QUESTIONS & ANSWERS

Banknote Technology Webinar
(July 5 - 7, 2023)

During the webinar, some questions from the chat could not be answered due to time limitations. Please find here the answers, which were provided by the presenting companies after the webinar

OVERVIEW

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BANQUE DE FRANCE (1/2)

"A journey through Banque de France banknote manufacturing "

Q: Cotton vs Hemp / Flex – what are the technical specification in comparison? Cost and performance like double folds, tear, tensile, porosity?
A: With the proper know how, mechanical properties can be managed to remain the same as 100% cotton banknote. As any new material used in an industry, price gap is closing as volume and know how are increased. We believe in reaching cost parity between cotton and alternative fibers in the near future.

Q: How does EverFit behave with tactile features, such as braille for visually impaired?
A: This question has been answered in the webinar. Tactile or haptic features are fully compatible with EverFit® and remain perceptible for longer times as the print is protected from erosion by the laminate. You can request a brochure at everfit@banque-france.fr

Q: Regarding EverFit, do this not obscure banknote features like Magnetics etc? Also how does this affect the soil detection?
A: All the level 2 security feature are compatible with EverFit® as the laminate does not interfere with UV, IR or Magnetics.

Q: How do EverFit, Flex / Hemp behave when it comes to recycling?
A: This question has been answered in the webinar. When recycling EverFit®, the introduction of alternative fibers does not introduce any concerns. For more information, please reach banknote-life@banque-france.fr.

Q: What is the thickness of EverFit layer ?
A: The laminating film has a thickness of 28 μm. The overall thickness of an EverFit® banknote remain in the standards as the paper is thinner with a lower grammage.

BANQUE DE FRANCE (2/2)

Q: Compare to the paper banknote substrate, which is better when it comes to durability?
A: EverFit® offers outstanding durability when compared to varnished paper banknote as the three main durability issues are solved (soiling resistance, mechanical resistance and ink abrasion resistance).

Q: LongerFIT: How this special treatment and technology influence cost and durability for e.g. double folds of the substrate comparing to your standard PVOH paper? Is the haptic or gloss or smoothness changes after treatment? Does this special banknote paper produced and sized on the surface directly on paper machine or need to be additional coated offline?
A: Haptic, gloss and smoothness remains in the standards when compared to standard PVOH. LongerFit® treatement is a specific sizing done online at the paper machine.

CANADIAN BANK NOTE COMPANY (1/1)

"Success relies on thoughtful integration and rigorous testing"

Q: Have you been doing durability test for produced banknotes?
A: Yes, we have been doing durability testing for produced notes. We are currently working on a correlation between our testing and “years in circulation”. This testing is being done on a series which has an understood circulation history with quite challenging environmental conditions.

CASH INFRA PRO (1/2)

"Contract design for international cash center projects "

Q: What is the engineer's role in the projects organized by FIDIC, since he is paid by the employer? This is particularly the case when technical/administrative issues need to be clarified.

A: The role of the Engineer contracted by the Employer: FIDIC contracts are based on a contract management concept that integrates a third person between the Employer and Contractor, "the Engineer," who takes over far-reaching tasks. The engineer is the contact point for all mutual claims and rights that arise during the execution of the contract. He is the contract manager, he is responsible for quality control and he interprets the contract. The Engineer mostly contracted by the Employer. Nevertheless, it is a contractual requirement that the Engineer performs his tasks in a fair and balanced manner, but also in a factually and technically correct manner.

Q: FIDIC offers several rainbow editions/ books - which are useful for Central Banks projects?

A: The FIDIC Red Book is applicable when the Employer takes over the design of the cash center/ building (Construction). The FIDIC Yellow Book is applicable when the Contractor takes over design and implementation of the cash center/ building (Plant and Design-Build). The FIDIC Silver Book is applicable for EPC/ Turnkey Projects. The FIDIC White Book is applicable for contracting the Engineer.

CASH INFRA PRO (2/2)

Q: International projects need to involve different parties from different countries with different laws. What kind of international law is FIDIC based on? Which legal basis is FIDIC based on?

