

# INFOSECURA

*A magazine for the security printing industry worldwide, published four times a year by Intergraf in Brussels and mailed to named members of the security printing community, such as security printers, their suppliers, banknote issuing, government and postal authorities as well as police forces in more than 150 countries.*

## **Intergraf International Security Printers Conference**

**Copenhagen**

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**INTERGRAF**

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## Unforgeable, verifiable and economical?

The subject of this issue of Infosecura is banknotes, or more precisely, security features on banknotes. In the last decades, banknotes have become very sophisticated and every time a central bank decides to issue a new series, not only will the design be on an artistically higher level, the security features will be more advanced, much more difficult to counterfeit and probably more expensive as well.

Security features are developed by security printers and banknote paper makers on the one hand - we are bringing examples from De La Rue and Giesecke & Devrient - and suppliers of materials to the industry, such as ink, foils and holograms on the other. In this issue we look at the new features by Crane and Sicpa. To do it justice, the subject would need a far more voluminous magazine than the present one and for space reasons alone we had to omit even mentioning such successful security feature developers as OVD Kinegram and Hologram Industries, etc.

Developing security features is economically risky, as the development process, involving usually advanced science, is long and expensive and the acceptance by central banks is uncertain. Often the first customers for new features or new substrates are very small and exotic countries, which function as a very useful reality check. Many of these countries are outside the temperate climate zone and therefore banknotes have to endure a far more challenging environment than that of Europe or the USA, making for an ideal testing ground. Fortunately, banknotes are also - still - a symbol of national pride and encouraging the central bank of country X to be the first to use the very advanced security feature Y has so far not been too difficult. More difficult has been the jump from a small country to a big one. Among substrates, after a number of several denominations in small to medium countries and even a relatively large one such as Mexico, Guardian made the leap to the whole series in Canada and from there to the future £ 5 and £ 10 notes for Great Britain. Sicpa's SPARK made the big time with the Euro and the US Dollar and Crane's Motion finally brought the currency of its home country, the USA, into the 21st century. It will now be interesting to see if and when any existing and new users will adopt the new versions of these successful features, e.g. Sicpa's SPARK Live and Crane's Rapid for their currencies.

Another testing ground for new materials and features for banknotes are commemorative notes. The print-runs are usually rather small and should a disaster occur,

the everyday use of currency and thus the national economy, will not be affected. Morocco thus gave Landqart's Durasafe a start. Now Poland, as the second among European nations, is testing the water with the 20 Złoty banknote printed on Innovia's Guardian. (Rumania was the first European country to go totally "Polymer".)

Alternative substrates aside, the idea behind the impromptu investigation into the security features used by a handful of different countries was to demonstrate that traditional security features still hold a large and important place on the world's currencies.

There are very few security features that made the leap from one side of the security printing world - banknotes - to the other side - passports and other ID documents. The one that did, is the Kinegram from Kurz and OVD Kinegram resp. The security characteristics of the Kinegram will get their deserved exposure in one of the next issues.

The Kinegram has the advantage that it is transparent and can cover personalized information and even the bearer portrait on a passport data page without influencing visibility. Although one could imagine an advanced security thread such as Motion or RollingStar on a polycarbonate data page, any such device would decrease the space available for personalized information. And on ID-1 cards any additional security feature that decreases available space seems even more unlikely.

The justification for the continuing development of security features is to raise the hurdles for prospective counterfeiters so high, that counterfeiting a given banknote becomes uneconomical. The second reason is to assure the everyday user with one glance, that the note is genuine. For this boldness and simplicity are the key words. Some existing features and even their second generations are brilliant examples of simplicity, while others that have added complex attributes to once simple structures pass by the man in the street. Any level 1 security feature that cannot be immediately recognized and verified by the unsophisticated user is a failure as well as a waste of money. In these times, when profit margins for banknote printing are squeezed and central banks are loath to pay more than they absolutely have to, every feature has to pay its way. Although central banks usually say that they are committed to cash, cash is not their only option, there are others, cheaper to produce and to process.

The editor

## A time for a wide vision and a narrow focus

*The 2015 Security Printers Conference and Exhibition is less than six months away. Online registration for the conference and exhibition is open and it is time to begin planning for this total immersion in the world of security. The event will cover every aspect of banknote and document security, from standardisation to fighting counterfeiting - and in our current world situation there could hardly be anything more topical and urgent.*

In technology driven industries such as ours, looking beyond narrow borders to developments that happen in adjacent sectors is vital for detecting future threats and finding early opportunities. As the only conference in the industry, Security Printers has for decades given participants the invaluable opportunity to see the industry as a whole and to observe developments and detect crosscurrents from within and without their specific field. But this wide view of the industry does not come at the expense of a deep examination of the developments and trends in either of the main sectors – banknotes and ID documents, may they be technological or driven by economic, political or societal forces. As the conference unites security printers and their suppliers with their clients in banknote and ID document issuing authorities and law enforcement agencies, social interaction between members of these groups is a major ingredient and a great advantage Security Printers 2015 offers. At the last Intergraf event, Security Printers 2013 in Vienna, of the 920 participants from 60 countries, 110 or 12% were representatives from central banks, ministries and police forces. 46% of the conference delegates in Vienna were printers and 40% suppliers to the industry.

Intergraf, the organizers of Security Printers 2015, have structured the event into two and a half days, 10 sessions and panel debates. After introductory plenary sessions for all delegates, those interested in banknote printing and those in ID documents participate in separate, in-depth sessions. Among the topics to be discussed in Copenhagen are:

- Innovation and new technologies in security printing documents
- Optimisation of operations and security through traceability in the supply chain
- Shaping the future of travel documents through standardisation and increased

functionality

- Interaction of banknotes, ATMs, counting and vending machines
- Breeder documents – the cornerstone of identity management
- Digital vs analogue in the production of security documents and banknotes
- The eternal fight against counterfeiting
- Ethics and trust in the realm of identity
- Mobile verification of security documents
- From counterfeiting to cyber crime

### Registration

Online registration is now open - to register for the conference and benefit of the early bird rates, visit [www.securityprinters.com](http://www.securityprinters.com).

### The Exhibition

Next to the conference, the Security Printers Exhibition is the second important pillar supporting the purpose of the event, which is to inform the industry, to bring clients - issuing authorities - and producers - printers and suppliers - together. Over 90 of the leading companies in the banknote and secure document field have already booked an exhibition space at Security Printers 2015. The exhibitors list is available at [www.securityprinters.com](http://www.securityprinters.com).

The exhibition is of great value to exhibitors and visitors alike. 85% of the participants in our post-event survey indicated they had established good to excellent business contacts at the previous edition in Vienna. Security Printers 2013 welcomed almost a thousand participants from issuing authorities, central banks, ministries, police forces, security printers and suppliers. The networking events in the exhibition area (Welcome Cocktail on Tuesday, 21 April, coffee breaks, walking lunch and the Exhibition Aperitif on Wednesday 22 April) offer limitless opportunities to meet new customers.

