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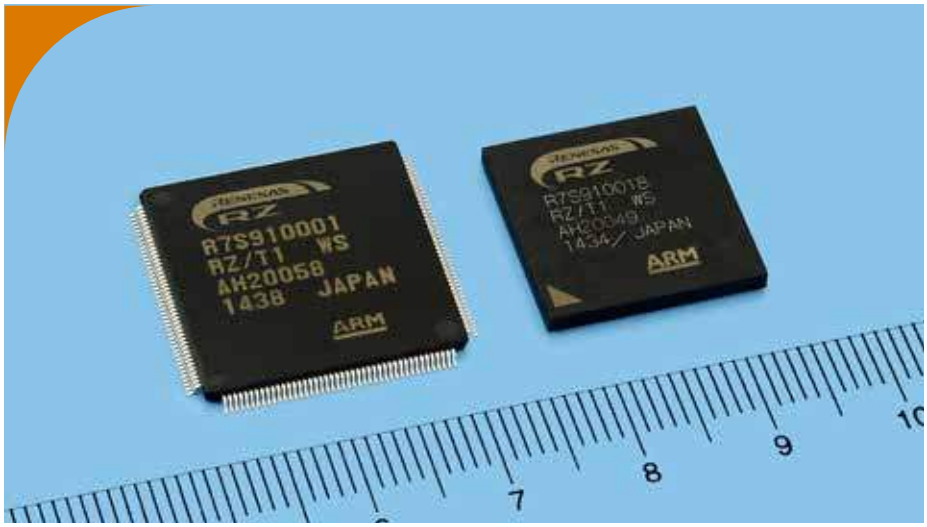
Renesas Electronics and G&D Collaborate



Renesas Electronics Europe, a provider of advanced semiconductor solutions, and Giesecke & Devrient (G&D), a leading international technology provider in the banknote, payment, secure communication and identity management sectors, have announced a collaboration on industrial security solutions and services.

Their first development focuses on an anti-counterfeiting solution for industrial products, which was demonstrated at the SPS IPC Drives in Nuremberg – Europe's leading exhibition for electrical automation.

The collaborative solution comprises Trusted Service Manager (TSM) technology from G&D and special chip activation technology within the Renesas *RZ/T* factory automation device. (TSM is defined as a role in an NFC mobile ecosystem, which acts as a neutral broker setting up business agreements and technical connections with various service providers in the ecosystem who wouldn't usually work together.)

'Together with G&D, we have found a methodology to prevent counterfeits,' stated Michael Hannawald, Vice President of Renesas' Industrial & Communications Business Group. 'Renesas will deliver protected devices to system manufacturers which are activated at the production line of the OEMs by our Trusted Service Manager provided by G&D. Renesas can now benefit from this TSM service expertise and system manufacturers can incorporate TSM-based security solutions into their products and service offerings,' he said.

G&D is a renowned provider of TSM services in the mobile world for SIM cards, Universal Integrated Circuit Cards (UICCs), and embedded secure elements.

There are two types of TSM – the secure element issuer TSM and the service provider TSM.

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U-NICA and ACTILOR Become Two Separate Companies

The U-NICA Group, a Swiss-based security solutions provider, has undergone a reorganisation and strategic reorientation that has seen it divide into two separate entities.

One entity, continuing under the name U-NICA, will focus on physical and digital security solutions for products, brands and documents.

The other, the newly founded ACTILOR Group, will focus on unique pigments and nanotechnology for government security and life sciences. Both organisations come under the umbrella of U-NICA Holding, headed by company founder Alfred Rutz as the CEO.

U-NICA was established in 2004 by Rutz – previously with banknote paper manufacturer Landqart – with the objective of creating a company to develop and offer technologies covering the different requirements of authentication and track and trace from one source.

It is headquartered in Malans, Switzerland and has around 70 employees, five sites in Switzerland and Germany, and representative offices in Hong Kong and the US.

The security printing side of the business was originally focused on *actilor*®, a protein-based security ink developed for government security.

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Today's Authentication Methods for Documents and Products

In this new monthly series of articles, *Authentication News*® will be taking a look at the characteristics and functions of the main groups of authentication features used on today's products and documents.

The series will cover both physical and digital features at all four levels of security (overt, semi-covert, covert and forensic).

We begin the series with an overview of one of the oldest, but still one of the most popular authentication devices in documents: the watermark.

Inside this Issue

Part 1 – The Use of Watermarks in Printed Security Documents

Watermarks are the oldest optical authentication device in documents – there even exists an 'Archive of Papers and Watermarks in Greek Manuscripts' designed as a research tool for scholars.