A: FIDIC contracts are based on a English legal background and if comparing it to other jurisdictions, having sometimes a different legal basis. This applies e.g. to the distribution of risk. A large percentage of internationally executed construction and plant engineering projects are executed anyway on an English legal basis. The English legal background of FIDIC standard contract models is therefore worldwide quite common.

CRANE CURRENCY (1/2)

"The Intelligent Evolution house note with RAPID® Vision Detect"

Q: Are RAPID and the new RAPID Vision and ‚Motion Surface' machine readable fearures as well?
A. See below

Q: What is the range of color combination that can be used on RAPID Vision?
A: We work with a wide range of colors and combinations to achieve the strongest, easiest to verify movement effects that also meet the imagery ideas and requirements of the central bank.

Q: Can banknotes be varnished with this feature?
A: Yes. RAPID® and RAPID® Vision can be varnished with no adverse effect.

Q: Can additional machine-readable features be integrated ?
A: Yes. RAPID® Vision with Detect is machine-readable. See below.

Q: What width would you recommend?
A: Every RAPID Vision security thread exhibits a customized appearance created by the central bank and Crane's designers. The selection of width (typically from 4 to 6 mm) is based on the customized effects and their integration into the banknote's overall design.

Q: In what widths is RAPID® Vision available?
A: 3–6 mm. The Intelligent Evolution House Note featured in the BTR#9 is 6 mm

CRANE CURRENCY (2/2)

Q: Are there any current customers? When will we see RAPID® Vision in circulation?
A: We are today working with a central bank that we believe has the goal of issuing a banknote with RAPID Vision before the end of the year. Stay tuned!

Q: You mentioned machine-readability, is RAPID® Vision detectable by machines?
A: Yes, all Crane micro-optic security threads can be machine-detectable. Crane uses a special IR material available only to the currency industry which unlike magnetics, is invisible to the eye but easily detected and verified. This is true even with most retail cash acceptors allowing the detection and stopping of counterfeits from being passed at the point of sale.

CCL SECURE (1/2)

"A window into banknote security"

Q: How the Lenses are being produced?
A: The lenses for CINEMA are integrated into GUARDIAN inline as part of the substrate production process. The lenses are formed using a CCL Secure proprietary process that enables the reproduction of millions of high precision, high quality lenses as part of a high speed manufacturing process. The lenses and high optically clear film we use are one peice, so enabling a 90 micron lens to be used without profile issues and to maximise the optical effects. This also significantly improves security and counterfeit resilience. If you want more information please contact us directly.

Q:What is the minimum thickness possible for CINEMA ?
A: CINEMA is integrated into GUARDIAN substrate and has been designed to utilise the Clarity C polymer core that GUARDIAN is printed on as part of the feature itself. So the thickness of the CINEMA feature is a combination of both the micro-optical elements and the GUARDIAN substrate for the thickness is over 90 microns without having profile issues. If you want more information please contact us directly

Q: Can we print over the lens structure?
A: This is being explored along with other options, CCL Secure will work with central banks and banknote producers to integrate CINEMA in to their designs. CINEMA is integrated into the substrate and this allows for considerable design flexibility. By working collaboratively with banks and banknote producers CCL Secure is able to create visual attractive and highly secure banknotes with stunning 3D and movement effects. Please wait to see what we are going to issue next... If you want more information please contact us directly.

CCL SECURE (2/2)

Q: Beside apply in banknote, is it possible to apply CINEMA, VIVID etc on others security documents?
A: CCL Secure does not offer CINEMA or VIVID for non-banknote applications. If you want more information please contact us directly.

Q: If a polymer banknote is "bleached" will the lenses remain functional or will they be damaged?
A: CINEMA is highly robust and has been thoroughly tested through all standard chemical and physical testing. CINEMA performs at least as well as other similar features and CCL Secure would be happy to share chemical and physical hazard testing information with interested central banks. If you want more information please contact us directly.