## INTERGRAF - DATES TO REMEMBER

10/11/2014

02/03/2015

30/03/2015

22-24/04/2015

**Start of registrations**

**Last day of early registration fee**

**Deadline for registrations**

**Security Printers International Conference and Exhibition**

Further details at: <http://www.securityprinters.org>



## Breaking tradition but honouring history

*Poland's first banknote printed on polymer is a clear departure from the tradition of having the national currency printed on paper. But as a commemorative banknote, rather than a circulation one, its purpose is also to remind Poles of a time in their recent collective past, when being patriotic meant more than singing*

Poland's new commemorative 20 Złoty banknote on polymer.



On August 5, Narodowy Bank Polski, Poland's National Bank, issued a new 20 Złoty banknote. As the whole series of Złoty denominations, except the Złoty 200 note, had been updated this year, the new note is not intended for general circulation, but to commemorate an event and a personality in the history of the country.

The note refers to the founding of the Polish Legion at the beginning of the 1st World War and thus prior to the re-establishment of Poland as an independent nation. The Polish Legion played an important part in laying the foundations of Polish independence, that finally came after the war in 1919. Since the break-up of the Polish state in the

late 18th century, there had been several uprisings against the powers that occupied Poland - Russia, Prussia, becoming Germany later and the Austrian-Hungarian Empire - and in 1914, Polish independence activists were organized into the Polish Legion, which fought on the side of Austria-Hungary against Russia, at the time perceived as the biggest enemy of Polish independence. The legion was led by Józef Piłsudski, who was later to become Head of State of Poland and successful commander of Polish forces in the Polish-Soviet War (1919-21), in which Poland was victorious. Although disbanded in 1917, the Polish Legions have remained present in the national memory. This presence is due to the legend created by poets, writers, painters and composers who fought in large numbers in the ranks of the Legions.

### Honouring history

The front of the note is dominated by a portrait of Marshal Józef Piłsudski, printed, as is the surrounding text and the 20 Złoty face value of the note, in intaglio. To the left of the note is a large transparent window with a strongly colour shifting holographic image of the Belvedere Palace in Warsaw, executed in "Latitude" - a new

substrate-integrated diffractive optically variable device (DOVD). In the top left, the note shows three leaves and the number 20 in a two-colour 'Aurora' colour shift feature, as well as blue ribbon printed in the metallic effect 'Metalix'. All three features are visible from both sides of the note. A further important design element on the front of the note is a shield in blue fine-line offset print with the eagle of the Polish coat of arms printed in intaglio over it. The serial number is printed in red in letterpress and as additional security feature, micro lettering is used in several places of the front of the note.

The reverse side of the note is printed in offset and shows the Virtuti Militari Order (Grand Cross with a Star) awarded to Marshal Józef Piłsudski, the badges of the 1st Brigade of Polish Legions and the Legion's eagle. And again on the right side of the note is the transparent window with the holographic image of the Belvedere Palace.

The Polish Legion commemorative note was printed by Polska Wytwórnia Papierów Wartościowych (PWPW) the Polish Security Printing Works, a company that only recently has been authorized to print banknotes on polymer substrate. In January 2013 PWPW was awarded a Guardian Printer Accreditation certificate confirming that the company meets all requirements necessary to produce banknotes on polymer substrate. Less than twenty companies hold that certificate.

'The production of the first Polish banknote on this kind of substrate is valuable experience to PWPW' said Marek Siwiec, President of the Management Board of PWPW. However, although this was PWPW's first polymer note to be issued, the company had successfully tried its hand on producing a sophisticated house note on polymer in 2013. That note also successfully combined offset with intaglio printing - on both sides - and the use of colour shifting inks in transparent windows and other features.

In its first 'official' polymer banknote, PWPW created a product that strongly reflects the strategy of Innovia Security, to add security features specifically developed for the Guardian polymer substrate. The most visible of these features on the banknote is 'Latitude', which the manufacturer describes as a diffractive optical effect generated by a diffractive structure embedded in silver nanoparticles that are printed on the substrate

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layer. The effect of this level 1 feature is similar to those on the Canadian dollar, but while the holographic effect is visible when tilting the note, when held against the light, the entire feature turns grey with the viewer able to see through the note. The feature is not dependent on a stripe or patch application and therefore allows great design flexibility - as long as there is

a window to put the feature in. The second and third feature, which appear together in the top left of the note are called 'Aurora' and 'Metalix'. Aurora is a colour changing feature that uses multiple colour pairs designed together which offer advanced effects when tilting the banknote and when light is reflected from the feature. Metalix is a metallic effect that has a high resistance

to chemicals and oxidation; preventing the tarnishing of the metallic print colours over prolonged use. It is available in several colours hitherto unusual for metallic inks.

### Upgrade of current Złoty series

In the field of Poland's traditional banknotes, which PWPW printed in past years, the Polish National Bank launched a gradual upgrade of the security features of the Złoty 10, 20, 50 and 100 notes in early April this year. The Narodowy Bank Polski left the graphic design of the notes unchanged, but uncovered the watermark area, and introduced an iridescent ink stripe, a new UV feature and a new recto-verso register security feature, which shows a crown in an oval. However, the 200 Złoty banknote remained unaltered. The new security features will make the difference between the old and the new series obvious, but the old notes in circulation will remain legal tender.



*PWPW's 2013 experiment with polymer bees*

## Denmark's Nationalbank to close printing works

Although the volume of cash in circulation remains high in Denmark, demand for new banknotes and coins has been falling for some years, and Denmark's Nationalbank does not expect the trend to reverse. Underlying factors include declining use of banknotes for transactions, better recirculation of banknotes and an improved banknote quality so that banknotes have a longer life. All in all, this means that production of banknotes and coins at Denmark's

Nationalbank is not economical and will not be economical in the future.

Consequently, Denmark's Nationalbank has decided to discontinue internal printing of banknotes and minting of coins during 2016. Like a number of other central banks, Denmark's Nationalbank will outsource these functions to external service providers. This decision is expected to yield total savings of kr. 100 million until 2020.

## Designing Norway's new banknotes

*With a current series of Korner notes dating back to 1994, Norges Bank thinks it is time for an update. The new series, the design of which has been published in October, will break with the tradition of a prominent portrait and introduces - on the reverse side - a fairly unusual design idea.*

*Two different visual interpretations of "the Sea", the theme for Norway's new Kroner series.*

In December 2012, Norges Bank, Norway's Central Bank, announced that it had started on a project to develop a new banknote series, the eighth series of Kroner denominated banknotes. The current series, which was launched in 1994 with the 200-Kroner note as the first denomination, has now been in circulation for nearly 20 years. The new series is to have a lifetime of 15 years and to allow for security upgrades during that

period. Late in 2013, Norges Bank decided that the overarching theme for the new series is to be "the sea", reflecting its importance for Norway's business sector and economic prosperity. The image of the sea is rooted in the popular imagination, has a visible Norwegian identity, serves as a "business card" for Norway and will be relevant for many years to come, Norges Bank said.