However, it is generally accepted that watermarks were first introduced into paper on an industrial scale around 1282 in Fabriano, a small town in the Italian region of Marche. The town's high-quality papermaking skills led to its prosperity in the late Middle Ages and Renaissance era, as well as, from 1470, the establishment in nearby Foligno of one of the earliest printing centres in Italy. Today, the tradition of fine paper continues with Cartiere Miliani Fabriano (Fabriano), which is now part of Fedrigoni SPA.

A watermark, as the name implies, is a mark or pattern in paper created during the water-based papermaking process. It appears as various shades of light and dark in the structure of the paper when viewed by transmitted light (or when viewed by reflected light against a dark background). The variation in shade is caused by density variations in the paper.

First use in banknotes

The first recorded use of a watermark in banknotes is accredited to the Bank of England in 1697, three years after the Bank was established. When the Bank first opened, it issued handwritten receipts to repay a depositor with the amount deposited at the bank. These promissory notes were on standard paper with the security lying in the handwritten unique number, date, amount, name of the depositor and the signature of the cashier. However, it became apparent that depositors wished to exchange or utilise these promissory notes commercially, and so they had to be more secure.

In 1697, a watermark was incorporated into the hand-made sheets of paper used to produce the notes.

A looped border pattern was incorporated into a porous frame or mould, which was dipped into water containing dispersed cotton fibres. The water drained through the mould leaving behind the retained fibres as a sheet which, when removed and dried, formed the paper. Where the pattern was present in the mould, less fibres would be retained as it drained less quickly compared with the freer flowing areas. This resulted in a light watermark or pattern that could be seen in the sheet in transmitted light.

Until the introduction of papermaking machines in 1799, watermarks continued to be incorporated by hand, generally by the use of wire strips retained above the porous mesh to create the designs.

Fourdrinier and dandy roll process

In 1779, Louis-Nicolas Robert, a Frenchman, was granted a patent for a continuous paper machine.

This invention was to be later developed and improved by Fourdrinier brothers in England, who patented their machine in 1806. This machine was more efficient and could make a wide variety of paper sizes very quickly. However, the invention cost so much it caused the Fourdriniers to go bankrupt and due to the difficulty to protect the patent, the new system spread quickly.

In 1826, John Marshall introduced the dandy roll to the Fourdrinier-type continuous machine. This made watermarks in the paper by impressing a water-coated metal stamp (the dandy roll) onto the paper during manufacturing. This development revolutionised the process of watermarking paper and the principles of both Fourdrinier and Marshall still apply today.

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Single-tone negative (bright) Fourdrinier watermark.

Example of a dandy roll for single-tone watermark on Fourdrinier machine.

A New Optical Reader – The Next Step in Item-Level Security?

TruTag Technologies, the developer of edible product security solutions, recently unveiled an enhancement to its spectral taggant technology with the launch of a new high-performance hand-held reader at the 2015 Active and Intelligent Packaging Industry Association (AIPIA) World Congress in Utrecht, Holland.

An example of the TruTag Model 4100 hand-held optical taggant reader.

For high-volume, high-value items (such as pharmaceuticals, industrial parts and electronic components), the ideal solution for an 'on-item' security solution will be microscopic, edible, and safe for food and human contact. It should also enable the end-user to verify product origin, lot number, and distribution history – provided it can be read and authenticated.

As a solution to this problem, TruTag Technologies has developed its *Model 4100* hand-held optical reader, which uses satellite imaging technology to ensure secure product authentication.

The solution is powered by a cloud-connected, solid-state imaging and processing engine, and can authenticate – in just a few seconds – medicines, electronic components, industrial parts, packaged goods and other items marked with silica-based *TruTag® microtags*.

According to TruTag, easy-to-use item-level decoding technologies like the Model 4100 are the next frontier in the continuing war on counterfeiting. Such technologies are invisible to the naked eye, but very visible with the right imaging and processing tool, and are applied directly to the product itself, not just its packaging.

www.trutags.com

G&D Collaborate *(Continued)*

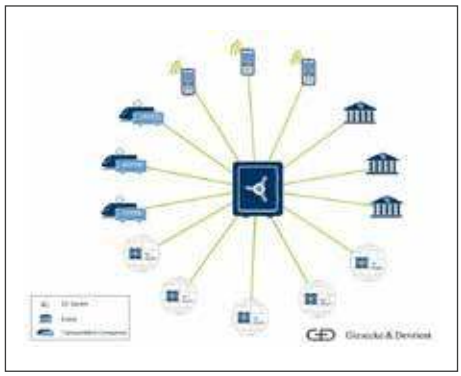
The former manages secure element lifecycles and security domains for service providers, while the latter manages the service provider's application provisioning to the service element and its application lifecycles.

