Think Smart in
Smart Card production

Glue tape lamination • Card milling • Flexible bump • Implanting
Combined milling & implanting • Plug punching • Testing & mounting • Software

Think different • Act different • Be different!
Think different - Act different - Be different

Mühlbauer Group

Your one-stop-shop technology partner
Mühlbauer is the only one-stop-shop technology partner and consultant for the card, Smart Card, passport/ePassport and RFID industry. With approximately 1,800 employees, development and production sites in Germany, Malaysia and Slovakia and a worldwide sales and service network, the Mühlbauer Group is the world's market leader in innovative systems and software solutions for the production and personalization of cards, passports and RFID applications. Additionally, Mühlbauer supports its customers in project planning, technology transfer including system integration and production support.

Business unit SmartID
More than 100 different standard and customized products and intelligent software solutions for data enrollment and production management have been added to the Cards and TECURITY® portfolio. Mühlbauer is the sole company in the world offering a full range of turnkey manufacturing solutions and software embedded processes - from micro-chip die bonding to cards and passport production and personalization to enrollment and verification of personal data. In the last 27 years Mühlbauer has installed more than 15,000 systems across the globe, and was intensively involved in over 100 government related ID projects for the manufacturing and personalization of ePassports, ID cards and other card related security documents, proving our extensive know-how. Furthermore, Mühlbauer manufactures complete Smart Label factory processes for RFID inlay production to RFID converting, testing and personalization. Other units in our SmartID business unit manufacture individual solutions for industrial image processing of cards, coins, bank notes, tubes and other products.

Business units Semiconductor Related Products and Traceability
Mühlbauer also develops and produces innovative systems such as micro-chip die sorting 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 Precision Parts & Systems
Mühlbauer’s Precision Parts and Systems segment produces high precision components both for the manufacturing of its own products and to other manufacturers in sensitive industries such as aerospace, motorsports, medical and semiconductor industry.

Maximum power due to strong synergies
While Precision Parts & Systems produces all required components for the complete Mühlbauer portfolio itself, the company’s core business, SmartID, benefits from our specialized know-how in handling micro-chips in the Semiconductor Related Products area. These synergies enable Mühlbauer to be a powerful and quick reacting complete solution provider for the Smart Card, passport and RFID industries.

Exclusive manufacturer service
Mühlbauer offers an exclusive manufacturer service. With production and service locations on five continents a reaction time of down to 2 hours is achieved. Worldwide spare parts repositories and individual service and financing concepts round-off the unique portfolio for all services around the main product.

See & Believe
In our show rooms and applications centers all over the world, such as in Germany, Malaysia, South Africa and the USA, we exhibit our complete Smart Card and ePassport production and personalization products, as well as RFID inlay production and converting processes. Almost any system is available, ready for demonstrations. Additionally, the company drives its know-how directly to the customers with the TECURITY EXPRESS show truck - a mobile high security production center, unrivaled worldwide.

Technology and market leadership
To ensure its technology and market leadership Mühlbauer, heavily invests in the development of new innovative products and technological processes. The company's research and development centers with over 340 highly qualified engineers and technicians closely collaborate with customers and research institutions. In such manner we can efficiently launch to market reliable solutions in increasingly shorter development and production cycles.

Open communication
While aiming to extend our leading market position in the emerging areas of government, security and biometric applications, Mühlbauer ensures strict privacy from project to project. Thus allowing open channels of communication with our customers. Speed, quality and clear customer orientation make us to the reliable partner for sophisticated industries.
Complete turnkey solutions for Smart Card production

**Product overview**

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Experience drives innovation

Visionary concepts

How would the world be without the visionary concepts and various important developments of the humans? Limits have been moved all time and, be sure, this will never stop.

Since several years, Smart Cards are embracing our whole life. The smart card enables more efficient work processes and reduces paperwork, and it increases security against fraud and forgery. Whether in the field of GSM or UMTS cards, debit and credit cards, access cards, loyalty cards or health insurance cards – these intelligent cards help us handle our daily dealings. Especially all kinds of ID cards are in the focus of the current and future security document markets.

Electronic access to information and services - e-government services, for example - can be made particularly secure, due to the Smart Card’s digital signature. These benefits and more make the Smart Card the ideal key to security and practical use in a fast growing multimedia society.

Imagine you can use one single card to pay for your tickets for trains, sports and music events, to handle your consultations online with the responsible health fund, to get money at the bank machine and to use secure electronic commerce over the internet. Not possible? Of course: “multiple applications” are the magic words!

The telecommunications market continues to grow. The use of m-commerce and multimedia applications is becoming common practice. There is a growing interest in new, demand-related applications that equip cell phones with enhanced functionality, making them indispensable parts of our everyday lives.

With all our solutions, Mühlbauer addresses all your business opportunities. You can grow in the speed that is ideal for you and move on in the direction you want.

Let us realize your future ideas!
Taking responsibility for realizing visions

Competence

**Glue tape lamination**
is the preparation of the module tapes for the hot melt implanting process. IC modules are laminated on the back side with an adhesive tape. We offer stand-alone and integration kits to be built in or attached to the implanting system.

**Milling**
Cavities for IC modules are milled into the card bodies. The cavities are dimensioned according to the module size to be implanted. Depending on the application, Mühlbauer milling systems offer a wide range of process and quality control features (e.g. for Dual Interface card production).

**Flexible bump**
is the latest process to ensure secure contact between module and antenna of Dual Interface cards. After a special milling process conductive glue is dosed into the two contact areas and cured before implanting the module.

**Implanting / Combined milling & implanting**
is the central process in the Smart Card production chain. IC modules are punched out of the tape and are placed and fixed in the cavity of the card. All Mühlbauer implanting systems support 'hot' and 'cold' implanting processes. Also, a wide range of process and quality control features is available, e.g. for chip encoding, contactless encoding and Dual Interface card production.

**Plug punching**
is used to pre-punch the SIM-plug. The plug is not completely punched from the card but still fixed in the card by two or more bridges.

