

# Innovative Technologies & Solutions for High Quality Personalization



# Application Areas



## ID CARDS & Passport

- NID cards
- Drivers Licenses
- Health cards
- Access cards
- ...



## BANKING CARDS

- Debit cards
- Credit cards
- EMV cards
- Metal cards
- ...



## TELCO/GSM (CARDS)

- GSM & UMTS cards
- Prepaid cards
- Multi-SIM cards
- eSIM
- ...



## SPECIAL CARDS

- Gift cards
- Loyalty cards
- Paper cards
- ...

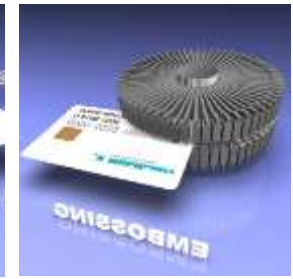
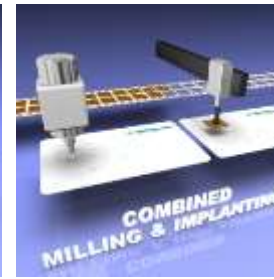
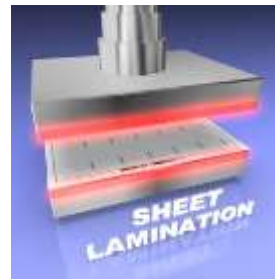
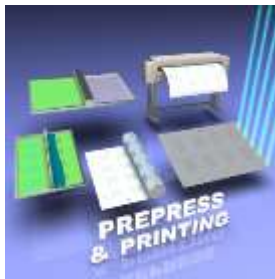


# Innovative Technologies for High Quality Payment Cards



## Standard Manufacturing Process:

- **Offset Print on Sheets (Artwork)**
  - Collating, Lamination & Punching of sheets
  - Milling & Embedding of chip
  - Personalization of card holders data
- Production of blank card bodies for each individual card type in „advance“
  - Binds production resources, material and cause stock management
  - Requires „long“ time to issue „new“ cards



Standard Manufacturing Process:

- Result: High value card body for each card type -> demand of secured storage and secure handling



Alternative:

- Reverse Transfer Printing Process Technology, but this cause high costs for print materials and additional efforts for material management



# New Generation of Payment Cards

## Simplify the Production

### Simplify the Production:

- Reduce time for card design development and manufacturing
- Minimize number of blank card body types
- Reduce costs for card production and personalization



- Usage of unified blank card bodies



# New Generation of Payment Cards

## Simplify the Personalization

### Simplify the Personalization:

- Full card personalization of magnetic stripe, chip and optical card data by inkjet (600dpi)
  - Increase machine throughput and production output
  - Reduce costs for card personalization by usage of FULL card-size color DOD printing technology
  - Reduce material wastage and minimize material disposal effort (non-sensitive waste)



- Full personalized Payment card (samples for Debit & Credit cards)

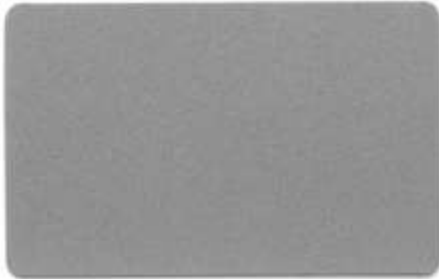




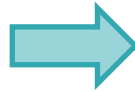
# New Generation of Payment Cards

## Simplify the Personalization

... another example with Gold & Silver Cards:



➤ Blank card body



➤ Personalized in black color



... or in full color with Liquid Coating



# New Generation of Payment Cards

## Biometric Cards

### Next Generation of Biometric Cards:

- Innovative Payment cards with integrated Fingerprint Reader
  - Energy supply for card holder authentication, payment transaction processing completely by RFID (without battery inside card)
  - Secures every single payment transaction (independent of purchase value) which would increase user acceptance



- Full personalized Biometric Payment card (samples for Debit & Credit cards)
- Solution based on Mühlbauer TeConnect® and DICL