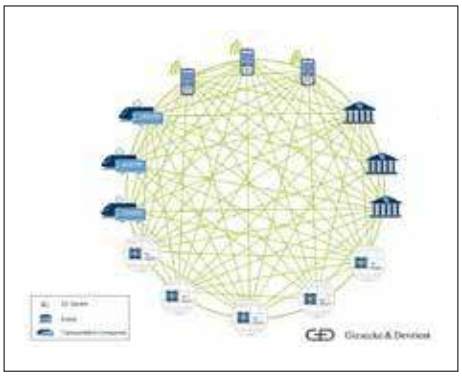
'We look forward to working with Renesas since the jointly developed solutions are a big leap toward real-time security on the chip level, which will benefit industrial facilities,' said Axel Deininger, Head of the Enterprise Security/OEM division in the Mobile Security business unit at G&D.

'For the first time, we are demonstrating a TSM service from our certified TSM hubs around the world, combined with semiconductors with embedded anti-counterfeiting technologies. This cooperation with Renesas allows us to address the emerging challenges of the connected industry', said Deininger.

www.gi-de.com

www.renesas.eu





NFC ecosystem with TSM (left) and without TSM (right).

Tomorrow's Security Today at ODS

Reconnaissance's *Optical Document Security*™ conference, the well-established event that covers the latest developments in optical technologies for document security, will take place 10-12 February 2016, in San Francisco, California.

This event brings leading researchers and developers together with security document issuers and printers to share the latest in optical technologies for securing documents. Because of its unique place as a specialist forum, researchers and start-up companies have used the event for the first presentations on several then-new – but now established – security products – something that will again happen in February.

While new products are important, so are developments of established products and processes. The 2016 programme includes presentations that also cover these developments.

Sessions cover the field

The titles of each conference session reveal the scope of the event. The opening session is titled simply 'Banknotes', with the opening paper, presented by Hans de Heij of De Nederlandsche Bank, covering the vital topics of human perception and user interface with security features. This is followed by papers from Banco de México and De La Rue, on their new image analysis software and lenticular device, respectively.

'Print & Printing', the second session, shows that there is still scope for innovative optical methods in these stages in the production of security documents. Topics include papers from Louisenthal and KBA-NotaSys, on optically variable structures and coatings, and intaglio quality measurement, respectively.

The University of South Dakota, a first-time speaker at ODS, will also be presenting its work on covert RGB upconverting inks.

Thursday afternoon is devoted to a session titled 'New Approaches to OVDs', which demonstrates the level of innovation and invention that continues in this field.

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The Rise of Inspection Technology in a Variable Printing World

Remember when the only quality control a printer was expected to perform included checking colour variation and print registration? And when the only additional elements a security printer was expected to check were static covert and overt security features?

This has now all changed with the advent of digital printing, where today's printer has also become responsible for ensuring the integrity of any variable data carried on the printed item.

This article describes how print inspection technologies have evolved to assist printers to meet these new responsibilities, and in particular refers to a recent case study involving Lake Image Systems (a leading provider of vision-based print inspection systems) and its client, a global security printer.

In the era before variable digital printing, a print inspection system would involve checking that, for example, every single print repeat in a continuous web was the same in every way. Detection of colour variation, print registration, streaks and hickies (the effect that occurs when a speck of dust or debris creates an imperfection in the printing), were at the heart of a successful print run, where defects were identified and removed later in the process.

In their simplest form, these systems presented a static image for the operator to view throughout the job, and make a subjective decision on print quality. As print speeds increased, however, human judgement could no longer be relied upon – and intelligent systems evolved to perform automatic measurement and verification functions, providing a more objective control of print quality.

The arrival of continually variable content has added another level of complexity that is not suited to traditional inspection methods. Most security-printed items today carry a myriad of variable data information, in the form of human- and machine-readable codes such as serial numbers and barcodes. These are often critical for track and trace and authentication purposes and demand 100% readability and integrity. This means that security printers are now expected to be experts in variable data printing.

Crucial to this expertise is not only the quality of the equipment used to print the codes but the inline inspection systems used to verify that the data carried in (or accessed via) the codes is readable, unique and complete. Failure to guarantee this can result in serious operational and security issues further downstream.

