

Embossing → Game Over?

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History

- 1959 First plastic embossed card issued by American Express
 - 1969 First Magnetic Stripe card came in the market
 - 1979 First Smart Card manufactured as ID 1 format
 - **1988 Mühlbauer started producing Smart Card Manufacturing Lines**
 - 1994 EMV first specifications released
 - 1995 The world's first contactless payment card in South Korea
 - 2003 NFC was approved as an ISO/IEC Standard



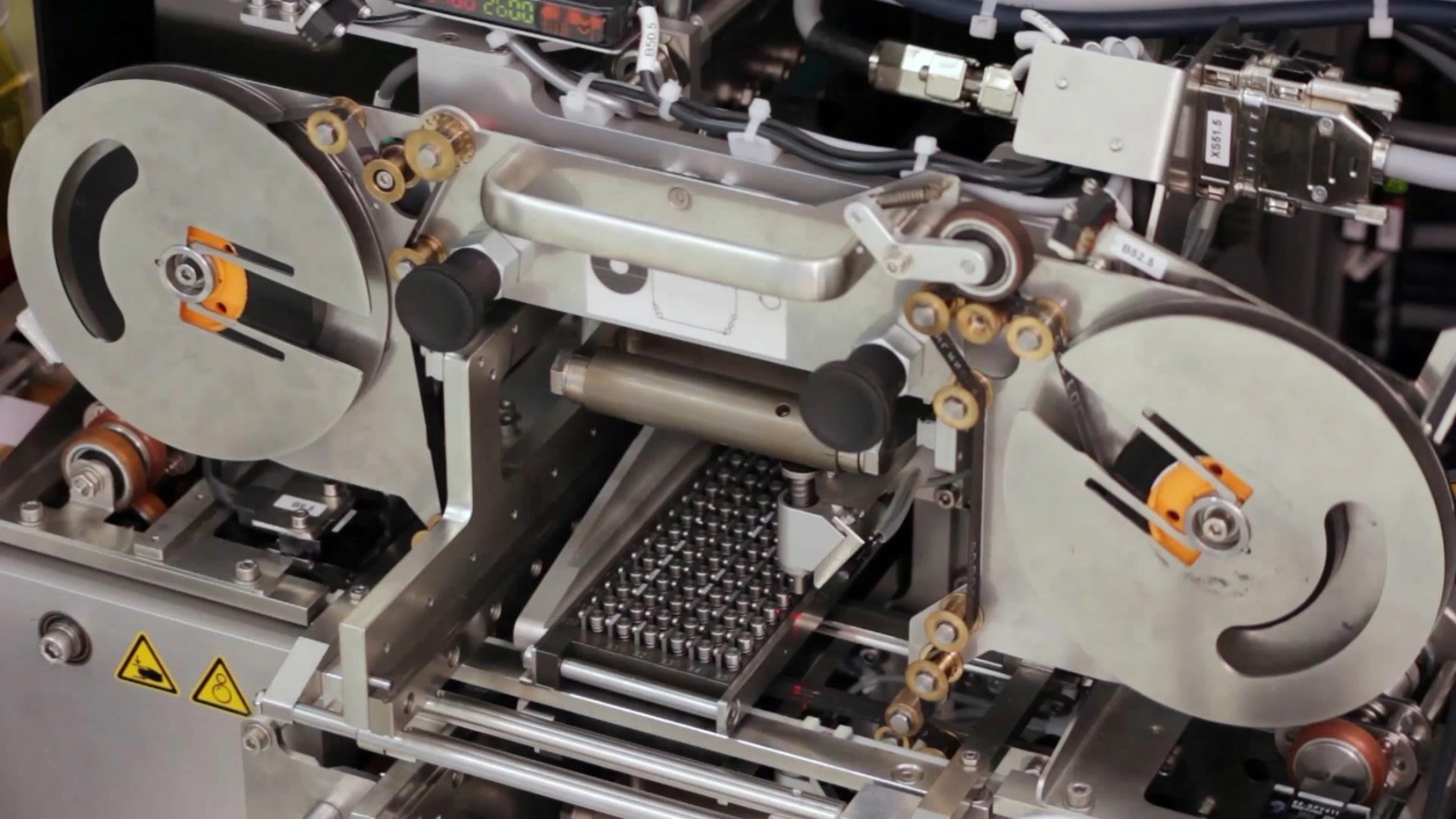
History

- cards continued to be embossed in case a transaction needs to be processed manually
- Mühlbauer Embossed Card Sample



