



Mühlbauer

High Tech International

MB EMBEDDED PICTURE

MÜHLBAUER COLOR FAMILY



MB EMBEDDED PICTURE

Color Picture inside Card Body

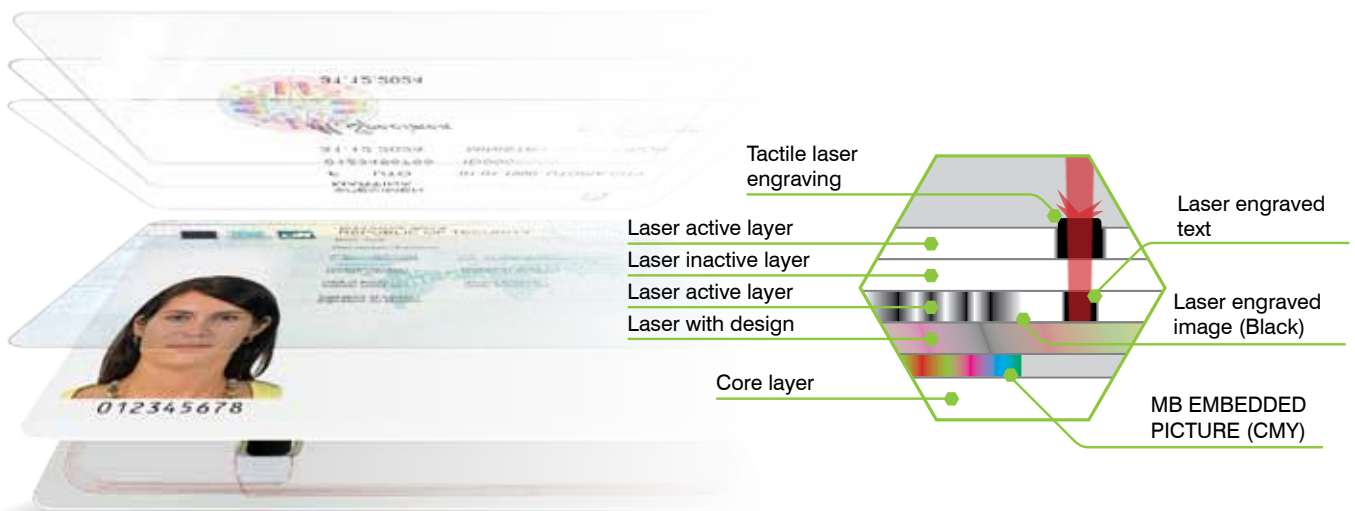
The photo on the personalized identity card is the main visual identifier of the document's holder. It is of utmost importance to present this main identifier in a perfect quality as well as to apply suitable protection against counterfeit attempts to change or manipulate the photograph. Moreover a main influence factor of the document specification is the service life-time for the complete identity document as well as the photo.

The launch of the grayscale laser engraving technology on polycarbonate documents marked a breakthrough for the personalization of identity documents. During this process the holder's portrait is laser engraved inside the multi-layered polycarbonate document structure and thereby protected against any kind of manipulation or substitution. Furthermore the latest laser engraving process allows the engraving of the

high-resolution photos while keeping all the original photo details, ensuring a perfect authentication accompanied by a high level of security and durability. This technology is the first choice in different forensic committees around the world with regard to these characteristics.

An identity project, however, must not only fulfill highest standards of security and durability but also needs to gain the acceptance of the general public. Authorities are faced with the general opinion that the implementation of grayscale images means taking a step backwards in technology.

Because of that reason Mühlbauer has extended its portfolio with the Mühlbauer Color Family containing MB D2T2 PICTURE, MB ALFRESCO PICTURE and MB EMBEDDED PICTURE. These different technologies are designed to meet the various demands with regard to quality, cost efficiency and durability.



