

INFOSECURA

Copenhagen!
It was great last
time.
It will be even
better in 2019!

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

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Of conferences, paper and hair on banknotes



There are two main subject groups in this issue of InfoSecura: next year's Security Printers Conference in Copenhagen and a look at the paper for both banknote and passports. The reason for the former is obvious, it is more or less a year until the next conference and the contents of the various sessions is taking shape. There are also various dates that come due, the 'call for papers', which opens on September 20, and the beginning of the sale of exhibition places on October 30. The call for papers is especially important. The members of the committee of experts, which is responsible for the content of the conference, are drawn from as wide a range of activities within the security printing industry as possible and they strive to select subjects and speakers that represent all sectors, but they still need and welcome suggestions for papers from those who are in the middle of it. So please keep the suggestions coming.

The second group of articles is concerned with paper, a material that is still at the centre of our industry, although just as most traditional things in industry or private life, it seems to be under threat. It is not only polymer that is becoming an increasingly strong competitor, but digital means of payment that threaten both paper and polymer.

There is one peculiarity in this issue, the interview with the editor. He usually tries to remain unseen behind every issue but on the occasion of the 20th anniversary of InfoSecura, Intergraf's general secretary thought it a good idea to let readers know who is behind the magazine. Until now, InfoSecura only had one editor, so it is a kind of double anniversary.

Although writing about banknotes and ID document is - at least for this writer - a pleasure, there is no denying that money and ID documents are very serious businesses. And so, not forgetting that mutilating banknotes is against the law in many countries, to inject a little lightheartedness, the editor could not help himself but adding the visual comment of a Finnish artist about the usual portraits of dead (white) men found on many banknotes. It does put the still current debate about including the portrait of a woman on any US Dollar note and which woman on which note, into a different perspective.

The Editor



*The Finnish artist Noora Schroderus embroidered imaginary hairstyles onto banknote portraits.
 photo: funtema.ru*



Hej Copenhagen! We are back!

When the Security Printers Conference and Exhibition was last held in Copenhagen in 2015, delegates loved it and so did the Intergraf organizers. Copenhagen is indeed a lovely city and the conference venue is perfect. So Intergraf decided to go back for the 2019 conference on October 23 to 25.

Say the word Copenhagen and many people will remember that song from the 1952 film 'Hans Christian Andersen' that began with the words 'wonderful, wonderful Copenhagen'. *"It was wonderful in wonderful, wonderful Copenhagen. Spring had arrived, around Rosenborg Castle the trees and flowers were in full bloom and along Nyhavn one could sit in the sun and admire the quaint sailing boats and drink beer. Many Copenhageners and foreigners did. But that was not the reason, security printers, their suppliers, delegates from Central Banks and law enforcement organisations had come to Copenhagen. Their reasons were solidly professional."* That's how we introduced the article on the 2015 Security Printers Conference and Exhibition in Infosecura. And it was all true, it was wonderful and that's why we are going back in 2019.



It won't be spring, but autumn, which is said to be as beautiful as spring in Copenhagen. There may still be roses around Rosenborg Castle, the leaves in the park will turn beautifully golden and red, and Nyhaven will be as romantic in October as it was in April. Certainly, weather is a fickle thing, especially in autumn in northern Europe and one cannot base the organisation of a conference for almost a thousand professionals on the promise of sunshine. But Copenhagen is a first-class choice regardless of weather.

COPENHAGEN: A SCORE SHEET

Copenhagen is very accessible, with direct flights from 150 destinations.

Copenhagen as a conference venue is incredibly convenient. The airport, as well as the city centre is ten minutes away from the conference centre and main conference hotel. The city centre is reached by a frequent, ultra modern driverless train.

Copenhagen is a heaven for design aficionados.

Copenhagen is green - both because of its many parks and its green solutions for sustainable meetings.



Copenhagen is surrounded by the sea and is often called the Venice of the North.

Copenhagen is tasty - try its new Nordic cuisine. The world's best restaurant, *noma*, is there.

Copenhagen is easy - most Danes speak English.

Copenhagen is Hygge - that special form of cosiness, that the Danes invented for when the weather turns cold.

Copenhagen is happy. It has been ranked as the happiest city in the world. ■



Welcome to the highest level of discussion in the industry

In Copenhagen we will look at the successes and the challenges in our industry and we are waiting for you to add your voice.

It is still more than a year to the 2019 Security Printers Conference and Exhibition in Copenhagen but the content of the next three-day conference is already taking shape. The format of the meeting will follow that of the last conference in Dublin by starting with a plenary session uniting both banknote and ID sectors on the first day. Day two and three will have separate sessions for banknote and ID producers and the end of the last day will see again a coming together of both sections.

In the first plenary session we will assess the threat to both. As banknotes and ID documents have to fight against counterfeiting, we will look at the direction into which counterfeiting is evolving and which role the Internet is playing in enabling criminals. Counterfeiting most often relies on widely dispersed networks of suppliers, which are accessible over the Internet or even the so-called Dark Net. That threat is growing.

In the sessions in the banknote sector on Thursday and Friday, the Internet will play again a big role as it is used increasingly and legitimately - in the form of apps - to communicate and to authenticate. Counterfeiting will be another focal point,

from looking at new ways counterfeiters are finding, examining the spread of counterfeiting to taking a close look at the motivation of counterfeiters.

We will also be talking about the competition, new forms of electronic payments and the threat from cyber currencies. As we are convinced of the future strength of physical currency, the cash cycle will also come up for discussion. In the sessions for the identity sector, document protection will play an important role but so will the protection of privacy. This is closely linked to the use of biometrics in ID documents and in checking IDs, e.g. at border crossings. These are some, but by no means all, of the thematic points of the conference. Experts and companies involved in banknote and ID systems development and the legal and operational underpinnings are invited to submit papers for consideration by Intergraf's Committee of Experts. The call for papers will open on 20th September at www.securityprinters.org until December 1st, 2018.

One of the major points of every Security Printers is the exhibition. The last edition in Dublin saw over a hundred exhibitors in an environment that was excellent, both for exhibitors and for visitors. Copenhagen will again offer the highest standard of convenience and accessibility. As the conference hotel, the conference rooms and the exhibition space are in one continuous unit, visiting and exhibiting will be not only a very efficient experience but a pleasant one as well. It will soon be time to book exhibition stands and prepare promotional material. The exhibition sale opens on October 30th, but all details are already available on the website www.securityprinters.org.

And finally, Security Printers is important for the opportunities to network. There will be plenty of opportunities to meet old and new friends, talk to important customers and suppliers and really find out what moves the industry - while having a very good time. ■

DATES TO REMEMBER

20/09/2018 call for papers

open on www.securityprinters.org (deadline for submission 01/12/2018)

30/10/2018 exhibition sale opens

(all information already available on www.securityprinters.org)

30/10/2018 - hotel booking opens

20/05/2019 - registration opens



THE MAN BEHIND THE MAGAZINE: MANFRED GORETZKI



Manfred Goretzki, perhaps a little too happy at the Guinness reception at the last Security Printers Conference in Dublin.

To mark the 20th anniversary of Infosecura, Intergraf asked Alison Grace, Intergraf's Communications & Social Affairs Officer, to interview the editor of Infosecura

Infosecura would not exist today without the hard work of Manfred Goretzki, this publication's editor and security printing industry expert. To celebrate 20 years of Infosecura, Intergraf has taken the opportunity to interview Manfred, the journalist behind your quarterly industry news.

Tell us about your role at Intergraf

I have worked for Intergraf since 1973, after studying in Berlin and working for a daily Berlin newspaper, editing films in Canada and later, in England, working as a designer. At the time, Intergraf (then called IMPA, the International Master Printers Association) was based in London. I was hired because I knew about printing and spoke English, French and German. At Intergraf, I am unofficially a member of the Committee and I contribute whatever I can. For Infosecura, I do everything: research, write, edit, sub-edit, page design, picture editing, layout and photography. I'm a one-man-band!

