Mühlbauer
High Tech International

CARD BODY PRODUCTION TECHNOLOGY

PRODUCT OVERVIEW

CONTENTS

MÜHLBAUER GROUP AT A GLANCE

MÜHLBAUER'S BUSINESS UNITS AND SITES

Founded in 1981 in the heart of Bavaria, the Mühlbauer Group has ever since grown to a leading global player in the fields of Parts & Systems, Semiconductor Related Products, Document Solutions & Equipment for Security Systems, and innovative Technologies for Electromobility and Flexible Solar Solutions. With around 4,000 employees, technology centers in Germany, Malaysia, Slovakia, the U.S. and Serbia, and 35 sales and service locations worldwide, Mühlbauer created a strong competence network around the globe.
Our global corporation continuously invests in the most modern innovations and creative ideas in order to enhance our competences and to provide you with optimized solutions. We aim to protect the environment with our advanced technologies and make life easier for countless people.

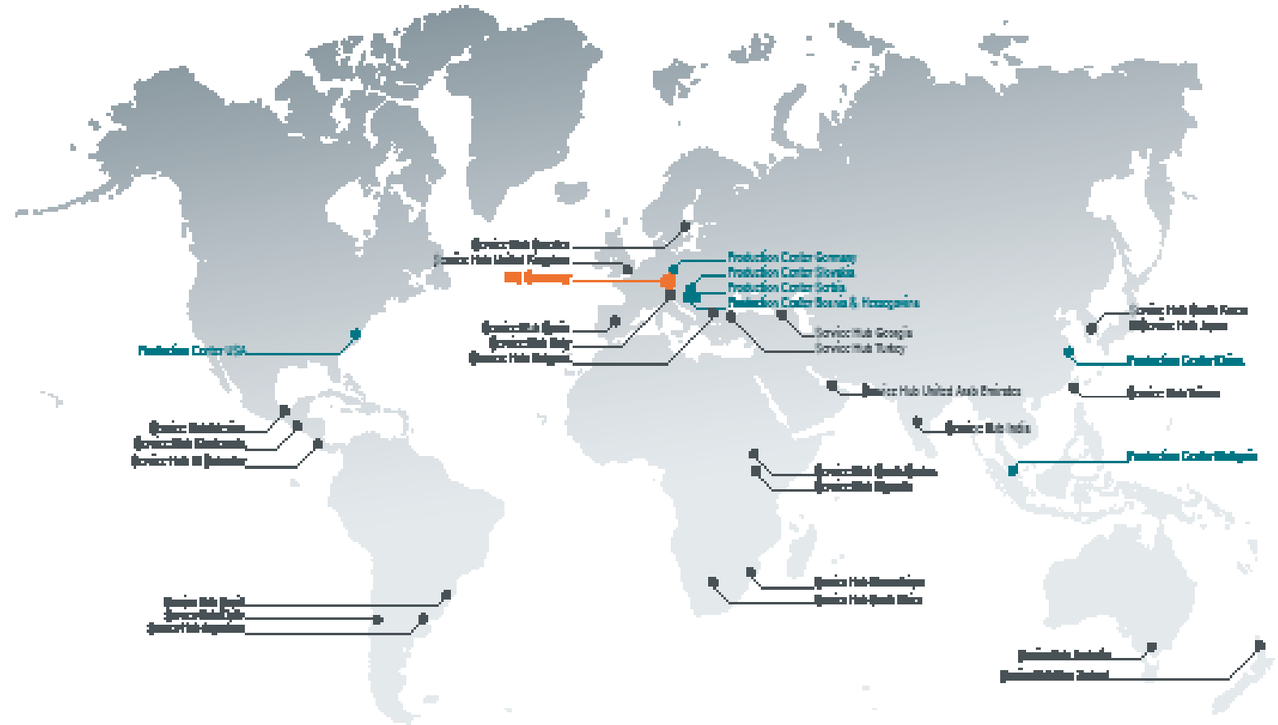
Our in-house precision part production **MPS** – Muehlbauer Parts & Systems – guarantees unlimited flexibility and highest customer satisfaction.

Our business unit **AUTOMATION** does not only develop and assemble individually customized production systems, but also offers intelligent software solutions for production automation (Industry 4.0). Vision inspection technologies as well as semiconductor and RFID applications complete our comprehensive portfolio.

Our youngest and currently most dynamic division **ATECH** – **Advanced Energy Technologies** – brings unique machinery requirements to series production. For the eMobility industry, we have been offering highly efficient production lines for the manufacture of pouch- and prismatic cells for lithium-ion batteries, as well as MEA's & stacks for fuel cells since 2022. Another promising area in this business field is our expertise in precise reel to reel material handling, which enables us to provide innovative production concepts for flexible solar cells and panels.

Our business unit **TECURITY®** is established as a competent partner for the implementation of security systems for identifying and verifying both documents and individuals. Our clients benefit from more than three decades experiential value which we have gained during the realization of over 300 ID projects worldwide.

There is no "can't do" at Muehlbauer. We tailor your solution!



Mühlbauer Bosnia & Herzegovina

Mühlbauer China

Mühlbauer Germany

Mühlbauer Malaysia

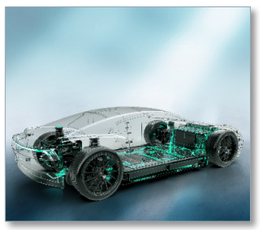
Mühlbauer Serbia

Mühlbauer Slovakia

Mühlbauer USA

MPS
Precision Parts & Surface Engineering

AUTOMATION
Production Equipment & Systems



MB ATECH
Battery & Fuel Cell Technologies

WORLD OF TECURITY®
Government & Technology Solutions

MANUFACTURING EXECUTION SYSTEMS

MB MCES
PERSONALIZATION MANAGEMENT SYSTEM

MB MCES is a personalization management software, which integrates incoming data with product definitions and controls the associated physical and electrical personalization processes. MB MCES handles personalization data from a variety of different input methods and formats.

MB INCAPE
INTEGRATED PRODUCTION MANAGEMENT SOFTWARE

MB INCAPE is Mühlbauer's Production Management Software for the production and personalization of electronic cards and documents (e.g. ID cards, ePassports, Driver's Licenses, EMV or GSM cards). Combining data management, production control and material management, the system allows for highly automated processes. It processes customer- and application-specific production, personalization, quality control and document delivery scenarios with highest solution flexibility.

MB PALAMAX®
TOTAL PROCESS TRANSPARENCY

MB PALAMAX®, Mühlbauer's Smart Factory solution, supports various applications from ID and document production over personalization to semiconductor backend and eMobility shop floors. It helps to monitor production data and makes it available for later processing, visualization and statistical analysis. This helps to uncover and realize efficiency boosts in your production system.

MB TOOL LEADER
CONNECTOR BETWEEN SYSTEMS

MB TOOL LEADER is a software package which consists of several applications and serves as a reliable link between the individual systems involved in the production process. By means of MB TOOL LEADER, the entire process chain – from the incoming order to the final precision part – can easily be monitored and controlled. This real-time machine monitoring guarantees an automated production process. Production errors can be detected and solved at an early stage. Thus, MB TOOL LEADER reduces the machine downtimes, which in turn leads to an increase of the machine's productivity by up to 20 percent.