As a result, inspection technology has evolved to combine traditional print quality inspection with a whole new range of challenges. These challenges include blocked inkjets, out of sync print engines, database errors, and IT failings.

A case in point

One of Lake Image Systems' largest security printing clients had a challenge related to the inspection and validation of a new authentication label, which incorporated a unique identifier printed in UV fluorescent ink.

The client's modular and narrow web presses enabled complex, multiple-layered printing – using specialised substrates and a variety of security print processes to add specific overt and covert features to each label. With the press running in excess of 30 metres per minute, an inkjet print head system digitally added a unique identifier number to each label, using a specially formulated UV fluorescent ink.

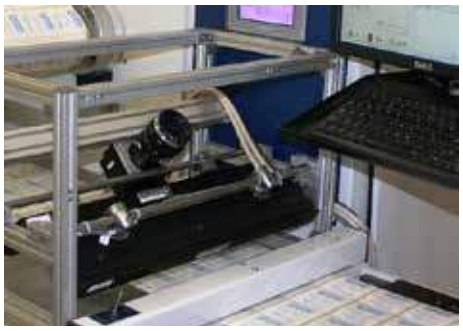
To maintain the high quality standards required, a small subset of the label print run was periodically manually inspected for readability and validated against the original data file by the client's QC department – a difficult task not made any easier by the small font size of the unique identifier. This inspection method was consequently falling short of requirements, by engendering increased production costs and introducing potential business risks.

The client therefore concluded that an automated system was needed that could inspect the UV fluorescent codes on all labels – and not just a subset – during the printing process, in order to mitigate potential risks.

This is where Lake Image Systems came in.

Following an internal process review, the client opted for a high-speed, camera-based OCR (optical character recognition) inspection system that could be integrated within its existing workflow.

The chosen system consisted of an 8,000 pixel resolution linescan camera (a camera with a single row of pixel sensors, as opposed to a matrix sensor formation). The camera was mounted inline on the label press and incorporated with a finely tuned UV LED light source to capture an image of each label and its fluorescent printed code.



Lake Image's high-performance linescan camera.

Lake Image's *Discovery MultiScan* software was then deployed to extract the unique identifier, inspect it and grade it for readability. The software matched the unique identifier against the original data file to ensure all codes were correct and created a log of any unreadable, duplicate and missing codes.

The client's QC team was able to view each label flagged as an 'error' using Lake Image's *MultiScan RollReview* – an offline label roll inspection system. The system showed an image of the suspect label, the inspection result and the expected data, enabling an operator to review the error and generate a label reprint file. This was an important step to maintain overall label job integrity and to keep reject rates to a minimum.

The client's investment in this system delivered benefits for the production team and for the business as a whole. 'Throughput has more than doubled, enabling us to meet tight delivery timescales,' commented a spokesperson on behalf of the client. 'At the same time, we have raised the production efficiency for this application by removing the need to do manual inspection, improving our overall bottom line'.

This case study demonstrates that inspection is a crucial part of the equation for the successful implementation of a digital print and finishing environment. However, as Martin Keats, Managing Director of Lake Image Systems observed, inspection is 'too often considered as an afterthought, once the budget has been spent and the risks have been discovered; yet its impact on bottom line profitability can be immense'.

Keats added: 'The print industry is now at a point where inspection functionality, performance and implementation provides an essential supporting role for the more glamorous printing technology. As such, it should feature as a critical element of every digital printing and finishing project if printers are to succeed in the digital world'.

www.lakeimage.com

Today's Authentication Methods *(Continued)*

In the Fourdrinier process, the pulp is fed through a sluice onto a specially woven metal or plastic fabric mesh conveyor belt (referred to as a wire) from a head tank, and the deposited slurry forms a continuous paper web. After the forming section, the web continues to have water removed until it reaches the dandy roll – a light roller covered by a screen, which can be embossed with a pattern or design.

The dandy roller compresses the web fibres – the greater the pressure, the thinner and brighter the lines on the paper (while the thicker areas block and absorb the light and appear darker). Fourdrinier watermarks are limited in the viewable number of tones and their contrast – a single- or two-tone watermark is the norm.

Cylinder mould-made process

This process was first used in 1848 and unlike hand-made paper, where the mould is flat, the cylinder mould-made process incorporates a slowly rotating cylinder mould, which picks up the paper stock from the vat. The stock is refined so the fibres are opened up for improved bonding.