GLEITSMANN SECURITY INKS (1/2)

"Modernising Tradition - The next generation of infrared inks "

Q: Is it a pigment or dyes?
A: It is a pigment

Q: Could you please explain how to measure the light fastness and chemical resistance of your product? For measuring do we need special equipment?
A: Normal equipment is used for light-fastness tests and other durability tests – standard procedure for all type of inks. Regarding light fastness, glair exhibits excellent and comparatively better properties compared to standard inks

Q: How is the migration of the color? Is it stable or does it move and thereby risk obscuring a design
A: It is stable and doesn't impact designs

Q: Existing for liquid inks? Gravure or flexo?
A: No, only available for intaglio and offset printing

Q: Can you please explain what factors can limit its imitation?
A: Specific tools/equipment usage, design incorporating a "IR-spilt-image"

Q: You introduced another second level features, "mouveINK" two years ago – why did you now change to the IR range of the spectrum?
A: We want to offer our customers the freedom of choice for all type of inks, standard visible inks, UV and/or IR-inks

GLEITSMANN SECURITY INKS (2/2)

Q: Could glair be combined with mouveINK in one single ink?
A: In principle yes but design aspects have to be considered when taking a decision. Our technical staff will help during design stage if required

Q: WQill GSI introduce more level 2 features in the near future?
A: Yes, we will present a new version of mouveINK and other features inks in the not too distant future.

HUNKELER SYSTEME (1/1)

"Energy Saving during the Wheel of Destruction"

Q: Is it possible to upgrade existing shredding systems to enable Central Banks to be ready for mixed substrate strategies?
A: Our systems are designed in a way that enables upgrading to mixed substrate destruction. For example, we apply two outlets on the material silos per standard, so at least mixed substrates in sequential mode destruction can be reached with reasonable investment.

Q: Can you give us an example on how much energy costs during the shredding process can be saved if the i.e., unprinted material is only shred according to Particle size P3 instead of P5?
A: We can make an example based on the project introduced during the webinar: Our customer required a shredding capacity of400kg/h. Approximately 2 tons of material had to be destroyed per day. It was a mix of 75% unprinted and 25% printed waste.

The calculated energy costs for destroying all the material in P5 were about EUR 38,000 per year. By eliminating the granulator for the unprinted material, the energy costs drop to about EUR 25,000. This is a difference of EUR 13,000 per year in energy costs alone. There are further savings in maintenance/wear parts - especially the knives of the granulator.

Q: What is the compaction ratio of briquetting presses and what reduction of storage space and transportation capacities can be expected?
A: Briquettes can be compressed in a factor of approximately 10:1. The storage space can be reduced by a factor of 10 accordingly.

The transportation savings are in a factor of around 4 to 5. Most likely you will reach the weight limitations of a truck, therefore the factor of savings is lower compared to the storage advantage.

HUECK FOLIEN (1/2)

"TRILUMIC® - A journey of holographic stripes from the reef to the Austrian alps "

Q: You showed many foil stripes – which are your latest banknote threads ?
A: Our latest product launches for security threads have been the TRILUMIC® feature on a banknote thread (1st banknote will be issued still this year) and our CoActive® Security thread. CoActive is the combination of a ColorSwitch with holographic effect which gives a lot of possibilities for the banknote designer.

Q: Which are the most important references of Hueck Folien ?
A: We are proud to be one of the suppliers for the EURO series and to be the sole supplier for the Swiss Franc.
For the security threads we think that the Bolivia series is a very beautiful banknotes and harmonious series
with our ColorSwitch Picture security thread.
For the foil stripes, the 15.000 and 30.000 Riels banknotes of Cambodia are a great design for a holographic stripe together with the UV TRILUMIC® on it.

Q: What is Hueck Folien doing in the sense of sustainability ?
A: Our company target is to have a ecologically neutral production by 2035. We just installed last year a 400 kW solar plant and we started to use also recycled films for our products.

Q: How to make sure the chemical resistance for the stripe?
A: For the physical and chemical resistance of all our products, i.e. security threads and stripes, we have our internal tests to make sure we fulfil all requirements of the papermill, the printer and our final customers the Central Banks.
There are many different tests the products have to pass, but I think these tests are anyway standard in our industry.