- zip-zap machine - mechanical version of the modern POS machine





2600

B50.5

AS51.8

B52.8



15-2027-11

Arguments against Embossing

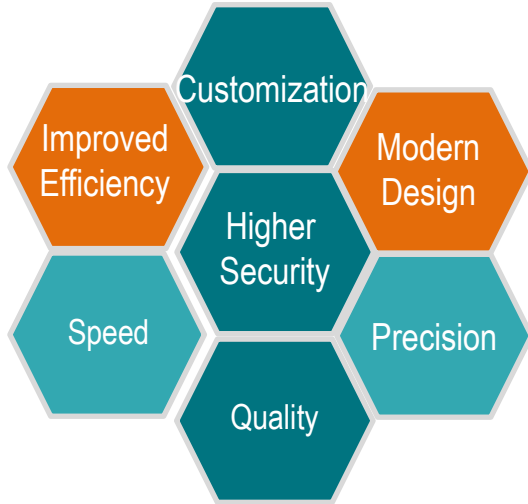
- 2008 **VISA** announced freedom of choice for the banks in terms of perso technology
 - the embossing process has increasingly lost this technical purpose because of electronic payment processes
 - embossing now serves more as a **visual enhancement** than as a security feature
 - Limited Security
 - Cost and complexity
 - Aesthetic considerations



