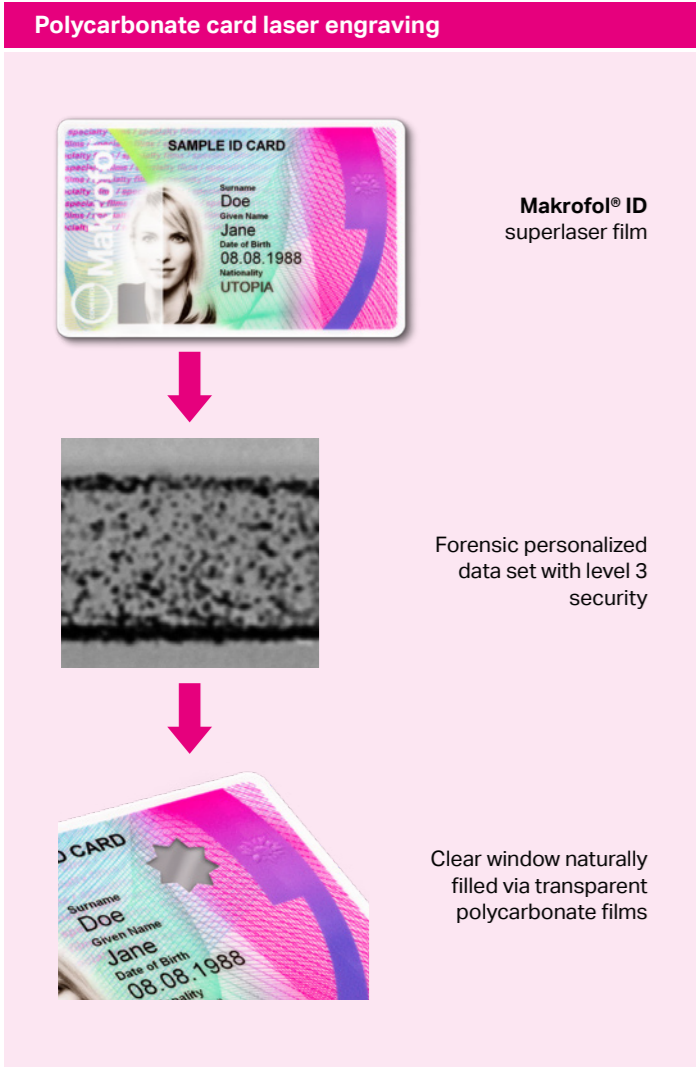


Choose Covestro polycarbonate films to enable very high security and durability for citizen identification documents



Successful programs with the government

Covestro **Makrofol® ID** polycarbonate films have been used in national identity cards, passports, driver's licenses and border crossing cards for many years

Highly tamper resistant

Makrofol® ID polycarbonate film layers are inseparably bonded without requiring an adhesive. It's no longer possible to gain access to the card interior without causing irreversible damage

Doing more with less

Makrofol® ID superlaser polycarbonate film requires only 75 % of the laser personalization system power settings compared to standard polycarbonate film for the same photo image and text resulting in reduced cycle time, lower system cost and maintenance

Proven quality

Makrofol® ID superlaser has higher contrast ratio for laser personalization with less risk of bubbles during laser personalization

Forensic data set

Makrofol® ID superlaser polycarbonate film (core and overlay film) have level 3 forensic security feature after laser personalization consisting of a three-layer structure which is nearly impossible to manipulate

Latest clear window concept

Makrofol® ID thin high opaque white polycarbonate films can achieve faster lamination process due to thinner film layer for the clear window construction within the polycarbonate card

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Security documents manufactured with Makrofol® ID for many years

Covestro is among the leading suppliers of polycarbonate films which are used for manufacturing highly secure ID documents such as ID cards, passports and driving licenses.

Covestro offers a variety of different polycarbonate films especially designed for manufacturing ID documents as well as security elements and raw materials for security inks. A large number of countries have decided to use **Makrofol® ID** for the manufacturing of their citizen's ID documents.

Today, **Makrofol® ID** has become a familiar name for the substrate material used for manufacturing secure plastic ID documents.

Please contact Covestro to discuss how **Makrofol® ID** polycarbonate films can help make your government identification documents more secure.



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Leveraging polycarbonate films for highly secure and robust identification documents.

A comparison of industry card substrate materials.

