Stamping temperature: Up to 230 °C; manual adjustable
  - Stamping pressure: 2.4 kN – 7.3 kN, manually adjustable
  - Max. hologram diameter: 20 mm
  - Throughput: Up to 3,200 cards / hour; depending on material and process

The CHS 200 is designed for the application of up to 3,200 holograms / hour and other security features and / or signature panels onto ID-1 cards. Holograms and signature panels are applied onto the card front or back side by using two CHS 200 modules which can be optionally connected with each other. The two systems can work independently from each other or as an in-line system. For in-line production two different card transport units can be activated: A flipping unit for front and back side applications or a linear transport for the application of two different security features on the same card side. Holograms or signature panels are applied one by one from reel onto the card surface by temperature, time and pressure. Process parameters are adjustable and storable by software. Highly accurate positioning of the foil is effected with a print mark recognition sensor.
CHS 6001
Card Hot Stamping System

KEY MODULES

- Magazine card input
- Test stations (card orientation, input thickness measurement)
- Hot stamping (position 1)
- Card turning
- Hot stamping (position 2 - optional)
- Card output
- Reject bin

UPH

3,000 3,500 4,000 4,500 5,000 5,500
The CHS 6001 can be easily integrated into any existing production environment, attaching security foils such as holograms, signature panels and / or other security features on the card front and / or back side with a maximum of two stamping units. Both sides of the card can be processed in one production cycle with the integration of the card turning station.

By using two stamping heads, the CHS 6001 reaches the market-wide best cost-per-card value. The CHS 6001 is a highly sophisticated card hot stamping solution for a wide application field, as well as for special applications. With a throughput of up to 5,500 cards / hour and in combination with the magazine buffer system, it is suitable for high-volume production tasks.
MCES
Personalization Software

**Key Features**

- Intuitive and secure user interface
- Open interfaces
- Adaptable for all purposes
  - Identification documents
  - Telecommunication
  - Payment
  - Others
- Multiple data input formats
- Chip OS specific coding applications
- Configurable payment application scripts
- High-secure document and data processing
- In-line card data testing
  - Data pre-test
  - Sample post-test
  - Full test
- Customizable reporting
- Vendor independent extensions through powerful SDK with system simulator
- Highly scalable system
- Runs on all machine sizes
FEATURES & ADVANTAGES

The User
has an intuitive and easy to use front-end, allowing easy and intuitive control of personalization jobs, processes and reports.

The Administrator
finds an environment allowing the fine-tuning of the security and a system that fully complies with the requirements for secure document production in the ID, telecommunication or banking areas. The MCES is ideally suited to run within the restrictions set out by PCI, the best practices as set out for EMV personalization, or the regulations prescribed by credit card companies.

The Supervisor
can get in-depth reporting that allows the management to make informed decisions.

The Management
gets a tried and proven system, as the MCES has been in use since 1999. It can be adapted easily and cost-effectively to new card products. Where required this can even be done independently of Mühlbauer, the machine vendor. Thus Mühlbauer gives its clients a speed and price advantage over users of other equipment. Therefore Mühlbauer empowers its clients to be able to take advantage of new opportunities in the market.

The MCES is able to support different interface methods. The Mühlbauer data acquisition handles the option of input files with a variety of different formats ranging from classic formats like Tag Length Value (TLV) coded files, through Comma Separated Lists (CSV) flat files, to XML files. The data required for the personalization process is merged with the product information within the MCES.

All personalization data can be buffered in encrypted form and deleted after use. The backend of the MCES are the Mühlbauer master system and various processing units. After the personalization finishes all stored personalization data is deleted. These processing units operate the individual personalization actions during which a large amount of logging data is generated allowing the generating of reporting information in XML. This in turn can be transformed into any required format.

The personalization management system integrates incoming data with product definitions in a similar way as a mail merge process. Additionally the MCES is a personalization management system controlling the associated physical and electrical personalization processes.

The MCES handles personalization data from a variety of different input methods, formats and applies them to the cards, regardless whether magnetic stripe, chip encoding, or one or more of the various optical personalization processes, such as thermo-transfer printing, laser engraving, embossing or indent printing. The MCES manages all personalization processes within one software system. All this technology has to serve the purpose of helping the customer to make the best use of his investment. Therefore the system has been optimized to give every stakeholder the best value for his money.
QUALITY ASSURANCE

Testing Equipment

Card Body Testing Equipment

Smart Card Testing Equipment

Card Personalization Testing Equipment
PRODUCT PORTFOLIO

Your One-Stop-Shop Technology Partner

Automation

Cards & ePassports
- IC Module Production
- Card Body & Smart Card Production
- Holderpage & Booklet Production
- Card & ePassport Personalization
- Packaging & Mailing

RFID / Smart Label
- Antenna Production & Inlay Assembly
- Converting
- Personalization

Traceability
- Marking
- Process Automation & Board Handling

Semiconductor Backend
- IC Module Production
- Carrier Tape Production & Forming
- Die Sorting
- Flip Chip LED

Vision Inspection Systems
- Industrial Inspection Systems
- Security Inspection Systems

Flexible Solar Technology
- Flexible Solar Cell Technology

TECURITY®
- Document Issuance Solutions for eID, ePassport, Driver's License, Vehicle Registration
- Border Management Solutions
- Production Facilities

Parts & Systems
- Precision Engineering
- Surface Engineering

Consulting
- Identification of Customer Requirements
- Planning & Design
- Implementation
- Ongoing Operations

Service
- Worldwide Locations for Service & Support
- Worldwide Spare Parts Supply
- Reaction Time & Full Service Contracts
- Service & Maintenance Management
- Updates / Upgrades
- Teleservice, Remote Access & Hotline
- Training & Support on Different Levels
- Production & Administration Support

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