GUARDIAN™

SECURITY FEATURES

REFERENCE GUIDE

EDITION 2 MAY 2013

NOW INCLUDES HORIZON & D-CODE

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INTRODUCTION

Guardian® polymer substrate delivers effective banknote management solutions using proven technology, to provide immediate benefits, and outstanding long term value. As well as continually advancing the frontier of security feature development through significant investments in research and development, ongoing work with industry partners enables the broadest possible spectrum of innovative security features to be integrated across the Guardian® banknote substrate platform. With increasingly sophisticated integration between substrate-embedded features, high security printing techniques, and advanced banknote design, unparalleled levels of security are now possible.

With manufacturing bases in both Australia and Mexico, the supply of Guardian® is strategically positioned to serve the global community. Guardian® is a trusted product to many Central Banks worldwide to develop and maintain a long-term currency management strategy that saves client nations many millions of dollars in public sector funds. An important element of many successful implementations has been PolyTeQ® Services. PolyTeQ® provides uniquely specialised and expert advice to issuers, printers and key stakeholders to ensure a quality outcome is achieved.

Propelled by a culture of innovation Guardian® has been at the forefront of change in the banknote market. As a platform that can accommodate security features from leading edge manufacturers across the industry and seamlessly integrate these with features exclusive to Innovia Security, Guardian® substrate continues to evolve with a commitment to being the leader in banknote counterfeit prevention.

CORE SECURITY

At the core of every banknote printed on Guardian® substrate is Clarity®C, a specifically formulated biaxially-oriented polypropylene (BOPP) film, which is exclusively manufactured for the specialised requirements of Guardian®. This BOPP film is produced using unique patented technology that results in a robust film with excellent printing and handling properties. Films of the same type and physical characteristics as Clarity®C used in our printing processes are not available commercially.

PROPERTIES OF CLARITY®C

This material has been specifically manufactured for the use in Guardian® banknotes. Using a unique 'bubble' process, Clarity®C contains perfectly even tensile strength horizontally and laterally within the film to create a perfectly flat and balanced structure. This process imparts a number of unique characteristics to create a high performance film. These optical and structural characteristics can now be detected using Verus® technology, the world's first device to authenticate both newly issued Guardian® notes as well as those already in circulation.

These characteristics, along with the fact that the film is only available in Guardian® means that Clarity®C is a unique film that can be immediately identified and authenticated.

While paper production is common place with many suppliers worldwide, the production of Clarity®C is a specialised technology requiring substantial investments.

SECURE SUBSTRATE

The Clarity®C film is opacified in a process where multiple layers of specialised coatings and inks are applied to both the front and back of the film core to produce an extensive range of security features integrated within. This unique film has now been converted into Guardian® banknote substrate. Each individual layer in the opacification process is customised to the specific requirements of each banknote denomination design. This process, coupled with the ability to register imagery and features perfectly, creates complex high security banknote design.

The unique 'bubble' process used to manufacture Clarity®C film

SECURE DESIGN INTEGRATION

The opacified layers in Guardian® substrate take full advantage of the three-dimensional space that polymer material provides, thus creating limitless possibilities for the application of security features. The result is a banknote design that seamlessly integrates different features in a way that is both aesthetically pleasing and makes the note itself more secure by "adding to the sum of the parts".

The banknote design can incorporate a combination of unique substrate security features and traditional printed features making it difficult, time consuming and costly to counterfeit, yet easy for the public and retailers to quickly authenticate. Guardian® is an ideal substrate to apply advanced designs and security elements through intaglio, offset, screen printing, foil application, letterpress and overcoating printing techniques.

This makes Guardian® a proven platform for the application of trusted features such as micro-printing, intaglio tactile features, intricate offset background patterns, see-through registration, IR features, magnetic features, visible and invisible fluorescent and phosphorescent features, colour changing inks and optically variable elements. The effectiveness of some of these processes is enhanced when printed on Guardian® due to the synergies offered by the smooth flat surface and the transparent windows with security print processes.

COMMITMENT TO INNOVATION

To remain the world's most sophisticated banknote substrate, a strong commitment to innovation is critical. Innovia Security's investment in R&D, and the innovative culture that it has developed and nurtures, mean that the discovery and development of new security feature technology is continually evolving. Our organisation has developed strong working relationships with other industry suppliers to ensure that banknote issuers have access to the industry's most advanced security features.