**Test systems**
Mechanical stress tests are performed to qualify the perfect gluing of the IC module in the card body. Bending and torsion of the card simulate the "normal" stress on the card in everyday life.
Glue tape lamination system
CML 3420, CML 3430

- Easiest and fastest tool change within seconds for highest uptime
- Best processability with heating from top and bottom
- Highest throughput of up to 18,000 UPH with lowest operator need (< 0.1 operator)

Your applications

- Lamination of IC module tapes

Your advantages

- Fastest setup time for different products
- Highest reliability
- Highest throughput of up to 18,000 modules per hour
- Lowest cost of ownership
- Highest autonomic production time
- Sensor and mechanically controlled module tape transport
- Best processability by top and bottom plate heating
- Tool change within seconds without removal of module tape
### Integratable Processes

#### Technical Description

**Design**
- Easily accessible control electronics and pneumatics
- SPS driven operator system
- Reeling and indexing systems for IC module tape, glue tape and spacer tape
- Locked production cabinet

#### Glue Tape Lamination Parameters
- Pressure time: 0-10 sec ± 0.1 sec
- Pressure: up to 300 N/cm²,  6 bar ± 0.3 bar
- Temperature: up to 180 °C ± 5 %

#### Workstations
- Glue tape prepunching unit
- Glue laminating station

#### Options
- Customized tool design
- 4/6/8/12-fold tool design

#### Spooling Systems
- Spooling systems TS 1141/1, /7
- Integrated tape buffer
- Low level detection

#### Glue Tape Lamination Parameters
- **Pressure time:** 0-10 sec ± 0.1 sec
- **Pressure:** up to 300 N/cm², 6 bar ± 0.3 bar
- **Temperature:** up to 180 °C ± 5 %

#### Availability
- > 95 %

#### Yield
- > 99.7 %

#### Facilities (basic)
- **Power:** 1 x 230 V, AC, ± 10 %, 16 A, N, PE, 50/60 Hz
- **Compressed air:** 6 bar, oil/waterfree, 65 l/min, according to DIN ISO 8573-1

#### Environmental Conditions
- **Room temperature:** 23 °C ± 3 °C
- **Humidity:** 50 % ± 10 %

#### Tape Specification
- **Module tape:** 35 mm/super 35 mm
  reel diameter max. 700 mm
- **Spacer tape:** 35 mm,
  reel diameter max. 700 mm
- **Glue tape:** widths max. 30 mm,
  reel diameter max. 200 mm

#### Dimensions (basic, closed/opened doors)
- **Height:** 2250/2250 mm
- **Length:** 900/300 mm
- **Depth:** 1000/2020 mm
- **Weight:** 410 kg

#### Throughput (basic)
- **CML 3420:** up to 9,000 modules/hour
- **CML 3430:** up to 18,000 modules/hour
**Milling system SCM 525**

- **All processes of a high volume system (e.g. dual interface card milling) for low budget price**
- **Highest milling accuracy by water cooled spindle drive (also during start-up)**
- **Best cost per card performance ratio**

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**Your applications**

- **Highest compact Smart Card milling equipment**
  capable for high accuracy milling of IC module cavity
- **Fully prepared for dual interface card production**
  including antenna touch sensor as option

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**Your advantages**

- **Operator friendly handling**
- **Graphical based milling program designer**
- **Highest autonomic production time of up to 3 hours**
- **Adjustment of plane inclination just by software for best flatness results within a few microns**
- **Statistic process analysis**
- **Cleaning by air burst & suction system to avoid scratches (e.g. caused by brushes)**
## Integratable processes

**Technical description**

### Design
- Easily accessible control electronics, located in the frame
- Automatic card transport and indexing system
- Menu driven software, available in different languages
- Color TFT monitor
- Windows based milling program designer
- Locked production cabinet
- Vacuum cleaning system

### Workstations
- 1 programmable NC milling head with integrated cavity cleaning
- Cavity measurement station with in-line feedback-loop to control the NC milling head
- Cavity cleaning station
- Reject/sampling station

### Options
- Optical card orientation check station
- Card thickness measurement station
- Antenna touch system for dual interface card production
- Spot check station

### Card feeding/stacking systems
- Manual card handlers CH 410
  - 500 card stacker
  - integrated reject box
- Automatic magazine handlers CH 4201 with 3 magazine positions
- Magazine changing system CH 4011, also available for autonomy time of up to 3 hours

### Card materials
- PVC, PC, ABS, other materials upon request
- Card dimensions according to format ID1

### Milling parameters
- CNC milling heads: 1
- Programmable axis: \((x, y, z)\)
- Dynamic axis drive accuracy: \(x, y = \pm 15 \mu m, z = \pm 10 \mu m\)
- Cavity depth measurement (option): \(z = 2.5 \mu m\)

### Availability
- > 95 %

### Yield
- > 99.5 %

### Facilities (basic)
- Power: 3 x 400 V, AC, ± 10 %, 32 A, N, PE, 50/60 Hz
- Compressed air: 6 bar, oil-/waterfree, 200 l/min according to DIN ISO 8573-1

### Environmental conditions
- Room temperature: 23 °C ± 3 °C
- Humidity: 50 % ± 10 %

### Dimensions (basic, closed / opened doors)
- Height: 2300/2350 mm
- Length: 1550/1550 mm
- Depth: 1070/2350 mm
- Weight: 500 kg

### Throughput (basic)
- Up to 2,800 cards/hour
Cavity milling system
SCM 5050

- Highest throughput and yearly capacity on smallest footprint (up to 5,000 UPH)
- Best accuracy, processability and flexibility due to two independent milling stations (6 axis)
- Highest operator friendliness and autonomic production time of up to 60 min.

Your applications
- Automatic milling of cavities for IC modules into plastic cards
- Automatic milling of cavities for Dual Interface applications
  patented antenna detection system (ATS) for highest reliability of detection of all kind of antennae

Your advantages
- Highest milling accuracy by water cooled spindle drive (also during start-up)
- Highest throughput and yield for Dual Interface cards (yield up to 99.7%)
- Highest autonomic production time according to throughput by magazine changing systems (up to 60 min.)
- Graphical based milling program designer
- Adjustment of plane inclination only by software within a few microns for best flatness results
- Free station on card transport for customized quality control station
- Cleaning by air burst and suctioning to avoid scratches
## Integratable processes

### Technical description

#### Design
- Easily accessible control electronics located under the table
- Automatic card transport and indexing system
- Menu driven software, available in different languages
- 1 color TFT monitor
- Locked production cabinet
- Vacuum cleaning system
- Windows based milling designer

#### Workstations
- 1 programmable NC milling head with 6 programmable axis
- 1 card thickness measurement station
- 2 cavity cleaning stations
- 2 cavity depth control stations - measuring cavity depth in-line loop for self-adjustment of the milling head
- 1 reject box and sampling station

#### Options
- Optical card orientation control check
- Monitoring system
- PRS vision system
- Options for Dual Interface card production

#### Card feeding/stacking systems
- Integrated magazine handling system with magazine buffer (300 or 500 card magazine handling)
- Card feeding from bottom into linear transport system
- Magazine changing systems - 9 magazine positions in the buffer or 18 magazine positions in the buffer
- Card handling system CH 4010/1, /O
- Card handling system CH 4201/1, /O

#### Milling parameters
- NC milling heads: 2
- Programmable axis: 6 (x, y, z, x₂, y₂, z₂)
- Dynamic axis drive accuracy: x, y = ± 15 μm, z = ± 10 μm

#### Availability
- > 97%

#### Yield
- > 99.7%

#### Facilities (basic)
- Power: 400 V, ± 10%, 32 A, 50 Hz
- Compressed air: 6 bar, oil/waterfree, 1050 l/min according to DIN ISO 8573-1