HUECK FOLIEN (2/2)

Q: Does Hueck Folien have a reference on polymer?
A: No, at the moment not yet, but we are under process of that.

Q: Can the foil stripes be over varnished ?
A: Yes, of course, the foil stripes as well as all security threads from our company can be overvarnished.

LANDQART AG (1/2)

"Landqart's 150th Anniversary Housenote "

Q: Who were your partners in the project?
A: The partners for the Landqart Anniversary note project were: Concept design by Andreas Iten; Origination and Print by Orell Fussli, Foil from Kurz; Inks and Spark from Sicpa; Substrate and concept design from Landqart

Q: It is possible to put two colours of paper? One on a side and another one on the other side
A: Yes, absolutely. This is done in a few circulating notes already (the Bahmas $50, the Kazakh 20,000 Tenge notes). We can adapt the paper layers to work harmoniously with the design and colour scheme of the note and/or series.

Q: What is the maximum length of a window for the thread?
A: We would stop short of making a full top to bottom window, and we recommend something in the region of 50% of the note height. The idea is to adapt it as best possible to the design of the note.

Q: Are there other features we can print on the banknote?
A: There is no limitation on printing on the surface of Durasafe.

Q: Could we put different color of the cotton paper at DURASAFE ?
A: See above, of course we can!

Q: Also, i heard from my colleague that Durasafe technology already got the Halal Certificate, this is true?
A: Yes, it is true. You can view and download the certificates (we have Halal and Kosher certification) from the download section of our website. We needed a way to prove, independently, that our notes did not contain any animal products, and this seemed the most practical way. We renew the certification on a regular basis.

LANDQART AG (2/2)

Q: Which countries applied durasafe substrate in passports and banknotes?
A: There are currently 19 denominations circulating on Durasafe in 8 countries.

Q: Is the grammage limited to 105 gsm?
A: For banknotes, this is the current grammage. For passports and certificates we use higher grammages to meet the needs of those markets and to distinguish the substrates from one another.

Q: How long is the lifetime of durasafe compared to Cotton Paper?
A: Our experience shows that it ranges from 2.5x to 4x. We take the view that 2.5x is a reasonable assumption. What is also important to understand is that the security features, such as security threads, will not be impacted by circulation. The polymer layer protects these features from dirt, dust, scratches, and makes them harder to harvest and re-use in counterfeiting.

LEONAHARD KURZ STIFTUNG (1/2)

"Making Security Happen – KURZ Technology in Application Know-How that speaks for itself"

Q: Is there a standard tolerance for the holographic patches?
A: The tolerance in application is mainly depending on the accuracy of the application machine. Generally a tolerance of around +/- 1 mm is feasible.

Q: With which equipment the KINEGRAM Patches can be applied? And has there anything changed due to the further developments of KINEGRAM?
A: An the banknote field besides the foil the quality and suitability of application machine is of great importance. The Machines of KBBS and Gietz are the mostly used ones. During the development of new features, KURZ normally makes industrial test on both machines , which represent rotary and up-down application.

Q: What is the difference between colour shift foil and colour shift film produced in PVD?
A: Color shift effects can be achieved by various means: By using cholesteric liquid cristal material, based on specific diffractive structures or by Physical Vapour Deposition (PVD). KURZ has the capability of using all of these methods, however KINEGRAM® COSMIC is based on PVD.

Q: Based on the experiences of the customers which is using OVD Kinegram apply on the substrate or applying in the printing work, how many defects can occure during the production / applying process?
A: Firstly, the term "defects" needs to be defined more precisely. Deficiencies can mean optical aspects, application problems, tolerance problems, missing durability criteria, etc. Therefore, it is inevitable to carry out industrial tests at the beginning of the project and to precisely define the technical specification including the limit samples for optical aspects.

LEONAHARD KURZ STIFTUNG (2/2)

Q: What is the meaning and importance of testing a foil before application? Does this testing impact banknote production schedules?
A: Testing every single production lot increases the chance of zero-problem production with regard to the application and durability performance. KURZ uses a proven and well accepted process that enables testing at the customer's site with minimal effort to avoid impact on production processes.