Production of Guardian® Substrate

Guardian® is a banknote substrate that offers multiple benefits - it is effective in minimising the economic damage caused by counterfeiting; it is highly durable and thus significantly lowers the costs of banknote management; as a clean material it offers public health and environmental benefits; and it offers positive long-term transformational benefits to Central Banks and its nation.

GUARDIAN® IS PROVEN TO BE:

- Secure
- Durable
- Clean
- Transformational

SECURE

Guardian® substrate is a valuable high-security defence for notes of sufficient value and circulation to be targeted by counterfeiters. The technical complexity required to counterfeit a Guardian® note effectively eliminates casual and semi-professional counterfeiting operations. This is enhanced by Guardian®'s ability to accommodate security features from leading edge manufacturers across the industry. Further, as a three-dimensional medium Guardian® substrate has spawned new frontiers in security feature development that traditional cotton-paper as a two-dimensional structure cannot offer.

DURABLE

Guardian® substrate has been proven to be an effective and robust banknote technology in diverse environments. In excess of 30 billion banknotes have been issued on Guardian® substrate, and in every environment has proven to deliver a note-life that remains useable multiples of times longer than cotton-paper. This longer note life and therefore lower turnover represents a significant cost-saving to Central Banks in the medium to long term. For lower denomination notes, where durability is critical, Guardian® delivers a compelling cost-benefit equation.

CLEAN

Independent studies show that, unlike cotton-paper substrate, bacteria cannot adhere easily to the surface of a Guardian® note. Further, the polymer substrate is resistant to dirt and grease, and can be washed clean if necessary. As a clean non-fibrous material, ATMs using Guardian® require less maintenance and cleaning compared to fibrous cotton-paper notes. In addition, an independent environmental study has proven that polymer notes are more environmentally-friendly than cotton-paper notes in each of the nine internationally-recognised metrics used to calculate environmental impact.

TRANSFORMATIONAL

25 years of polymer substrate innovation has had a transformative influence on the banknote industry and its stakeholders.

In creating for the first time in 300 years a viable alternative to cotton-paper, Guardian® has created long term positive changes to the commercial environment in the banknote industry.

Specifically, with great counterfeit protection and durability, the introduction of Guardian® provides efficiencies that has transformed the operations of Central Bank systems.

Guardian® technology has also changed the way the public view their currency and their nation. While there will always be detractors, Guardian® notes are accepted by a significant majority of the population.

To minimise the risk in making the transformation from paper to polymer, PolyTeQ® Services provide Central Bank advice and Technical Services expertise to ensure a smooth and orderly transition.

All security features are applied to Guardian® using the following security print processes:

- Offset
- Foil Application
- Screen Printing
- Intaglio
- Letterpress
- Overcoating

WINDOW ELEMENTS

- Clear Window
- Frameless Window
- Half Window
- WinBOSS®

DESIGN ELEMENTS

- MultiCLR®
- Vignette
- Shadow Image
- Domino®

STEALTH ELEMENTS

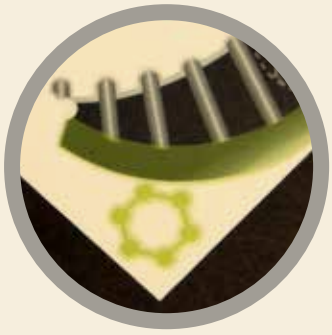
- MAGread®
- ECLIPSE®
- D-CODE™
- Micro-Lettered Threads

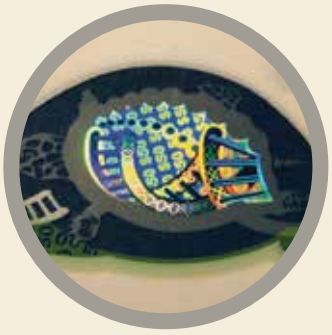
METALLIC EFFECTS

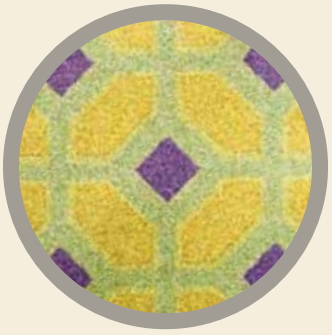
- LATITUDE®
- METALIX®
- APPLIED DOVDs

SWITCHING EFFECTS

- HORIZON®
- AURORA®
- G-Switch®
- IRIswitch®







WINDOWS Clear and Frameless Windows

WINDOW ELEMENTS *LEVEL 1*

The Clear Window is a hallmark security feature of polymer substrate technology which has become one of the most distinctive and attractive design elements of a Guardian note.