Makrofol® ID



Secure your citizen identification documents today with polycarbonate films

Today, more and more countries and citizen identification programs are turning to polycarbonate as the material of choice to construct robust and secure identification documents. Preventing counterfeiting, alteration and data substitution are some of the key government concerns relevant to ID document security.

By leveraging polycarbonate substrate for ID cards and passport data pages, governments can enable highly secured identification documents which are highly tamper resistant, easy to verify and last minimum of 10 years in compliance with stringent requirements of core government ID programs.

Polycarbonate has been used for government identification programs for many years and various core government ID programs around the world such as national ID cards, driver licenses, passports and border crossing cards are created using polycarbonate substrate material.



Successful government identification programs start at the document design and creation process. Choosing the most appropriate substrate material based on the key criteria of security, reliability, durability and quality aspects are some of the key concerns for identification document programs today.

ID cards and passport data pages leveraging 100 % polycarbonate films will form a monolithic structure (mono-block) after lamination and cannot be separated.

Enabling innovative security concepts for ID cards and passports to protect the physical document and the chip and content within

Highly tamper resistant

Personalization happens inside the card via laser engraving with very high security

Very high image resolution

Polycarbonate substrate can acquire very high image resolution for personalization on identification documents

Broad operation temperature range

Polycarbonate card substrate can operate in a wide range of temperature from -30 °C to 125 °C compared to other ID card substrates

Attempts toward document attacks will leave tamper evidence to enable very high security for the personalized data and features incorporated within the card.

Lamination without adhesives

Polycarbonate is laminated by temperature and pressure to create a monolithic block - no adhesives are required

Very fast processing time

Polycarbonate films have very fast cycle time for personalization compared to other substrate materials

Very high range of security features

Polycarbonate cards allow the implementation of a wide array of overt, covert and forensic security features during the card construction and personalization processes

ID card substrates and general applications

Substrate	Advantages	Limitations	Common Applications	Card Durability
PC Polycarbonate	<ul style="list-style-type: none"> High laser engraving quality including Level 1 and 2 security features (tactile engraving, clear window, changeable laser image and more) Can be laminated without adhesives High temperature and impact resistance No recurring printing ribbon supplies needed Compatible with contact and/or contactless chips 	<ul style="list-style-type: none"> Higher material cost 	<ul style="list-style-type: none"> High security documents such as national ID, driver license, passport data page, border crossing cards, etc 	<ul style="list-style-type: none"> Approx. 10 years
PVC Polyvinyl Chloride	<ul style="list-style-type: none"> Low material cost Receptive to color dye printing Compatible with most laminate materials Easily configured with contact and/or contactless chips 	<ul style="list-style-type: none"> Short lifetime of cards Risk of counterfeiting (blank cards can be purchased online) Delaminates and distorts with stress and age over time May bend when laminated 	<ul style="list-style-type: none"> Financial cards, membership cards, loyalty cards, staff access cards, some government ID's 	<ul style="list-style-type: none"> Approx. 3 years
PET Polyethylene Terephthalate	<ul style="list-style-type: none"> Crystalline plastic with higher heat resistance compared to PVC Compatible with contact and/or contactless chips 	<ul style="list-style-type: none"> Limitation in security features compared to PC cards Not as durable as PC Require laser receptive layer in card construction for laser engraving 	<ul style="list-style-type: none"> Transport cards, financial cards, some government IDs 	<ul style="list-style-type: none"> Approx. 6 years
Composite PVC/PET	<ul style="list-style-type: none"> PVC core is easily embedded with chip PVC outer surfaces are easily printed with dye diffusion thermal transfer PET layers improve strength and lifetime Same offset printing and card construction characteristics as PVC 	<ul style="list-style-type: none"> Hybrid cards may be more expensive than the price of PVC cards May still undergo similar PVC shortcomings 	<ul style="list-style-type: none"> Transport cards, financial cards, driver license 	<ul style="list-style-type: none"> Approx. 5 years
Synthetic Paper/PET	<ul style="list-style-type: none"> Synthetic paper material receptive to dye and inkjet printing with tear resistance More robust than standard paper Durability of the card depending on the overlay film substrate used 	<ul style="list-style-type: none"> Does not bond to itself as require other substrate layers (i.e. PET) Identification documents made only by synthetic paper material not possible No mono-block construction possible Easy to counterfeit as widely available online 	<ul style="list-style-type: none"> Loyalty cards, membership cards, school ID, some driver licenses 	<ul style="list-style-type: none"> Depending on card construction