What was your first Security Printers event?

The first – and my first – conference was in 1976 in Milan with around 70 delegates. Intergraf had decided to start organising an event for security printers because they had a lot to talk about, but nowhere to talk.

What was your best/most memorable conference?

Hard to say, but Montreux in 2003 was important for Infosecura because I gained more freedom to design the magazine. It was also the beginning of growth for delegates – from 553 at the previous event to 797. This conference also marked closer cooperation with suppliers.

How has the event changed?

The conference itself has changed a lot; from being an opportunity to talk to colleagues and to the competition, to an event where people expect good content and to really learn something.

How has the industry changed?

Private banknote printers have become a lot more important, although banknote printing is still primarily a state endeavour. The industry has changed from banknotes being relatively simple – i.e. intaglio and offset printing with the inclusion of a watermark – to there now being dozens of different security features. It used to be that the paper and printing were the most important features, but this

is no longer the case. Now what is really important – part of the added value – is the whole array of security features. The development of this over the last 15-20 years has been really staggering. ID documents have followed the same trajectory, but later.

Visas always had watermarks, etc., but what has really changed in IDs is the data page. The passport I had when I came back from Canada in 1972 is amazing. It had a black and white photograph stapled in and an old rubber stamp. Security = zero! What you have now is very sophisticated. This has changed enormously.

What developments have most surprised you?

The way the banknote and ID document sectors try to make their products fun. Take the Swedish passport, for example, which includes day and night-light effects. In general, however, developments have been gradual and incremental. There was no light-bulb moment.

What developments have most impressed you?

Impressed or frightened? The advance of non-cash payments. It is a part of our Western 'convenience' culture, and being a cultural thing, it is hard to change. Whatever you think about, if you have got something that is functional and convenient it will win over everything. It is more important than aesthetics. It is more important than what it does to the economy. If it works, and if it's convenient it wins. This is totally different in, say, India.

How do you see the future of the industry?

It will be a fight against everything going electronic. The industry has to ensure two things: (1) trust and (2) communicating information. The public needs to trust that a €10 note is really worth €10, which when you look at the thing as such, it is not. It is only a symbol of value. We also have to inform the public more about what physical money and documents do and why they are worth keeping. The industry has to work to promote the benefits of these products. We are fighting back, but it's not going to be easy.

What is your wish for the future of the industry?

To hold on! And to increase the trust of people in physical money and documents.

What should Infosecura readers know about Intergraf?

They should get to know more about Intergraf as an organisation. It has always been treated as something separate from the event, but has a lot more to offer. Intergraf's certification scheme, for instance. This has been a very important and positive development, which shows that Intergraf really works for the benefit of the industry. ■

DISCUSSING CASH - A CHANGE IN TONE

The discussion about the pros and cons of cash versus digital payment methods seems to be endless. However, lately there seems to have been a shift in the thinking of some central banks towards retaining cash. Perhaps the efforts by the industry to promote cash are beginning to bear fruit.

So far, no country has abandoned its physical currency in favour of electronic payment methods. It even looks as if that moment will be a very long time in the future, if ever. While some countries in the recent past have favoured the move towards a cashless future, others have become more cautious. When the Bank of England appointed Sarah John as new Chief Cashier, the Bank's Governor, Mark Carney said: "She will bring a wealth of experience to our work to issue the polymer £20 and to research new banknote technologies as well as the future of banknote demand", continuing "she will be responsible for the production of high quality, secure notes which the public can use with confidence." That does not sound as if the Bank of England will be giving up issuing banknotes anytime soon. Even Sweden, which among European countries has gone furthest towards a cashless state and where more than half of all bank branches no longer carry cash and only 13 per cent of purchases are paid for in cash, is now urging its citizens to have some bank notes, preferably in small denominations, stashed away in case of a natural disaster or of war. This attests not only to Sweden's increasing nervousness about its neighbour Russia but also about being totally at the mercy of electronics.

This nervousness can be found at central banks across Europe. As an article in 'Politico' reports, Europe's central bankers are warning that a gradual phase-out of cash in many countries poses a serious threat to the financial system, as relying too heavily on digital payment systems exposes them to catastrophic failures in the event of cyber attacks. Regulators are adding that IT failures, systemic hacking risks - and the fact that vulnerable members of society would be alienated in a cashless world - all argue in favour of keeping a robust system in place — i.e., cash.

"Increasingly, central banks insist that cash will also play a role. We do not foresee a totally cashless society," said Ewald Nowotny, governor of the Austrian National Bank, at a recent conference in Brussels. "If there is for instance an energy blackout, cash is the only surviving way of payment." Catastrophic natural disasters seem to be getting more frequent and when they strike, electricity supply usually goes down first - as Puerto Rico could attest to fairly recently. Banks are trying to devise back-up systems, but the only fallback

that works when nothing else does is cash. A small outage at Visa in June this year gave Europeans some inkling of what a failure of electronic payment systems could mean. As it was temporary, it was just an inconvenience, but it was scary nevertheless.

The fear that people are turning away from cash is not restricted to Europe. As the South China Morning Post reported this summer, China's central bank urged to tone down what it calls an "over-hype" of a cashless society, as mobile payment volumes continue to soar to new heights. "Cash has been rejected for some consumers in tourist attractions, restaurants, retailers and other industries. This damages the legal status of the Yuan, and hurts consumers' rights to choose payment methods," according to the notice posted on the central bank's website. Mobile payment transactions reached 81 trillion Yuan (US\$12.8 trillion) from January to October last year, according to figures from the Ministry of Industry and Information Technology. Payments via mobile-phone apps such as WeChat Pay and Alipay accounted for more than 80 per cent of the country's mobile payment segment. China is often seen as the first nation to move towards a completely cashless society, the SCMP said.

When central banks talk about retaining cash, they often ask for a 'robust' system of cash and that means using it as a means of exchange as well as a store of value. Much has been made of the allegation that cash is used increasingly as a store of value rather than as a means of daily payment. Looking at production figures of the ECB, one could doubt that much cash is stashed away. It is true that the ECB printed 715 million €200 notes, a typical hoarder note, in 2018 and 284 million of them in 2017, but none in 2016, 2015 and 2013. Apart from the low print numbers, using banknotes as a store of value is scant comfort for banknote producers as the main reason for this is that interest rates are very low to non-existent. As soon as they would start to rise, much of the cash from under mattresses would move into bank accounts. There are few people in say Turkey or Venezuela that keep much cash hidden at home. And, reassuringly, the European Central Bank said that close to 80 per cent of all payments are still done in cash in the Eurozone.

But perhaps our fearful point of view - from the middle of Europe - is somewhat distorted. The danger of cash disappearing may be more of a regional phenomenon, e.g. in Northern Europe and China and perhaps also a generational one, with many young people losing the cash habit. In this context, the realization by central banks that a cashless economy is not a good idea is encouraging but it is not - yet - a victory for cash. ■

UK SEEKS EVIDENCE ON CASH/DIGITAL

In a call for evidence about the use of cash and digital payments in the new economy, the UK Treasury tries to be even-handed, but in the accompanying document it shows its greater support for digital payments.

In March 2018, the UK Treasury launched a call for evidence about cash and digital payments in the new economy. The aim of the inquiry was to see how the transition from cash to digital payments impacts on different sectors, different regions and different demographics. It sought to gather evidence to inform that debate, *by exploring how the government can support digital payments, ensure that the ability to pay by cash is available for those who need it, whilst cracking down on the minority who use cash to evade tax and launder money. To explain the thinking behind the discussion, the government published a 29 page document. It states that digital technology has revolutionised the way people shop, sell, and save, and people are increasingly moving away from using cash. Cash has fallen from being 62 per cent of all payments by volume in 2006, to 40 per cent in 2016, and is predicted by industry to fall to 21 per cent by 2026. It represented only 15 per cent of the total value of consumer spending in 2015.*

Meanwhile, the growth in the use of digital payments has been rapid. Contactless payments made each month have grown by nearly twenty times in the three years to June 2017. Research suggests that two-thirds of people are making more payments digitally than they did five years ago, the document states.