The Clear Window has remained highly effective against counterfeiting due to technology that has enabled increasing window areas and greater design complexity in and around the Clear Window.

The Charles Darwin Guardian® Note (released December 2012) shows how multiple windows can be placed across a note with each accommodating different security features.

This reduces counterfeit risk and at the same time provides the public with a simple, clearly identifiable method of authentication.

KEY BENEFITS

Integrated Security – Integrated within transparent windows, Latitude™ is highly secure, durable and provides strong resistance against counterfeiting.

Primary Recognition – Clear Windows are a primary security feature of a Guardian banknote: immediately visible, easy to authenticate, extremely difficult to counterfeit

Dual-Sided Design Integration – Seamless design solutions can use the same window for different design purposes on each side of the note.

Security Platform – Fifth generation windows technology (eg, Canadian note series) incorporates additional security features in much larger window areas.

Instant Recognition – Latitude™ is highly visible making it easily recognisable by the general public. These large, complex windows have taken the counterfeit challenge to a new level.

WHO DOES IT BENEFIT?

This highly visible, easy to recognise feature is ideal for use by the general public who can quickly and easily identify a genuine banknote from a counterfeit.

RESISTANCE TO COUNTERFEITING

Including a transparent window in a banknote has proven to virtually eliminate the problem of the 'casual counterfeiter.'

DESIGN INTEGRATION

Windows provide a seamless integration to the overall banknote design. They complement the overall theme of the banknote design, offering advanced design personalisation options for both sides of the note.

HOW IT WORKS

DURING THE SUBSTRATE MANUFACTURING PROCESS, SPECIFIC AREAS OF THE FILM ARE UNCOATED CREATING A TRANSPARENT WINDOW THAT ALWAYS FORMS AN INTEGRAL PART OF A BESPOKE BANKNOTE DESIGN.

Frameless Windows have a seamless design through the perfect registration of offset ink layers into the window, which eliminates the appearance of the white border. This is made possible through an additional surface preparation of the window.

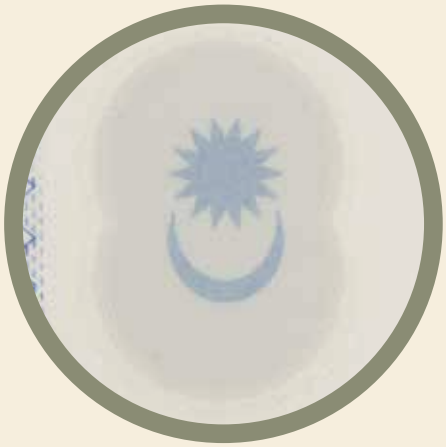
More aesthetically pleasing, this also enhances durability through further protection of the window edges. Security is enhanced through use of the secure simultaneous offset process.

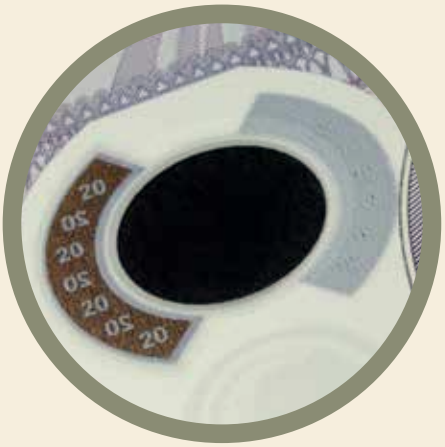
HALF WINDOWS, WinBOSS®

WINDOW ELEMENTS *LEVEL 1*

The Clear Window paved the way for additional security features to be used within its borders. From the days of the first generation window in the late 80's, the development of complex windows has remained a consistent R&D focus that has yielded a further four generations of windows.

Two commonly used security features are the Half Window and WinBOSS® that have featured on numerous banknotes throughout the last decade.





Half Windows enable printing on one side of the window while keeping a glossy surface on the obverse side - a technique that is extremely difficult to simulate.

HALF WINDOWS

Half Windows are a variation to the Clear Window in which only one side of the window area is opacified. This creates a area where one side of the window remains glossy while the other side functions as a normal printing surface. The glossy surface is difficult to copy using photocopiers and scanners.