The cylinder – whose surface is covered by the forming wire mesh to which watermarking elements have been precisely welded – is partially submerged in the vat full of stock. The cylinder rotates, water flows through the mesh and through the watermark mould, which has various levels of porosity according to the design of the mould. The pulp accumulates on the wire surface forming a fibre mat, which is removed by its transfer to a travelling felt belt moving along the paper machine.

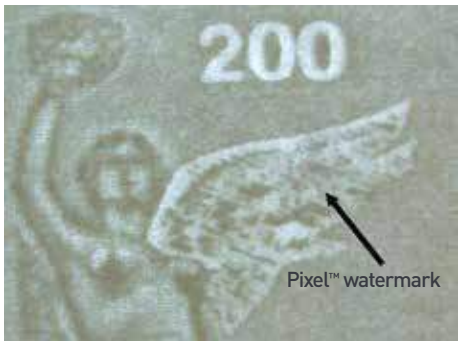
Excess water is removed in the press section and the web is then heat-dried before passing through a size bath, after which it is again dried. It then passes through a conditioning chamber to ensure all the paper has the same humidity, and calendared through hot steel cylinders to obtain the requisite smoothness. At the end of the machine, the paper web is wound on to a reel prior to conversion to sheets.

Cylinder mould-made watermarks are the closest that machine production can come to the fine quality of hand-made mould watermarks. The quality of the watermark is dependent primarily on the mould, which will normally be made by a highly skilled tradesman, either by the traditional method using wax and a cutting tool or more commonly now by computer-controlled engraving.

But the fibre length and refined state of the stock also play a critical part in the quality. As a general rule, the shorter the fibre length the more multi-tonal the watermark, but the weaker the paper.

For maximum security, many favour a multi-tonal portrait watermark to match the person printed on the banknote. First, there is a highly recognisable image to compare the watermark with, and second, the watermark will be more difficult to copy.

Often banknote watermarks will have a highlight or electrotype watermark of the denomination next to the main watermark image – this makes it easier to verify and more secure.

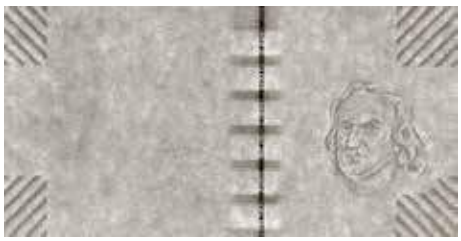


Multi-tonal portrait watermark with Pixel highlight wing and electrotype denomination.

Another highlight watermark feature is the *Pixel*™ watermark developed by ArjoWiggins Security and first used in the Mexico 200 pesos note. Pixel watermarks are used to create a light feature (wing) in the actual watermark, and there is an electrotype (200) denomination.

Watermarks for durability

Not all watermarks are for security purposes. De La Rue patented a system to strengthen the most vulnerable parts of banknotes – the corners and edges – by utilising deep grooved watermarks. The technology was named *Cornerstone*® and *Edgestone*®. Cornerstone is often used on its own but both can be employed together. In a field test by the Bank of England on its £5 note, Cornerstone increased the life of banknotes by 8%.



Cornerstone: watermarks at the four corners strengthen paper and increase banknote life.

Polymer banknotes

Polymer banknotes do not have watermarks as such, but *Guardian*® – Innovia's polymer substrate – does have a similar feature called a 'shadow image'. Working like a cotton substrate watermark, it is viewed in transmitted light where a positive image is seen, and in reflected light where there is a very diffuse negative image.

There are a number of hybrid substrates containing polymers as well as cotton, which have watermarks, or features providing a similar function to watermarks. The two best known of these are Giesecke & Devrient's *Hybrid*™ and Landqart's *Duranote*®.

Counterfeits

Although counterfeits of both Fourdrinier and mould-made watermarks exist, the multi-tonal, mould-made watermarks provide the most difficult challenge to counterfeiters. The most common method of counterfeiting involves printing in some form, such as screen, offset or colour photocopying, using white ink or oils, to provide a transparent effect.

Generally these counterfeits can be fairly easily detected, although some need careful examination and, if the interrogator is not familiar with the genuine watermark, he can be deceived. However, a side-by-side comparison with the genuine watermark almost always immediately reveals the counterfeit.

US currency watermarks are not as multi-tonal as mould-made watermarks that are generally used in banknotes. The US uses flax (with long fibres) as well as cotton in its substrate, and uses a watermark process unique to Crane & Co its paper suppliers. Criminals preferred to clean the ink off low denomination US banknotes and use the paper to reprint a higher denomination, rather than try to counterfeit the paper.