Q: How, if at all, are the foil tests different from banknote durability tests?
A: The outgoing tests at KURZ and the incoming tests at the customer's site are identical and focus on the application itself (speed, prevention of flaking,...) and an agreed catalogue of durability tests. KURZ provides a protocol of the outgoing test results, which is part of the agreement.

Q: How does KURZ ensure that all its knowledge and experience is maintained within the company over time?
A: The advantage of a big organization like KURZ is, that knowledge and experience is widely shared amongst various teams (chemistry, physics, engineering, application, production, QS etc.) This ensures the continuity of knowledge and gives new employees the opportunity to build up experience due to the large number of projects.

Q: Given the pressure on governmental budgets, is foil – especially knowing that its application requires a certain prepraration and know-how – a critical cost factor in the production of banknotes?
A: Like any other feature on a banknote, also foil based elements come at a price. However, the wide range of KURZ features from basic KINEGRAM® to more sophisticated versions, such as KINEGRAM ZERO.ZERO® or KINEGRAM COLORS®, as well as the thread, stripe or patch form factor, allows for a tailor-made solution also in terms of cost. And as mentioned in the presentation, the total cost of ownership is defined by many more factors than just the price of the consumable itself, such as speed, yield, downtime avoidance, ...

LUMINESCENCE SUN CHEMICAL SECURITY (1/1)

"Sustainable banknote ink - A realistic journey"

Q: Are your mineral oil free inks in circulation?
A: Our mineral-oil free offset inks have been in circulation for more than a decade with very positive feedback from our customers. We were also the first in the industry to stop the use of Cobalt driers in our inks. We are currently going through production qualification trials of our mineral-oil free intaglio inks with various partners.

Q: What are SUN Chemical's sustainability targets?
A: Sun Chemical is on track to reduce CO2 levels by 30% by 2030 and become carbon neutral by 2050. We don't only look at the production processes but also the impact of our inks on their final product. We follow the 5 R's approach by looking to Reduce, Reuse, Renew, Recycle and Redesign.

Q:Are all your UV curable inks LED curable?
A: In general, our UV curable inks can work with LED curing systems. In the banknote industry we see this implemented in the Offset, Screen and numbering printing process.

META MATERIAL (1/2)

"KolourOptik® Stripe – Next-generation Plasmonic banknote security feature "

Q: How do we request KO sample material for testing as a Central Bank?
A: Please send requests for sample materials to sales@metamaterial.com. We have a selection of banknote samples & application-ready material available.

Q: Does it cure with UV or Oxidative ?
A: If the question is referring to application of the stripe to the banknote, then our stripe product includes a hot-stamp adhesive that is applied with heat and pressure. However, for the foil construction itself, KolourOptik® effects are produced from metallized, UV-cast nanostructures and microstructures.

Q: Is Kolour Optik applied in any circulating banknote?
A: The KolourOptik® technology is a brand new security solution and is not yet featured on a circulating note.
LumaChrome, our color-shifting optical thin film, has been featured on over 30 denominations, delivered on over 7 billion banknotes, and is still produced in our secure production facility.

Q: Varnishing process (acrilyc) , have some effect on the thread? Can it be over varnished ?.....also overprinted ?
A: KolourOptik® is compatible with varnish and other protective coatings. The KolourOptik® microstructures and nanostructures are closed structures and the plasmonic colors, 3D depth, and movement effects remain consistent across environmental conditions, including moisture and soiling.

Q: Standard application material is sufficient or does KO require any special application equipment?
A: Our stripe product is manufactured in a standard form factor and has been industrially applied and validated with a variety of application machines, without any special modifications required.

META MATERIAL (2/2)

Q: Can it work with both paper and polymer substrates?
A: KolourOptik® technology is compatible with all substrates. Speak to our Sales team for more information.

Q: How many colors are available?
A: KolourOptik® technology supports a palette of over 200 plasmonic colors. For details or custom color requests, please connect with our Sales team.