In spring 2014, a competition was held for the design of motifs for the new banknote series. Eight of the first entries were selected by a group of experts to take part in the final round of the competition. The jury concluded that two proposals stood out: Ripple Effects by Enzo Finger, and Norwegian Living Space by The Metric System and Terje Tønnessen. The jury selected Enzo Finger's proposal as the winner of the



competition but Norges Bank decided that not his but a combination of two other proposals submitted will go on for further work. The obverse sides of the notes will be developed on the basis of the proposal from The Metric System, Norwegian Living Space. The basis of the reverse sides will be the pixel motifs submitted by Snøhetta Design called Beauty of Boundaries.

Norges Bank is now working further on motifs and designs to enable security elements intended for the public and machine-readable security elements to be designed and incorporated into the notes. For that reason, the finished notes may differ somewhat from the basis shown above. The first of the new notes will be issued in 2017 at the earliest.

## Banknotes: under- or over-featured?

*Security features are there not only to make it difficult and expensive for prospective counterfeiters to replicate a banknote, but for the general public to see immediately that they have the genuine article in their hands. Central banks therefore take care to educate users in recognizing security features. The whole gamut of security features has become very large in recent years. Billetaria, the magazine of the Banco d'Espagna lists 7 classes and a total of 26 distinct security features, several of which are produced by several companies.*

Central banks have to decide not only which features to employ on which denominations, but how many features are needed to guarantee sufficient security without confusing the public. A comparison of the number and kind of level one features used by different central banks is instructive. This - necessarily incomplete and unscientific - short survey looks at the security features in the banknotes of large countries - the EU, US, Great Britain and India, of Middle Eastern countries, - Israel, Egypt and Kuwait, one country in South America - Peru and at the currencies of countries that use polymer as banknote substrate - Australia, Canada and Romania.

### Big Countries: European Union

Although not a country, the biggest currency issuer in the western hemisphere is the European Central Bank, responsible for the currency of the European Union. In 2013, the Euro has entered its second series, the Europa Series with the € 5, which was followed by the € 10 in September 2014. The ECB employs ten different security features on or in its banknote paper: intaglio printing, portrait mould-made watermark and electrotype watermark, holographic security stripe or patch (with a portrait hologram in the Europa series), an iridescent transparent stripe with the denomination number, a security thread, micro printing, an OVI feature - the colour-changing number (on the €50, €100, €200 and €500 banknotes) - or the colour changing "Spark OVM" in the new Europa series, back/front register feature, and a UV (and UV-C in the Europa series) as well as infrared feature.

### USA

The US \$ 100, the flagship of the last generation of US dollars which, however

belatedly, entered circulation in 2013, shows most predominantly the "Motion" stripe by Crane. Equally striking is the colour-shifting bell inside a copper-coloured inkwell. When tilted, the bell changes from copper to green, an effect, which makes the bell seem to appear and disappear within the inkwell. Additional security features are a watermark, intaglio printing, security thread, a colour shifting 100, a large golden 100 on the back of the note, micro-printing and red and blue security fibres in the paper. In total there are eight security features in the \$100 note, which is here taken as the latest example of security feature application in the USA.

### United Kingdom

The Bank of England only issues four denominations of pound sterling notes, the £5, £10, £20 and £50. All notes, which until now are all printed on paper, have intaglio printing, a metallic security thread, a portrait watermark, micro lettering and a UV feature. The £5 and £10 notes have a holographic patch and the £20 has a holographic stripe. The £50 note has a "Motion" stripe instead of a holographic one. Both the £20 and the £50 have a front/back register feature. In total there are maximal 7 different security features on each denomination.

The Bank of England has announced that in 2016 a new £5 note will be issued on polymer followed one year later by a polymer £10. The security features for these notes have not yet been published.

### India

The Reserve Bank of India has changed the design of the country's Rupee banknotes very little since the introduction of the Mahatma Gandhi series in 1996 which has notes in the denominations of Rs.5,



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Rs.10, Rs.20, Rs.50, Rs.100, Rs.500 and Rs.1000. All notes carry a watermark duplicating the Gandhi portrait and all have a windowed security thread, wide on the Rs. 1000 and Rs. 500 notes and narrower on lower denominations. All except the Rs. 5 and 10 notes have intaglio printing as well as a latent image showing the denomination and a special intaglio mark to aid the visually impaired. In addition there is a UV feature showing the number panels and the Rs. 500 and Rs. 1000 notes use Optically Variable Ink for the denomination number and a see-through register feature. In total there is a maximum of seven security features on Indian Rupee notes.

*And the winners are: Watermarks, both mould made and electrottype, intaglio, and see-through register feature.*



*Above, the sophisticated back/front register of the 20 Reais note from Brazil.*

**Israel**

The Bank of Israel has announced a new series of Shekel notes and already presented the design for the new NIS 50 note, but at the time of writing had not published a list of security features for the new series. The present series has a holographic foil feature in the denomination number which also contains the value in micro numbers, a portrait watermark, a front/back register feature, a security thread, intaglio printing, latent image, optically variable ink, micro-text, a large denomination value number in Iridodin, and a serial number in UV reflective ink. The total number of security features is 10. Israel's only polymer banknote, the INS 20, has the same number of security features but instead of a watermark it employs micro perforation.

**Egypt**

According to the Central Bank of Egypt, all of the country's six denomination have intaglio printing on both sides. They also have portrait watermarks and electrottype watermarks, see-through registration features, a 1,5 mm magnetic security thread, a 3 mm holographic thread and fluorescent numbering. From the 100 Pound down to the 5 Pound notes all notes have an oval fine-line moiré anti-scanning device. The 100 and 50 Pound notes display the value also in blind embossing and the notes from 200 down to 20 Pounds display an optically variable ink feature, while the 10 and 5 Pound notes have neither blind embossing nor an OVI feature. The maximum number of security features on the current Egyptian pound series is eight.

**Kuwait**

At the end of June 2014, the Central Bank of Kuwait released the sixth issue of Kuwaiti Dinars into circulation. There are six denominations from 1/4 Dinar to 10 Dinars. All notes have intaglio printing on both sides, an OVI feature, a feature the Bank calls 'Spectrum', a watermark, a

colour-changing security thread, a see-through registration and a UV feature. The 5 and the 10 KD denomination has additionally a Spark feature. In total there are eight security features.

**Peru**

In late 2013, the Central Reserve Bank of Peru updated one note of its family of Nuevo Soles Banknotes - the 100 Nuevo Soles - by replacing the colour shifting ink in the denomination number with a Spark feature and the security thread with a Motion thread. As the other four denominations, the note has intaglio printing, a watermark with electrottype number and a see-through register feature. Instead of the Motion thread and the Spark feature, the 10, 20 and 200 Nuevo Soles have colour shifting ink in the large denomination number. The new Nuevo Soles series employs a maximum of six security features.