To counter this, the Federal Reserve replaced the portrait watermark with large denomination numerals as watermarks in the low denomination notes so that higher denominations on low denomination paper would be obvious.

Summary

In virtually all research on banknote and document security features involving the public, it is the watermark that is the most recalled, recognised and used. This is, perhaps, not surprising considering watermarks even pre-date security printing.

But whereas other security features come and go, the watermark is the most ever-present, known and looked-for authenticating feature. This speaks volumes about its enduring quality, in particular for banknotes, as a critically important, secure document authenticating feature.

Digital Print on Offset Paper – the Learning Points

By Alan Hodgson, Printing Consultant

High-speed digital printing is now making inroads into commercial print. In order to make progress in this area these printing presses need to be compatible with standard offset paper stock. The purpose of this article is to outline the innovations that were required to make this happen, highlighting the areas where this knowledge can be used in the production of secure documents on paper substrates.

The technology innovations required to make digital presses compatible with offset paper are presented at technical meetings, such as the Digital Printing conference that took place in Portland, Oregon in September (see AN October 2015). The significant challenge has been to ensure this compatibility at the speeds required to challenge smaller offset lithography presses. The opportunity for secure document production is that many of the learning points are transferrable to the type of substrates used in the production of paper-based items such as passports and visas.

The challenge posed by offset paper

High-speed presses were initially introduced for transactional printing for applications such as financial statements, and therefore were initially offered for plain paper substrates using high-speed inkjet with water-based inks. However, commercial printing uses a much wider range of paper substrates and an important one amongst these is coated offset paper. The problems that unfold here are that offset paper is really not designed with digital printing in mind, particularly with inkjet.

An overview of the technologies utilised in high-speed inkjet presses was presented in a previous article (see AN November 2015). It was shown that the combination of high speed and high image quality was not an easy demand to fulfil with inkjet technology. Aqueous inks on plain papers fundamentally dry through liquid absorption into the pores of the paper. Smoother papers are capable of higher print quality but tend to take longer to absorb the ink. As a result, inkjet tends to have increasing problems with image quality and image smear (smudging) on these types of papers.

Solutions are emerging for these issues and these initiatives are moving the right way for the printing of secure documents. While secure documents may not be using coated papers, such products have a reduced ink absorption capacity so these issues remain of interest to us.

Water-based inkjet inks

One of the key learning points that is emerging from this challenge is a reinforcement of an early lesson from inkjet printing. It is of critical importance to treat an inkjet printing implementation as a system. In the case of a secure document this means that the ink, paper and printer settings must all be designed together.

Consider two different ink/paper combinations. A dye-based aqueous ink that effectively wets a highly porous paper will be touch-dry very quickly but can suffer from bleed, low optical density and poor gamut. The other extreme would be a pigment-based aqueous ink on a substrate of lower porosity such as offset paper. This combination can show great print quality when measured as optical density and gamut but suffers from print-to-print offset and low smudge resistance.

This latter combination is important in the personalisation of secure paper documents such as passports and visas, as pigment black inks are used almost exclusively to ensure IR machine readability. Some of the work on pigment ink selection currently being published as a result of this offset paper initiative could be of significant value in the personalisation of secure documents.

This work has also highlighted some image quality issues around a phenomenon known as coalescence. This is where the rate of penetration of the inkjet drops into the paper is slow enough for them to flow on the paper surface and coalesce into random patterns. This leads to a further reduction in the rate of drying and smudge resistance, reduced image quality in portraits due to mottle and lack of definition in text and barcodes. Coalescence is sometimes seen as an issue in secure document production but, as shown by this offset paper initiative, careful choice of the ink/paper/drying conditions can go a long way to mitigate this.

Inkjet inks without water

There are a number of alternatives to water-based inkjet inks, based on oils and organic solvents. These have some interesting characteristics for secure documents but the liquids still need to be removed somehow after printing.

Drying is all about liquid removal. An interesting approach to this is to have no liquid to remove in the first place. The obvious established solution in this regard is to use UV cure inkjet inks. But at the highest print speeds, ink mobility before curing can cause print quality issues too.

A novel solution to this problem appears with the UV cure system in the *Konica Minolta KM-1*. This B2-size sheet-fed inkjet press uses heated inkjet print heads to lower the viscosity of the ink in order to make the fluid printable. When the droplets land on the paper they cool rapidly with a consequent increase in viscosity, effectively immobilising the printed dots before subsequent UV curing.