So far there is little to argue with. The document however shows that the UK Treasury is far from neutral in the debate between cash and digital payments, as at several points it explains that it likes to explore how the government can support digital payments. It is aware of potential factors that could be inhibiting the adoption of electronic payments, among them the cost of some payment instruments (the average transaction cost to merchants of processing a debit card is 0.24 per cent of turnover to process, compared to 0.15 per cent for cash), to a lack of trust in electronic payments, and a lack of understanding of the products and services available to consumers and businesses.

Admittedly, the government also promises to ensure that the ability to pay by cash is available for those who need it. It admits that cash continues to play an important part in the lives of many, whether as a budgeting tool or as a cheap and convenient method of payment. Research suggests that across the UK, 2.7 million people (out of 65 mill.) are

entirely reliant on cash.

The document also states: *Although cash usage is declining, the government wants to explore how to ensure cash remains accessible and secure for those who need to use it. It is committed to making sure that the public's legitimate cash needs continue to be met, whether that's through sufficient access to ATMs, or other sources. The government is keen to understand whether the current denominational mix meets the needs of cash users, including vulnerable groups, who use cash on a daily basis for legitimate purposes.*

With reference to cash use to launder money, etc. and while talking about the denominational mix of currencies, the document said that the £50 note, the highest denomination in the UK, is believed to be rarely used for routine purchases and is instead held as a store of value. There is also a perception by some that £50 notes are used for money laundering, hidden economy activities and tax evasion. This is in contrast to the Euro area, where the € 50 note (€45) is the most widely used denomination, with over 9 billion of them in circulation, representing 46 per cent of Euro banknotes. There are also €100, € 200 and € 500 notes, although the latter will be phased out. The use of £50 notes for money laundering means that whatever the highest denomination is, it will be the one used for these nefarious purposes, although carrying suitcases of £50 notes seems like a somewhat old fashioned method to transport ill-gotten gain, with crypto-currencies and hidden electronic means readily available.

ICA RESPONDS

Although the call for evidence ended on June 5th, and the results have not yet been published, the International Currency Association published its response, emphasizing an international perspective on the economic and social role of cash. It cited a report by the Bank of International Settlement that cash in circulation has risen from 7 per cent of GDP in 2000 to 9 per cent in 2016 in a sample of countries including CPML countries. The BIS report explains that the demand has been driven by the store of value function of cash following the financial crisis of 2008. But the transaction function of cash is important too. The ECB's report on cash use states that that 79 per cent of all point-of-sale transactions were carried out in cash, amounting to 54 per cent of the total value of all payments in the Euro area. In Switzerland, the Swiss National Bank's Survey on Payment Methods 2017, concludes that 70 per cent of transactions are settled in cash, representing 45 per cent of value. Infosecura reported and commented on all three reports. ■
Cash-and-digital-payments-in-the-new-economy.pdf



The Swiss National Bank has just published its first survey on payment behaviour and the use of cash in Switzerland. As the country is not a member of the Euro zone but is totally surrounded by it, the SNB's findings reveal interesting differences.

In their relationship with cash, the Swiss seem to be a little different from the rest of the Europeans. The Swiss Franc is a symbol of stability and value. Swiss banknotes are not only seen as beautiful, they are also very secure and exceptionally well made. And they seem to be popular. It took a long time to get the current series on the way, not least because the notes are printed on a paper/polymer/paper composite substrate, which had to overcome some technical difficulties. Moreover, for the designs, a competition was held which gave the general population a voice in their approval. And a last remarkable thing: Switzerland insists on issuing and keeping the largest value banknote in the world, the Sfr 1000 note, while most other countries are stopping or have stopped high value denominations, most notably the European Union, which will be discontinuing the €500 note.

So far these characteristics are more or less common knowledge. But what is the verifiable truth about the Swiss and their relationship with their money?

HOW DO THE SWISS PAY?

Following a study by the European Central Bank (ECB) conducted in 2015 and 2016 and one by the US Federal Reserve in 2016, the Swiss National Bank (SNB) conducted its own payment study in autumn 2017, the results of which were published recently. The aim was to examine the payment methods used by Swiss households, the use of cash and the underlying motives for using one or the other. 2000 Swiss residents provided information about their payment habits and particularly their use of cash. They noted down in a payment diary all purchases, made in seven consecutive days, giving amounts and locations for each. Reoccurring payments, such as rents and insurance payments were noted separately as aggregated monthly expenses. A total of 22 500 transactions were recorded. The study answered, among others, the use of high denomination notes, the Sfr 200 and Sfr 1000, and the role of cash as store of value.

A LEVEL PLAYING FIELD

One of the findings is that both cash and non-cash payments are readily available in Switzerland, and there is no fear of difficulties in obtaining or using cash as e.g. in some remote areas on Sweden. Choosing cash or non-cash payments is therefore a matter of preference in Switzerland, not necessity. The average value of payments was Sfr 41, with a majority being under Sfr 20 and only 2 per cent over 200 Sfr. This contrasts the € 18 (Sfr 20.90) per purchase average in the Euro area. 70 per cent of these purchases used cash, but cash made up only 45 per cent of the value of the total. As in the Euro zone, this indicates the use of cash mainly for smaller purchases but again in contrast to the Euro, 35 per cent of non-regularly occurring purchases over Sfr 1000 were also made in cash. With Sfr 133 (€ 115) the Swiss also carry more cash in their wallets than their Euro area contemporaries (€65), but the Euro area average hides great national differences. Germans are relatively close to the Swiss in carrying on average € 103, while the Portuguese average is only € 29. In card ownership, the Swiss are similar to their Euro neighbours. 90 per cent owns a debit card (93 per cent in Euro-land own a debit or credit card) 40 per cent a credit card and only 10 per cent own or use a payment app. As already stated, cash made up 70 per cent of all payments, debit cards accounted for 22 per cent, credit cards for 5 per cent and the rest was made up by payment apps, etc. Overall cash is used for smaller amounts, debit cards for medium amounts and credit cards for larger amounts. The decision to use either cash or cards seems to be primarily one of convenience at the point of purchase.

SOME CHANGES TO COME, BUT NOT MANY

The SNB survey also asked whether respondents thought they would use non-cash payment methods more in future. About half of all respondents said they see no reason to change their payment habits, while again about half said that they expect to use non-cash payments more in the medium term. Of the latter, 48 per cent said that they may follow a societal move away from cash, 30 per cent said there was broader acceptance of non-cash payments, 29 per cent thought these were faster, 21 per cent that they were more secure, 18 per cent more integrated and 6 per cent that they were cheaper.

VIVE LA DIFFERENCE

When abroad, the payment behaviour of the Swiss changes. The use of cash drops to 52 per cent, and 25 per cent of respondents said that they use credit cards noticeably more often when abroad than in Switzerland and debit cards less often (3 per cent). The country is completely surrounded by the Euro area, but the study does not differentiate

between the Euro neighbours and those with other currencies.

Another area where Switzerland is different from its neighbours is the use of large denominations. At the end of 2017, Sfr 200 and 1000 notes, with 61 million and 50 million notes respectively, accounted for 23 per cent of all Swiss banknotes in circulation. In terms of value this was Sfr 62 Billion or 76 per cent of the value of all notes in circulation. But how many of these notes are held in Swiss households and what are they used for? According to the SNB survey, 40 per cent of respondents had at least owned a Sfr 1000 note within the last two years, for the Sfr 200 note, the response was 66 per cent. For both notes these figures are noticeable higher in the Italian speaking Canton Tessin. The majority of these notes were used for payment of invoices at the post office - which in Switzerland is used extensively for settling financial transactions - and for purchases, such as cars (30 per cent of those that use Sfr 1000 for purchases). The notes are also more used by men than women and by older people.