**Polymer currencies: Australia**

On its website the Reserve Bank of Australia (RBA) notes that Polymer banknotes were developed to make the currency more difficult to counterfeit. The current Australian Dollar series was introduced in 1992 and over the years it proved to be very resistant to counterfeits. However, this year the RBA announced that there will be a new series with new and improved security features. So which are the security features that made the polymer Australian Dollar so successful? The RBA regards the substrate itself as a security feature (although for this brief survey it is not regarded as such). The next important feature is the clear window with a white image printed in it and from the AUS\$ 10 onwards, a wave pattern and in the higher denominations the value number embossed on it. A "shadow image" visible when the note is held up to the light, replaces a watermark. Intaglio printing is used for the value number, the portrait and other pictorial elements. Finally, there is a see-through register, micro-printing and a UV feature. In total the Australian Dollar shows eight security features.

**Canada**

If Australia shows where banknote printing on polymer has been, Canada is a prime example of where it is going. Introduced in 2011, Canada was the first major western country to move its total suite of banknotes to polymer. Now all five Canadian Dollar denominations in polymer are in circulation. The notes use intaglio printing in the large denomination numbers, the shoulders of the main portrait and the words "Bank of Canada - Banque du Canada".

Most of the remaining security features

are packed into the large window and the secondary 'frosted maple leaf window'. In the large window there is a holographic and colour changing repeat of the main portrait and of different towers. The holographic stripe is a Kinegram Zero.Zero, made by Kurz, (OVD Kinegram), which shows the details and colours clearly from both sides of the note. This application of a holographic stripe within a window is said to be a "first" in an issued banknote. Surrounding the window are several numbers and words, some of them transparent. A second, smaller window in the shape of Canada's national symbol, the maple leaf, contains a frosted area that, when viewed against a single-point light source, shows a circle of numbers matching the note's value. The final number of security features is three or four, depending how one counts.

### Romania

Romania was the first European country to go fully 'polymer' in 2005. There are seven denominations in circulation and the lowest ones, the 1 Leu, the 5 Lei and the 10 Lei are printed in offset only. Curiously, on introduction in 2005, the 10 Lei note was printed with intaglio, but since 2008, it has been printed in offset. The higher denominations of 50, 100, 200 and 500 Lei are all printed with intaglio on both sides. In all notes, the dominant feature is the transparent window with a white printed image and the embossed value of the note. Although the series is printed on polymer, the National Bank of Romania claims that there is a watermark, and indeed, when held up to the light, the main portrait is repeated in a kind of shadow image, that is not visible if the note is viewed flat. The other security features are micro-perforation, optically variable ink, latent image, a magnetic security thread, see-through register, an iridescent stripe, a UV feature and micro lettering as well as golden metallic ink on one image. In the higher denominations, the Romanian Lei notes display 12 security features.

### Conclusion

The number of security features employed by the 11 surveyed currencies varies from four (Canada) to 12 (Romania). Both extremes are 'polymer' currencies but Romania's multitude, decided on about ten years ago, was probably a sign of early timidity with no single feature dominating the notes, while Canada's decision to pack the biggest punch into a dominating feature and location is a sign of supreme confidence in the new material. The Bank of Canada would probably claim more than four features, but they are all connected to the central window and Zero.Zero stripe. The secondary feature, the frosted maple leaf that displays

the denomination number when viewed against a light source, is neither obvious nor easy to use.

The paper currencies use between six and ten security features. The Euro uses most with 10 and the Peruvian Nuevo Soles least with six, but the latter uses two dramatic features, Spark OVM and the Motion stripe, while only the notes of the new Euro Europa series uses Spark. The most consistently used feature is intaglio printing, used on all notes except low denomination Indian and Romanian ones. See through register is also very popular, with nine out of 11 currencies using it. All paper currencies use watermarks - both mould made and electrotype. The differences in the number and kind of security features in polymer notes are probably more due to the time they were issued, with few of the 'dramatic' features available when the series were issued. It remains to be seen which way the polymer UK £5 and £10 notes will go. Will it be the bold statement of the Canadian dollar, which draws the eye of the user to one spot, or the traditional 'blanket' approach, cramming as many security features as possible into one note?

While in the past, most security features were part of the paper - watermarks, both mould made and electrotype and security threads - or were applied by printing, such as intaglio printing, many features are now applied independently of the printing process, either before or after. Over the years, security features have moved from discreet to showy and so far there is no irrefutable evidence for which kind of feature works better. The efficacy of security feature may also depend on the age and the cleanliness of the note, with some features being more durable than others. For example, intaglio does lose much of its 'feel' in older notes both in paper and in polymer and a dirty note will not have the 'feel' or sound of a new note on cotton paper, especially in hot and humid climates. Other, very successful features such as Crane's Motion, and indeed all window threads, are only possible on paper. And finally, the decision which security feature to choose will also be an economic one. The popularity of the see-through register feature is probably due to the fact, that it does not cost anything to add this feature to a note, while the best OVD foil and ink features demand serious investment. It is very difficult to correlate the use of advanced security features and the incidences of counterfeiting but it would be very interesting to see which effect security features have on the number of detected counterfeits - the reduction of the latter is after all the reason for these features to be there in the first place.

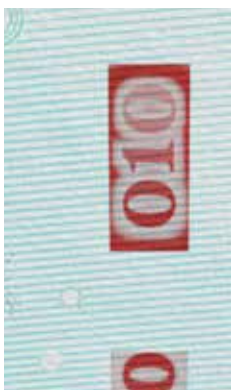


## Motion's Rapid move

*It is an economic necessity that successful security features have to change to continue to frustrate counterfeiters and to keep central bankers interested. Modern security features have become technically extremely complex and the challenge for the developers of the features is to make the result simple enough to make it interesting and understandable for users, who only spend a split second looking at it. Here is a feature that succeeded brilliantly.*



Crane's Rapid feature



When in 2006 Sveriges Riksbank, the Swedish Central Bank, released a new version of the 1000 Kronor note into circulation, it made quite a stir, not only in banknote circles but among the general public in Sweden as well. Here was, for the first time, a banknote with a security feature that did not have to be held up against the light, embarrassing both donor and receiver of the note, or subtly touched to feel if the print was raised. What the public saw instead was both novel and counter-intuitive: a wide stripe with a visual depth far deeper than the thickness of the note and two images that moved as if floating on a liquid surface at right angles to the direction the note was tilted. It was a bit like cinema. Fittingly the feature was called "Motion", and it came from America, the country of the Movies.

The note was of course printed in Sweden, at the historic Tumba Bruk printing works that the US security paper manufacturer Crane bought in 2001 from the Sveriges Riksbank and established as Crane Currency A.S. Crane's pedigree goes back almost as far as Tumba Bruk's. Crane & Co Inc. in Massachusetts, USA, has provided the US Bureau of Printing and Engraving with paper for the Dollar since 1879 and one of the early Cranes is said to have delivered banknote paper to the revolutionary hero and engraver Paul Revere, who printed the paper money of the (pre-independent) American Colonies.

In 2006, Crane did not manufacture the Motion feature itself but in 2008 it bought

the owners of the technology, Visual Physics, a subsidiary of Nanoventions, based in Atlanta, Georgia, which gave Crane exclusive control of Motion. Motion is based on an array of micro lenses interacting with graphic images, which creates simulated moving images on the security thread that not only appear to move as the bill is tilted, but also switch from one image to another.