#### Environmental conditions
- Room temperature: 23 °C ± 3 °C
- Humidity: 50% ± 10%

#### Dimensions (basic, closed/opened doors)
- Height: 2248/2248 mm
- Length: 1915/2793 mm
- Depth: 990/2360 mm

#### Throughput (basic)
- Up to 5,000 cards/hour

#### Card materials
- PVC, PC, ABS, other materials upon request
- Card dimensions according to format ID1
Cavity milling system
SCM 5060

- Highest throughput and yearly capacity on smallest footprint (up to 6,000 UPH)
- Highest milling accuracy by water cooled spindle drive (also during start-up)
- Highest autonomic production time of up to 45 minutes

Your applications

- Automatic milling of cavities for IC modules into plastic cards
- Automatic milling of cavities for Dual Interface applications
  patented antenna detection system (ATS) for highest reliability of detection of all kind of antennae

Your advantages

- Highest throughput and yield for Dual Interface cards (yield up to 99.7%)
- Graphical based milling program designer
- Adjustment of plane inclination only by software within a few microns for best flatness results
- Free station on card output transport for customized quality control station
- Lowest cost of ownership
- Highest reliability
Integrable processes

Technical description

**Design**
- Easily accessible control electronics located under the table
- Automatic card transport and indexing system
- Menu driven software available in different languages
- 2 color TFT monitors
- Locked production cabinet
- Vacuum cleaning system
- Windows based milling designer

**Workstations**
- 2 programmable NC milling heads with 6 programmable axis
- 2 card thickness measurement stations
- 2 cavity cleaning stations
- 2 cavity depth control stations, measuring cavity depth in-line loop for self-adjustment of the milling head
- 2 reject boxes and sampling station

**Options**
- Optical card orientation control check
- Monitoring system
- PRS vision system
- Options for Dual Interface card production

**Card feeding/stacking systems**
- Integrated magazine handling system with magazine buffer (300 or 500 card magazine handling)
- Card feeding from bottom into linear transport system
- Magazine changing systems
  - 9 magazine positions in the buffer or
  - 18 magazine positions in the buffer
- Card handling system CH 4010/1, 10
- Card handling system CH 4201/1, 10

**Card materials**
- PVC, PC, ABS, other materials upon request
- Card dimensions according to format ID1

**Milling parameters**
- NC milling heads: 2
- Programmable axis: 6 (x, y, z, x1, y1, z1)
- Dynamic axis drive accuracy: x, y = ± 15 μm
- z = ± 10 μm

**Availability**
- > 97 %

**Yield**
- > 99.7 %

**Facilities (basic)**
- Power: 400 V ± 10 %, 32 A, 50 Hz
- Compressed air: 6 bar, oil-waterfree, 1050 l/min according to DIN ISO 8573-1
- Vacuum: -0.7 bar, 130 l/min

**Environmental conditions**
- Room temperature: 23 °C ± 3 °C
- Humidity: 50% ± 10 %

**Dimensions (basic, closed/opened doors)**
- Height: 2320/2320 mm
- Length: 2800/3560 mm
- Depth: 1000/2400 mm
- Weight: 1528 kg

**Throughput (basic)**
- Up to 6,000 cards/hour

**Card materials**
- PVC, PC, ABS, other materials upon request
- Card dimensions according to format ID1
Flexible bump system

FBC 1200

- Easiest integration into existing production chain
- Process know-how and experience in more than 30 projects
- Customer proven reliability even for production of Dual Interface ID card projects

Your applications

- Latest technology for producing dual interface cards
  with secure contact between module and antenna, proved by Mühlbauer, independent test institutes,
  many customers and long time field experience since 2003

Your advantages

- Vision system for process quality check guarantees 100% good cards for your customer
- Process tracking and statistic function for vision system
- Best cost/card ratio, especially for high volume production
- FBC technology offering lowest cost/card especially for high production volumes with close to 100% yield
Integratable processes

Technical description

Design
- Computerized control system/PC-controller
- Automatic card transport and indexing system
- Menu driven software, available in different languages

Workstations
- Card input for manual card placement into the stacker
- Flexible bump dispensing station
- Bending station
- Pattern and recognition system
- Reject box
- Card output

Options
- 3 free stations for customer specific modifications and extensions e.g. cavity check
- Antenna resistance measurement station
- Sample box
- Automatic card input and output
- Cavity check
- Stereo microscope
- Precuring system for additional process stability for specific card designs

Card materials
- PVC, other materials upon request
- Card materials according to ID1

Process conditions
The viscosity of the resin has to be adapted to the environmental conditions, its age, etc. to reach the optimum process stability

Facilities (basic)
- Power: 3 x 400 V, AC, ± 10 %, N, PE, 3 x 32 A, 50/60 Hz
- Compressed air: 7 bar, oil/waterfree according to DIN ISO 8573-1
- Vacuum: internally

Environmental conditions
- Room temperature: 23 °C ± 3 °C
- Humidity: 50 % ± 10 %

Dimensions (basic, closed/opened doors)
- Height: 2300/2300 mm
- Length: 1920/2340 mm
- Depth: 990/2330 mm
- Weight: 480 kg

Throughput (basic)
- Appr. 1,500 cards/hour

Card feeding/stacking systems
- Card input CH 4101
- Card output CH 4101/O
- Card handling system CH 4201/VO

Card materials
- PVC, other materials upon request
- Card materials according to ID1

Process conditions
The viscosity of the resin has to be adapted to the environmental conditions, its age, etc. to reach the optimum process stability

Facilities (basic)
- Power: 3 x 400 V, AC, ± 10 %, N, PE, 3 x 32 A, 50/60 Hz
- Compressed air: 7 bar, oil/waterfree according to DIN ISO 8573-1
- Vacuum: internally

Environmental conditions
- Room temperature: 23 °C ± 3 °C
- Humidity: 50 % ± 10 %

Dimensions (basic, closed/opened doors)
- Height: 2300/2300 mm
- Length: 1920/2340 mm
- Depth: 990/2330 mm
- Weight: 480 kg

Throughput (basic)
- Appr. 1,500 cards/hour

Card feeding/stacking systems
- Card input CH 4101
- Card output CH 4101/O
- Card handling system CH 4201/VO
Module implanting system

SCI 820

- Best cost/card ratio on smallest footprint
- Best operator friendliness (e.g. freely programmable and storable implanting parameters)
- Best processability for best production quality
- Highest production stability and reliability leading for highest yield and lowest cost/cards

Your applications

- Fully automatic module punching, implanting and testing in one compact system
- All inline quality assurance, card orientation, height measurement, module inspection etc.