It could be expected that the Sfr 200 and Sfr 1000 denominations are used widely as store of value. However, the study reveals that, although 37 per cent of respondents do have a 'stash' of banknotes at home or in safety deposit boxes, three quarters of them have less than Sfr 1000 put aside and 40 per cent of them use Sfr 100 notes for the purpose. Only 11 per cent use Sfr 200 notes and 5 per cent Sfr 1000 notes. As for the reasons for holding cash, 63 per cent of respondents want cash to be instantly available when needed, 12 per cent want to have a reserve, 5 per cent feel that they need a fall-back in case of a crisis and 3 per cent do not trust banks. Only one per cent hold cash because they fear negative interest rates. In the Euro area, 24 per cent of the ECB survey held cash outside banks, whereby the differences between member countries ranged from 40 and 37 per cent in Slovakia and Lithuania respectively to 15 per cent in France. ■

The full survey is available on the SNB website www.snb.ch/en/iabout/cash/id/paytrans_survey_2



Just like any other business, banknote printing evolves. In July 1997, four and a half years before Euro banknotes were issued to the public and the Euro area became a reality, the European Central Bank wrote on its website about the production and issue of banknotes in the EU member countries. At that time there were only 15 EU member countries, of which 13 had their own banknote printing works. The odd ones out were Luxembourg and Portugal, which bought their banknotes from commercial security printers, De La Rue and Oberthur respectively. In eight EU countries, banknote printing works were part of the national central bank (Belgium, Denmark, Greece, France, Ireland, Italy, Austria and the United Kingdom). In two countries (Finland and Sweden), they were companies owned by the national central bank. In Spain banknote printing was done by a state owned company, the Fábrica Nacional de Moneda y Timbre. In the Netherlands, banknotes were printed by Enschedé, a private company. Finally, in Germany, the Bundesbank had two suppliers: the state-owned Bundesdruckerei and

Since the European Central Bank first wrote about banknote production on its website in 1997, encompassing both state owned and private banknote printers, much has changed in the industry. Among both kinds, some have closed or stopped printing banknotes, while others expanded and grew stronger.

privately owned Giesecke & Devrient in Munich.

That was 21 years ago. Meanwhile, the European Union grew to 28 member countries and the Euro zone was created, which began with 11 of the then 15 EU member states in 1999 with a period of "book money" before the issuance of the physical notes. Greece joined in 2001, just one year before the cash changeover, followed by Slovenia in 2007, Cyprus and Malta in 2008, Slovakia in 2009, Estonia in 2011, Latvia in 2014 and Lithuania in 2015. Today, the euro area numbers 19 EU member states.

In banknote printing much has changed, even in those 15 member countries at the time. Belgium is set to close its banknote printing works by 2020, Denmark's Nationalbank, although it printed a very interesting, somewhat minimalist series of banknotes between 2009 and 2011, closed its printing works in 2016 and in Spring 2018 signed a four-year contract with Oberthur Fiduciaire SAS for the production of the Danish Kroner. In the Netherlands, the Nederlandse Bank never owned a

printing works, but bought its Guilders, and later its Euros, from the private banknote printer Royal Joh. Enschedé in Harlem, a company with a glorious history spanning 315 years. In December 2016 the company announced that it would stop printing banknotes.

Greece, France, Ireland, Italy and Austria are still producing banknotes in printing works owned by their national banks. They all print Euros, which are printed even in the UK, although it is not part of the Euro area. There, Euros are produced by De La Rue in Gateshead, while Pound Sterlings are printed by the same company in Loughton, near London, in a plant that is still owned by the Bank of England but is now operated by De La Rue.

UNCERTAINTY AND AMBITION

There is also some movement within the block of Euro producing countries. There were reports in the Irish press in March 2018 that the strategic plan of the Central Bank of Ireland had called for closing the bank's banknote printing plant in Dublin. The plan was to go before the Central Bank Commission at the end of March but since then no mention of a closure has been made on the bank's website.

Among the state or central bank owned banknote-printing works, the Banque de France has made great strides to be the leading producer, supplying on average 25 per cent of the Euro notes required. It is also the only of these publicly owned works to have a fully integrated banknote paper mill and banknote printing works. Bank de France in 2015 transformed its paper mill in Vic-le-Comte in the Auvergne into a subsidiary, entitled *EuropaFi*, with the aim to make it the most modern banknote paper mill in Europe and the leading producer of banknote paper in the Euro area.

In Spain, the Pesetas and later Spain's Euro allocation were printed by the Fabrica Nacional de Moneda y Timbre - Real Casa de la Moneda (FNMT), until 2016, when, to follow ECB rules, Euro printing was transferred to a new company called Imprenta de Billetes S.A. (IMBISA), 80 per cent of which is owned by the Banco de España and 20 per cent by FNMT.

Among the picture of closures in European banknote printing since 1997 there is one positive exception, Portugal, which in that year had no banknote printing works. In 1999 the Banco de Portugal started Valora S.A. which is still operating from the Banco de Portugal's premises in Carregado, printing Euros.

Today neither Finland nor Sweden print their own banknotes, Euros for the former and Kronor for

the latter. Finland's Suomen Pankin Setelipaino, or Bank of Finland Security Printing House, changed its name to Setec Oy even before the advent of the Euro and was then merged into the French/Dutch company Gemalto. It last won a contract to deliver 23m Euro 100 notes to the Bank of Finland before the summer of 2003. Setec said at the time, that even though it was concentrating on developing electronic and visual ID cards, it was still maintaining its traditional money printing operations.

Sweden sold its traditional supplier of banknotes, Tumba Bruk, owned by Sveriges Riksbank, to US company Crane Currency and concluded a contract for the continued production of its Kroners. When Crane Currency decided to move the production of Swedish currency to its new factory in Malta at the end of 2018, the Riksbank gave notice of the termination of the contract, as the agreement with Crane stated that they would print Swedish banknotes at the printing works in Tumba.

The Euro zone countries of Cyprus, Estonia, Latvia, Lithuania, Luxembourg, Malta, Slovakia and Slovenia do not have national banknote printers and are free to source their Euro allocations either at other national bank owned printing houses or on the private banknote printing market. Malta seems to be a much favoured destination for banknote printers, as both De La Rue and Crane Currency have or will have banknote printing operations there. However, Crane Currency does not have a license to print Euros and Malta's central bank does not have its own banknote printer.

Within the EU but outside the Euro zone, Bulgaria has its own banknote printing works, the Printing Works of the Bulgarian National Bank JSC, which prints its currency. The Bulgarian National Bank claims that its printing works is one of the most advanced in Europe. In 2013, the banknote production unit was made part of a new company owned jointly by Printing Works of the Bulgarian National Bank JSC and François-Charles Oberthur International SA. The Bulgarian Printing Works holds a 30 per cent share in the newly established company, called Oberthur Fiduciaire JSC.

Of the remaining EU countries outside the Euro zone, Hungary produces its own banknotes at Penzjegynyomda Zrt., owned by the central bank Magyar Nemzeti Bank, which also owns the 200 years old Diósgyőr Papermill. The Czech Republic's Česká Národní Banka prints its Korun notes in the Czech State Printing Office and Poland's central bank, the Narodowy Bank Polski has its own sophisticated printing works, the Polska Wytwórnia Papierów Wartościowych S.A. (PWPW), which is owned by the state treasury. ■

FOLLOW THE PAPER TRAIL

A number of privately owned banknote paper makers have been sold in the last two years. What is behind this? Just overcapacity, or are there other factors?

Something is up in the world of banknote paper. In February 2018 De La Rue's decision to exit security paper manufacturing by selling its Overton and Bathford mills to private equity firm Epiris, which formed a new company called Portals De La Rue, followed a hasty sale of Swiss security paper maker Landqart to the Swiss National Bank (90 per cent) and Orell Füssli (10 per cent) in December 2017. SNB bought Landqart because it needed to secure the supply of Durasafe for its currency, of which Landqart is the only supplier.