Q: How is KolourOptik different from micro-lens solutions?
A: First and foremost, KolourOptik® technology does not include any lenses. Some of the key advantages over lenticular or microlens solutions include:

- No inks, dyes, lenses, or laminated layers are used in KolourOptik® thus, a more sustainable solutionKolourOptik® offers multiple colors, used without limitation, in any combination, anywhere on the security feature
- Color is created and controlled on a pixel-by-pixel basis, at the nano-scale, for ultra-high resolution security
- KolourOptik® is only 4 – 6um thick, as compared to typical thickness of 30 – 100um for lenticular solutions
- Thinner solutions are easier to apply and, as a result, can work with any substrate and any application machinery, without risk of banknote distortion

NOTE PRINTING AUSTRALIA (1/2)

"QUALITY MANAGEMENT - An integral part of NPA's customer relationship "

Q: How does the customer communicate their quality expectations to you?
A: NPA works collaboratively with our customers to understand their quality expectations. We are able to use all information supplied by the customer to build a quality framework that aligns our standards to customer expectations. This may take the form of a product or technical specification, information detailing key concerns, or feedback regarding past performance in circulation. NPA has translated specific information regarding acceptable quality limits (AQL) for banknote defects into our quality plans and single note inspection models, ensuring banknotes are delivered in accordance with NPA's high quality standards.
NPA highlights our product quality as the focus of our banknote printing. If our customers have not formulated their quality expectations, NPA will apply their own high quality standards to production. We will develop a banknote specification that ensures our customers receive banknotes printed according to NPA's ongoing quality standards, maintained over many years printing for the Reserve Bank of Australia and many other customers.

Q: How has the staff embraced the daily operations focus?
A: Our production staff have engaged strongly with the daily operations focus, as they have seen an immediate benefit from the program. As a result, NPA has seen a strong benefit in improved productivity and efficiency.
The daily focus utilises a structured program of Management visits to each press, followed by daily technical and operational reviews. This ensures that our print teams see immediate action on any ideas or concerns they raise regarding safety, quality or delivery. In turn, Management is able to quickly respond on any factors that may be hindering our teams in achieving the quality and productivity goals NPA strives for. The daily operations focus has improved the performance and outcomes for both print crews and management.

NOTE PRINTING AUSTRALIA (2/2)

Q: What future improvements are you planning to implement to further improve Quality?

A: NPA has always invested strongly in Quality management. In recent years, we have expanded our Quality Control lab to ensure our QC team has the equipment and capacity to provide quality support whenever NPA production is running, including after hours and weekends.

We are now investing in automated quality inspection systems. This will allow our QC team to increase the frequency of testing, and focus more strongly on the quality aspects highlighted by our customers. In the coming months, NPA will integrate the Proxima-o/p and Proxima-i quality inspection units into production, and implement a Zeiser inspection unit on our Numerota press. Our Finishing department will commence operation of a BPS X9, in addition to our BPS2000s, further enhancing our single note inspection capabilities.

Alongside our continued investment in automated quality inspection, NPA Quality will implement enhanced quality inspection plans that ensure alignment of quality standards across every inspection system, at every stage of production. This will further enhance NPA's commitment to meeting and exceeding the quality expectations of our customers.

OBERTHUR FIDUCIAIRE (1/3)

"How banknotes are connecting people to their national agricultural heritage "

Q: Why did you focus on the case of SISAL Fibres out of all the others?
A: We studied the potential benefits of this fibre some years ago, and then conducted a deeper investigation when we had interested parties in Africa. We were able to identify a local producer, and obtain a high optical and mechanical quality pulp grade particularly adapted for banknote paper. Then the technical interest as a fitness improver was demonstrated.

Q: Isn't the model of using fibres grown closer to the paper mill the best option in terms of environmental footprint?
A: This is indeed an ideal case when considering the transportation impact. But the actual situation is that cotton is cultivated worldwide and even if the cultivation of the alternative organic fibre is far away from the paper mill. The benefits of using fibres from easy to grow plants consuming limited water or requiring few inputs, makes the model environmentally valid and rewarding.

Q: Are you currently evaluating other fibres?
A: Yes we are. We have implemented an extended survey and we are continuously looking for any potential validation of natural fibres within our banknote paper making activity. We have several ongoing projects with customers for which local fibres are being studied and evaluated.