MB EXPERT SYSTEM
RESOURCE PLANNING

MB Expert system is specialized tool developed for planning, scheduling and optimization production within production floor. This resource planning software system helps organizations automate and manage core business processes for optimal performance taking into account production's articles, orders and human resources.

FEATURES & ADVANTAGES

- Configurable workflow steps regarding personalization, quality assurance & issuance
- Seamless connection to MB PALAMAX® & MB DATA PREPARATION
- Fully-automated processing & production management
- Simplified administration due to web-based operator clients
- Scalability regarding different documents, machines & personalization locations
- Monitoring of real-time performance of the production
- Flawless integration of Mühlbauer's material management system (MB INCAPE WAREHOUSE)
- Seamless tracking of documents from point of production to issuance
- Connection to card / document management systems via web service, database, file-based interface
- Statistical tool analyze collected data & deliver customized statistics on OEE
- Standard interface to personalization machines with integration of third-party machines possible
- Tool which enables the remote operation of machines on the shop floor from a control centre
- Integration of MB USER MANAGEMENT
- Tool which increases effectiveness & efficiency so that production becomes more profitable
- Full coverage of production control requirements (security industry & EMV standards)
- Enables production engineering to prepare & test a repeatable factory set-up. Factories can switch between products within minutes.

MAE 12

TAPE LAYERING SYSTEM

Mühlbauer's MAE 12 tape layering system 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. In the tape layering process, up to 12 magnetic stripes are transferred onto overlay foils. Using 12 tracks, this machine can produce up to 72,000 cards per 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.

KEY FEATURES

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

FEATURES & TECHNICAL DATA

KEY FEATURES

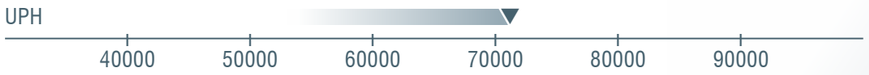
- Automatic application of signature stripes & magnetic stripes for bank cards, ID cards, loyalty cards etc.
- High flexibility in terms of sheet size, tape materials, positioning & quantity of tracks
- Cost-efficient solution especially for high-volume production
- Sensor controlled alignment system for overlay referenced to edge
- MB INCAPE ready

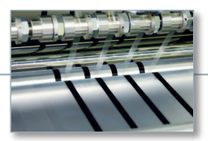
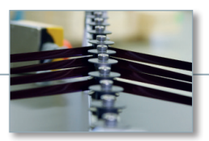
PRODUCTIVITY / PROCESS UNITS

- Reel-to-reel or reel-to-sheet (can be modified)
- Integrated spooling systems for different stripe-substrate
- Continuously adjustable processing speed & temperature
- Operator-friendly & fast adjustment of track positions
- Material buffer for high autonomy
- Availability: up to 95%
- Yield: up to 99.7%

TECHNICAL DATA

- Sheet materials: PVC, PC, ABS; 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: min 6 mm to max 16 mm
- Number of application tracks: up to 12
- 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 per hour



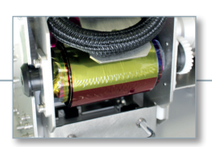
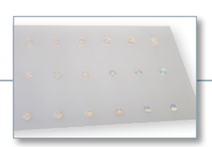

SSH 2008/2

SHEET HOT STAMPING

The SSH 2008/2 is the second generation of Mühlbauer's proven semi-automatic hot-stamping machine for sheets. DOVIDs like holograms and other heat-activatable features can be applied on plastic sheets. The holograms can be applied either on the surface of a final product or on a single sheet layer which will be laminated to a final sheet in a later step. Thus, the hologram can be hidden inside the material structure as a forgery-proof security element. The SSH 2008/2 is preferably used for the production of embedded holograms for security documents like ID cards or passports.

KEY MODULES

- x/y sheet table
- Hot stamping unit (1 head)
- DOVID application

FEATURES & TECHNICAL DATA

KEY FEATURES

- Semi-automatic sheet hot stamping system for applying holograms or KINEGRAMs® on overlay or core sheets
- The system can be matched with different products & layouts in very short time production surroundings
- All necessary parameters, (temperature, pressure & time) can be set according to different materials
- Highest security due to hologram / KINEGRAM® under the overlay
- Highest flexibility for various applications & customization like vision, barcode reader or OCR
- Highest accuracy for hologram / KINEGRAM® applications
- Operator-friendly handling system
- Flexibility due to adjustable & storable process parameters
- No offset between hologram / KINEGRAM® & card layout

PRODUCTIVITY / PROCESS UNITS

- Vacuum table for moving sheet from a loading position to all application positions in sequence & aligning sheets to a reference edge & clamping sheets by vacuum
- Feeding & positioning the tape under the application head by means of a tape spooler
- Special sensor placed in the stamping position for hologram positioning to print mark
- Pneumatic-driven application head allows a programmable adjustment of the press force, stamp temperature & dwell time
- Sharp edges of the applied holograms without flakes offered by special foil stripper
- Stamping tool for standard geometry for simple standard shapes (circle, rectangle with rounded corner, oval), for customized dimensions or for special geometry (optional)
- DOVID tape destruction before rewinding (with cutter to slit stamped hologram foil)

TECHNICAL DATA

- Sheet size: max. 630 x 630 mm
- Width of DOVID tape: max. 45 mm
- Core diameter: 1“ or 3“
- Reel diameter: max. 120 mm
- Stamp size: max. ø 20 mm
- Hot stamping force: up to 3 kN
- Position accuracy: ± 0.1 mm
- Hot-stamping temperature: 20 - 170° C

ASH 10000

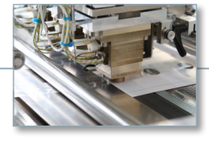
SHEET HOT STAMPING

Mühlbauer's ASH 10000 is designed for hot stamping of DOVIDs and security foils in defined position and pitching them onto plastic sheets. These DOVIDs are mainly applied on the backside of an overlay foil or on the printed core layer.

Both principles are providing the possibility to embed DOVIDs inside of the card structure, no matter if the foil is an overlay or a core material. The machine´s main area of application is on ID-1 and polyarbonate cards.

KEY MODULES

- Reel or sheet input
- DOVID application
- Hot stamping unit (4-8 heads)
- Cleaning module
- Vision control system (optional)
- Cutting unit - reel-to-sheet
- Reel or sheet output



FEATURES & TECHNICAL DATA

KEY FEATURES

- Fully automatic sheet hot stamping system DOVID and security foils in defined position & pitch onto plastic sheets
- Hologram / KINEGRAM® applied under the overlay to achieve a highly durable security feature (up to level 3)
- Temperature & pressure can individually be set for each application head
- Hologram applied to the overlay foil by pressure & temperature

PRODUCTIVITY / PROCESS UNITS

- Input material supplied in reel (R2R, R2S) or sheet form (S2S)
- Reel slit into sheet size by sheet cutting unit (R2S)
- Alignment of foil & smooth transport through the machine
- Applying hologram from holo foil to sheet
- Standard - 4 hot-stamp heads, optional up to 8 hot-stamp-heads (sheet layout)
- Process quality checked by a vision system (optional)
- Bad holograms marked by a bad unit marker
- Collection of incorrect sheets in reject box
- Foil rewound onto the output foil spooler (R2R) or sheets are stacked in the output stacker (R2R, S2S)

TECHNICAL DATA

Input from reel (R2S, R2S); output to reel (R2R):

- Reel diameter: max. 500 mm
- Reel width: max. 630 mm
- Core diameter: 76 mm (3")
- Application temperature: RT -170°C
- Throughput: up to 10.000 UPH

Input Stacker & Alignment Unit (S2S):

- Max. height of sheet stacks: 700 mm
- Sheet Size: min. 270 mm x 194 mm
- Sheet Size: max. 630 mm x 630 mm
- Sheet materials: PVC, ABS, PC, paper: ≥ 0.075mm

Hologram Size:

- Typical stamping tool size: max. ø 20 mm for standard thermal hologram foils

FP 201

FOIL PUNCHING SYSTEM

Mühlbauer's FP 201 is a semi-automatic system to punch thin plastic material. It is the ideal solution for low-cost punching of compensation layers for contactless cards, hybrid cards and RFID tickets.