Motion went on to be extremely successful, with 22 different currencies and 53 denominations using the feature, among them the USA, Mexico, United Kingdom, Denmark, Sweden, Chile, Tanzania, Morocco, Libya, Peru and others.

One of the biggest successes of Crane was to secure the use of Motion as one of the main features of the redesigned \$100 note. The US Bureau of Engraving and Printing had contemplated using the feature as far back as 2007 and it was incorporated into the \$100 bill in 2010, but a disastrous technical hitch prevented the denomination from being issued. It came into circulation finally in 2013. The use of Motion in the latest UK £ 50 note is another success, adding to the prestige of the feature.

### Rapid

Motion proved that micro-optics that provide visually exciting effects and extensive design flexibility are what many central banks want for their currencies to look modern and to deter counterfeiters. The question for Crane was, what to do next. Some improvements appeared in recent years such as 'Motion Switch with Micro Text', which as the name suggest, displays a micro text on the moving image. It is a clever way to deter a very pedantic counterfeiter, but by the time a suspicious user gets out a magnifying glass to examine whether a micro text is there or not, the note has been passed and the counterfeiter has made his money. The real answer came in mid-2014 with Rapid.

Motion, as something totally new, only needed to move when tilted and the images had to be recognizable. But familiarity leads to a lessening of critical observation and Crane needed something that was sharp and clear and immediate. While images in Motion are recognizable but sometimes a little blurred, Rapid provides the same motion

with sharp, clear images and a very rapid response. It only needs tilting of the note by a few degrees for the images in the thread to move. Crane points out that the optical movement will catch the user's attention even at transaction speeds under any lighting conditions. The company states that Rapid uses a newly developed lens configuration, which is naturally soil resistant and allows the use of both top side adhesives and varnish on the thread for added integration with the substrate. This naturally improves durability, making the technology suited even for high volume transaction notes.

Rapid is integrated into the paper as a window thread and the feature is able to carry additional security devices such as

fluorescence and micro text. Within the windows of the thread, the design possibilities are practically endless.

Crane stresses that its security features Motion and Rapid encourage the user to inspect the note more closely. For anyone who has never seen either feature before, this is doubtlessly true. However, it would be interesting if this could be experimentally verified or if a striking security feature - not only Motion or Rapid, but also optically variable features such as those found on the Canadian notes or even the Spark feature - encourages or discourages the average user from looking at further - or all - security features in a banknote.

## An even livelier Spark

*Looking at Level 1 security features, there are very few that are immediately recognizable and so obvious that any counterfeiter would need to try to copy them but would invariably be doomed to failure. Prominent among these select few is SICPA's SPARK feature, which is found on an impressive number of currencies, among them such important ones as the Euro. Now SICPA has introduced the second generation of the feature, SPARK Live, which promises to add even more sparkle and light and increased security to many more currencies.*

Hans de Heij of De Nederlandsche Bank mentions in his well-known banknote study, that when doing research for its new series of polymer banknotes, the Bank of Canada found that some Level 1 security features are inherently usable by the public and do not require training. With some security features, such as the holographic stripe, untrained participants were able to identify nearly all of the counterfeits even when good quality counterfeits were included. What is true for holographic stripes is probably also true for OVDs such as Sicpa's Spark feature. The Spark feature uses the screen-printing process to deposit a design in 'optically variable magnetic ink' on the banknote substrate - paper or polymer - in which the magnetic particles contained in the ink are oriented in a pre-determined way when the sheet is moved through the magnetic assembly in the printing press. This creates a dynamic optical effect combining dramatic colour shifting with movement,

which is fixed when the still wet ink is UV cured.

Spark was introduced in 2006. The feature creates a controlled optical effect that is immediately recognizable and can only be produced by the original technology. No alternative, off the shelf technology can reproduce the optical effect, which makes the feature very secure. The issuing bank simply has to educate the public as to what the feature looks like and any user of a banknote with Spark will be able to tell almost instantly, whether the feature is genuine or not.

Issuing banks seemed to have been fully convinced, as in 2014, over 100 denominations in 54 countries are using the spark feature. For banknote printers as well as for issuing banks, adding SPARK is no simple decision, as apart from the cost of 'optically variable magnetic ink' (OVMI) orienting and fixing the magnetic particles in the ink requires a dedicated magnetic unit in the

*SPARK Live introduces new optical variations to a well-known banknote security feature.*





**INFOSECURA  
BANKNOTE  
PRINTING**

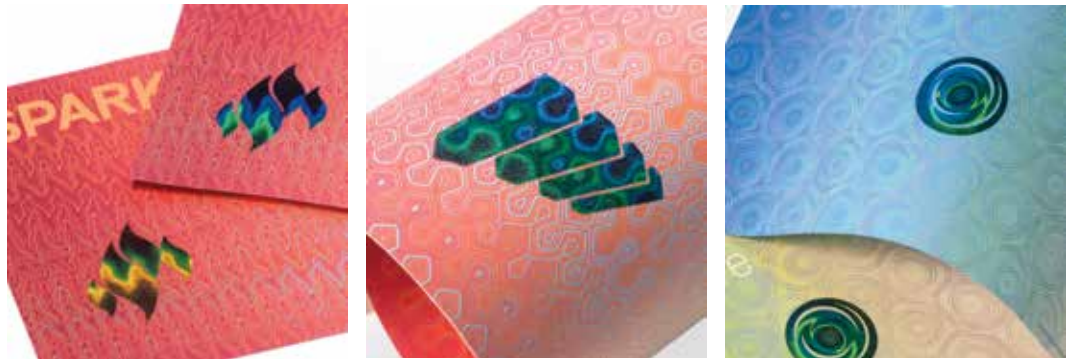
NotaScreen printing press, which entails substantial investment. It is proof of the importance that, e.g. the European Central Bank, attaches to the feature, that all the different printers printing the Euro notes were required to acquire the 'SPARK' capability, before the first note - the €5 - of the new Europa series was introduced. The new € 10 note, which entered into circulation on September 23, also displays SPARK prominently in the denomination value.

**SPARK Live**

This year, SICPA introduced the second generation of SPARK, called SPARK Live, which required the first version to be called SPARK Origin. SPARK Live, which has a new ink formulation, requires the modification of the magnetic unit in the NotaScreen machine and a modified UV IRD curing unit.

The new feature offers 'bright contrasting colours, intense light reflection' and enables a wide range of customized designs that "give a distinct sense of depth to the security feature", as the company puts it. The most noticeable difference between SPARK Origin and SPARK Live is the movement in the feature, which is very distinct. SICPA identifies four families of effects which can be used in different designs: Rolling-bar, which is a bar of light that moves up or down the design, Truspin, a circular feature that moves around a centre point, but in an off-centre way, Sandune, an up and down movement of several different pictorial elements and finally Openform, which can have different customized shapes and motifs. Already, the SPARK feature is used on banknotes in a large variety of designs. SPARK Live promises many more brilliant design sparks.