Your advantages

- Water and air cooled punching process, flatness compensation and fully controlled process parameters by software
- Highest productivity and smallest footprint
- Module inspection for positioning, rotation and surface (dust, overwelding, glue etc.)
- Wizards and operator instructions for best uptime and operator friendliness
- Highest autonomic production time with Mühlbauer magazines and magazine changing system (e.g. avoid 100% double cards)
- Possible integration of personalization units like chip encoding, laser or inkjet personalization etc.
Integratable processes

Technical description

Design
- Easily accessible control electronics, located in the frame
- Automatic card transport and indexing system
- Automatic IC module tape indexer
- Automatic spooling systems for module tape and spacer tape
- Automatic module pick and place system
- Menu driven software, available in different languages
- Color monitor
- Locked production cabinet

Workstations
- Module punching system
- Implanting unit
- Hot press station
- Flatness compensation
- Implanting accuracy: $x, y = \pm 30 \, \mu m$
- Implanting pressure: up to 200 N $\pm 2$ N
- Implanting temperature: up to 250 °C $\pm 4$ °C
- Implanting time: up to 10 sec $\pm 0.1$ sec

Options
- Card orientation check
- Cavity presence check
- Liquid glue dispensing systems - necessary for cold implanting process
- Cold press station incl. module height difference measurement
- Electric test/encoding station
- Inkjet printing module EM 750/I - up to four line printing - others upon request
- Applications for Dual Interface card production
- PRS vision system
- Up to 8 chip encoding stations
- Laser engraving module EM 750/L

Card feeding/stacking systems
- Card handlers CH 410 - 500 card stacker - integrated reject box
- Automatic magazine handlers CH 4201

Card materials
- PVC, PC, ABS, other materials upon request
- Card dimensions according to format ID1

Tape specification
- Module tape: 35 mm Jedd sup. 35 mm pitch 9.5 or 14.25, reel diameter max. 330 mm
- Spacer tape: 35 mm reel diameter max. 330 mm

Process parameters
- Availability: > 95 %
- Yield: > 99.7 %

Facilities (basic)
- Power: 1 x 230 V AC, $\pm 10 \%$, 16 A, N, PE, 50/60 Hz
- Compressed air: 6 bar, oil/waterfree, 250 l/min, according to DIN ISO 8573-1
- Suction: -0.12 bar, 1300 l/min
- Cooling water: 1 bar, 12-15 °C, 1 l/min

Environmental conditions
- Room temperature: 23 °C $\pm 3$ °C
- Humidity: 50 % $\pm 10 \%$

Dimensions (basic, closed/opened doors)
- Height: 2300/2300 mm
- Length: 1720/1720 mm
- Depth: 1070/2430 mm
- Weight: 500 kg

Throughput (basic)
- Up to 1,500 cards/hour
Module implanting system
SCI 4000/08

- Best operator friendliness (e.g. freely programmable and storable implanting parameters)
- Best processability for best production quality
- Highest production stability and reliability leading for highest yield and lowest cost/cards

Your applications

- Fully automatic module punching, implanting and testing
  in one compact system
- All inline quality assurance
  card orientation, height measurement, module inspection etc.

Your advantages

- Water and air cooled punching process, flatness compensation and fully controlled process parameters by software
- Highest modularity (e.g. liquid dosing, vision)
- Highest productivity and smallest footprint
- Module inspection for positioning rotation and surface (dust overwelding glue etc.)
- Wizards and operator instructions for best uptime and operator friendliness
- Highest autonomic production time with Mühlbauer magazines and magazine changing system (e.g. avoid 100 % double cards)
- Latest integratable module tape lamination (as option) for continuous production also during material change
- Possible integration of personalization units like chip encoding, laser or inkjet personalization etc.
Integratable processes

Technical description

Design
- Easily accessible control electronics, located in the frame
- Automatic card transport and indexing system
- Automatic IC module tape indexer
- Automatic spooling systems for module tape and spacer tape
- Automatic module pick and place system
- Computerized control system
- Menu driven software, available in different languages
- Locked production cabinet

Workstations
- Cavity presence check
- Tacking station
- 1st hot press station
- Cold press station
  - incl. module height difference measurement
- Electric test
  - contact head
  - integration of customized encoding/test system upon request
- Reject station
- Module punching system
  (punching of the IC modules from glob top side)
- Pick & place unit transfers working modules to the tacking station; reject modules are transferred to a reject box

Options
- Card orientation check
- Liquid glue dispenser (pneumatic or motor driven) for cold implanting process
- Hot liquid glue dispensing EM 8900/HLG
- IC module inspection
  - vision system for surface inspection of the implanted module
  - camera/monitor system with IPRS software
- Applications for Dual Interface card production
- Inkjet printing module EM 750/1
  - up to four line printing (others upon request)
- Laser engraving module EM 750/1
- Improved inline lamination system
  CML 3325, no machine stop during tape connection or tool cleaning

Card feeding/stacking systems
- Automatic magazine handlers CH 4201
- Automatic magazine buffer CH 4010

Card materials
- PVC, PC, ABS, other materials upon request
- Card dimensions according to format ID1

Tape specification
- Module tape: 35 mm J edec sup. 35 mm pitch 9.5 or 14.25, reel diameter max. 500 mm
- Spacer tape: 35 mm reel diameter max. 330 mm

Process parameters
- Implanting accuracy: ± 30 µm
- (ISO points to punch line)
- Implanting pressure: up to 200 N ± 2 N
- Implanting temperat.: up to 250 °C ± 4 °C

Availability
- > 95 %

Yield
- > 99.7 %

Facilities (basic)
- Power: 1 x 230 V, ±10 %, 32 A, N, PE, 50/60 Hz
- Compressed air: 6 bar, oil-free, 850 l/min, according to DIN ISO 8573-1
- Cooling water: 1 bar, 12-15°C, 1 l/min

Environmental conditions
- Room temperature: 23 °C ± 3 °C
- Humidity: 50 % ± 10 %

Dimensions (basic, closed/opened doors)
- Height: 2240/2240 mm
- Length: 2670/2690 mm
- Depth: 1060/2400 mm
- Weight: 850 kg

Throughput (basic)
- Up to 4,000 cards/hour
Module implanting system

**SCI 8610**

- Best operator friendliness (e.g. freely programmable and storable implanting parameters)
- Highly accurate implanting process
- Highest throughput of up to 6,000 cards/hour

### Your applications

- **Fully automatic module punching, implanting and testing** in one compact system
- **All inline quality assurance**
  - card orientation, height measurement, module inspection etc.

### Your advantages

- Highest modularity (e.g. liquid dosing, vision)
- Highest productivity and smallest footprint
- Integration of lamination system and inkjet possible
- Highest process stability
- Maximum productivity and small footprint
- Best cost/card ratio
Integratable processes

Technical description

Design
- Aluminium table with all workstations
- Easily accessible control electronics, located in the frame
- Automatic 2-track card transport and indexing system
- Automatic IC module tape indexer
- Automatic spooling systems for module tape and spacer tape
- Automatic module pick and place system
- Swivel arm with display
- Menu driven software, available in different languages
- Locked production cabinet

Workstations
- Cavity presence check
- IC module punching system, 2-fold
- Tacking station (2-track)
- 1st hot press station (2-track)
- 2nd hot press station (2-track)
- Cold press station
  incl. module height difference measurement
- Reject station

Options
- Card orientation check
- 3rd hot press station (2-track)
- Electric test / encoding station
- Optical module surface inspection system
- Inkjet printing extension module
- Upgrade kits for Dual Interface card production
  - glue dot inspection
  - antenna inspection
  - contactless encoding
- Sampling station
- Integrated lamination module
- Spaciltape winder
- 4/8 chip encoding stations