# New Generation of Payment Cards

## Potential of Cost Reduction

Step in a better card product:

- Print of card holders signature during personalization
  - Card body doesn't require the additional signature panel
  - Cost saving (material) and faster card manufacturing
  - Printing of signature by DOD and protection with Liquid Coating (LQC)
  - Secures the card already before shipment against misuse



- Printed Signature, secured by Liquid Coating (LQC)

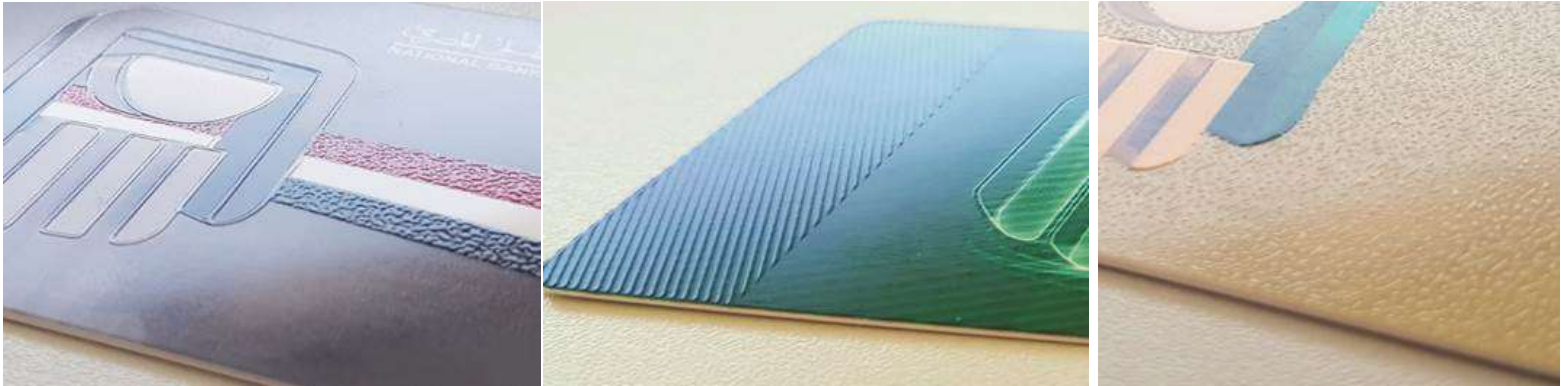


# New Generation of Payment Cards

## Potential of Additional Card Feature

Additional / NEW Card Design Feature:

- Improved card design
  - By usage of Mühlbauer standard Liquid Coating (LQC)
  - New card surface design with glossy OR matt structure
  - Also for a better card surface protection and enhanced resistance against abrasion



- Sample Payment cards with standard Liquid Coating

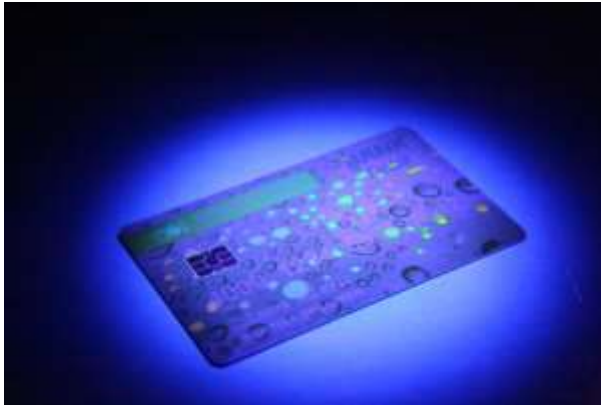


# New Generation of Payment Cards

## Potential of Additional Security Feature(s)

### Additional Card Security Features:

- Increase of card security
  - By usage of UV fluorescent ink for card surface protection -> Liquid Coating (LQC)
  - Possibility on card front side as innovative card structure in addition
  - Possibility on card back side as additional security element (UV ink for signature)