*SICPA's new SPARK Live feature is available in several different families of effects: Rolling-bar, Truspin, Sandune and Openform.*



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## De La Rue's four winners

*De La Rue, as a banknote printer and a papermaker, has used its vast knowledge of the needs of banknote issuing authorities to develop a range of sophisticated security features that can be found on many banknotes the world over.*

The four outstanding security features for banknotes that De La Rue developed and produced are the security thread StarChrome, the colour-changing feature SPARK Orbital and the UV feature Gemini and the paper feature Cornerstone. In addition, the company has developed the polymer banknote substrate Safeguard.

### StarChrome Security Thread

StarChrome was first used in 2003 and is currently used in 75 denominations. It is the market's most successful premium security thread and has proved very popular with issuing authorities around the world. It was one of the first colour changing security threads to appear on the market. StarChrome provides a clear colour change from red to green when the note is tilted. The feature has since been combined with holographic technology to create Kinetic StarChrome, De La Rue's newest security thread. The method of production is liquid crystal coating and printing. StarChrome offers customisable designs, which allow this thread to be integrated into the overall design of the banknote. The security threads come with very versatile functionality in the range of widths, demetallisation, machine readability, fluorescence, etc.



*De La Rue's StarChrome*

*The UV feature Gemini (right)*

*SPARK Orbital is an extension of SICPA's SPARK ink technology. In addition to the colour change effect, by tilting the banknote in any direction a bright ring can be seen moving around a central point of the image.*



*The functional watermark feature Cornerstone (right)*

### SPARK Orbital

SPARK Orbital was introduced in 2013 and is currently used in 8 denominations, two of which are on the polymer substrate Safeguard. It was developed to provide a dynamic, high impact public recognition feature that expanded the performance of SICPA's SPARK ink technology. In addition to the colour change effect, by tilting the banknote in any direction a bright ring can be seen moving around a central point of the image. The Orbital effect is created using a combination of high magnetic strength ball magnets and special magnet cover plates, which "focus" the magnetic field.

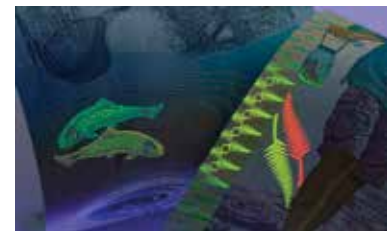
The strength of the effect and its brightness means this feature can be easily authenticated in a wide range of viewing conditions including poor light. This strong

public recognition brings with it a degree of inherent security as it encourages the public to authenticate the feature. When applied over a transparent window on Safeguard there is the additional benefit of the feature being seen from both sides of the note. Additionally the use of novel strong magnets and the "focusing" cover material in the production of the Orbital effect create another layer of counterfeit deterrence.

Due to a marketing arrangement both SICPA and De La Rue sell SPARK Orbital. SICPA's SPARK Truespin is the equivalent to Orbital but using the new SPARK Live technology instead of SPARK.

### Gemini

Gemini was first introduced in 2003 and is currently used in 129 denominations. Gemini uses two separate ultra-violet fluorescent inks that are carefully colour matched to appear as a single colour under normal lighting conditions. This feature then dramatically transforms into two different fluorescent colours under UV illumination. The inks are applied with lithographic printing. The benefits of Gemini are the increased security value of two combined UV colours creating additional complexity for the counterfeiter. The feature is easily incorporated in the creative design



process and into both existing and new designs. Gemini provides proven security that is both simple and intuitive – UV security features are widely understood and used by tellers and retailers globally. It uses existing and widely available standard UV light equipment to visually authenticate the note.

### Cornerstone

Cornerstone was first used in 2003 and is currently used in 212 denominations. It was developed in response to the market need



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due to turned or missing corners. Cornerstone works by increasing the stiffness of the paper in this area, thereby significantly reducing the incidents of turned note corners in circulation.

Cornerstone uses the inherent watermarking properties of cylinder mould made papermaking to address the problem – by placing a specific watermark pattern in the corner of the banknote. In industry standard laboratory tests, Cornerstone has been

shown to give a 40-60% increase in stiffness. This increases note life in countries where notes are automatically out-sorted for folded or missing corners. The stiffening effect of feature lasts the lifetime of the note, delivering excellent handling and printability of the paper as the additional watermarks provide especially flat ream profiles. The feature can be incorporated into many existing banknote designs and it can be used in banknote counters, sorters and ATMs with no alterations to the machinery.

## An arsenal of features to fight counterfeiters

*Being a printer and papermaker for banknotes has the advantage of the greatest possible familiarity with the total banknote manufacturing process. Giesecke & Devrient have turned this knowledge into an array of beautiful and effective security features.*

Security printers and papermakers Giesecke & Devrient provide a wide range of banknote security features, among them substrate-embedded features which naturally are among the most successful ones, as they cannot be separated from the substrate and thus are a very effective barrier against counterfeiting. As embedded security features are being incorporated into the paper during the paper making process, counterfeiters can only imitate but not recreate them. Even very traditional security features, such as watermarks and intaglio printing, have undergone significant changes that make them into very sophisticated features easily recognized by the public. The cylinder mould watermark, now a state-of-the-art security feature, combines for example highlight watermark with pixel watermark. In intaglio printing, thanks to the use of computer-aided FIT engraving technology, translucent multi-tone structures can be produced in addition to tactile elements. The result is a wide spectrum of additional colour shades.

ColourShift security threads



(right) The RollingStar security thread



A further example of a longstanding security feature is the security thread Colour Shift, which has been in use since the early 2000s. These optically variable threads are available as covered or as window threads. They can be up to 5 mm wide and also contain multi-functional characteristics such as holograms, demetallization, UV luminescence, and machine readability, thus providing additional functionalities for different control levels. Thin film colour shift threads by Louisenthal are being used in

more than 20 national currencies and 50 denominations.

Functional inks and pigments, which have been in use for several years now, change their appearance depending the angle from which they are viewed: they are visible or invisible, or they change colour. A wide range of sophisticated designs is on offer, all of which are screen printed: from iridescent to optically variable colours. Because all effects can be printed on the banknote in perfect register both horizontally and vertically, they can be perfectly integrated into any design. Special-effect inks are available in various colours and can be applied to the banknote as a localized patch, as stripes, or as a combination of the two. Additional covert effects that are only visible using special readers help to increase security further.

The latest and most sophisticated security thread is RollingStar. It is based on microscopic mirrors plus ColourShift. The combination of the two technologies results in a dynamic movement, which also features a clear, eye-catching colour shift, from gold to green. Over four million of these tiny mirror facets are lined up precisely over an area of one square centimetre and angled to produce a dynamic reflection. When the note is tilted and light hits the surface of the mirror facets, it travels over it in a predetermined manner. The reflection is initially white. Combining this with a multilayer, metallic ColourShift vapour deposition results in an additional, precisely defined colour shift. Even small discrepancies in layer thickness would lead to different colouration. RollingStar security threads can be combined with a variety of functional properties such as cleartext and machine-readable magnetism (MultiCode).