WINBOSS®

The ability of transparent windows to accept a permanent emboss, called WinBOSS®, is an important feature which leverages the intaglio process to enhance the security of the banknote. This is achieved by leaving the engraved areas of the intaglio plate uninked to create an embossed design during the intaglio printing process.

This is most effective when the uninked design is a 'transitory image' embossed into the transparent window area, generating an image that is visible in both transmission and reflection. A transitory image comprises of perpendicular lines offering a secure latent image for banknotes.

WinBOSS® is a highly durable, substrate embedded uninked intaglio feature that is only visible at certain viewing angles.

MultiCLR®

DESIGN ELEMENTS LEVEL 1

Guardian® substrate can incorporate a spectrum of colours, which represents an innovative and effective security enhancement to aid in reducing the threat of counterfeiting and soiling.

MultiCLR® (pron: Multi-Colour) is available in many colours and design options and includes a choice from dual coloured substrate – one side of the substrate is a different colour to the other side, or multi-coloured substrate – which uses different colour layering combinations producing a three, four or even five colour banknote substrate banknote.

MultiCLR® delivers a wide spectrum of substrate colours.

KEY BENEFITS

Increased personalisation – MultiCLR® offers further personalised design opportunities to enhance banknote aesthetics

Durability – MultiCLR® reduces the appearance of soiling effect

WHO DOES IT BENEFIT?

Beneficial to the general public, MultiCLR® is easy to see and identify.

RESISTANCE TO COUNTERFEITING

MultiCLR® increases overall banknote security through more advanced design.

DESIGN INTEGRATION

MultiCLR® presents excellent design opportunities to allow further creativity to enhance both the aesthetics and security of the note, which complement simultaneous offset and intaglio print in the overall design. Further enhancements to the MultiCLR® feature can be achieved with the addition of other Guardian® features such as; G-Switch®, Windows, Aurora™, Metalix®, Latitude®, Horizon®

HOW IT WORKS

MULTIPLE COLOURS CAN BE APPLIED DURING THE SUBSTRATE MANUFACTURING PROCESS. MULTICLR® CAN OFFER DUAL OR MULTI COLOURED OPTIONS WHICH CAN ALL BE APPLIED AT THE SAME TIME DURING MANUFACTURE.

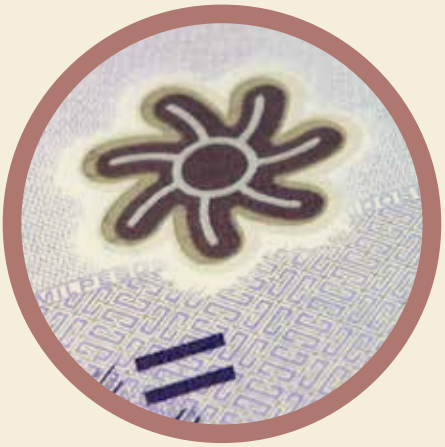
VIGNETTES, SHADOW IMAGES

DESIGN ELEMENTS LEVEL 1

Shadow Images are similar to watermarks in paper, where an image, numeral or text is revealed when viewed in transmission. Shadow Images can either be a 'tonal image' such as a portrait or a bold 'highlight' such as numerals to further personalise the banknote design.

As a traditional security feature option, the public will often look for a watermark feature. Shadow Images is an instantly recognisable feature whose technology allows for tight registration and therefore strong integration within the overall banknote design.

Vignettes are printed designs within windows. This enhances design personalisation of windows and provides the public with recognisable aesthetics; vignettes are also effective in security and design aesthetics of both transparent and half windows. It creates a further degree of difficulty for the counterfeiter who is already challenged with the task of emulating a window in the banknote design. Additionally, vignettes can be integrated with other window features, such as G-Switch®, Aurora™, Metalix® and Shadow Images to make it more difficult, time-consuming and costly to counterfeit.



Shadow Images are similar to watermarks in paper, where an image, numeral or text is revealed when viewed in transmission. Shadow Images can either be a 'tonal image' such as a portrait or a bold 'highlight' such as numerals to further personalise the banknote design.

Vignette design varies from simple shapes through to more detailed portraits and other iconic images that enhance design and provide a means to visually integrate the offset design into the window area.

KEY BENEFITS

Traditional – Shadow Images are a traditional banknote security feature that are used on many banknotes world-wide

Advanced integration in register – Shadow Images are manufactured in tight registration to the overall banknote design

WHO DOES IT BENEFIT?