Card feeding/stacking systems
- Integrated magazine handling system with magazine buffer (300 or 500 cards magazines)
- Card feeding from bottom into linear transport system
- 11 magazine positions in the magazine buffer

Card materials
- PVC, PC, ABS, other materials upon request
- Card dimensions according to format ID1

Tape specification
- Module tape: 35 mm/Jedec sup. 35 mm pitch 9.5 or 14.25, reel diameter max. 500 mm
- Spacer tape: 35 mm
  reel diameter max. 330 mm

Process parameters
- Implanting accuracy: \( x, y = \pm 30 \, \mu m \) (ISO points to punch line)
- Implanting pressure: up to 200 N \( \pm 2 \, N \)
- Implanting temperature: up to 250°C \( \pm 4 \, °C \)
- Implanting time: up to 10 sec \( \pm 0.1 \, sec \)

Availability: \( > 95 \, % \)

Yield: \( > 99.7 \, % \)

Facilities (basic)
- Power: 3x400 V, AC \( \pm 10 \, \% \), 32 A, N, PE, 50/60 Hz
- Compressed air: 6 bar, oil-/waterfree, 600 l/min, according to DIN ISO 8573-1
- Suction: -0.12 bar, 1300 l/min
- Cooling water: 1 bar, 10-13°C, 2-3 l/min

Environmental conditions
- Room temperature: 23 °C \( \pm 3 \, °C \)
- Humidity: 50 % \( \pm 10 \, \% \)

Dimensions (basic, closed/opened doors)
- Height: 2340/2340 mm
- Length: 3300/4100 mm
- Depth: 1990/3390 mm
- Weight: 1800 kg

Throughput (basic)
- Up to 6,000 cards/hour
Card implanting system

**SmartCardLine**

- Highest level of operator friendliness (e.g. with automatic opening doors, wizard guided menus)
- Unique card handling guarantees highest throughput, best quality and process times
- New unique magazine changing system, combining highest autonomy and smallest footprint
- Easiest accessibility to all process stations for highest uptime and easy maintenance

### Your applications

- **Fully automatic module punching, implanting and testing**
  in one compact system
- **All inline quality assurance**
  card orientation, height measurement, module inspection etc.

### Your advantages

- **Easy handling and operation**
  - Look & feel graphical user interface with touch screen technology (operator and express mode)
  - Complete machine overview on one screen
  - Process PCs directly at process modules with complete process visualization & statistics
  - Removable and pluggable service terminal
- **Innovative process concept for highest throughput and flexibility**
  - Sensibly structured installation space with easy access to all modules
  - Maintenance friendly design, process units close to the operator
- **Highest modularity**
  - Freely configurable according to processes, applications and throughput demands at up to 6,000 UPH
  - Easy upgradeable, even on customer's side
  - Integration of inline module tape lamination system optionally possible
**Integratable processes**

**Design**
- Easily accessible control electronics located under the table
- Automatic card transport and indexing system
- Menu-driven software, available in different languages
- Touch screen and color TFT monitors
- Vacuum cleaning system

**Workstations**
- Cavity presence check
- IC module punching system
- Tacking station
- 1st hot press station
- 2nd hot press station
  incl. module height difference measurement
- Reject station

**Card materials**
- PVC, PC, ABS, other materials upon request
- Card dimensions according to format ID1

**Tape specification**
- Module tape: 35 mm, pitch 9.5 or 14.25, reel diameter max. 500 mm
  - spacer tape: 35 mm, reel diameter max. 330 mm

**Process parameters**
- Implanting accuracy: \( x, y = \pm 30 \mu \text{m} \)
- Implanting pressure: up to 230 N ± 2 N
- Implanting temperature: up to 250 °C ± 4 °C
- Implanting time: up to 10 sec ± 0.1 sec

**Options**
- 3rd hot press station
- Electric test station
- Optical module surface inspection system
- Sampling station
- Integrated lamination module
- Spacer tape winder

**Card feeding/stacking systems**
- Roundtable magazine changing system
  - automatic magazine changing
  - capacity of up to 6 magazines

**Tape specification**
- Module tape: 35 mm, Jedec sup. 35 mm
  - pitch 9.5 or 14.25, reel diameter max. 500 mm
  - spacer tape: 35 mm, reel diameter max. 330 mm

**Facilities (basic)**
- Power: 400 V, ± 10 %, 32 A, 50 Hz
- Compressed air: max. 10 bar, oil-waterfree
  - 500 l/min according to DIN ISO 8573-1

**Environmental conditions**
- Room temperature: 23 °C ± 3 °C
- Humidity: 50 % ± 10 %

**Dimensions (basic, closed/opened doors)**
- Height: 19300/2210 mm
- Length: 3860/4700 mm
- Depth: 1175/2725 mm

**Environmental conditions**
- Room temperature: 23 ± 3 °C
- Humidity: 50 ± 10 %

**Dimensions (basic, closed/opened doors)**
- Height: 19300/2210 mm
- Length: 3860/4700 mm
- Depth: 1175/2725 mm

**Throughput (basic)**
- Up to 6,000 cards/hour
**Combined card milling & implanting system**

**CMI 200**

- **Best customer proven cost/card performance**
- **Milling & implanting in one compact system**
- **Highest accuracy for milling and embedding far above ISO standards**

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**Your applications**

- **Milling & Implanting of Smart Card modules**
  
  Fully automating the process of card separation, cavity milling, module implanting and testing

---

**Your advantages**

- Best user friendliness, life time and reliability due to fully software controlled programmable NC milling head, process and parameter files including GUI and process analysis
- Meeting the high quality Mühlbauer engineering and assembling standard
- Highest accuracy for milling due to loop back function, milling reference top site inclination plain and automatic drilling tool connection, same as graphical cavity designer software
- Easiest operation with fastest tool change-over times, standard magazine changing system, wizard and software adjustable parameter files (position x/y, temperature, time, pressure ...) for highest uptime and autonomy (> 30 min)
- Using standard Mühlbauer processes for milling, implanting, module punching etc. guarantees best processability and quality for all standard applications (e.g. brushless cleaning station, air/water cooled punch, flatness compensation, bottom cooling plates ...)
## Integratable processes

### Technical description

#### Design
- Easily accessible control electronics, located under the table
- Automatic card transport and indexing system
- Automatic IC module tape indexer
- Automatic spooling systems for module tape and spacer tape - skeleton tape destroyed
- Programmable linear module punching - pick and place system
- Color monitor for data visualization
- Locked production cabinet

#### Workstations
- 1 NC milling head
- Cavity cleaning station
- Cavity depth control station with feed-back loop
- Module prefixing and implanting unit
- Hot press station
- Cold press unit incl. module height difference measurement
- Electric contact station
- Card reject sorting

#### Options
- Optical card orientation check
- Card thickness measurement system
- Graphical based milling program designer
- 2" hot press unit