Q: Pre or post coating is possible of natural fibres mixing with cotton?
A: Yes, the use of natural fibres mixed with cotton is compatible with both highly durable treatments applied at the paper machine and for post-print protective varnishes. These fibres are made of cellulose, and the paper made from them reacts as if it was a pure cotton based paper.

OBERTHUR FIDUCIAIRE (2/3)

Q: How are the printing properties of SISAL compared to cotton?
A: The integration of sisal in the paper composition is seamless with regard to printability. The usual machine settings can be followed and no modification to the standard setting is required, whatever the printing process.

Q: Would you propose a European CB to use SISAL over cotton? As none are really locally grown. Or would you propose something completely different?
A: As said, in terms of cultivation location indeed, Sisal does not really differ from cotton as both are cultivated worldwide, but Sisal offers extra benefits as it is an easy to grow plant consuming limited water, requiring no inputs and this is environmentally very interesting.
In addition, at Oberthur Fiduciaire, we are also investigating alternative compositions based on fibres from plants grown in Europe and we can already propose beneficial alternative compositions.

Q: What about the bleaching of these fibers? What colour will the final produced paper then have?
A: The bleaching processes used for these natural fibres does not differ from the process used to bleach cotton. It is possible to get bleached paper pulp with high mechanical strength and optical properties.

Q: Did you do the simulation of composition of SISAL / Cotton and what is the perfect mixture? What are the final performance specifications for a SISAL / Cotton substrate compared to standard cotton ? How long did you do the research to using SISAL as a fiber?
A: Yes we have intensively studied mixed compositions based on Sisal and cotton and the benefits of using sisal as a fitness improver can already be seen for a limited concentration of Sisal. Reaching 10% to 20% substitution rate appears to be a good target.

We had the opportunity to study the benefits of using sisal in real circulation conditions, and we can confirm that the measured paper results met with the expected enhanced mechanical performance. (answer continues on next page)

OBERTHUR FIDUCIAIRE (3/3)

A: (continued from previous page) Due to their morphology and composition, sisal fibres enhance the mechanical properties of the banknote paper mix by increasing the internal cohesion of the paper which makes the banknote more resistant to degradation in circulation, boosting tear resistance, and tensile and folding endurance.

Sisal fibres also increase the wet strength as a result of better fixation of the wet strength resin on the fibers, thanks to the presence of reactive hemicelluloses.

From the concept, the selection of a sisal grade of a high mechanical and optical quality level, to the real circulation exercise, it took us between 18 months to two years.

ORELL FÜSSLI (1/1)

"ESCHER® - A 3D Intaglio Revolution"

Q: Based on your presentation, whether any differences of making the intaglio plate between the existing and 3D Intaglio?
A: The platemaking process itself is identical to a convential 2D Intaglio process. The difference lays in the source of the design data.

Q: Does Escher® have any influence on the production process?
A: So far, we carried out multiple tests on a prototyping equipment, a MiniOrloff, and we have produced a test note.
We did not see any influence on the production process.
The intaglio plates have been produced following state-of-the-art design rules, e.g. line width, depth, shape, wiping direction,...
The source if the motif printed has no influence.

Q: How can you use this method for someone who has passed away or for a building which no longer exist anymore? (As you cannot scan the person/building anymore)
A: In that case, we use one or several portraits of that person, e.g. photographs. A digital artist builds a 3D-model of that person from scratch, using these photographs.
This becomes now the interpretation of that artist, not an objective scan from a machine anymore. We can ask the artist to make it look as realistic as possible.
Orell Füssli is currently working on ESCHER portraits, we will present a new test note in 2024.
In the case of a building, we need to investigate if and how we can rebuild it.

Q: Do you need special equipment for the design department for this method?
A: We use special software to create and modify 3D models. For testing purposes we used a simple 3D-Scanner.
The other equipment (computer hardware, computer-to-plate,...) is conventional.