The best examples of RollingStar ‘in



# INFOSECURA BANKNOTE PRINTING

action', are probably the 100 Dirham note of Morocco's central bank Bank al-Maghrib, which was issued in 2013 and the Bank



The RollingStar windowed security thread on the 500 Baht note.

of Thailand's new 500 Baht note, which incorporates several new and enhanced security features to facilitate authentication by the public (including the visually impaired) and banknote sorting machines. The RollingStar windowed security thread on the reverse combines colour-shift with animated images. The colour changes from gold to green, and illustrates a dynamic 'moving-boxes' effect. The thread also includes Cleartext.

Another good example is the 'Ryder Cup' note by the Royal Bank of Scotland, which commemorates

the first time in 40 years that the prestigious golf competition between the USA and Europe has been held at Gleneagles in Scotland. The note, the first one in Europe to use Louisenthal's Hybrid polymer/paper/polymer substrate, is a veritable showpiece for G&D's and Louisenthal's oeuvre.



The Royal Bank of Scotland's 'Ryder Cup' note on Louisenthal's Hybrid polymer/paper/polymer substrate.

The guilloches and the prominent portrait on the face of the note has been enhanced by G&D's fitaglio 2.0 banknote origination process. Integrated into the guilloches is the latent image of a number "5", offering a genuine digital image flip. It is embedded directly into the intaglio master by means of high resolution engraving and then embossed onto the banknote paper. The Ryder Cup trophy on the front of the note is printed with SICPA's SPARK ink in a transparent window and it is thus

Louisenthal's HighLight and Pixel watermarks. (right)



visible on both sides of the note.

The image is repeated in the see-through Filigram window, creating an image that is both transparent and translucent. Employing most advanced laser technologies, filigree lines are cut into the core paper substrate generating the image of the Ryder cup when viewed in transmission. Covered by the thin protective film layers, this secondary window adds a further security element which is easy for the public to identify. The banknote is also the first in Europe to feature the RollingStar security thread.

## Attractiveness and functionality

ColourShift security threads are characterized by a high level of attractiveness and functionality: The threads change colour like a chameleon, e.g. from magenta to green or from green to gold, depending on the viewing angle. Their brilliant colours make the optically variable threads easily identifiable. Since ColourShift threads were first developed almost ten years ago, Louisenthal has incorporated these features into banknotes in over 20 different national currencies.

In addition, the ColourShift threads can be supplemented with transparent text areas – Cleartext – and other hidden features, such as features with magnetic properties, in order to be also mechanically checkable. ColourShift and the combined ColourShift/ColourFix solutions allow central banks to implement up to six different colour-change options and to integrate the threads seamlessly into their banknote designs. Prominent examples of the use of ColourShift threads are the new series of South African Rands and the currencies of Hong Kong and Oman.

For any security paper maker, watermarks are a staple. Louisenthal has continued to further develop watermarks over the years by introducing HighLight watermarks for numbers or letters and pixel watermarks for portraits and the like. HighLight watermarks make use of a significantly reduced paper thickness which creates very light images, increasing the visibility of special design elements, e.g. numbers or letters. Pixel watermarks typically depict dark points (pixels) in front of a large, light background. Contrast variations of this kind are particularly hard for counterfeiters to reproduce.

## Some blue sky among the clouds for De La Rue

*De La Rue, one of the world's most important security and banknote printers, is back at an even keel, after appointing a new Chief Executive Officer and winning the - for this British printer - 'must have' contract of printing the Bank of England's Sterling notes. But that does not mean the new CEO will have an easy ride.*



*De La Rue's new CEO  
Martin Sutherland*

Things are looking up for De La Rue. After the sudden departure of the last CEO, Tim Cobbold, who left to run global events company UBM earlier this year, DLR's board appointed Martin Sutherland, formerly MD of BAE Systems Applied Intelligence, as its chief executive at the end of August. Mr Sutherland, who has been at Applied Intelligence parent company, BAE Systems, a British multinational defence, security and aerospace company, since 2008, has taken up the role in October. In the interregnum, the post of CEO had been occupied by Philip Rogerson, who now has returned to his previous function of chairman. Mr. Rogerson said: "The board is delighted to appoint Martin as De La Rue's CEO. He brings strong commercial skills, and wide experience of growing technologically demanding businesses supplying governments and financial institutions worldwide."

Mr Sutherland has also the advantage of experience in the security area. Following BAE Systems' acquisition of Applied Intelligence, he led the integration of this unit into BAE Systems, which now serves customers across the Americas, Europe and AsiaPac with intelligence, counter fraud and cyber security solutions. At BAE Systems Applied Intelligence, prior to becoming managing director, he set up a commercial security group, launching a counter fraud business and latterly running the Government business in the UK.

### Back at the job

In a second positive development, in September, the Bank of England (BoE) declared De La Rue to be its "preferred bidder" for the 10 year contract to print banknotes for the Bank of England, which is due to start in April 2015. This was not yet the full contract, but a declaration of intent. The final contract was signed on October 13.

De La Rue is certainly not new to the job, as it has been printing Sterling banknotes for the Bank of England at the Bank's Debden factory since 2003 under a contract that will come to an end in April 2015.

The Bank of England said that it started a formal public procurement process in November 2012 for the printing of the Bank's banknotes at the Bank's facility in Debden, Essex. Following the receipt of bids in June 2014, the Bank completed a thorough evaluation of the submitted bids and signed the

contract in October. Printing under the new contract is due to commence in April 2015. The Bank announced in March 2014 that it had entered into a contract with Innovia Security to supply the polymer material for the next £5 and £10 banknotes. De La Rue will print the new notes at the Bank's facility in Debden on this substrate.

The Financial Times (FT) commented that the contract is not De La Rue's most lucrative, either in terms of revenues or profits, but it has obviously enormous reputational importance and Colin Child, DLR's Chief Operating Officer and finance director called it a "flagship contract".

Originally the contract had been valued at around £ 1bn, now, according to the BoE, it would be worth "several hundred million less", the FT reported. This means that the contract had been awarded at a much lower margin than before. De La Rue's other big commission is the order to provide biometric passports to the UK government over 10 years, which is worth £400m.

### A difficult start

Although having a new managing director and having secured the most prestigious banknote printing contract in Britain, De La Rue has to expect stormy times ahead. On September 26, just days after the emotional high of the BoE contract announcement, De La Rue had to issue its third profit warning in two years, sending its share value down by a third. 70 % of DLR's revenues come from making paper and printing banknotes for central banks in 150 countries. Prices for paper have been under pressure for more than a year, while competition is pushing down rates for printing too. Philip Rogerson said: "For the first time, we are seeing real pricing pressure in print. There is overcapacity in the market and people are aggressively going after business."

Even in the passport sector the news is not all good, with lower-than-expected conversions from machine-readable passports to advanced biometric passports. Several passport contracts DLR had expected to be available for tender stayed with the company's competitors.