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

KEY MODULES

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

FEATURES & TECHNICAL DATA

KEY FEATURES

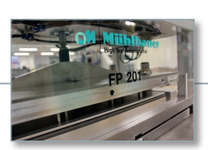
- Manual input sheet
- Punching in one stroke with highest accuracy
- Manual sheet output
- In-house tool manufacturing for highest flexibility of tools
- Special / customized tool design
- Fast in-house regrinding service
- Most proven punching system for various materials

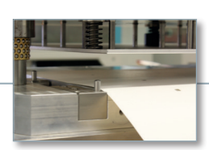
PRODUCTIVITY / PROCESS UNITS

- Hydro-pneumatic driven punching system (direct drive)
- No electricity: easiest operation & maintenance
- Availability: up to 95%
- Yield: up to 99.7%
- Alignment to reference pins

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: Hydro-pneumatic driven (air pressure connection 6 bar)
- Punching accuracy tool: +/- 0.02 mm
- Punching accuracy position: +/- 0.1 mm
- Throughput: up to 300 sheets per hour





MTT 2462

WIRE EMBEDDING & RFID INLAY PRODUCTION SYSTEM

Mühlbauer's Wire Embedding and RFID Inlay Production System MTT covers all production processes in one: chip punching, chip module implanting, ultrasonic wire embedding, thermo-compression chip welding and electrical as well as optical test followed by bad unit marking. The MTT is a robust and proven solution with already 100 systems sold worldwide.

RFID inlays for any ePassport and Smart Card application can be produced: whether it is ID-1 or ID-3 format, or for hybrid, dual interface and contactless cards.
The automatic sheet sorting process separates good sheets from rejected sheets. The rejected sheets can then easily be reworked through a special machine software mode.

KEY MODULES

- Automatic sheet feeding
- Reject module detection by vision
- Chip module punching
- Chip module implanting
- Ultrasonic wire embedding
- Thermo-compression chip welding
- Contactless test
- Optical quality check and bad unit marking
- Automatic sheet unloading
- Sorting of good / rejected sheets

FEATURES & TECHNICAL DATA

KEY FEATURES

- All-in-one solution for wire embedding & RFID inlay production
- Know-How regarding antenna design & sheet layout is completely kept in-house
- Easy import of CAD data
- Any antenna geometry is possible, including meander
- Powerful design software for easy creation of new antenna layouts
- High stability without any adhesive; vacuum is used instead
- Electrical optical testing incl. bad unit marking
- Rejected sheets can easily be reworked by MTT's "rework mode"
- MB INCAPE ready

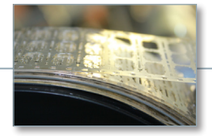
PRODUCTIVITY / PROCESS UNITS

- Automatic sheet placement line +/- 0,1 mm
- Fully automatic sheet feeding with vacuum tables
- Pick & place unit capable of handling any chip size on the market
- Direct removal of bad chips detected by vision
- Pneumatic shuttle system for smooth transport of antennas
- IC modules can be placed in mold-up & mold-down mode, without any major modifications on the machine
- Ultrasonic wire embedding only or in combination with contactless chip embedding; adjustable control units for embedding & bonding; highest precision through linear motor in both x- & y-direction with longest lifetime
- Thermo Compression Welding: up to 6 combi heads incl. thermo compression welding and wire break control sensors for standard applications
- For dual interface cards up to 10 slim-head ultrasonic wire embedding possible incl. wire break control sensors
- Yield: up to 99.7%
- Real* wire embedding repeatability: less than +/- 0,05 mm
- Real* chip embedding repeatability: less than +/- 0,05 mm
- Real* thermo compression repeatability of welding less than +/- 0,01 mm
  (* the real repeatability of linear motors is on +/- 6 mm)

TECHNICAL DATA

- Materials: PETG, PVC, Polycarbonate, Teslin, paper; others on request
- Max. sheet size: 600 x 600 mm - others on request
- Sheet thickness: 0.1 – 0.3 mm (others on request)
- Wire thickness: 0.08 – 0.12 mm
- Module tape: 35 mm; reel diameter max. 330 mm
- Spacer tape: 35 mm; reel diameter max. 330 mm
- Throughput: up to 1,800 contactless inlays per hour; up to 2,300 dual interface inlays per hour; depending on antenna design & material





ITH 540 & IT 50

INLAY TEST HANDLING & INLAY TESTING SYSTEMS

The inlay test handler ITH 540 is a semi-automatic machine for the testing of transponders integrated in sheets. The system is well-proven, easy-to-operate and offers 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 significantly been simplified. The integrated ETS-surface for ergonomic operations guarantees convenient functionality for operators. Running costs are reduced by the machine´s maintenance-friendly, long-lifetime construction.

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 defect. Two LEDs indicate the test results; green indicates a functional antenna, whereas red indicates a defect. Damaged antennas are then be marked to ensure all antennas used in production are fully functional.

ITH 540

IT 50

KEY MODULES

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

FEATURES & TECHNICAL DATA

KEY FEATURES

ITH 540
- Realization of testing & pre-personalization
- High flexibility regarding materials & sheet layouts
- Operator-friendly
- Automatic reject marking
- Automatic counting of functional & rejected antennas

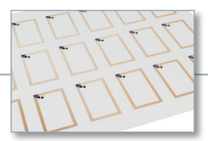
IT 50
- Manual inlay testing device
- Test based on ATS (Answer To Select) test of antennas
- Configuration is adjustable to customer requirements according to ISO 14443A or ISO 14443B

PRODUCTIVITY / PROCESS UNITS

ITH 540
- Y-axis sheet table
- Contactless testing station
- Reject marking
- Availability: up to 95%
- Yield: up to 99.7%

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 per hour; depending on material & test parameters, as well as on operator speed



ITH 550

AUTOMATIC INLAY TEST HANDLING

The inlay test handler ITH 550 is a fully automatic machine for the testing of transponders integrated in sheets. The system is well-proven, easy-to-operate and designed to test different sheet layouts. The Testing and pre-personalization of RFID pre-laminated sheets or finalized sheets significantly been simplified. The integrated ETS-surface for ergonomic operations guarantees convenient functionality for operators. Running costs are reduced by the machine´s maintenance-freindly, long-lifetime construction.