HISTORY CHANGING HANDS

Earlier in 2017, Arjowiggins, a company owned by Sequana, a paper and packaging group, had sold its Dutch banknote paper subsidiary Arjowiggins Security BV, formerly - and again - known as VHP Security Paper BV, or Van Houtum en Palm to Oberthur Fiduciaire. For a while Arjowiggins Security held on to its one remaining production site for security paper, the mill in Crèvecoeur in France until it was itself sold to Swiss investment firm Blue Motion Technologies Holding. Both Van Houtum en Palm and the Crèvecoeur mill have a long history. The former was founded in 1644, producing its first banknote paper in 1890. In 1945 VHP became the only Dutch banknote paper supplier and in 1978, it was bought by the Dutch National Bank, which sold it in 2000 to Arjowiggins. That company's mill in France was even older. The Crèvecoeur paper mill, formerly called the Moulin du Marais, started making paper in 1580, producing the first banknote paper in 1791 during the French revolution.

One of the largest moves in the paper industry was that of the sale of Italy's Fedrigoni Group to Bain Capital Private Equity in April. Although Fedrigoni produces banknote and security paper in its Fedrigoni Security subsidiary, the unit only accounted for 11 per cent of the turnover of the group. In 2015 Fedrigoni had bought Sequana's banknote and security paper mill in Salto, Brazil, which had only recently commissioned a new paper machine, doubling the site's capacity to 20 000 t p.a. Sato is said to be the largest - and only - banknote paper producer in South America.

Fedrigoni Security, which was formerly known as Cartieri Miliani Fabriano, is the sole accredited Italian supplier of banknote paper for the Euro. Cartieri Miliani Fabriano has the longest history of all paper makers. Paper making started in the town of Fabriano in 1264.

One other movement was that of Crane Currency. The company, which also has a long history in the USA and is the sole supplier of banknote paper to the US treasury, moved into the banknote printing business when it bought the banknote paper mill and banknote printing works Tumba Bruk from the Swedish Central Bank - Sveriges Riksbank - in 2002, which had founded the company in 1755. In 2016, Crane Currency decided to build a new banknote printing facility with three print lines in Malta and move the Swedish banknote printing operations there. As the original contract with Sveriges Riksbank stipulated that the Swedish currency should be printed in Tumba, Riksbank gave notice to terminate the contract. The Riksbank however confirmed that the banknote paper mill would remain in Tumba and Riksbank is now working to find a new printer of Swedish banknotes. Whether that new supplier will use paper from the Tumba Bruk mill is open to question.

MANY MOVEMENTS FOR WHAT?

So what is up in the banknote paper market? Is all that selling and buying of companies mere coincidence? When Sequana considered putting Arjowiggins on the market, the company justified this by saying that "the banknote paper business has suffered substantial losses for more than two years due to structural changes, volume reduction and overcapacities in the market". Some sources even say that there is twice as much capacity in the banknote paper market as is needed to satisfy demand. Yet, in spite of having changed hands, none of the paper mills in question have stopped producing banknote paper. One may argue that large private banknote printers, as e.g. Oberthur with VHP, have added a paper mill to offer a complete service to central banks, but this cannot be a general trend, as De La Rue has just been doing the opposite. The picture is not yet clear.

THE WIDER PICTURE

It is possible, although for an outsider hard to prove, that a lot of the turbulence was an echo of the sudden 2016 demonetisation of over 86 per cent of the Indian Rupee and the subsequent need to replace the now worthless banknotes.

India is the second largest producer of banknotes after China and its four banknote printing plants are able to meet its normal requirements. India, however, is not yet self-sufficient in banknote paper. The Security Paper Mill in Hoshangabad, Madhya Pradesh, established in 1968, was India's first. With a capacity of around 2 800 t p.a. it could only meet a small part of India's requirements. A second paper machine in Hoshangabad increased production to 6 000 t p.a. and a new paper mill with a capacity of 12 000 t was built in Mysore, close

to one of the printing works. This company, Bank Note Paper Mill India (BNPM), is a joint venture of Bharatiya Reserve Bank Note Mudran (BRBNMPL) and Security Printing and Minting Corporation of India (SPMCIL). In May this year, after the upheaval affecting European paper mills, the production capacity of this mill was increased from 12 000 to 16 000 t p.a. In normal circumstances, India requires between 22 000 and 25 000 tons of banknote paper of which it then produced about 18 000 t p.a. itself, but the time immediately after demonetisation was far from normal.

As the two Indian mills could not meet that extraordinary demand, orders were placed at eight European mills, among them Landqart, Fabriano, Arjowiggins, etc. for a total of 27 500 tons of banknote paper to be supplied to India from April to December 2017. The Indian press noted that the positive response from almost all the companies invited by BRBNMPL resulted in the price of the currency paper being almost 10% lower than the price fixed for the last orders placed in 2015-16. This points to a buyer's market. With the production increase in Mysore, India now produces about 22 000 t p.a. Some projections say that India will require about 48 000 t p.a by 2024/25.

As soon as the emergency was over, the orders dried up, putting several mills into difficulties. Was that the main or the only reason for their difficulties? That is one part of the enigma of the changing of hands of those companies. There may be another one, even more difficult to prove.

GRAND DESIGNS INTERFERING?

As the banknote paper business is a truly global one, any change anywhere in the world affects all participants. On August 12, the South China Morning Post (SCMP), a daily paper in Hong Kong, published an article claiming that "multiple sources in the China Banknote Printing and Minting Corporation (CBPAMC) confirmed to SCMP last month, that production plants across the country

were running at near full capacity to meet an unusually high quota set by the government this year."

Most of the demand was said to come from participants in the "Belt and Road Initiative" and one source said Chinese Yuan notes only made up "a small proportion of the orders". Beijing had launched the "Belt and Road" plan, a global development blueprint involving about 60 countries from Asia and Europe to Africa, to stimulate economic growth with large-scale investment and infrastructure construction projects in 2013. India is mentioned in that blueprint but so is Pakistan, which means that any realisation of the plan will not be easy.

That article in the South China Morning Post and the mention of India in it caused shock among Indian political circles and led to questions in parliament. The government has now said that "reports about any Chinese currency printing corporation getting any orders for printing Indian currency notes are totally baseless."

But it may be more significant for European banknote paper makers that China had "seized the opportunities brought by the initiative" and "successfully won contracts for currency production projects in a number of countries including Thailand, Bangladesh, Sri Lanka, Malaysia, India, Brazil and Poland," as Liu Guisheng, president of the CBPAMC wrote in May in an article in 'China Finance', a bi-monthly journal run by China's central bank. The Belt and Road Initiative is not only an economic project but a political one as well, and one can assume that in trying to win contracts for currency production, there may be a bit of political pricing as well. China has three banknote paper mills and, according to the same article, demand for Yuan notes has fallen lately, due to the enthusiastic acceptance of electronic means of payment by the Chinese population. If new customers could be found elsewhere, that would be useful for Chinese banknote paper mills. ■

EUROPEAN BANKNOTE PAPER: PRIVATE AND PUBLIC

The demand for banknote paper in Europe is met by both privately and publicly owned companies, although private suppliers seem to have the edge for the moment. Although the picture in Asia is not dissimilar, in the two largest economies, India and China, the supply comes almost exclusively from publicly owned companies, (see previous article) with India trying to achieve self-sufficiency.

Over the years, some of the few central banks in Europe that had their own banknote paper facilities have left the field. The Dutch national bank sold its mill in 2000 and Sweden did so in 2002. Some have held on to their paper mills. Poland's PWPW, owned by Poland's treasury, not only prints the country's banknotes but also produces its own paper. Spain's banknote printer, the Real Casa de Moneda - Fábrica Nacional de Moneda y Timbre also has its own paper mill in Burgos, which also supplies paper for the Euros. It has produced banknote paper for Spain and for the ECB and other

central banks for over 50 years. The Central Bank of Ukraine also has its own paper mill which has an annual capacity of 3 100 tons, as has the Hungarian Central Bank, with the Diósgyőr paper mill.