This is a similar ink transmission system to that used by Xerox in their solid ink devices, implemented on a production scale in their *CiPress* printers. These use a wax-based ink that is kept molten in a heated inkjet head and solidifies on contact with the paper. The printers then use a subsequent heat/pressure treatment to increase ink adhesion and surface flatness.

The challenge with these systems for secure documents is ensuring tamper-proof ink adhesion, as they can exhibit reduced penetration into the paper, resulting in a potential susceptibility to physical alteration.

Alternatives to inkjet

Inkjet is not the only potential solution for high-speed digital printing onto such papers. Liquid toner technology as found in the *Xeikon Trillium* and *HP Indigo* systems is also a viable alternative. It is not a technology found in smaller units such as desktop printers as the fluid management and printing control systems are not easy to scale down. However, the technology does work for high-speed digital production machines.

Liquid toner technology is in place in secure document production. However, it does have challenges similar to the non-aqueous inks described above.

Conclusion – gathering the learning points

The challenges faced by introducing coated offset papers into high-speed presses are similar to those found in inkjet printing low porosity papers in secure documents. They have placed emphasis on the critical importance of treating any inkjet printing implementation as a system. In the case of a secure document this means that the ink, paper and printing parameters must all be designed together.

There are alternative technologies to water-based inkjet and some of these are already established in secure documents on a larger production scale. UV cure inkjet and liquid toner printing fall into this category and innovations are still appearing in these. Further technologies such as wax-based printing also exist and are worthy of consideration for some applications.

U-NICA and ACTILOR *(Continued)*

But, as Alfred Rutz explains, 'The great potential of this product, its increasing market demand from key clients, and the necessary focused market development led to the entrepreneurial decision to carry out reorganisation'.

Hence the formation of a new company of the same name.

Actilor is an organic printing ink, based on a special protein extracted from the 'purple membrane' of a micro-organism called *Halobacterium salinarum*, which creates a distinct colour change when exposed to light.

This can be reversible, or the colour change can be fixed by exposing the ink to a laser, thus allowing a specific code or other design to be written to the colour-shift patch.

Actilor can be applied to banknotes, passports, visas, and other security documents, and can be verified with the naked eye. It provides other functions too, such as the option for optical data storage. A further expansion of this field and an increase in production capacity is intended for the future.

Expanding into life sciences

In addition, says the company, the Actilor protein provides enormous potential for further applications in the field of life sciences, including cosmetics and medicines. 'Which is why we decided to expand the business areas and further develop its various opportunities within the framework of a company of its own, specialising in biotechnology solutions, headed by new company management,' Rutz commented.

This new management is headed by Hertor Bauer (Commercial Division) and Samuel Schindler (Operations).

The other business areas of the U-NICA Group – which are mostly involved with physical and digital security technologies that are incorporated into the product or its packaging, rather than added on as labels – are unaffected by the reorganisation. 'In these fields we will continue to focus our concentration on sales, cooperation agreements and our customer projects with renowned, internationally active companies, in order to extend our global security solutions for the various branches over different business areas, and to give our customers complete solutions coming from one source,' said Rutz.

Both corporate groups are planning for substantial expansion of global sales activities in 2016 in order to move ahead with this development.

www.u-nica.com

www.actilor.com

From the Archives

10 years ago...

UK Passport Printer Up for Sale

Authentication News® reported that UK passport printer Security Printing Systems (SPS) was up for sale by its owners authentos, with a price tag of £150 million. SPS was acquired in 2001 by authentos, which was set up by venture capitalist APAX the previous year as the holding company for its acquisition of the state-owned German banknote and security printer Bundesdruckerei. Bundesdruckerei was subsequently sold back to a consortium of German banks for the sum of €1. It was understood SPS was being sold to pay off authentos' remaining debts.

Based in Oldham, UK, SPS printed UK passports, as well as giro cheques and other government security documents. It was originally part of the HMSO (Her Majesty's Stationery Office), being spun out as a separate company when the government-owned security printer was privatised in the mid-1990s.

NM Rothschild was reported to have been appointed to handle the sale of SPS. The news of the sale was a surprise, since the company was positioning itself through Bundesdruckeri International Services division squarely in the ID and biometrics markets. The acquisition of SPS was seen as a strategic move into the international markets that the company was looking to supply.

Later in 2006, 3M acquired SPS in a move to expand its secure document and issuance platform. In 2009 SPS lost a major passport contract and, in 2014, 3M announced its closure.

20 years ago...

New System for Green Card

Authentication News® reported that the US Immigration and Naturalisation Service (INS), an agency of the Justice Department, had appointed Information Spectrum Inc, of Annandale, VA as prime contractor to design and implement a new card issuing system to combat counterfeit cards used by illegal immigrants.