KEY MODULES

- Input feeder
- Contactless test station
- Vision inspection
- Reject marking
- Output stacker

FEATURES & TECHNICAL DATA

KEY FEATURES

- Realization of testing & pre-personalization
- High flexibility regarding materials & sheet layouts
- Operator-friendly
- Automatic reject marking
- Automatic counting of functional & rejected antennas

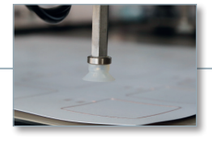
PRODUCTIVITY / PROCESS UNITS

- Input stack & sheet feeder
- Automatic sheet transport
- Contactless testing station
- Optical antenna & hologram inspection (optional)
- Reject marking
- Output stacker & reject box
- Availability: up to 95%
- Yield: up to 99.7%

TECHNICAL DATA

- Max. sheet size: 650 x 650 mm
- Sheet thickness: 0.20 to 0.80 mm (others on request)
- Configuration: adjustable to customer requirements according to ISO 14443 A or B
- Throughput: Up to 10,000 sheets per hour; depending on material per test parameters as well as on operator speed





IAL 10000

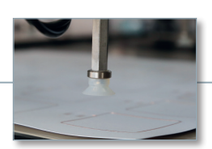
INLAY ASSEMBLY LINE

IAL 10000, Mühlbauer's Inlay Assembly Line, is the first of its kind which can process unlaminated sheets. IAL 10000 supports ID-1, ID-3 documents and even customized form factors and includes Mühlbauer's new graphical interface for highest operator and maintenance convenience. The machine is operated by means of a touchscreen terminal. The inlay production process starts with the antenna creation, chip placement and all the necessary electrical and / or vision tests – including marking of bad units and placing them in a reject box). This is followed by the collating process, during which various layers (number, material and thickness of layers may vary) are piled up, and the welding. IAL 10000 is a highly modular machine which can be tailored to the individual project requirements.

KEY MODULES

- Foil Input
- Cutting & Punching
- Glue dispensing
- Chip application
- Wire embedding
- Welding: wire to chip
- Electronic test
- Vision inspection
- Collating unit
- Unlam output





FEATURES & TECHNICAL DATA

KEY FEATURES

- Roll-to-Sheet, Sheet-to-Sheet, Roll-to-Roll
- Complete inlay assembly (including card / e-holder page layer collating)
- Fully modular as the process requests
- Wide format: 750 x 750 mm
- Automatic angle X, Y adjustment by vision system on various machine stations
- Inlay quality assurance: vision inspection and/or electrical test (ATS or RFM), bad mark printer, reject tray

PRODUCTIVITY / PROCESS UNITS

- Raw material is unwound from roll or sheets inserted into input stacker
- Reference holes & chip cavities are punched; then the foil is cut into sheets
- Glue is applied beside the chip cavities for chip fixation
- Chips are electrically tested before punching & placing them into cavities (optional)
- Vision system for detection of reject module, tape position & tape orientation
- Applying of the antenna is done by an ultrasonic wire embedding system with up to 12 heads per embedding module (optional: 2 embedding modules)
- Antenna wires are welded to chips
- Inspection by an optical inspection system and/or an electrical system, bad marked inlays are rejected into an integrated bin
- Manual rework of rejected inlays is possible. (alternatively: MTT 2462)
- Feeding & collating of additional compensation layer
- Feeding & collating of overlay from top and/or bottom

TECHNICAL DATA

- Sheet size: 190 x 190 mm, up to 750 x 750 mm
- Possible substrate materials: ABS, PC, PVC, PETG, Teslin, others on request
- Machine configurations: standard 4 heads; up to 24 heads
- Antenna types: Contactless, Dual Interface, Coil on Module (inductive coupling), Dipole

SSC 2502 & SSC 2502/1

SEMI-AUTOMATIC SHEET COLLATING SYSTEMS

Mühlbauer's semi-automatic operated sheet collating system SSC 2502 is designed for the gathering and pre-fixing 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 a 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.

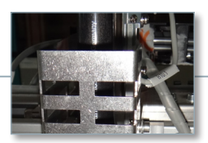
The manually operated sheet collating system SSC 2502/1 is also designed for collating and welding of plastic foils into sheets ready for lamination. The system is flexibly adjustable in height and table position and thus guarantees operator-friendliness. The layers are manually aligned to reference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

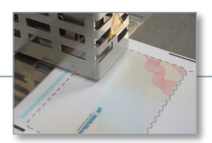
SSC 2502

SSC 2502/1

KEY MODULES

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





FEATURES & TECHNICAL DATA

KEY FEATURES

- Semi-automatic operated collating system for individual sheet layers & security layers
- Suitable for standard collating tasks & security applications
- Smallest footprint requirements & easy operation
- Easy set-up & maintenance
- MB INCAPE ready

PRODUCTIVITY / PROCESS UNITS

- Alignment of sheet layers based on cutting edge of the sheet
- Adjustable stop-pins on table
- SSC 2502/1 – manual ultrasonic welding unit
- SSC 2502 – foot switch operated thermal welding
- Adjustable welding temperature
- Availability: up to 95%
- Yield: up to 99.7%
- Environmental conditions:
  Room temperature: 23°C; +/-3°C
  Humidity: 50%; +/-10%

TECHNICAL DATA

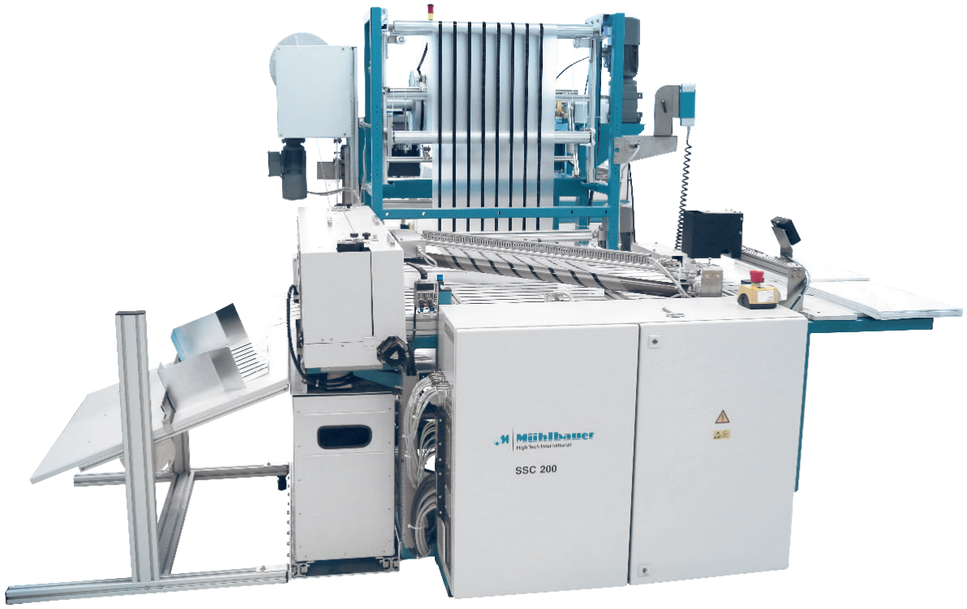
- Sheet materials: PVC, PC, ABS; others on request
- Sheet size min. / max.: 290 x 290 mm / 800 x 800 mm
- Sheet thickness min. / max.: 50 - 400 μm
- Max. collating thickness: up to 1 mm
- Max. welding temperature: up to 450°C
- Throughput: Up to 100 sheets per hour; depending on material & operator

SSC 200

SEMI-AUTOMATIC SHEET COLLATING SYSTEMS

Mühlbauer's SSC 200 machine concept is as simple as it is ingenious. Only one operator gathers the core sheets before manually aligning them manually at the adjustable stop pins. The machine works individual 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.