BANQUE DE FRANCE PUBLIC AND AMBITUS

The exception to this quiet picture of state owned mills in Europe, however is the Banque de France, which has both a paper mill and a print works, physically close together in Central France in Vic-le-Comte and Chamalières respectively. BdF said it aims to make its subsidiary EuropaFi the most modern banknote paper mill in Europe and the leading producer of banknote paper in the Euro area. According to BdF, EuropaFi already produces on average 25 per cent p.a. of the Euro paper.

The BdF mill in Vic-le-Comte in 2017 installed a new paper machine for banknote paper - including for the Euro - which was to go into production at the end of 2017. The total investment amounted to 75 million euros. The aim of EuropaFi is to double the production capacity and to manufacture around 50 per cent of the paper needed for the annual issue of Euro banknotes. In the long term, the site must supply several printers in the Eurozone and in doing so will squeeze private papermakers even more.

As the largest producer of banknotes in the Eurosystem, the Banque de France has, since the launch of the single currency in 2002, produced close to 20 billion euro banknotes, i.e. 22 per cent of the total volume printed to this day. First specialised in the production of low denomination banknotes of the series 1 (5, 10 and 20 Euros), it has since 2012 played a major role in the initial issuance of the new Europa series, printing 36 per cent for € 5, 25 per cent for € 10 and 44 per cent for € 20 notes. BdF is also involved in producing the new € 50 banknote.

In 2017 the Banque de France introduced “Projet Refondation”, an ambitious project to build a new banknote printing works and a “centre Fiduciaires” adjacent to the EuropaFi paper mill on the Longues site in Vic-le-Comte. The project, which has passed the public consultation stage, will enter the construction phase in 2020, which will last until 2023.

The ambitions of the banknote production side of the Banque de France are of course directed towards the Eurosystem, but not only. With half of its capacity used for printing banknotes in other currencies than the Euro, the Banque de France is also a key player on the international banknote production market. Although no official figures are available, the capacity of the Vic-le-Comte mill can be estimated at between 3 300 and 3 600 t p.a. The claim of producing about 25 per cent

of the Eurosystem’s paper requirement therefore sounds about right. The ECB merely allocates to each central bank member of the Eurosystem the amount of banknotes to be printed in a specified denomination. Not all denominations are printed every year and no central bank prints all denominations. The ECB also does not dictate to the central banks which printing works or which banknote paper supplier to use as long as both paper mill and printer are ECB certified.

We can assume that national central banks will use banknote paper suppliers in their country, although that is not a rule. As both the Banco de Portugal and the Bank of Ireland are shareholders in Banque de France’s EuropaFi mill, we can also assume that the paper they use for printing their respective Euro allocations will come from EuropaFi. Spain will use Burgos paper and Italy Fabriano. That leaves Germany’s two Loisenthal mills with 20 000 t p.a. capacity (although that includes security paper) and Oberthur’s recently bought VHP B.V. mill in Holland with a capacity of 6 500 t p.a. The traditional printer of the Dutch contingent of Euros Joh. Enschede, is no longer active in banknote printing.

Not even counting other banknote paper makers within the Eurosystem, the ECB is said to have certified seven, that leaves a considerable amount of banknote paper capacity free to chase orders in Europe and internationally. Add to that the capacity of recently independent De La Rue Portals, which is not selling to the Eurosystem, of 14 000 t p.a. cotton banknote paper and the fact that the Bank of England has switched totally to polymer, any disturbance in overseas markets, such as a new paper mill in India or China’s reported entry into the international banknote manufacturing market, may cause nervousness in Europa. ■

NEWS

Bank of England appoints Sarah John as the new Chief Cashier

Since June 1st, 2018, the Bank of England’s new Chief Cashier and Director of Notes is Sarah John. Sarah joined the Bank as a graduate from Cambridge in 1999 and has undertaken a wide variety of roles in relation to monetary policy, financial stability and markets – most recently as Head of Sterling Markets Division. As Chief Cashier and Director of Notes, Sarah will be responsible for the production of high quality, secure notes.

Victoria Cleland, the outgoing Chief Cashier, who had spoken at the last Security Printers Conference in Dublin, has been promoted to Executive Director for Banking, Payments and Financial Resilience. ■



Much ado about nothing

The demonetisation of India's 500 and 1000 Rupee notes in late 2016 was an epic event. It also seemed to have achieved little or nothing, according to the Reserve Bank of India's (RBI) annual report released on August 29th. On November 8, 2016, when prime minister Narendra Modi declared the Rs500 and Rs1,000 invalid from the next day, these two notes accounted for Rs15.44 lakh crore (trillion) circulating in the Indian economy, or 86 per cent of the total by value. According to the RBI report, Rs15.31 lakh crore (trillion) returned to the banking regulator. The government had expected that only Rs 10 lakh crore would return.

The annual report of the Reserve Bank of India found that 99.3 per cent of the money withdrawn from circulation had been returned to banks, indicating either there was less "black money" than expected, or that schemes to launder money were more successful than thought.

One of the secondary aims of the scheme was to move India closer to a cashless society and electronic transactions did increase for a while but they did not rise at a pace the government expected. However, as of March 2018, the value of banknotes in circulation had increased by 37.7 per cent, the latest RBI report said. Now that the official results are out, some criticism is fierce. Palaniappan Chidambaram, a finance minister under the previous Congress-led government, said the country had paid a huge price. "Indian economy lost 1.5 per cent of GDP in terms of growth," he tweeted. "That alone was a loss of Rs 2.25 lakh crore (2.25tn) a year. Over 100 lives were lost. 15 crore (150m) daily wage earners lost their livelihood for several weeks. Thousands of SME units were shut down. Hundreds of thousands of jobs were destroyed", the Guardian wrote. ■

EU ABANDONS CASH PAYMENT LIMITS

EU abandons attempts to legislate Europe-wide limits on cash payments, but national limits stay in place. Also the ECB has not reversed the decision to halt issuing of € 500 notes.

In February 2016, the EU Commission published a communication to the EU Council and the Parliament on an Action Plan to "further step up the fight against the financing of terrorism (COM (2016) 50)". This Action Plan stated that "payments in cash are widely used in the financing of terrorist activities... In this context, the relevance of potential upper limits to cash payments could also be explored." The EU Economic and Financial Affairs Council ("ECOFIN") agreed and called on the Commission "to explore the need for appropriate restrictions on cash payments exceeding certain thresholds".

Over two years later, the European Commission published a report on the impacts of restrictions on payments in cash, in which it concludes that the Commission is "not considering any legislative initiative on this matter". The basis of this decision was a study commissioned by the Commission, which found that the likely impact of a cash payment restriction on combating terrorist financing is limited. "Amounts involved are so small, that the threshold levels would have to be set at an exceedingly low level. In the researched terrorist financing cases, neither a cash payment restriction nor a

declaration obligation would have had a significant impact", the study said.

NOT ONLY TERRORISM

The Commission initiative was also directed towards tax fraud and money laundering. However, tax fraud is often conducted through non-cash transactions, using complex legal structures and multinational operations. In these cases, a prohibition on payments in cash would be totally ineffective.

With regard to money laundering, the Commission said that it appears that homogeneous restrictions on high value payments in cash, whether in the form of a prohibition or declaration obligation, would have a positive impact on the fight against money laundering, even though this impact could not be exactly quantified. As money laundering is a by-product of other criminal activities, such positive impact would extend indirectly to the fighting of these activities, even though the restrictions would not affect the activities themselves.