- Sample Payment card with special Liquid Coating under UV-light

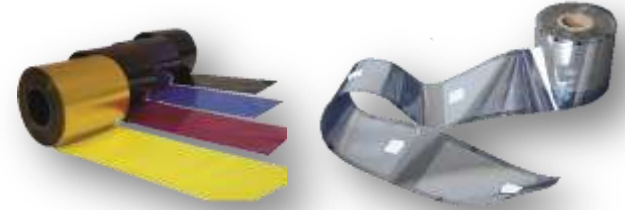


# New Generation of Payment Cards

## Personalization Cost – Reduction & Production Efficiency Increase

### Consumable costs per card:

- Sample Card by D2T2 Printing Process approx. 8-12 Cents
- Sample Card by Re-Transfer Printing Process approx. 38 Cents
- Sample Card by DOD Inkjet Printing Process approx. 2 Cents ONLY



- DOD Inkjet printing process cause **-80..95%** material cost savings!
- Full color DOD Inkjet printing machine speed is 6,000 cards/hour → 2-4-times faster!  
→ 2-4-times more production capacity with just 1 machine!



- Consumable materials for DOD Inkjet Printing process



### High Value Cards:

- Innovative Payment cards by a valuable card material and „metallic sound“ of the card by usage of those
- Multiple types of „metal cards“:
  - Full metal cards
  - Metal hybrid cards
  - Further advantage: No direct consumable materials for personalization necessary



- Typically optical card personalization by **LASER** engraving technology



# New Generation of Payment Cards

## Card Personalization Systems

### Instant Issuance



SCP-I  
D2T2, Embossing

### Modular Systems



SCP 60  
up to 200 uph



SCP 501/801/1501  
up to 1,500 uph



SCP 4000  
up to 4,000 uph



SCP 6000 DOD  
up to 6,000 uph





# New Generation of Payment Cards

## Card Personalization Systems

### Modularity:

- Innovative personalization systems for innovative payment cards:
  - Example: Configurable card input /output modules



- Standard & Metal card input units for SCP 1501 and 4000 (Multijob)



# New Generation of Payment Cards

## Card Personalization Systems

Extension capability:

- Innovative personalization systems for innovative payment cards:
  - Example: SCP 6000 DOD for full color inkjet + laser



- SCP 6000 DOD with extension laser engraving

UPGRADE CAPABILITY:

- MULTIPLE LASER UNITS
  - FIBER LASERS
  - GREYSCALE LASERS
- ADDITIONAL FEATURES
  - CLI / MLI
  - MICROTTEXT WAVELINE
  - TACTILE DATA
  - GHOST IMAGES



### Data Verification Module – Enhancement of the Quality Assurance Process:

- To ensure correct personalization of the card or ID-document
- Integrated in the personalization machine - at the end of the machine; just before the output
- Check of all produced cards – 100%
  - Linked with personalization platform manager MCES
  - Linked with production management software
  - Physical access to the module by authorized staff only
    - by minimum two persons to avoid human mistakes & manipulations



➢ Sample: Data Verification Module in SCP 1501



### Data Verification Module – Enhancement of the Quality Assurance Process:

- Just one (1) single card inside the verification module
- Reading & Check functionalities of:
  - Chip – contact/contactless based -> ATR & ATS, reading of personalized data
  - Magnetic stripe -> reading of track 1,2,3
  - Camera system -> optical reading of personalized data on card front side & card back side
  - Verification of the identified document data with original personalization data -> decision true or false
    - Good result: transfer of document into the output unit
    - Poor result: transfer into rejection box / stop of system & alert