#### Card feeding/stacking systems
- Magazine changing systems CH 200 - automatic magazine changing - 300 or 500 card magazine handling

#### Card materials
- PVC, PC, ABS, other materials upon request
- Card dimensions according to format ID1

#### Tape specification
- Module tape: 35 mm Jede sup. 35 mm pitch 9.5 or 14.25, reel diameter max. 500 mm (330 mm with integrated laminator)
- Spacer tape: 36 mm reel diameter max. 330 mm

#### Process parameters
- NC milling heads: 1
- Programmable axis: 3 (x, y, z)
- Dynamic axis drive accuracy: x, y = ± 30 μm, z = ± 15 μm
- Implanting accuracy: x, y = ± 50 μm
- Implanting pressure: up to 200 N
- Implanting temperature: up to 250 °C ± 4 °C
- Implanting time: up to 3 sec ± 0.1 sec

#### Facilities
- Power: 9 x 400 V, AC ± 10%
- Compressed air: 16 A, N, PE, 50/60 Hz
- Vacuum: 6 bar, oil-waterfree internally

#### Availability
- Greater than 95%

#### Yield
- Greater than 99.5%

#### Environmental conditions
- Room temperature: 23 °C ± 3 °C
- Humidity: 50% ± 10%

#### Dimensions (basic, closed/opened doors)
- Height: 1850/2150 mm
- Length: 3200/3200 mm
- Depth: 1250/2500 mm

#### Throughput (basic)
- Up to 2,000 cards/hour

---

Yield: > 99.5%

Environmental conditions:
- Room temperature: 23 °C ± 3 °C
- Humidity: 50% ± 10%
Combined card milling & implanting systems

CMI 2000/05, CMI 3000/05

- Lowest operator need with 0.4 - 0.5 operators per machine
- Highest flexible integration of personalization units
- Statistic process analysis incl. all quality assurance processes

Your applications

- Milling & implanting of Smart Card modules
  Fully automating the process of card separation, cavity milling, module implanting and testing

Your advantages

- Best user friendliness, life time and reliability due to fully software controlled programmable NC milling head, process and parameter files including GUI and process analysis
- Meeting the high quality Mühbauer engineering and assembling standard
- Highest accuracy for milling due to loop back function, milling reference top site inclination plain and automatic drilling tool connection, same as graphical cavity designer software
- Easiest operation with fastest tool change-over times, standard magazine changing system, wizard and software adjustable parameter files (position x/y, temperature, time, pressure ...) for highest uptime and autonomy (> 30 min)
- Using standard Mühbauer processes for milling, implanting, module punching etc. guarantees best processability and quality for all standard applications (e.g. brushless cleaning station, air/water cooled punch, flatness compensation, bottom cooling plates ...)
**Technical description**

**Design**
- Easily accessible control electronics, located in the frame under the table
- Automatic card transport & indexing system
- Automatic IC module tape indexer
- Automatic spooling systems for module tape and spacer tape
- Programmable linear module punching pick and place system
- Color monitor for data visualization
- Locked production cabinet

**Workstations**
- 1 NC milling head
- Cavity cleaning station
- Cavity depth control (with feed-back loop)
- Module prefixing and implanting unit
- Hot press station
- Cold press unit incl. module height difference measurement
- Electric contact station
- Card reject sorting

**Options**
- Optical card orientation check
- Card thickness measurement system
- Liquid glue dispensing units
- 2nd hot press unit
- Electric test/encoding station (up to 8 cards in parallel)
- Optical module surface inspection system
- Hot liquid glue dispensing EM 8900/HLG
- Upgrade kits for Dual Interface card production
- Antenna resistance measurement system
- Antenna pad inspection
- Antenna touch sensor
- Glue dot inspection
- Inkjet engraving module EM 7501
- Up to four line printing
- Others upon request
- Laser printing module EM 750/L
- PRS vision system
- Monitoring system
- Up to 8 chip encoding stations without extension module
- Improved inline lamination system CMI 3325, no machine stop during tape connection or tool cleaning.

**Card materials**
- PVC, PC, ABS, other materials upon request
- Card dimensions according to format ID1

**Tape specification**
- Module tape: 35 mm/Jedec sup. 35 mm pitch 9.5 or 14.25 mm
- Spacing tape: reel diameter max. 500 mm (330 mm with integrated laminator)

**Process parameters**
- NC milling heads:
- Programmable axis:
- Dynamic axis drive:
- Cavity depth control:
- Implanting accuracy:
- Implanting pressure:
- Implanting temperature:
- Implanting time:

**Availability**
- > 95 %

**Yield**
- > 99.5 %

**Facilities (basic)**
- Power: 3 x 400 V, AC; ± 10 %, 32 A, N, PE, 50/60 Hz
- Compressed air: 6 bar, oil-waterfree, 3850 l/min according to DIN ISO 8573-1
- Suction: 0.25 bar, 3850 l/min (per milling unit)
- Cooling water: 1 bar, 12-15 °C, 1 l/min

**Environmental conditions**
- Room temperature: 23 °C ± 3 °C
- Humidity: 50 % ± 10 %

**Dimensions (basic, closed/opened doors)**
- Height: CMI 2000/05 2340 mm
- Length: CMI 2000/05 3300 mm
- Depth: CMI 2000/05 1070 mm
- Weight: CMI 2000/05 800 kg
- CMI 3000/05 1000 kg

**Throughput (basic)**
- Up to 2,000 cards/hour with CMI 2000/05
- Up to 3,000 cards/hour with CMI 3000/05

**Card feeding/stacking systems**
- Magazine handlers CH 4201
- Magazine buffer CH 4010
Combined card milling & implanting system

CMI 4000/05

- Lowest operator need with 0.4 - 0.5 operators per machine
- Highest flexible integration of personalization units
- Statistic process analysis incl. all quality assurance processes

Your applications

- Milling and implanting in one compact, high flexible and reliable system
  including antenna touch system for dual interface production etc.
- All quality assurance tests
  like ATR, vision system, module input check etc.