Personalization Technology Alternatives



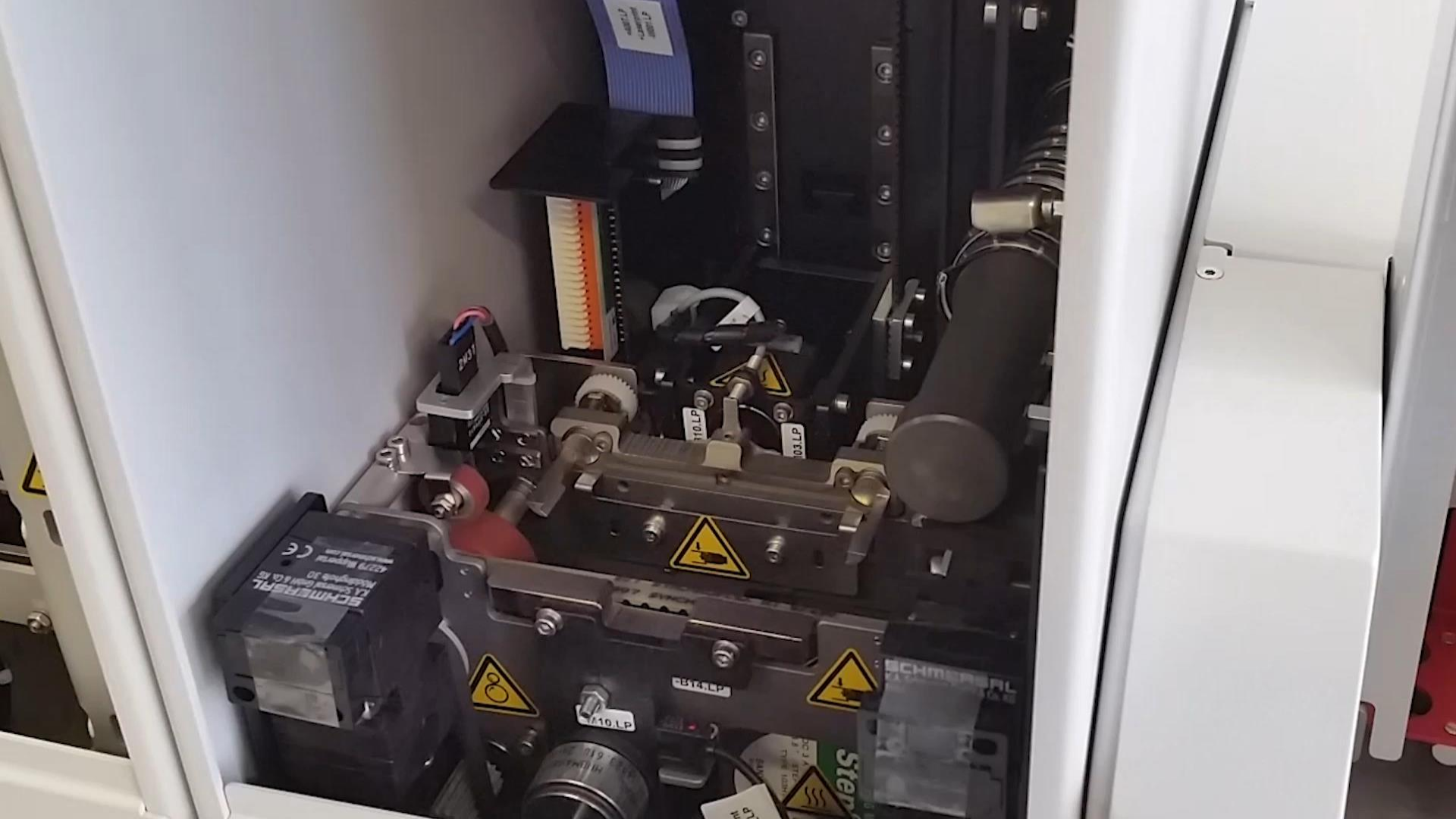
Laser Personalization





**GAIN AN
ENORMOUS
ADVANTAGE**
in Metal Card Personalization





- DPSS Lasers – for „premium“ marking qualities
- Fiber Laser – for „economic“ investments & long term usage (life span of the laser light source)
- CO₂ Lasers – for „special“ applications



FIBER LASERS



GREYSCALE LASER - LES 20 FP



GREYSCALE LASER - LES 22 FP



FIBER LASER - LES 31 F



FIBER LASER - LES 32 FP

DPSS LASERS



DPSS LASER - LES 16



DPSS LASER - LES 25

CO₂ LASERS



LES 30 C



LES 30 C-SC



LPS 150



Banking Cards & others based on PVC

PRODUCTION VOLUME / THROUGHPUT



SCP 60 NOVUS



SCP 501/801/1501

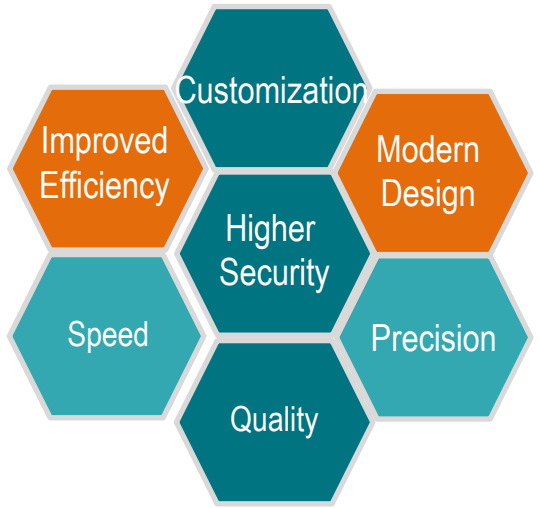


SCP 4000

ID Cards & others based on PC



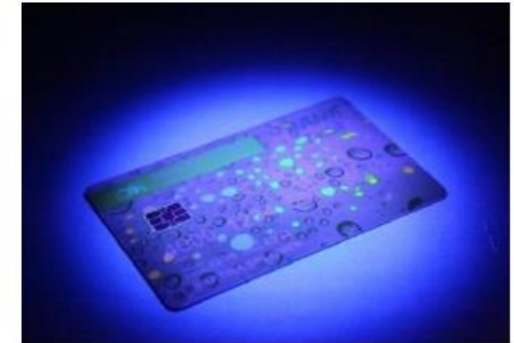
DROP on DEMAND Inkjet Personalization



Mühlbauer – Color DOD-Inkjet Printing

Advantages:

- Real full „edge-to-edge“ printing –
 - simplifies the blank card stock management
- High resolution of 600 dpi – perfect print quality
- Available for different substrates, as single pass print engine
- Various applications, e.g. payment cards; loyalty cards; ID documents
- Several additional features with varnish
 - **(MB Liquid Coating)**



Mühlbauer – Black/White DOD-Inkjet Printing

- Depending on kind of substrate, 2 kind of personalization processes available

#1: white substrate -> white data elements are „non-printed“ areas

#2: dark substrates -> special ink printing system with white ink



Picture1: white card body & full color edge-to-edge print



Picture 2 & 3: silver / golden card body with white + black ink prints



Varnish is an innovative card feature:

- For commercial and non-commercial cards providing a NEW kind of tactile surface structure
- Types of varnish:
 - **Basic:** Clear varnish



Picture: Clear Varnish with tactile structure

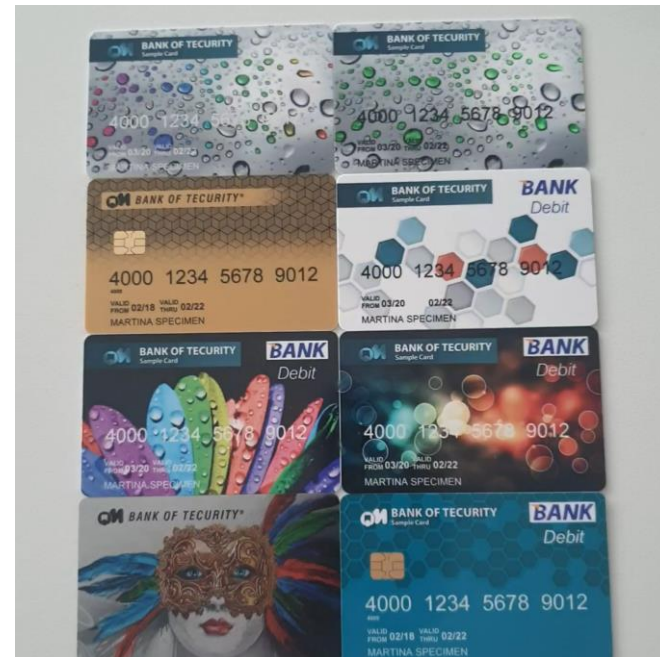


Varnish is an innovative card feature:

- Types of varnish:
 - **Enhanced:** UV fluorescent (clear under normal light)



Picture: UV fluorescent varnish (green)



Video



Varnish as an „**add-on**“ feature:

- For mass commercial & non-commercial cards = refining capability



Always perfect matching of varnish to the offset print!





Banking Cards & others based on PVC



ID Cards & others based on PC



Embossing vs Laser Engraving vs InkJet: Process

PROCESS	Embossing	Laser Engraving	DOD InkJet Printing
			
Durability of characters	*	***	**
Flexibility (font type, size,)	*	***	**
Color	**	*	***
Process Stability -> uptime	*	***	**
Dual Interface Antenna (size)	*	***	***
SUMMARY:	*	***	**



- Market Experience of more than 35 years with >80.000 systems
 - One Stop Shop technology partner with full product range
 - In-house development, production and qualification
 - World Wide direct Service Support 24/7
 - Fully independent technology partner
 - German Based Quality & Reliability
 - Expertise proven by World-Wide References at all Market Leaders
 - Flexible Business & Commercial Models
 - unbeated delivery times
 - Full-Warranty Principle with free hotline support



Thank you for your attention

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