It should be noted that the Commission has only decided to halt any legislative action regarding EU-wide cash limits. Those limits already in force in member countries and limiting cash transactions to between €1000 and €15 000 will stay in place. The Commission has also not withdrawn the decision to stop issuing € 500 notes, which are also suspected - without firm evidence - of being used in criminal activities. ■

BEAUTY AND SECURITY IN EVERY DETAIL

The new passport of the Republic of China (ROC) Taiwan is equipped with the very latest in security technology, an ultra-thin KINEGRAM TKO with the elaborate KINEGRAM ZERO.ZERO Combi. This high-end solution is a veritable technology leap and the most advanced product in foil based document security today.

This article was contributed by OVD Kinegram



The data page of the new ROC Taiwan passport

Be fitting the country's natural beauty and its former name of Formosa, the Republic of China Taiwan's new passport's principal security feature, a KINEGRAM foil, displays beautiful images of orchids and butterflies. After nearly a decade of using the previous document, this new passport edition also marks the 20th anniversary of collaboration between ROC Taiwan and OVD Kinegram AG.

For the past two decades, Taiwan has been at the forefront of adopting the latest innovations in security technologies, choosing the most advanced and most reliable solutions available in the market for its passports. Its latest remake uses a paper-based data page with a protective KINEGRAM TKO (Transparent Kinegram Overlay), which contains a diffractive OVD, the KINEGRAM ZERO.ZERO Combi.

The KINEGRAM TKO is an ultra-thin foil for ID cards and passport personalization pages, providing highest security levels against tampering and forgery. It allows the use of optically variable security elements, provided by the KINEGRAM ZERO.ZERO technology, in combination with a tamper-evident security film, while ensuring perfect visibility of the underlying personalized data. Attempts to remove the foil will immediately lead to the destruction of the KINEGRAM structures and image. KINEGRAM TKO is fully compatible with all printing systems for personalization (ink-jet, laser or color-laser printers) and can thus also be used in a decentralized issuance environment.

The KINEGRAM ZERO.ZERO Combi is the very latest and most advanced product in foil based document security. It combines the unique and

proprietary "metal-on-demand" characteristics of KINEGRAM ZERO.ZERO with transparent KINEGRAM features protecting the picture area. The high resolution fine metallic lines in perfect registration with the diffractive structures, show a striking optical brilliance, which is combined with the transparency of a high-refractive index non-metallic coating.

KINEGRAM ZERO.ZERO Combi also provides ideal conditions for optimizing the integration of the foil with the background document design. Design integration has indeed become a must, calling for images which are naturally easy to combine with the underlying print and biographic data, ideally even having a logical and highly obvious relation to the document design. The use of a novel security laminate such as KINEGRAM TKO with KINEGRAM ZERO.ZERO Combi technology provides unprecedented opportunities for document designers in this regard.

Taiwan is not new to this technology. The three previous generations of Taiwan passports were equipped with KINEGRAM foils, the first of which used a KINEFILM and was issued in 1998. The present new passport thus marks the 20 years' milestone anniversary of a highly successful and trustful collaboration.

The dark green cover of the passport, showing the ROC's national emblem, a blue sky with a white sun in the middle, reveals a paper-based data page on top of which the protective KINEGRAM TKO is laminated. The TKO's KINEGRAM ZERO.ZERO Combi security feature depicts various images typical for Taiwan, notably phalaenopsis orchids and endemic butterflies. Incidentally, the phalaenopsis marks the world's most important orchid species, of which nearly one quarter are grown in Taiwanese greenhouses.

Many of the proprietary KINEGRAM technology's optical effects are unique and cannot be replicated or imitated with holography or other foil origination technologies. Taiwan's new passport KINEGRAM ZERO.ZERO Combi features some of the most striking and important of these optical effects.

Most notably, one of three orchid images in the top right of the data page is realized in Surface Relief Effect, making the leaves appear to protrude from the plane and seemingly tactile, while in fact being completely flat. The two orchids to the left of it appear semi-transparent. The shape below these orchids is equally semi-transparent, but realized as lens effect, enveloping the secondary image. To the left of the secondary image, a colourful pump



The orchides and the butterflies





The 'pumping' effect



Coloured and colourless transparent effects

effect in the contours of the letters "TWN" can be observed. The contour lines seem to enlarge and contract as the passport is tilted, this effect is referred to as "pumping". By reversing the direction of tilting, the apparent movement will be reversed accordingly. Above this area, a line of small letters "TWN" is realized in a colourless dynamic matte effect, and the text seems to move right or left when the passport is tilted about the vertical axis. The letters "TWN" can be seen in different levels of grey, without any colour, and appear to dynamically and dramatically change their gray color.

The butterflies on the bottom left of the main portrait display the unique Diffractive Watermark effect in an achromatic fashion. Details of the butterflies appear very bright and colourless in contrast to the background, which appears dark. When the KINEGRAM is rotated by 180°, this contrast between the elements is reversed.

Besides second line features such as Microtext and UV Print (in hexagonal and wavy patterns), the KINEGRAM also contains forensic features requiring specific equipment for checking, and thus provides complete security on all levels.

The new passport was successfully issued on 5th February 2018 and was received with much praise among industry experts and the public alike. The ROC Taiwan as one of the world's top 25 economies can once again count its beautifully designed new passport, featuring the latest in innovative security technology, among the best-secured identity documents in the world. ■

KINEGRAM and KINEGRAM ZERO.ZERO are registered trademarks of OVD Kinegram AG.

PASSPORT PAPER - COTTON OR NOT

When seasoned experts have different opinions about a subject, to put these opinions to the readers is not to prove one right or wrong, it is to encourage those in the field to reflect on their own preferences and to see if the reasons are still as valid as when they first thought of them. Infosecura would love to hear your opinion.

When the Editor of this magazine asked some colleagues on Intergraf's Committee of Expert, which is responsible for the content of the *Security Printers* conferences, the simple question of "what is passport paper" he expected a simple answer. He did not get it. Tony Dean, now a De La Rue consultant, who can look back at decades of experience in passports at the UK Home Office and later at De La Rue said: "That is not a simple question at all. It depends on whom you ask". He then expanded his answer in writing.

LOOKING AT THE USE OF PAPER

There are so many uses for paper from tissue paper, art paper, copier paper to banknote paper. All have different uses so require different properties. The properties of the paper are adjusted by changing the type and proportion of the components that are used in the basic pulp mix from which the paper is formed.

Many people believe that the term security paper refers to just one type of paper and that it generally contains a secure watermark, most probably of the mould-made type and possibly coloured and/or invisible fibres and/or planchettes and sometimes a security thread. This is true to some extent, but it is not correct to think that banknote paper and passport paper are the same.

If one considers how these two papers are used, it should be quite obvious that they should be different. Banknotes are handled by multiple people on a regular basis and sometimes screwed up in pockets or even used for all sorts of things that they were not intended for, some legal and some illegal. Passport paper, on the other hand, has a relatively cosseted life. It is bound closely with many other pages and then secured within a protective cover. In many cases it is used only once per year and even then it is looked after very carefully.

It is when it falls into the hands of the fraudsters that the paper's different needs become more interesting. It is almost unheard of for a banknote to be fraudulently altered, just rubbing out the number 10 in a denomination and changing it to a 50 is unusual and likely to be detected instantly, and so counterfeiting the entire note is more likely.

For passports, forgery (i.e. alteration of some detail or another) is more common than counterfeiting. These different attack vectors are what drives the difference in the properties of the paper.

A banknote paper needs to be strong and durable with a surface that resists dirt and damage. A passport paper does not need such robustness, but it needs to be easily damaged or be tamper evident. If a fraudster attempts to remove or change something such as a laminate, visa, ink stamp or some personalisation details then the paper surface is damaged either physically or visually. In passport papers, visual change is achieved by the incorporation of chemicals into the structure of the paper that

stain the paper a different colour if an ink removal chemical such as bleach or a solvent is used to remove the ink.