The contract was worth $275 million over three years. Information Spectrum in turn contracted Lasertechnics, a subsidiary of Sandia Imaging Systems, to provide high-speed card printers and consumables for the new fraud-resistant ID card programme.

The INS issued several different types of authorisation and ID documents to immigrants. Approximately 750,000 Employment Authorisation Documents (EADS) were issued annually to aliens who were granted temporary permission to work in the US; around 200,000 Border Crossing Cards were also issued annually to Mexicans and Canadians who were frequent border crossers, and 1.3 million Alien Registration Cards (Green Cards) were issued to legal permanent residents.

The new system issued documents, including the famous Green Card – the much sought after resident-alien status in the USA – in the form of PVC photo-ID cards with holographic laminate. Card production was expected to begin early in 1996, starting with EADS, followed by Border Crossing and Green Cards.

Sandia supplied up to 14 of its *Model 7R* printers that utilised dye sublimation to personalise PVC cards with digitised colour photos, fingerprints, signature and other features. These included holographic laminates, and the INS considered the use of holomagnetic stripes on its cards. The printing speed of two tandem 7R systems was over 300 an hour.

The new system electronically received complete card production information on aliens applying for US credentials. It then produced the card for mailing, including printing and sealing the envelope. The INS looked to install the new card printing system at four operating sites, the first being its Nebraska Service Centre in Lincoln. An online back-up system was also maintained in the Washington, DC area.

Tomorrow's Security Today at ODS *(Continued)*

Sectago, a young company giving its first ODS paper, reveals its mask-less lithography method to make continuous motion DOVID security features, while three papers in this session – by Toppan Printing, Surys (the new name for Hologram Industries) and the Reserve Bank of Australia – provide updates on optical security techniques which exploit surface plasmon resonance.

Opalux provides an update on how it is converting its opalescent materials into useable printing pigments, while the CSEM offers information on its embeddable sub-wavelength gratings, and IMT RAS explains its new control software for e-beam, dot-matrix and direct-writing systems.

The session closes with two papers on nano-optic technologies (from Nano Tech Security and Simon Frazer University).

And that's just the first day!

Friday morning sees a session on 'Combination Features' followed by a session on 'Smartphone Authentication' – both of which are certainly development areas.

The first features a paper from Zhongchao Special Security Tech Co, the first at ODS from this subsidiary of China Banknote Printing and Minting Corp, in which it unveils its work on interferential thin films.

The 'Smartphone Authentication' session opens with a paper from Raymond Wong, now at Hong Kong Polytechnic University but formerly with the HK Police, who explores the potential for a virtual ID document.

Newcomer Alise Devices explains its *LILIAC* transmissive security feature, then Goznak shows its smartphone-based method for analysing banknote images, with Orell Füssli closing the session with a paper on its *Blue Light* watermarking method for smartphone examination.

The final session of ODS 2016 covers the all-important topic of 'Authentication & Examination'. Another newcomer, ASE Optics explores the use of plastic optics as authentication tools, then Regula gives details of its equipment for examination and authenticity of secure holograms.

This is followed by another paper on the topic of image analysis, from a research group comprising KBA-NotaSys, Wincor Nixdorf and InIT which is working towards a low-cost analysis system.

The final paper of the conference has the European Central Bank describing its experiments in the use of infra-red image capture to screen for latent fingerprints on suspect banknotes.

What about the next big thing?

As is traditional at ODS, the two-day conference is preceded by the half-day 'Short Course on Optically Variable Devices'. This year, the course is given by Dr David Tidmarsh and Dr Mark Deakes of Reconnaissance, who between them are experienced in OVDs for banknotes, payment cards, tax stamps, brand protection and ID documents. While delivering the necessary foundation information for those new to OVDs, they promise a stimulating exploration of the latest techniques and consideration of what might become 'the next big thing'!

An always-popular and well-attended component of ODS is the conference dinner and table-top exhibit, which takes place on Thursday evening. This allows delegates to look at and examine the new developments that presenters describe in their papers, as well as other new optical security features from non-presenting organisations.

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OPTICAL DOCUMENT SECURITY
San Francisco, USA
www.opticaldocumentsecurity.com

14–16 MARCH 2016
HIGH SECURITY PRINTING EUROPE
Bucharest, Romania
www.hsp-europe.com

26–27 APRIL 2016
LABEL SUMMIT LATIN AMERICA
Cartagena, Colombia
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10–12 MAY 2016
SDW 2016
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