# Innovative Technologies for High Quality Identity Cards



# High Quality Identity Cards

## Card Holders Portrait – Greyscale goes to Color

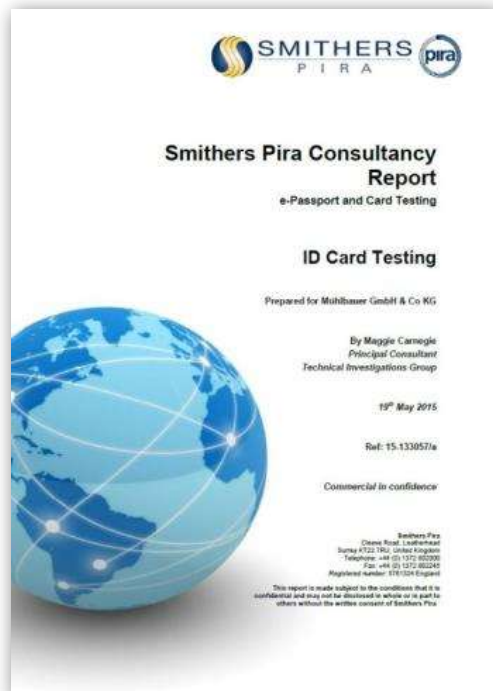


### Demands for secure Identity Documents:

- Usage of Polycarbonate material
  - Lifetime & usage of the document for 10 years
  - Increase number of security features
  - Add NEW feature(s) to existing security features



### Security Level



MB D2T2 Picture

MB Embedded Picture

MB ALFRESCO Picture

MB DOD Color Picture



### Durability Level



# High Quality Identity Cards

## Card Holders Portrait in COLOR – Mühlbauer Technologies

10+

Lifetime of  
more than 10 years



Inkjet (+LOC)



Laser



Inkjet+Laser+LOC



Embedded Picture



Alfresco+Patch



Alfresco+LOC



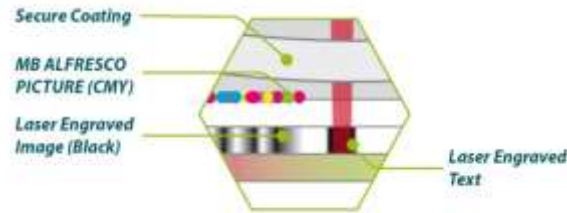


# High Quality Identity Cards

## Card Holders Portrait in COLOR – Mühlbauer Technology ALFRESCO



Inkjet + Laser = MB Alfresco®



Alfresco+Patch



Alfresco+LQC



# High Quality Identity Cards

## Mühlbauer Technology ALFRESCO + Patch



**MB ALFRESCO**

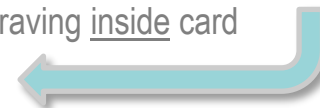


Protective Patch (Clear)

Alfresco+LQC



Laser engraving inside card



DOD Print on Card Surface

Card Body



# High Quality Identity Cards

## Mühlbauer Technology ALFRESCO + Partial Patch



**MB ALFRESCO**



Partial Patch – Combination with:

- Security feature CLI/MLI
- Tactile laser feature



Alfresco+LQC



# High Quality Identity Cards

## Mühlbauer Technology ALFRESCO + Liquid Coating (LQC)



### MB ALFRESCO



Alfresco+LQC



- Laser Engraving inside Card
- DOD Print of Liquid Coating
- DOD Print on Card Surface
- Card Body



### Benefits of MB Alfresco & Liquid Coating:

- Ink is translucent
  - 1. Visibility of Holgram (e.g. overlapping the photo)
  - 2. Visibility of UV security print of the document



Alfresco+LQC 



# High Quality Identity Cards

## Mühlbauer Technology LIQUID COATING (LQC)

### Benefits of MB Alfresco & Liquid Coating:

- Ink is translucent
  - 3. Visibility of Relief Embossing & Microtext of the document after LQC processing
  - 4. Various types of coating designs – also belonging to the document holder's photo geometry



Alfresco+LQC



# High Quality Identity Cards

## Mühlbauer Technology LIQUID COATING (LQC)

Mühlbauer LIQUID COATING (LQC) is:

- Surface Protection
- Design Feature
- Part of Security Concept



Alfresco+LQC



...for high secure ID Card & Passport Documents.