Due to the ease of use, the Shadow Image is effective for use by the general public.

RESISTANCE TO COUNTERFEITING

Shadow Images cannot be digitally printed which eliminates the casual counterfeiter.

DESIGN INTEGRATION

Shadow Images can be integrated very effectively as a continuation of the vignette design in the transparent window. This offers additional aesthetics and security in the banknote design.

HOW IT WORKS

WHEN HOLDING THE BANKNOTE UP TO THE LIGHT, AN IMAGE, NUMERAL OR TEXT APPEARS IN TRANSMISSION THAT THAT CANNOT OTHERWISE BE SEEN. THIS EFFECT HELPS MAKE THE BANKNOTE DESIGN SECURE AND UNIQUE.

DOMINO®

DESIGN ELEMENTS *LEVEL 1*

Domino® is a durable, tactile, embossed feature that allows for both fast and effective denomination of banknotes by the vision impaired. It is visually subtle and does not distract the visually capable from the other authentication features.

KEY BENEFITS

Domino® assists the vision impaired in denominating and orientating banknotes both effectively and efficiently, without the use of an external device.

Domino® complements other design aspects for accessibility for the vision impaired such as different sizes, different colours, larger numerals and hand held devices.

WHO DOES IT BENEFIT?

Domino® is a feature for the vision impaired. It allows for the fast and efficient denomination of banknotes without the use of an external device.

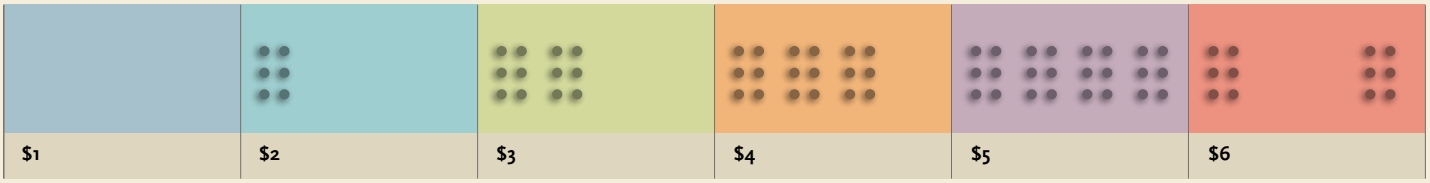
DESIGN INTEGRATION

Domino® is visually subtle and can be placed over offset design. Domino® is enhanced through the Guardian® substrate as it is permanently deformed into shape so that the feature will hold its tactility for much longer than other substrates.

HOW IT WORKS

DOMINO® IS A TACTILE EMBOSS FEATURE THAT IS APPLIED AS A SINGLE PASS ON A NUMEROTA PRESS AFTER THE OVER COATING PROCESS. DOMINO® CONSISTS OF SIX SETS OF EMBOSSED DOTS OF UP TO 100 MICRONS IN HEIGHT. DENOMINATIONS ARE DIFFERENTIATED BY MULTIPLE SETS OF DOTS. DOMINO®'S HIGH ABRASION RESISTANCE WITH THE SMOOTH GUARDIAN® SUBSTRATE ENHANCES THE OVERALL TACTILE AND DURABILITY CAPABILITIES OF THE FEATURE AND MAKES IT SUPERIOR TO OTHER SIMILAR TACTILE-BASED FEATURES ON PAPER-BASED SUBSTRATES.

DENOMINATIONS ARE DIFFERENTIATED BY MULTIPLE SETS OF DOTS



MAGread®

STEALTH ELEMENTS LEVEL 3

As opposed to traditional straight thread formats, the beauty of MAGread® is that it can be designed in any format including straight thread, non-linear complex curves, and non-continuous and multi-directional patterns.

MAGread® is a Level 3 machine readable security feature that uses magnetic ink, allowing for total design freedom.

KEY BENEFITS

Traditional – Magnetic threads are a traditional banknote security feature used in many notes around the world

Multiple design formats – MAGread® does not need to be straight line and can be designed to suit any banknote design

Machine Readable – MAGread® is a machine readable feature allowing for easy identification by cash handlers

WHO DOES IT BENEFIT?

As a Stealth Element, MAGread® is a machine readable feature that allows Central Banks to efficiently verify banknote authenticity.