Your advantages

- No mechanical adjustment necessary due to 2 programmable independent (x, y, z) NC milling heads
- Options for dual interface card production with a yield > 99.7% available
- Freely programmable implantation position for x, y, z and rotation only by software (no mechanical adjustment)
- Programming of milling cavities via graphical milling designer and visualization
  incl. auto calibration, loop back and diameter correction for easiest operation
- New integrated module tape laminator (as option) for continuous production also during material change
- Adjustment of plane inclination by software & milling reverence top side for best milling and implanting quality
- Highest autonomy with Mühlbauer magazine changing system incl. unique separation technology
  (avoid 100 % double cards also with difficult electrostatic charged materials)
**Technical description**

**Design**
- Easily accessible control electronics, located in the frame under the table
- Automatic card transport and indexing system
- Automatic IC module tape indexer
- Automatic spooling systems for module tape and spacer tape
- Programmable linear module punching pick and place system
- Color monitor for data visualization
- Locked production cabinet

**Workstations**
- 1 NC milling head
- Cavity cleaning station
- Cavity depth control (with feedback loop)
- Module prefixing and implanting unit
- Hot press station
- Cold press unit incl. module height difference measurement
- Electric contact station
- Card reject sorting

**Options for milling, implanting, lamination**
- Optical card orientation check
- Card thickness measurement system
- Liquid glue dispensing units
- Optical module surface inspection system
- Hot liquid glue dispensing EM 8900/HLG
- Inkjet printing unit
- Upgrade kits for Dual Interface card production
- PRS vision system
- Monitoring system
- Up to 8 chip encoding stations
- Card handling system GH 4010/1, 1/O
- Inline laminating system CML 3325, no machine stop during tape connection or tool cleaning

**Tape specification**
- Module tape: 35 mm/Jedec sup. 35 mm pitch 9.5 or 14.25, reel diameter max. 500 mm
- Spacer tape: 35 mm reel diameter max. 330 mm

**Process parameters**
- NC milling heads: 2
- Programmable axis: 3 (x, y, z)
- Dynamic axis drive accuracy: x, y = ± 15 μm
- z = ± 10 μm
- Implanting accuracy: x, y = ± 30 μm
- Implanting pressure: up to 200 N ± 2 N
- Implanting temperature: up to 250 °C ± 4 °C
- Implanting time: up to 3 sec ± 0.1 sec

**Availability**
- > 95 %

**Yield**
- > 99.7 %

**Facilities (basic)**
- Power: 3 x 400 V, AC ± 10 %, 32 A, N, PE, 50/60 Hz
- Compressed air: 6 bar, oil/waterfree, 950 l/min according to DIN ISO 8573-1
- Suction: - 0.25 bar, 3850 l/min (per milling unit)
- Cooling water: 1 bar, 12-15 °C, 1 l/min

**Environmental conditions**
- Room temperature: 23 °C ± 3 °C
- Humidity: 50 % ± 10 %

**Dimensions (basic, closed/opened doors)**
- Height: 2340/2340 mm
- Length: 3300/3300 mm
- Depth: 1070/2040 mm
- Weight: 1000 kg

**Throughput (basic)**
- Up to 4,000 cards/hour

**Card materials**
- PVC, PC, ABS, other materials upon request
- Card dimensions according to format ID1
Plug punching system

**CMP 200**

- Cost/card driven system for simplified card handling but still with best quality and reliability
- Best quality for GSM punching due to separate card punching and cutting station
- Highest throughput on smallest footprint

---

**Your applications**

- Punching and cutting of plugs for GSM cards
- Punching and cutting of various GSM shapes
  
  high flexibility due to in-house development & process

---

**Your advantages**

- Punching of all GSM shapes
- Process know-how for highest lifetime and quality of punching tool guarantee best cost/card ratio
- In-house tool design and regrinding service for best quality and fastest delivery
- Automatic magazine changing systems with an autonomic production time of up to 20 minutes for best operator friendliness
- Easy change-over to different tools
### Integratable processes

**Technical description**

**Design**
- Easily accessible control electronics, located in the frame under the table
- Hydro pneumatic driven punching system
- Automatic card transport and indexing system
- Automatic magazine handlers and card indexer
- PLC controlled system
- Menu driven system, available in different languages

**Workstations**
- Hydro pneumatic punching station
- Hydro pneumatic cutting station

**Card feeding / stacking systems**
- Magazine changing systems CH 200
  - Automatic magazine changing
  - 300 or 500 card magazine handling

**Card materials**
- PVC, ABS, other materials upon request
- Card dimensions according to format ID1
- SIM modules according to ID000 format

**Process parameters**
- Punching system: hydro pneumatic driven
- Cutting unit: hydro pneumatic driven
- Punching accuracy: ± 0.1 mm

**Facilities (basic)**
- Power: 1x230 V, AC, ± 10 %, 16 A, N, PE, 50/60 Hz
- Compressed air: 6 bar, oil-water free, internally
- Vacuum:

**Environmental conditions**
- Room temperature: 23 °C ± 3 °C
- Humidity: 50 % ± 10 %

**Dimensions (basic, closed/opened doors)**
- Height: 1850/2100 mm
- Length: 1250/2500 mm
- Depth: 1050/2500 mm

**Throughput (basic)**
- Up to 3,000 cards/hour
Plug punching systems

**CMP 2000/M, CMP 2010**

- Punching of standard GSM cards with all different geometries
- Punching and cutting of different shapes based on ID1 card size

**Your applications**

- GSM cards in all known materials
- Gift cards, Key Tags, Mini-VISA and Mini-GSM (3FF)

**Your advantages**

- Manual or fully automatic systems
- Powerful hydraulic driven punching and stamping system
- In-house tool design and regrinding service
- Optional processing all over the surface of ID1 cards for gift cards, Mini-VISA and other customized designs like key tags
- Process know-how for highest life time and quality of punching tool
- Fastest system in the market with more than 4,000 cards/hour on lowest footprint
Integratable processes

Technical description

Design
- Easily accessible control electronics located under the table
- Hydraulic driven control electronics
- Automatic card transport and indexing system
- Automatic magazine handlers and card indexer
- Computerized control system
- Menu driven software, available in different languages

Workstations
- 1C module recognition
- Hydraulic driven punching station
- Hydraulic driven cutting station

Options
- Punch check sensors after the punching process
- Automatic and programmable sampling station or module check before card output
- Double card recognition
- Mini-VISA modification

Card feeding/stacking systems
- Magazine handler CH 4201
  - automatic magazine changing
  - 300 or 500 card magazine handling
- Magazine buffer CH 4010
  - automatic magazine changing
  - 300 or 500 card magazine handling
  - integrated magazine buffer, 18 positions

Process parameters
- Punching station: Hydraulic driven
- Cutting station: Hydraulic driven
- Punching pressure: max. 70 bar, adjustable
- Punching force: max. 14 kN, adjustable
- Punching speed: freely programmable
- Punching accuracy: ± 0.1 mm

Facilities (basic)
- Power: 3 x 400 V, AC, ± 10 %, 16 A, N, PE, 50/60 Hz
- Compressed air: 6 bar, oil/waterfree, 520 l/min
- Vacuum: internally

Environmental conditions
- Room temperature: 23 °C ± 3 °C
- Humidity: 50 % ± 10 %

Dimensions (basic, closed/opened doors)
- Height: 2300/2300 mm
- Length: 1920/2340 mm
- Depth: 990/2300 mm
- Weight: 480 kg

Throughput (basic)
- Up to 4,000 cards/hour

Card materials
- PVC, ABS, other materials upon request
- Card dimensions according to format ID1
- SIM modules according to format ID000, other formats upon request
Smart Card testing & counting systems

Mühlbauer card qualification

- Systems perform fully proven, reliable counting and testing according to ISO specifications

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<th>Your applications</th>
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<table>
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<th>Your advantages</th>
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<td>CM 2000 counts cards (laminated or monolayer, standard, transparent or black) during or after all production steps</td>
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<td>TWT 2500 performs a testing method for the adhesive test between module and card body</td>
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</table>
Integratable processes