Facts & Figures

Applications	High Secure Cards, Identity Cards, Driver's License, Polycarbonate Passport Datapages
Durability	10+ years ^{1) 2)}
Resolution	Up to 1440 dpi
Card Material	PC, PVC, other materials on request
Consumables	MB EMBEDDED PICTURE ink
Central Security Aspect	No blank documents, Personalization on different layers of document
Personalization Infrastructure	Centralized with accompanied document production

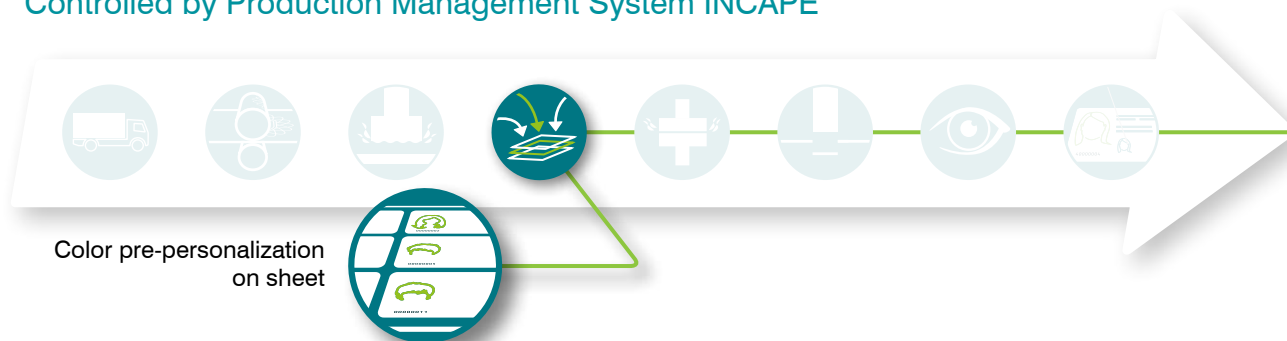
¹⁾ Depending on normal use conditions

²⁾ Depending on used card material

Conventional color picture personalization technologies are in broad use. However, it has its limitations in durability, especially in the form of light fastness. Additionally the colored photo is on top of the document's surface which might be susceptible to manipulation of the photo. Therefore Mühlbauer has been looking for the next color photo technology. The main question was: "Why not start personalization already during the production of the

document?" Due to the vast experience with its own equipment, Mühlbauer knows the document production and personalization process by heart. The well proven document production workflow therefore has been extended by an additional pre-personalization process step before the different polycarbonate layers are collated and laminated together. With this approach the color image is irreversibly located inside the document body.

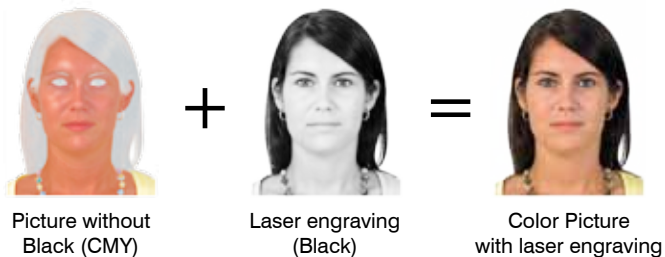
STANDARD INDUSTRIAL PRODUCTION FLOW Controlled by Production Management System INCAPE



The sophisticated MB EMBEDDED PICTURE technology smartly combines color picture personalization with laser engraving. To achieve the high-secure personalization result, the image of the holder is split into two parts using special image processing algorithms. The converting process transfers the picture information, which describes the details (forensic information), into a greyscale image, whereas the remaining color parts are converted to a separate color image. The holder's portrait is then pre-personalized by a special inkjet printing on a layer of the document construction with up to 1440 dpi resolution. The pre-personalized products are completely tracked during each production step and the

reject handling is controlled by the INCAPE production management system. During the personalization process, the remaining greyscale information containing all contrast information of the picture is engraved into the inner layers of the document by using laser engraving technology. The final result is a high resolution color picture, which shows utmost details. The greyscale picture can be additionally verified under IR light.

The three main advantages are obvious: First of all the special inkjet personalization technology guarantees perfect quality with up to 1440 dpi resolution and durability also with regard to light fastness. Secondly the photo is equally protected from substitution and manipulation as in the laser engraving technology because of being inside the multi-layered document construction. Taking document security into account, MB EMBEDDED PICTURE finally offers a feature which is not available in any other personalization technology: There are no blank documents available anymore which can be used for fraudulent activities as each document is pre-personalized with the photo.



MB EMBEDDED PICTURE combined print and laser engraving personalization



Color picture inside



No blank documents



High-resolution color picture



On demand production



100% automated production



Lifetime of more than 10 years ¹⁾

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