RESISTANCE TO COUNTERFEITING

Due to the magnetic inks, MAGread® offers further security enhancement as a machine readable feature.

DESIGN INTEGRATION

Due to its unique design flexibility, MAGread® has the capacity to be seamlessly integrated into the design of a banknote.

HOW IT WORKS

MAGREAD® CONTAINS MAGNETICALLY READABLE INKS WHICH ARE PRINTED DURING SUBSTRATE MANUFACTURE. THESE INKS MAKE THE FEATURE MACHINE READABLE ON CASH PROCESSING MACHINES. MAGREAD® IS VISIBLE IN BOTH TRANSMISSION AND REFLECTION.

ECLIPSE®

STEALTH ELEMENTS LEVEL 2

Eclipse® is a transmission optically variable device (OVD) that reveals a hidden image when looking through the transparent window at a point light source. This device is unique for its ability to be seen at night or in dim light, an environment that often renders many security features unusable.

Eclipse® is a transmission optically variable device (OVD) that appears when looking through the transparent window at a point light source.

KEY BENEFITS

Easy to recall – The uniqueness of the feature provides for the immediate recall of its presence when required

Accessible – No specialised device is required for authentication

Robust protection – A highly durable feature due to its mechanical strength and a high resistance to chemical attack

WHO DOES IT BENEFIT?

As a Stealth Element that requires any point light source for verification, Eclipse® is designed for use by the general public and cash handlers. As a highly durable feature, Eclipse® remains active even when the note reaches the end of its useful life.

RESISTANCE TO COUNTERFEITING

The uniqueness of Eclipse® is a deterrent to the casual and semi professional counterfeiter as simulations for such a feature are difficult.

Both mechanical and optical methods have been tried but remain unsuccessful, with the projected image proving to be very difficult to counterfeit.

DESIGN INTEGRATION

ECLIPSE® first appeared on a circulating note in 2001 as a simple symmetrical structure, and has been featured in five denominations using various designs. A sixth denomination, the Mexican 50 Peso note, is the first banknote to use an asymmetrical structure in the form of a '50' image.

Considerable investments in R&D have enabled exciting new advances in ECLIPSE® technology which includes a motion feature. Movement of the projected image occurs when the note is moved side-to-side while viewing (see 'Innovating for 25 Years Concept Note'). Further, with more sophisticated imagery comes the opportunity to integrate ECLIPSE® into the overall design theme of the banknote.

HOW IT WORKS

BY HOLDING ECLIPSE™ UP TO THE EYE WITH A DISTANT POINT LIGHT SOURCE IN THE BACKGROUND, THE TRANSPARENT WINDOW IS TRANSFORMED INTO A RECOGNISABLE IMAGE VIA LIGHT DIFFRACTION. ECLIPSE™ IS AN ADVANCEMENT OF WINDOE®, IT IS LARGER ENHANCING THE ABILITY TO SEE THE FEATURE FURTHER FROM THE EYE, IT PRODUCES A BRIGHTER PROJECTION AND ALLOWS FOR DESIGN FREEDOM. ECLIPSE™ IMPROVES THE SECURITY OF THE BANKNOTE THROUGH PROVIDING ADVANCED DESIGNS.

D-CODE™

STEALTH ELEMENTS LEVEL 3

D-CODE™ is both a highly advanced security feature and highly efficient note identification system. A covert security feature that embeds a unique code into Guardian® substrate, D-CODE™ uses a state-of-the-art high speed detection system that allows a Central Bank to confirm the authenticity and denomination value of each note.

D-CODE™ technology generates a large number of unique codes, each of which can be associated with an individual denomination – no two codes allocated to a Guardian® note will ever be the same.

D-CODE™ is used in combination with Guardian®'s proprietary high security Metalix® security feature, which is printed in a window or half window and can be designed in any shape.

D-CODE™ is noted for its unique code application and high durability. It is a robust and leading edge security feature and note identification system.

KEY BENEFITS

Integrated Security – As a covert security feature, the presence of D-CODE™ is invisible to the counterfeiter. By being embedded in the substrate and used in conjunction with Metalix®, D-CODE™ can only be detected using a specialised detection device.

Unique Identification Code – D-CODE™ technology has the ability to generate a large number of unique codes, one of which can be assigned to a specific denomination. Aligning that unique code with a specific banknote is leading edge security capability amongst machine readable features

Highly Durable – By being embedded in polymer substrate and protected by Metalix®, D-CODE™ is a longlife security feature that will remain functional for the note's entire working life.