DLR's chairman said the latest profit warning made for a "tricky start" for new boss Martin Sutherland. (Source: Financial Times, The Guardian)



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## **SAC interoperability test - many still not there**

*By the end of this year, the third generation of security mechanisms for ePassports - Supplemental Access Control (SAC) - has to be implemented by all EU countries. The countries are free to choose between several systems on offer, but all have to be able to talk to each other. For quite a few systems there is still work to be done - in a hurry.*

Currently, over 100 countries have ePassport systems, which use contactless technology. There are - or will be soon - three mechanisms in use. The first one, introduced in 2005 was Basic Access Control (BAC), defined by the International Civil Aviation Organization (ICAO) in DOC 9303. In 2009, the German Federal Office for Information Security (BSI) introduced a second-generation security mechanism, Extended Access Control version 1 (EACv1), which has since been upgraded to version 2 (EACv2). And this year, a few weeks after the publication of this magazine, the third generation will go live: the Supplemental Access Control (SAC) mechanism, a new mechanism defined by the ICAO in 2010 and based on Password Authenticated Connection Establishment (PACE), a protocol for generating keys for secure messaging.

EAC is able to support biometric data such as fingerprints and iris scans. EAC is an additional mechanism, not a replacement of BAC and while it is, according to ICAO, not mandatory, it is recommended to protect biometric data.

The third generation of ePassport security mechanisms, Supplemental Access Control (SAC) is deemed by the European Union as to be so important for the security of ePassports for the next 10 to 20 years that its implementation in EU countries is mandatory by the end of 2014. SAC is based on the version 2 Password Authenticated Connection Establishment (PACE v2) protocol. With 28 countries in the EU and several vendors offering SAC systems, interoperability is not only a major challenge, but an absolute must. In June 2014,

the European Commission (EC) and ICAO organized a SAC interoperability test in Madrid to assure that European countries are ready to launch SAC in time. 17 European countries and Japan took part and 13 vendors, among them Arjowiggins, De La Rue, EDAPS, Gemalto, G&D, Oberthur, PWPW, Safran Morpho, etc. offered their ePassport solutions. The tests were conducted and analysed under the supervision of an ICAO team of experts from Australia, Germany, the Netherlands and Switzerland, and a member of the ISO group. The aim of the interoperability test was to evaluate, whether electronic passports and inspection systems with SAC are communicating securely with each other. The results for the 52 ePassport samples and 11 inspection systems tested, were given at a recent ICAO MRTD Regional Seminar. While, on some measures, results were better than the last Interoperability test in London in 2013, 15% of ePassport samples still had a large number of failures (more than 20 failures). Meanwhile, five samples had zero failures and seven only had one failure.

Holger Funke, an expert proposed by the German Government to support and assist the tests, writes on his blog (<http://blog.protocolbench.org>) that the document quality varied from "close to release state" to "experimental state". Elsewhere he noted that "it was 'astonishing' that many inspection systems did not pass the Basic Access Control (BAC) tests." There is extensive documentation about the tests and their results on the ICAO website and elsewhere ([http://www.icao.int/Meetings/mrtd-madrid-2014/Documents/31\\_InteropResults\\_Test2014.pdf](http://www.icao.int/Meetings/mrtd-madrid-2014/Documents/31_InteropResults_Test2014.pdf))

## **"SeManTiK" research project completed**

*A two year project, sponsored by the German Government, which united Bundesdruckerei, Infineon Technologies and the Fraunhofer Institute for Reliability and Microintegration has been successfully completed and developed realistic test methods and simulation models and explored new methods of integrating the chip into the card body.*

Electronic identity documents (eIDs) in the form of contactless smartcards will in future be more than just proof of identity. They could additionally serve as multi-functional cards that can be used in many other areas of everyday life: for instance, as a public

transport ticket, as company ID or as a library card. This is indeed consumer-friendly, but will expose the smartcards to greater pressure than before. In order to adequately address new use scenarios already during the design phase of the smartcards

**IMPRESSUM**

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and in order to enable better testing and assessment conditions, Bundesdruckerei GmbH, Infineon Technologies AG and the Fraunhofer Institute for Reliability and Microintegration IZM have joined forces as partners in the two-year SeManTiK project ("Secure and long-life eID applications for human/machine interaction"). They developed realistic test methods and simulation models and explored new methods of integrating the chip into the card body.

**New tools for smartcard tests**

More than 35,000 cards were packaged, tested, analysed and evaluated in 20 different test combinations. The new test sequences developed in the project made it possible to obtain extraordinarily reliable and precise confirmation of failure rates and patterns which have been observed in international smartcard projects with more than 50 million cards in day-to-day use. "In future, our research results from SeManTiK will thus become part of the work of the international standardisation bodies of the smartcard industry and demonstrate Bundesdruckerei's innovation leadership", says Joachim Kloeser, chief project manager and coordinator at

Bundesdruckerei. Thanks to SeManTiK, card manufacturers can simulate the life of the documents better than before and adjust the design as required. "If contactless eIDs are to be used several times a day in future, they must withstand significantly greater stress than before", says Peter Stampka, initiator and project manager at Infineon Technologies in Regensburg. "The results from SeManTiK will help to improve the mechanical strength of contactless eIDs and are therefore also an important step towards achieving parity between the optical and electronic security of ID documents." The SeManTiK project was sponsored by the German Federal Ministry of Education and Research (BMBF) with €1.8m over a term of 2.5 years. The "human/machine interaction" research topic addresses new technologies in an interdisciplinary research and action plan. It focuses on technical innovation which, along with social innovation, responds to the special challenges facing society at times of demographic change. The expertise of the Federal Criminal Police Office for forensic and methodological analyses as well as the know-how of Specialty Films of Bayer MaterialScience AG in the field of substrate materials also contributed towards the research work.

**Netherlands to introduce electronic driving license**

Gemalto announced that it is delivering its Sealys electronic driving license to RDW, the public body responsible for driver licensing and vehicle registration in the Netherlands. The Gemalto driving license combines visual, physical and electronic security features that provide strong protection against fraud and forgery. In addition, a contactless microprocessor securely stores all the individual details printed on its tamper-proof polycarbonate body. It will enable the Dutch police force to verify the authenticity of the document with authorized NFC mobile readers.

The credit card-sized document meets all the requirements of the latest EU-wide initiative to establish a modern, harmonized driving license in member states. RDW evaluated a number of security design offerings and Gemalto's proposal, combining creative layout with unique multiple features, stood out as the best solution:

- A transparent window in the pure polycarbonate structure provides an immediate visual check
- The brand new Sealys Secure Surface


feature enables tactile relief and optical effects on certain areas of the document

- Sealys Edge Sealer offers additional protection through laser markings on the edge of the card

"Ensuring only authorized drivers take to the road is a vital element of any road safety program, and the driving license also serves as official ID credential for citizens," said Andre Uuldriks, Unit Manager of the Driving License department for RDW. "We loved the unique combination of security features matching a very advanced document design. We plan to introduce the new electronic driving license no later than the end of year."

"The inclusion of a microprocessor on licenses reinforces public trust in the integrity of a document. In addition, it enables an extensive set of electronic verifications to check document authenticity and driver's identity," said Frédéric Trojani, Executive Vice President of Government Programs at Gemalto. "The Netherlands will benefit from our experience acquired through large-scale deployments of secure driving licenses notably in France, India, Ireland, Mexico, Morocco and the UK. The new card also creates a future-proof platform for accessing eGovernment services in the years ahead."





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