KEY MODULES

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

FEATURES & TECHNICAL DATA

KEY FEATURES

- Semi-automatic collating system for high volumes
- Automatic feeding & positioning for overlay from reel
- Automatic transport & cutting system
- Automatic welding parameter control
- Manual feeding & alignment to reference edges of core layers in sheet format
- Easy set-up & maintenance
- MB INCAPE ready

PRODUCTIVITY / PROCESS UNITS

- Integrated spooling systems for overlay foil
- Integrated register punch for lamination of CLI / MLI feature (optional)
- Sensor-controlled alignment of overlay to edge or magstripe
- Two adjustable ultrasonic welding units
- Adjustable stop pins
- UV-illumination system to check security feature (optional)
- Thickness measurement system to avoid double sheets (optional)
- Cutting unit after welding position
- Sensor-controlled overlay alignment to edge or magstripe position
- Availability: up to 95%
- Yield: up to 99.7%

TECHNICAL DATA

- Sheet materials: PVC, PC, ABS
- Overlay thickness: 40 – 300 μm
- Width of overlay reel: max. 720 mm
- Reel diameter / core diameter: max. 750 mm / 76 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 per hour; depending on material & operator



SSC 2700

SEMI-AUTOMATIC SHEET COLLATING SYSTEMS

Mühlbauer's semi-automatic 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 stands out 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.

KEY MODULES

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



FEATURES & TECHNICAL DATA

KEY FEATURES

- Semi-automatic collating system for individual sheet layers & security layers
- Suitable for standard collating tasks & security applications requiring vision controlled positioning processes
- Most precise vision-controlled alignment of sheet layers
- Smallest footprint requirement & easy operation
- Each single layer parameter is individually programmable (correct sequence)
- Material shelf for ergonomic supply of sheets (optional)
- Programmable welding position, time & temperature
- Up to 7 different welding positions programmable
- MB INCAPE ready

PRODUCTIVITY / PROCESS UNITS

- Vision system for high-precise sheet alignment of front & back-side print
- Alignment to print marks, antenna pads, security features or other visible features on the layers
- Integrated register punch for lamination of CLI / MLI feature (optional)
- UV-illumination system available to check presence of UV-print (optional)
- thickness measurements to avoid double sheets (optional)
- Up to three independent alignment camera systems
- Two thermal welding units from top, (optionally from top and bottom)
- Availability: up to 95%
- Yield: up to 99.7%

TECHNICAL DATA

- Sheet materials: PVC, PC, ABS; 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 per hour; depending on material & operator

ASC 2900

AUTOMATIC SHEET COLLATING SYSTEM

Mühlbauer's ASC 2900 is a fully automatic, completely flexible sheet collating system. Due to it's modular design the system can collate up to 5 core layers from sheet and 2 overlays from reel. 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 700 sheets per hour. Despite machine´s complete automation the ASC 2900 still allows flexible usage for the producer. The easy change-over between different materials and the handling of up to five core layers, enable the programming of a variety of product configurations.

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

FEATURES & TECHNICAL DATA

KEY FEATURES

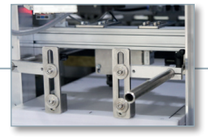
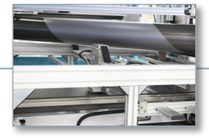
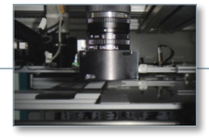
- Automatic high-speed sheet collating system
- Feeding of overlay from reel
- High-precision alignment by vision systems
- Proven solution for high-end products like security documents or contactless cards
- Alignment programmable to print marks, antenna pads, security features or other individual shapes on the layers
- Sheet-to-sheet handling system for core layers
- Output of collated & pre-fixed sheet to stacker system
- Modular design for flexible configuration of individual collating-units (on-site upgrade / extension possible)
- Up to 8 layers possible
- MB INCAPE ready

PRODUCTIVITY / PROCESS UNITS

- Spooling system for two overlay foils on reels
- Continuous edge control system for magnetic stripe overlays
- Cleaning system for endless overlay and core sheets (optional)
- Double sheet detection by ultrasonic sensor
- Cutter unit after welding position
- Ultrasonic welding system
- Vision-controlled alignment system
- Thickness measurement unit (optional)
- Integrated register punch for lamination of CLI / MLI feature (optional)
- Availability: up to 95%
- Yield:up to 99.7%

TECHNICAL DATA

- Sheet materials: PVC, PC, PET; others on request
- Alignment accuracy: +/- 150 μm
- Width of overlay: max. 720 mm
- Reel diameter: max. 750 mm
- Sheet size max.: 650 x 600 mm
- Sheet thickness: overlay ≥ 50 μm / core ≥ 100 μm
- Throughput: up to 700 sheets per hour; depending on material & layout

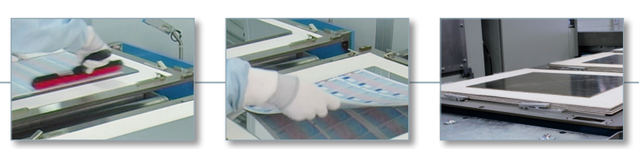
LP 5570

SHEET LAMINATION SYSTEM FOR COMPLEX CARD CONSTRUCTIONS

Mühlbauer's lamination system LP 5570 is perfectly suited for complex card constructions such as high security cards. It is designed to laminate pre-lams, plastic cards, Smart Cards and contactless cards. The system complies with the latest demands regarding economics, sustainability as well as product and process quality. All important process parameters such as temperature, pressure and cycle time are controlled continuously and individually controlled. 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. Available options are weight compensation and a 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 the production material.

KEY MODULES

- Automatic loading and unloading basket
- Semi or fully automatic handling of cassettes
- Lamination press
- Press force reduction
- Freely programmable process parameter
- Product temperature measurement
- Vacuum
- Cooling unit
- Weight compensation
- Thermal oil heating



FEATURES & TECHNICAL DATA

KEY FEATURES

- **Automatic, full-size sheet lamination system**
- **Suitable for complex card constructions like ID & other high security cards**
- **Available as single or twin stack**
- **Fully modular system design**
- **Wide range of programmable process parameters**
- **Intuitive human interface ensuring easy & efficient system & process handling**
- **Optimized energy management system for environmentally friendly & cost-saving operation**
- **Uniquely designed heating plates for perfect homogenous temperature conditions**
- **MB INCAPE ready**

PRODUCTIVITY / PROCESS UNITS

- **Up to eight openings**
- **Vacuum system (optional)**
- **Weight compensation system (optional)**
- **Average heat variation on heating plates: +/- 1°C**
- **Average heat variation overall heating plates: +/- 3°C**
- **Special temperature management**
- **Programmable cycle-time, lamination pressure & temperature**
- **New product-parameter teach; set-up in just five minutes**
- **Heating & cooling in both presses possible (optional)**
- **Availability: up to 95%**
- **Yield: up to 99.7%**