Mühlbauer  
ALFRESCO &  
LIQUID COATING

are tested and certified by:

- Smithers Pira
- FOGRA

**10+**

Lifetime of  
more than 10 years





### Mühlbauer LIQUID COATING (LQC):

- Surface Protection
- Design Feature
- Part of Security Concept

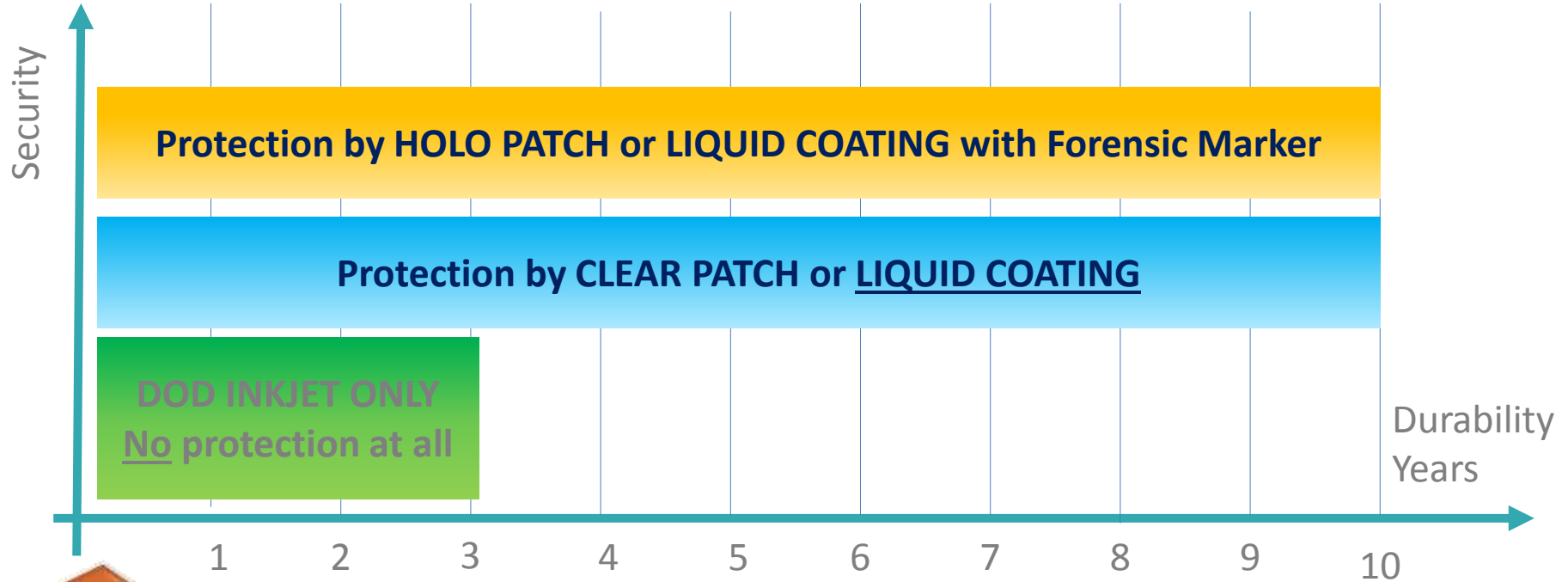


- Sample ID document with special Liquid Coating under UV-light



# High Quality Identity Documents

## Mühlbauer Technology Liquid Coating (LQC)



### Laser Engraving:

- Optimized laser marking types:
  - Accordig product: ID-card, Passport, Banking card (e.g. Metal card and/or PVC)
  - Accordig security feature applications, e.g. „Clear Laser Marking“; „Picture in Shadow“
  - Accordig volume: small/medim/high volumes



Sample: Clear Laser Marking



Sample: Picture in Shadow



### CARD Personalization Systems



SCP 60 NOVUS  
up to 120 uph



SCP 60  
up to 200 uph



SCP 300  
up to 600 uph

COMING  
SOON



SCP 501/801/1501  
up to 1,500 uph

COMING  
SOON



SCP 2000  
up to 2000 uph



SCP 4000  
up to 4,000 uph



SCP 6000 DOD  
up to 6,000 uph

PRODUCTION VOLUME / THROUGHPUT

NEW



# Thank you for your attention

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