PWPW (1/1)

"A banknote for a new era of space exploration "

Q: How often do you design and produce a commemorative banknotes?
A: Since 2006 we design and produce at one commemorative banknote a year for the National Bank of Poland. Although there were years when we did two.
Each project, whenever it's for Polish National Bank or foreign central bank, is always a creative and innovative work as there is always at least one component that will go into to production for the first time.

Q: What central banks should start with to design a commemorative banknote?
A: First thing is to start with enough time prior to the planed issuing date, as designing and producing may take time especially when client does that for the first time and needs to get to know the best existing options within the banknote manufacturing industry.
Nevertheless it all starts with the topic for the banknote. The clients needs to go out to designer with the well described idea on what event or person should commemorated and what it should be associated with that can be represented visually on the banknote.
Once it's there the designer can go on and make propositions on how to compose it on the banknote surface, what substrate it should be printed on and what security features implemented.

Q: How long it takes to do a commemorative banknote?
A: It depends, of course, on circumstances. Our experience shows that the regular projects finalize with 5 to 10 months. The main time influencing factor is the complexity of the technical specification of the banknotes; what comes to the question what innovative features are planned to be used and if those has already been tested in the industrial production. If not the time for testing should be considered. The good practice and, what I always recommend to our clients, is always to start early enough before the planned issuing date to have enough time to choose the best viable option for new banknote.

SURYS (1/2)

"VibesTM: Sublimating your banknote in many different ways "

Q: What exactly could be detected by a sensor?
A: As Vibes™ has a standard construction with metal, it can be either detected using IR and conductive detectors .On top of that, magnetism can be added to be detected by high speed sorting machines.

Q: Do you seen any changes in movement or other effects after intaglio printing onVibes™ threads?
A: Thanks to its structure, Vibes™ thread is Vibes is intrinsically robust to the paper introduction and all the printing processes. The thread has been inserted in paper and intaglio test have been performed without any modification in the effect.

Q: Can you produce VIBES with a color shifting?
A: We decided to create colored metallic threads with black personalized designs as this kind of thread do not exist in the banknote market.
The pastel metallic color background available in different colors give full harmony to the banknote design through color similar to the printing design or contrasted color to make it more eyes catching.
On top of that, the association of simple designs and Vibes™ moving optical effects opens up unexpected design possibilities to banknote designers, enabling them to convey their inspiration and emotions through the creation of visual and tangible objects.
It is technically possible to produce Vibes™ with color shifting effect. We are currently working on upgraded versions and colorshifting effects are under development to provide a large variety of visual effect options.

Q: Can you provide threads for trials / sample notes?
A: We currently have some spools available for trials and we would be more than happy to send them to papermakers to make their own embedding and mechanical & physical tests.

SURYS (2/2)

Q: With how many companies did you test Vibes?
A: At present time Vibes™ has been tested and fully validated by 2 valuable papermakers. Threads have been tested in standard and high durable substrates and ran perfectly well. We are currently running other qualification programs.

Q: Is it possible to have several colors on the same thread?
A: We opted to use a single metallic color to provide aesthetics to the full banknote. Rainbow or block fluorescent can be added to the thread to even more customize it. Other options of customization will be available in a near future.

Q: What is micro-structure depth?
A: The depth of the micro structure is around a few microns and therefore allows a thin thread structure with an easy integration. We can therefore have mono and biflex structure depending upon customer needs.

Q: What width of a stripe or patch would you recommend to get the optimum effect?
A: It is well established that the larger, the better and Vibes™ security thread minimum width is 4mm. Internal tests showed that 5 mm wide threads provide a better visibility.

Q: Readable with existing machines? or we need new machines to read these features?
A: Vibes™ is readable with all existing machines: either IR, conductivity and magnetism. There is no need to invest in new sensors when switching to this kind of thread. It makes the change cost effective without big changes in all the sorters used for the cash cycle.

Q: How is the actual image created in the thread, if not printing is used?
A: Images are recorded in the substrate through very sophisticated proprietary algorithms. This technics make it impossible to replicate.

QUESTIONS & ANSWERS

Banknote Technology Webinar
(July 5 - 7, 2023)

During the webinar, some questions from the chat could not be answered due to time limitations. Please find here the answers, which were provided by the presenting companies after the webinar