Technical description

SCF 2300, SCT 2400
Card materials
• Card dimensions according to format ID1

Process parameters
• Bending height: according to ISO/IEC 10373-1
• Bending speed: 10 - 40 cycles/min
• Test modes: ISO

Facilities (basic)
• Power: 115 or 230 V, AC, ± 10 %, 0.10 or 0.20 A, N, PE, 50/60 Hz

Dimensions (basic, closed/opened doors)
SCF 2300:
• Height: 320/590 mm
• Length: 600/600 mm
• Depth: 580/580 mm
• Weight: 30 kg

SCT 2400:
• Height: 320/590 mm
• Length: 600/600 mm
• Depth: 580/580 mm
• Weight: 30 kg

MAT 1230
Card materials/Chip modules
• Card dimensions according to format ID1 or MMC
• 6-, 8-contact and MMC modules
• Other card & module versions/types upon request

Process parameters
• Moving distance of plunger: 7.5 mm
• Cycle time disgorge: appr. 9 sec
• Measureable force: min: 0.1 N max: 500 N
• Pressure surface of plunger: 28.3 mm²

Facilities (basic)
• Power: 115 or 230 V, AC, ± 10 %, 0.10 or 0.20 A, N, PE, 50/60 Hz

Dimensions (basic, closed/opened doors)
• Height: 320/590 mm
• Length: 600/600 mm
• Depth: 580/580 mm
• Weight: 30 kg

CM 2000
Card materials
• Card dimensions according to format ID1
• All common plastic and paper cards
• Thickness from 0.25 to 0.9 mm - with extended counting option
• Counting of multi layer, mono layer, molded, black and transparent cards

Process parameters
• Counting speed: 150 mm/sec
• Counting process: Usage of photo sensors
• Stack width: up to 450 mm

Facilities (basic)
• Power: 230 V, AC, 2 A

Dimensions
• Height: 250 mm
• Length: 700 mm

TWT 2500
Card materials
• Card dimensions according to format ID1
• All common plastic and paper cards

Facilities (basic)
• Power: 230 V, AC, ± 10 %, 16 A, 50/60 Hz

Dimensions
• Height: 225 mm
• Length: 580 mm
• Depth: 500 mm
The module inspection system MI is used to inspect the contact surface of IC modules with respect to scratches and positioning.

The system can be integrated into our testhandlers and implanting systems for quality control procedures even on shiny surfaces.

**Your advantages**

- Fully automatic quality control with reject handling
- Own PC, monitor, camera system and software
- Automatic position check, module orientation and surface inspection, e.g. for scratches and contamination

The antenna touch system ATS is used for fully automatic production of Dual Interface cards, detecting each kind of antenna (etched, coilwinded, printed etc.) at highest speed and reliability.

The system is able to detect and stop at the antenna surface with highest accuracy within a few microns. Change-over to other material or layout of the antenna is possible without any adjustment of the ATS system.

Additional to the ATS system further quality systems like resistance measurement and optical antenna pad recognition are available.

**Your advantages**

- Fastest change-over times for different products
- Highly reliable and proven system on the market for Dual Interface cards
- Highest accuracy with fast program setup only by software
- Highest output yield - even for critical detecting applications
Open universal personalization management

Mühlbauer MCES

- Open universal platform
- Global platform script interpreter
- Prevention of cloned documents and mismatched data by use of a two-way data assurance process
- Flexible configuration of the personalization process steps
- Control of input and report data flows

Your applications

- Fully automatic data distribution to individual machine modules for personalization of all types of ID documents
  ID cards, driver's licenses, health cards, bank/credit cards, passports, ...
- Mühlbauer provides consulting and engineering capabilities
  that allows you to remain in accordance with the industries highest standards. We can lead you to a fast, clean, and cost effective overall solution using our knowledge and experience of more than fifteen years in the Smart Card industry.

Your advantages

- Independent data engineering by the user or full development capabilities supplied in-house by Mühlbauer
- Free access to all necessary personalization functions (chip mapping, APDU-sequences, ...)
- Universal platform for all Mühlbauer systems with personalization functionality ranging from our table-top machines to our highest throughput machines
- Data engineering with standard programming tools C++ and SQL
- Object oriented design

Interested?
Just ask for our special software brochures!
Integrated production management system

**Mühlbauer INCAPE**

- 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 documents
- Covers fully the production control requirements (security industry and EMV standards)

**Your applications**

- ICAO-compliant personalization of identity documents in visual and electronic format
- Full production control loop to trace back physical documents in the production area, completed actions in the production area and handled data through the complete system
- Interface to PKI systems from any supplier or Mühlbauer TRUST
- Complete production & personalization management software solution
- Various pre-defined modules ready on stock for customization

**Your advantages**

- Manage the complete document issuance cycle from operations scheduling, personalization, quality control and shipment with one system
- High production security (full control about systems, persons and data in the personalization area)
- Reduce your costs due to a more efficient, secure and cost-effective controlled production
- One system for the complete control of personalization management
- Easy handling of job administration and secure data for all the production equipment
- Proven for all possible personalization applications (ID documents, banking etc.)
- Integrated user administration
- Compatible with all known encoding systems (e.g. Mühlbauer MCES)
- Fulfills highest security requirements (EMV/ICAO...)
- Multi product management with highest flexibility
- Upgradable by the customer
- Statistical process control for complete transparency and traceability of production

Interested?

Just ask for our special software brochures!
**Product portfolio**

### Smart Identification

#### Cards & Security

- **Smart Card**
  - IC Module & Inlay Production
  - Card and Smart Card Production
  - Personalization & Mailing

- **ePassport**
  - IC Module & Inlay Production
  - Holder Page Production
  - Booklet Production
  - Booklet Perforation
  - Personalization & Mailing

#### Security Systems & Solutions

- Data Enrollment
- Border Crossing/Verification
- Access Control & Surveillance

#### Smart Label

- RFID Transponder Production
- Converting & Insertion
- Testing & Personalization

### Semiconductor Related Products

- Die Sorting/Die Bonding
- Flip Chip Bonding
- Mark, Test, Scan, Pack
- Carrier Tape Forming
- Industrial Image Processing
- Smart Label

### Traceability

- Board Handling
- Automation

### Precision Parts & Systems

- CNC-Milling, -Grinding, -Turning,
  - Cutting, -Bending, -Eroding,
- Surface Treatment
- Component Manufacturing & Assembly

### Consulting

- Identification of Customer Needs
- Planning & Design
- Implementation
- Ongoing Operations

### Service

- Worldwide locations for service & support
- Worldwide spare parts supply
- Reaction time & full service contracts
- Service and maintenance management
- Updates/upgrades
- Teleservice, remote access & hotline (24 hours)
- Training & support in different levels
- Production & administration support
Contact us
Mühlbauer - always on site

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ГУ РосНИИТ и АП  Ассоциация МВТК

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