TECHNICAL DATA

Number of openings	**4, 6 or 8 (upgradable – even on site)**
max. Sheet size (material)	**580 x 780 mm**
max. lamination plate size	**590 x 790 mm**
Size of Heating plates	**620 x 821 mm**
max. press force	**1250 kN / 250 bar**
Press force range	**40 - 1250 kN**
Repeat accuracy of press force	**± 0,5 %**
Hydraulic pump motor	**2,2 KW**
Noise level	**72 dB(A)**
opening per daylight	**60 mm**
Closing stroke	**500 mm**
Closing speed	**10 mm/s**
Pressing speed	**1,8 mm/s**
Return speed	**10 mm/s**
Working temperature accuracy	**± 1.0 °C**
Thickness of plate	**36 mm**
Material of plates	**Steel, nickel plated**
Surface finish (ground)	**1,2 µm**
Parallelism per opening	**0,2 mm**

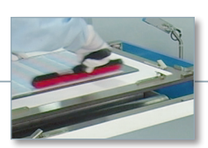
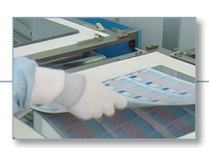
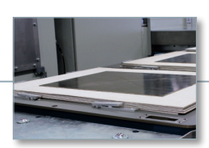
LP 5570/ECO-LINE

SHEET LAMINATION SYSTEM FOR PVC & PC VOLUME PRODUCTION

Mühlbauer's lamination system LP 5570/ecoLINE is perfectly suited for PVC and PC volume production tasks. It is designed to laminate pre-lams, holderpages and similar products such as plastic cards, Smart Cards and contactless cards. The system complies with the latest demands regarding economics sustainability as well as product and process quality. All important process parameters such as temperature, pressure and cycle time are continuously and individually controlled. 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 ist the weight compensation for the hot press, which allows for the lamination of plastic cards. The LP 5570/ecoLINE 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.

KEY MODULES

- Automatic loading & unloading basket
- Semi or fully automatic handling of cassettes
- Lamination press
- Press force reduction
- Freely programmable process parameter
- Product temperature measurement
- Cooling unit
- Weight compensation
- Thermal oil heating

FEATURES & TECHNICAL DATA

KEY FEATURES

- Automatic, full-size sheet lamination system
- Available as twin stack
- Features the most accurate heating technology worldwide
- Suitable for PVC volume production
- Wide range of PC programmable process parameters
- Intuitive human interface ensuring easy & efficient system & process handling
- Optimized energy management system for environmentally friendly & cost-saving operation
- Uniquely designed heating plates for perfect homogenous temperature conditions
- Modular system design
- MB INCAPE ready

PRODUCTIVITY / PROCESS UNITS

- Eight or ten openings
- Weight compensation system (optional)
- Average heat variation on heating plates: +/- 1°C
- Average heat variation overall heating plates: +/- 3°C
- Special temperature management
- Programmable cycle time, lamination pressure & temperature
- New product-parameter teach; set-up in just five minutes
- Heating & cooling in both presses possible (optional)
- Availability: up to 95%
- Yield: up to 99.7%

TECHNICAL DATA

Number of openings	8 or 10 (upgradable – even on site)
Max. sheet size (material)	590 x 730 mm
Max. lamination plate size	600 x 740 mm
Size of heating plates	620 x 744 mm
Hydraulic pressure	250 bar
Min. press force	40 kN
Max. press force	785 / 1250 kN (Heating/Cooling Press)
Repeat accuracy of press force	± 0,5 %
Hydraulic pump motor	2 x 2,2 kW
Noise level	72 dB(A)
Opening per daylight	50 mm
Closing stroke	500 mm
Closing speed	10 mm/s
Pressing speed	1,8 mm/s
Return speed	10 mm/s
Working temperature accuracy	± 1.0 °C
Thickness of plate	36 mm
Material of plates	Steel, nickel-plated
Surface finish (ground)	1,2 µm
Parallelism per opening	0,2 mm

CP 202

CARD PUNCHING SYSTEM

Mühlbauer's fully-automatic card punching system CP 202 is designed for the punching of plastic cards from sheets. The system is suitable 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 to choose between 3-up or 4-up punching layouts offers flexibility. The optimized design allows for a quick and easy change over time. Depending on configuration and material this system can reach a throughput of up to 16,000 cards per hour.

KEY MODULES

- Sheet input
- Sheet alignment
- Punching unit
- Automatic skeleton ejection
- Magazine card output

FEATURES & TECHNICAL DATA

KEY FEATURES

- Automatic card punching & sheet feeding
- Optical sheet alignment & positioning system ensuring highest punching accuracy
- In-house tool manufacturing assuring highest life-cycle of tools
- Fast in-house regrinding service
- Intuitive user interface for easy operation
- Lowest footprint for limited production area

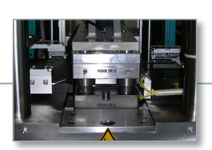
PRODUCTIVITY / PROCESS UNITS

- Automatic sheet feeding from sheet stacker
- Electric-driven punching system
- Adjustable punching speed
- Optical sensor system from bottom for sheet alignment & positioning in punching position
- 3- / 4-up punching tools
- Automatic card stacking system to standard Mühlbauer card magazines
- Availability: up to 95%
- Yield: up to 99.7%

TECHNICAL DATA

- Sheet materials: PVC, ABS; others on request
- Sheet size min. / max.: 295 x 360 mm / 405 x 640 mm
- Sheet thickness: 500 – 1,000 μm
- Punching speed: programmable, max. 0.4 s / cycle
- Punching tools: 3- / 4-up
- Product size: ID-1
- Punching accuracy (position): +/- 100 μm
- Throughput: up to 16,000 cards per hour with layout 4 x 8





CP 2007/A - CP 2007/M

CARD PUNCHING SYSTEM

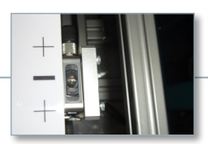
Mühlbauer's fully- and semi-automatic card punching systems CP 2007/A and CP2007/M are designed for the punching of plastic cards from sheets. The systems enable high-quality and high-volume production of standard material ID-1 cards or specially shaped cards (depending on tool design). The powerful hydraulic punching systems ensure continuous precision with alignment to print mark. The tools are well proven with an extremely long life cycle. The possibility to choose between up to 6-fold punching layouts offer flexibility and the optimized design allows for a quick and easy changeover times. Depending on configuration and material, these systems can reach a throughput of up to 35,000 cards per hour.