A banknote is not personalised with the bearer's details so it does not need to be receptive to ink once it is produced. A passport paper needs to accept personalisation at the time of issue plus visas and ink stamps as part of its working life. This again requires different structural properties.

As mentioned previously, these structural differences in the paper are achieved by adjusting the type and mix of components.

The strength of paper comes from the intertwining of fibres. The longer the fibres, the more they bind together, the stronger the paper will be. Cotton tends to provide the longest fibres so typically that is what is used for banknotes. Different types of woods have different lengths of fibres, so a paper made from just wood fibres can be adjusted to provide different strengths according to the properties required. The security of passport paper is more reliant on the authentication of the watermark and evidence of tampering, so shorter hard wood fibres can be used to enhance the tonal qualities of the mark and increase the frangibility of the paper.

The different use cases for banknote paper and passport paper dictate different paper structures and this is driven not only by the way the paper is used, but also by the ways in which it is attacked.



THE CASE FOR COTTON PAPER

An opposing view came from another prominent (but former) member of the Committee of Experts, who could also look back on decades of work with passports and whose company is one of the prominent passport producers in Europe.

He too mentioned that this is a very delicate issue because there are many opinions on the paper issue. Admitting that although wood pulp based paper is more fragile in order to detect attempts of forging or tampering, it is not suitable for a document with a life expectancy of up to ten years. The responsibility of a passport producer is to guarantee to the customer the life of the document for its entire validity and this can be made only with cotton based paper.

A further argument is that nowadays the inner passport pages do not contain any sensitive personal data in order to detect forgeries. Most of them are used for stamping entry-exit and to stick visa labels on them. All sensitive data are in the data page, which can be either made with paper and will thus need protection by special foil laminates or from polycarbonates for laser engraving.

Of course for passports, the cotton percentage can be reduced to 50 per cent to keep the cost as low as possible. A further argument for cotton-based paper is the quality of the watermark which we believe should be multi-tone which in turn requires mould made and not fourdrinier made watermarks.

A THIRD VIEW - GEMALTO

As any in opinion-piece that offers three opinions, the third one is a synthesis of the two preceding ones. It comes from Gemalto, which is most prominent in producing digital security for government and companies, but also makes passports and which won the tender for the new - post Brexit - UK passport in May this year.

Gemalto writes that it uses all kind of material for its paper, from 100 per cent Chemical Wood Pulp (CWP) to 100 per cent cotton and a mixture of CWP/cotton. Gemalto is agnostic and offers all options for its paper elements.

The optimal configuration is chosen with the customer in regards to its passport design and production needs. A secure passport is a combination of a secure design, technologies, which are difficult to copy, multiple security features, and the use of materials, technologies and inks that are durable and difficult for criminals to source.

CWP offers key advantages for the passport industry: quality and durability. In the past 20 years, the development of chemical wood pulp raw materials, chemistry and chemicals has been strong leading to an excellent quality for CWP. One specific benefit of CWP is its availability and this is important in order to deliver passport projects quickly.

Cotton has been used in the banknote industry since the beginning as it offers long durability. On top of this, cotton can offer very good performance in some printing processes used for passport.

Such divergence of opinions is useful in clarifying the preferred characteristics of the passport paper. In the end, however, it is the customer who defines the material and design of the passport, as Gemalto wrote. But such examination may shift the arguments from price to function.■



TO PROVE WHO YOU ARE

Considering there is free movement of people in the EU, and birth certificates are often linked to identity fraud, it seems logical that such breeder documents should be able to be verified in every country. It can be done through harmonisation. We are not there yet, but CEN is trying.

and especially birth certificates is urgently necessary. The European standardisation agency CEN has created a working group TC224/WG19, which consists of 29 registered experts from Austria, France, Germany, the Netherlands, Norway, Switzerland, Spain, the United Kingdom and from ANEC (as of May 2018). The secretariat is provided by the German standards organisation DIN and the convener is Dr. Andreas Wolf, who gave a presentation on the subject at SDW in London this year. The work of WG19 is a follow-up to the EU Commission financed research into the area of breeder documents and document verification, namely projects Origins, Fidelity and Aries. It has the final aim to standardize breeder documents, which may eventually enable developing European technical specifications on breeder documents.

A DOCUMENT TAKES SHAPE

One of the projects, the Fidelity project, suggested a harmonized layout for birth certificates with 17 mandatory data records including document number, place of birth, date of birth, sex of the child, surname and forenames of the child, sex, surname and forenames as well as birth name of the first parent, sex, surname and forenames and birth name of the second parent, name of the issuing authority and date and place of issuance. Then there are a number of non-mandatory but recommended data records including date, place of birth, citizenship and credential number of the first parent, the same data for the second parent, the birth place address, time of birth, secondary identification number and remarks. The Fidelity project provides mandatory and optional features for breeder documents to achieve life-long durability, security against manipulation and fraud and machine readability to enable automated processes. Fidelity suggest to produce breeder documents centrally with a standardized number scheme for tracking and - if needed, revocation but recommends to personalize breeder documents locally.

A birth certificate as suggested by the EU project Fidelity

Breeder documents are uniquely challenging, because there are so many of them. Technically, they are simply civil status documents, register extracts from civil status registers such as marriage certificates, partnership certificates, death certificates and copies from the register of death certificates and most significantly birth certificates. That alone does not make them numerous or problematic, rather it is the fact that they have been issued locally by myriads of different authorities in a sheer endless variety of formats and with information that is seldom uniform, even across one country. Among the five documents it is birth certificates that are most closely linked to document fraud, because on the basis of a birth certificate a person can obtain an identity card and a passport.

Add to this that just about every person born in Europe and alive today, had his or her birth registered somewhere and registers and documents may have been destroyed by war or certificates may have been issued in countries that no longer exist. Birth certificates do not have a validity date and where there is no central register, a document, however doubtful, is all there is. This means that the deficiencies of the past cannot be corrected. We have to live with hard to verify birth certificates, but at least we can try to remedy the situation for the generations to come.

Clearly the present state of affairs is unsatisfactory and the issuance of harmonized civil documents

Given that the European population is no longer static, it is important to establish Europe-wide harmonized numbering, e.g. with a 15 digit number which includes the country code, the issuing authority and a consecutive number. Every document before personalisation and issuing should have an individual number. A logical consequence of this is the necessity to establish a Europe wide tracking system.

Machine readability should be achieved by using two 2D barcodes, a QR code or data matrix or other standardised 2D barcode, which should contain the unique number printed at the time of pre-personalisation, the same number again, the mandatory data records and, optionally, biometric

template data. Interoperability will depend on the creation of servers to access the data. These could be centralized, national or local and they need to contain information detailing the document status: generated, at issuer, issued, lost/stolen, revoked, out-dated. The data is anonymized and does not permit identity tracking. The idea behind this is to guarantee privacy. The owner of the document is the owner of its data.

THE OBJECT OF THE WORK

The scope of the document the working group is aiming to establish, is to provide guidance to generate, manage and use secure and interoperable breeder documents in Europe. It is to provide a framework in which citizens retain the control of breeder document data and use them to support identity proofing and verification, establishes methodologies to assess and increase the level of trust in breeder documents. It will specify methods for defining physical and logical/digital representations of a secure breeder document, securing breeder document processes, and linking the document

to its legitimate holder. The types of documents considered are: birth certificates, marriage certificates and death certificates. It is also concerned with management processes for registration, issuance, renewal, inspection/verification, and revocation. This will also include considerations like first-time application, later-in-life registration of an identity, and content update.

The planned content of the technical specification will be the European interoperability framework on breeder documents followed by life cycle management: legal basis and governance, stakeholders, life cycle phases, security features, secure procedures. The common specifications will include data structures and the unified numbering scheme for hardware-, paper and server-based breeder documents.

Dr. Wolf said that we are on the way to a secure and interoperable European breeder document, but we are not there yet. A lot has been done already but much remains to be done. ■

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