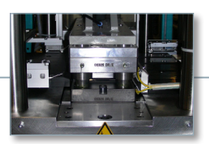
CP 2007/A

CP 2007/M

KEY MODULES

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





FEATURES & TECHNICAL DATA

KEY FEATURES

- Automatic card punching system
- Manual / automatic sheet feeding system
- Optical sheet alignment & 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
- Upgradeable modular system design – on-site upgrade to automatic system
- Special shape tools available (including 2-step punching & cutting)

PRODUCTIVITY / PROCESS UNITS

- CP 2007/M based on manual sheet feeding
- CP 2007/A with automatic sheet feeding from sheet stacker
- Hydraulic-driven punching system (direct drive)
- Adjustable punching speed
- Optical sensor system top / bottom for sheet positioning in punching position
- 1- to 6-up punching tools
- Automatic card stacking system to standard Mühlbauer card magazines
- Magazine changer / buffers: CH 2007/3; CH 2007/B; CH 2007/LS for highest autonomy time & layout sorting
- Conveyor belt for special cards (shape, size & perforation)
- Availability: up to 95%
- Yield: up to 99.7%

TECHNICAL DATA

- Sheet materials: PVC, ABS, Paper; others on request
- Sheet size min. / max.: 290 x 360 mm / 810 x 760 mm
- Sheet thickness: 300 – 1,000 μm
- Punching speed / pressure: manually adjustable / 30 kN
- Punching tools: 1- to 6-up for ID-1 cards
- Product size: up to 205 x 260 mm
- Punching accuracy (position): +/- 150 μm
- Throughput: up to 35,000 cards per hour; depending on material & layout (with 6-up tool)

CP 2021/A - CP 2021/M

CARD PUNCHING SYSTEM

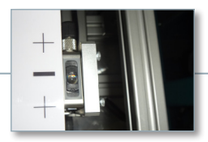
Mühlbauer's fully- and semi automatic card punching systems CP 2021/A and CP 2021/M are designed for the punching of Smart Cards from sheets. The systems enable the high-quality and high-volume production of ID-1 cards with capability of punching a wide range of materials, including polycarbonate. The powerful hydraulic punching systems ensure continuous precision with alignment to print mark. The tools are well proven with an extremely long life time. The possibility to choose between of 1-, 2-, 3-, 4- or 5-fold punching layouts offers flexibility and the optimized design allows for quick and easy changeover times. Depending on configuration and material, these systems can reach a throughput of up to 31,000 cards per hour.

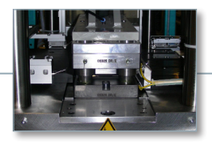
CP 2021/A

CP 2021/M

KEY MODULES

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





FEATURES & TECHNICAL DATA

KEY FEATURES

- Solid machine design for high speed & high precision
- Optical sheet alignment & 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
- Upgradeable 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 & 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%

TECHNICAL DATA

- Sheet materials: PVC, PC, ABS, 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 per hour; depending on material & layout (with 5-up tool)

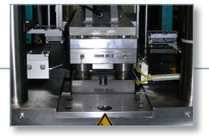
CP 2022/A

FULLY AUTOMATIC CARD PUNCHING SYSTEM

Mühlbauer's fully- and semi automatic card punching systems CP 2022/A and CP 2022/M are designed for the punching of Smart Cards from sheets. The systems enable the high-quality and high-volume production of ID-1 cards with capability of punching a wide range of materials, including polycarbonate. The powerful hydraulic punching systems ensure continuous precision with alignment to print mark. The tools are well proven with an extremely long life time. The possibility to choose between of 1-, 2-, 3-, 4- or 5-fold punching layouts offers flexibility and the optimized design allows for quick and easy changeover times. Depending on configuration and material, these systems can reach a throughput of up to 31,000 cards per hour.

KEY MODULES

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



FEATURES & TECHNICAL DATA

KEY FEATURES

- Solid machine design for high speed & high precision
- Optical sheet alignment & 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
- Upgradeable modular system design – on-site upgrade to automatic system
- Most proven punching system for polycarbonate cards in the market

NEW FEATURES & ADVANTAGE

- Seamless connection to MB PALAMAX® and MB FAS (Factory Automation Solution)
- State-of-the-art electronics
- New MB GUI (Graphical User Interface)
- Incorporates the latest in safety technology
- RoHs-compliant
- Can be fully integrated in to our state-of-the-art „Lights-out factory"
- Adaption to all customer requirements thanks to in-house development possbil

PRODUCTIVITY / PROCESS UNITS

- CP 2022/M based on manual sheet feeding
- CP 2022/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 & 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 2022/3; CH 2022/B; CH 2022/LS
- Availability: up to 95%
- Yield: up to 99.7%

TECHNICAL DATA

- Sheet materials: PVC, PC, ABS, 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 per hour; depending on material & layout (with 5-up tool)

CI 100

CARD INSPECTION SYSTEM

Mühlbauer's CI 100 is an economic, automatic inspection system for ID-1 plastic cards 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 5,000 cards per hour. The system can 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 such as double-sided print and surface inspection, as well as one additional inspection station per side, for example fUV or micro text.

KEY MODULES

- Card input magazine
- Cleaning module
- Card turning
- Reject sorting
- Print inspection
- Surface inspection
- Card output magazine

FEATURES & TECHNICAL DATA

KEY FEATURES

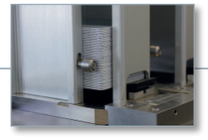
- Automatic card inspection system
- Wide range of optical inspection parameters
- Independent optical systems for print inspection & surface inspection
- Software allowing visualization of each individual inspection station
- Statistic & reporting features; counting & sorting
- Customized extended statistic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

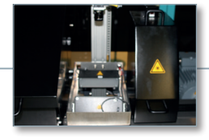
PRODUCTIVITY / PROCESS UNITS

- Input card magazine with automatic card separation
- Surface & print inspection system for card front side / back side system (optional)
- Inspection features (optional)
- UV inspection
- Microtext inspection
- Magazine output changer
- Availability: up to 95%
- Yield: up to 99.7%

TECHNICAL DATA

- Card materials: PVC, PC, ABS; 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 5,000 cards per hour; depending on process parameters





CI 200

CARD INSPECTION SYSTEM

The CI 200 is an economic automatic inspection system for ID-1 plastic cards 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 per hour. The system can 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 such as double-sided print and surface inspection, as well as one additional inspection station per side, for example for UV or micro text. Furthermore, output sorting is available in 2-fold, 4-fold or 6-fold with freely definable tray allocations.

KEY MODULES

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

FEATURES & TECHNICAL DATA

KEY FEATURES

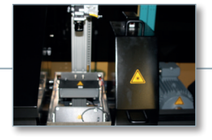
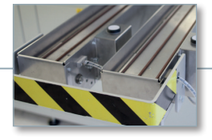
- Automatic card inspection system
- Card feeding from input card stacker / card output to multiple card output conveyor
- Wide range of optical inspection parameters
- Independent optical systems for print inspection & surface inspection
- Software allowing visualization of each individual inspection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

PRODUCTIVITY / PROCESS UNITS

- Input card stacker with automatic card separation
- Surface & print inspection system for card front side / back side system (optional)
- Inspection features (optional)
- UV inspection
- Microtext inspection
- Sorting system 4- or 6-fold (optional)
- Magazine based card feeding & output (optional)
- Availability: up to 95%
- Yield: up to 99.7%

TECHNICAL DATA

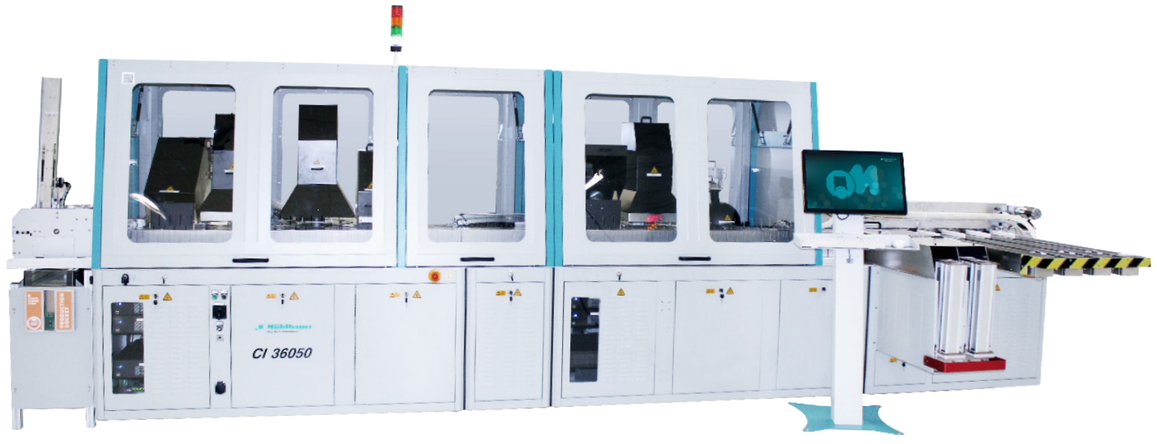
- Card materials: PVC, PC, ABS; others on request
- Card size / thickness: ID-1 / 350 – 1,000 μm
- Resolution print inspection: 75 μm / Pixel
- Resolution surface inspection: 75 μm / Pixel
- Optical system surface inspection: greyscale matrix camera
- Optical system print inspection: color matrix camera
- Throughput: up to 20,000 cards per hour; depending on process parameters

CI 36050

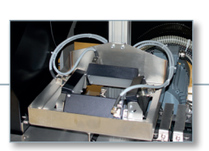
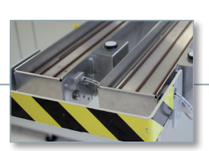
CARD INSPECTION SYSTEM

Mühlbauer's CI 36050 is a fully automatic high-speed inspection system for ID-1 plastic cards. The base system provides automated 100% inspection of every card with a throughput of 36,000 cards per hour for almost all inspection applications. The system can 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 such as double-sided print and surface inspection and up to 3 additional inspection stations per side, for example UV, micro text, DOVID, foil card or transparent card inspection. Furthermore, output sorting is available in 2-fold, 4-fold or 6-fold with freely definable tray allocations.



KEY MODULES

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

FEATURES & TECHNICAL DATA

KEY FEATURES

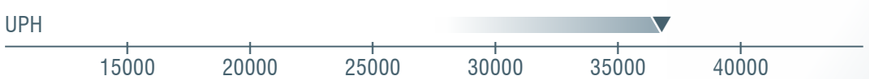
- Automatic card inspection system
- Wide range of optical inspection parameters
- Precise optical systems for print inspection & surface inspection
- Software allowing visualization of each individual inspection station
- Statistic & reporting features; counting & sorting
- Customized extended statistic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

PRODUCTIVITY / PROCESS UNITS

- Input card stacker with automatic card separation
- Surface & print inspection of card front side; back side system (optional)
- Optional inspection features
  - » UV / microtext
  - » DOVID inspection
  - » Foil card inspection (highly reflective)
  - » Transparent card inspection
  - » Customized inspection features
- Sorting system 4- or 6-fold (optional)
- Auto-teach function
- Magazine based card feeding & output (optional)
- Availability: up to 95%
- Yield: up to 99.7%

TECHNICAL DATA

- Card materials: PVC, PC, ABS; 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 per hour



CHS 6002

CARD HOT STAMPING SYSTEM

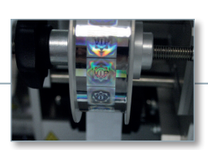
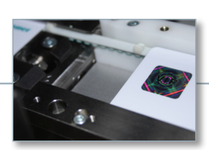
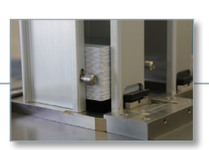
The CHS 6002 is Mühlbauer's fully automated hot stamping solution for ID-1 cards, designed to apply holograms, signature panels, and other security features with unmatched precision. Its modular design ensures seamless integration into existing production environments, while the advanced AI-supported vision system guarantees 100% quality control. Ideal for banking cards and specialized applications, the CHS 6002 offers high autonomy for large-scale production with operator-friendly functionality.

The machine is available in 3 different versions:

CHS 6002/S Single head stamping machine
CHS 6002/T Twin head stamping machine
CHS 6002/2S In/Off-line connection of 2 single head stamping machines

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

FEATURES & TECHNICAL DATA

KEY FEATURES

- Automatic card hot stamping system for holograms, signature panels, scratch-off panels, etc.
- Card handling magazine to magazine
- Easy adjustable stamping position
- In-house tool manufacturing & customization
- Highly accurate card alignment in stamping position
- 100 % inline quality check
- Modular inline connection of several systems
- Operator friendly teaching & operation
- MB INCAPE & PALAMAX® ready

PRODUCTIVITY / PROCESS UNITS

- Hot-stamping principle: cam-controlled roll motion
- Direction of roll motion: forward or backward (settable by software)
- Speed of roll motion: 10 - 100% (settable by software)
- Foil transport: programmable pitch or print mark detection
- Transport direction: forward or backward (settable by software)
- Transport speed: adjustable by Software
- Direction of stripper: forward or backward (settable by software)

TECHNICAL DATA

- Card format / materials: ID-1 (CR 80) / PVC, PC, ABS; others on request (e.g. metal or paper)
- Card thickness: 0,5 - 1,0 mm
- Foil specification
- Core diameter: 1", 3"
- Max. outer diameter: 200 mm
- Width: 10 – 85 mm
- Hologram positioning: Adjustable pitch or printmark registration
- Stamping temperature: Up to 20 - 250 °C; programmable
- Stamping pressure: adjustable by software
- Standard stamps: MiniVisa; Visa; MasterCard; signature panels, other shapes are possible on request
- Position accuracy on card: ± 0.05 mm
- Position accuracy foil transport: ± 0.15 mm
- Environment temperature: 20 - 25°C
- Environment humidity: 30 - 70%
- Throughput: up to 6,000 cards per hour; depending on foil material and quality

UPH
1000 2000 3000 4000 5000 6000

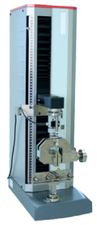
QUALITY ASSURANCE

TESTING EQUIPMENT

CARD BODY TESTING EQUIPMENT

CSG 100 / 200
Card size gauge

CTG 100 / 200
Card thickness / cavity depth gauge



DLT 500
Peel force tester

SMART CARD TESTING EQUIPMENT

SCF 2300
Flexion test system

TWT 2500
Three wheel testing system

SCT 2400
Torsion test system

MAT 1230
Module adhesion testing system

CARD PERSONALIZATION TESTING EQUIPMENT

MEASURING MICROSCOPE
Measuring of embossing distances

COLOR DENSITOMETER
Measuring of color density

UV-LIGHT CABINET
Inspection of various printing processes

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

SEMICONDUCTOR BACKEND
- IC Module Production
- Carrier Tape Production
- Die Sorting

INDUSTRIAL INSPECTION SYSTEMS
- Packaging
- Metal Working
- Special Solutions

FUTURE TECHNOLOGIES
- Concentrator Solar Technology
- Flexible Solar Cell Technology
- Solar Panel Technology
- E-SIM PERSO
- LED Technology
- eMobility

TECURITY®

- ID Card Solution
- ePassport Solution
- MB IDVERSO® Border Management Solution
- Driver's License & Vehicle Registration Solution
- Production Facilities

PARTS & SYSTEMS

- Precision Parts
- 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 (24 hours)
- Training & Support on Different Levels
- Production & Administration Support

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