WHO DOES IT BENEFIT?

Central Banks, commercial banks, cash centres and CITs are all entities that use high speed note processing to detect note authenticity and quality and could thus benefit from the use of a D-CODE™ high speed detection device. The detector system was been developed in tandem with the development of D-CODE™ which identifies the note as genuine and also confirms its denomination. The high speed detection device can be retrofitted to banknote sorting machines and will manage up to 40 notes per second.

RESISTANCE TO COUNTERFEITING

As an invisible, high tech security feature that generates a wide range of unique codes, the presence of D-CODE™ is unachievable for the casual and semi-professional counterfeit operation and for the time and effort required of a professional counterfeiter, uneconomic to pursue.

DESIGN INTEGRATION

D-CODE™ can be integrated into any banknote design that uses Metalix® as a Design Element. In requiring a minimum surface area to ensure machine readability, D-CODE™ does need to be factored into the overall banknote design.

Metalix® offers a wide colour palette to integrate with any banknote design including Red, Gold, Copper, Silver, Blue, Green, Violet and Salmon.

HOW IT WORKS

D-CODE(TM) IS THE PRODUCT OF R&D WORK IN NANOTECHNOLOGY. THE FEATURE IS ONLY DETECTED THROUGH THE INSTALLATION OF A HIGH SPEED DETECTION DEVICES THAT CAN BE RETROFITTED TO BANKNOTE SORTING MACHINES.

MICRO-LETTERED THREADS

STEALTH ELEMENTS *LEVEL 2*

Micro-lettered Threads are either printed or shadow images. They can be a straight line (as with threads in paper banknotes), or can take the form of different shapes with curves and be discontinuous with text or numerals used to further personalise the banknote. This allows for further security and easy identification for the public.

Micro-Lettered Threads can be designed as a straight line, or different shapes with curves and be discontinuous with text or numerals.

KEY BENEFITS

Traditional **-** Micro-lettered threads are a traditional banknote security feature used in many notes globally

Highly Durable **–** By being incorporated into the substrate, Micro-Lettered Threads are highly durable and will last the life of the banknote.

WHO DOES IT BENEFIT?

As a Level 2 feature, Micro-Lettered Threads are legible with the use of a magnifying glass. This simple device allows for quick recognition by the general public or cash-handlers.

RESISTANCE TO COUNTERFEITING

Micro-lettered threads increase the overall design making it an added feature that hinders the efforts of counterfeiters.

DESIGN INTEGRATION

Micro-lettered threads offer advanced design formats which enhance banknote design and security, and are customisable to enhance the overall banknote design. Further enhancements to the micro-lettered threads feature can be achieved with the addition of other Guardian® features such as; Shadow images, Windows.

HOW IT WORKS

MICRO-LETTERED THREADS ARE PRINTED IN THE SUBSTRATE LAYER AND CAN BE INCORPORATED AS A THREAD OR A SHADOW AS REQUIRED BY THE BANKNOTE DESIGN. IF DESIGNED AS A THREAD IT CAN BE VIEWED IN TRANSMISSION OR REFLECTION, AND IF DESIGNED AS A SHADOW WILL BE VISIBLE ONLY IN TRANSMISSION.

LATITUDE®

METALLIC EFFECTS LEVEL 1

Latitude® is a foil-effect feature that uses the world's first substrate-integrated optically variable device (OVD) that is not restricted to the patch and stripe formats of traditional foil. Latitude® is designed in the window of a Guardian® note and offers total design freedom.

This reduces counterfeit risk and at the same time provides the public with a simple, clearly identifiable security feature.

Latitude® is embossed in-line with the substrate manufacturing process meaning that no adhesive processes are required for any part in the feature's application.

Latitude® is a Metallic Effects feature that when tilted, provides colour shifts and movement in the image.

KEY BENEFITS

Integrated Security – Integrated within transparent windows, Latitude® is highly secure and owing to its design flexibility makes it strongly resistant to counterfeiting.

Highly durable – Latitude® offers superior durability and significantly longer note life due to it being embedded in the substrate.

Design Freedom – Not restricted to stripes or patches, Latitude® allows for multiple design possibilities around feature size, shape and positioning on a banknote.

Instant Recognition – Latitude®'s foil effect is highly visible making it easy for the general public to recognise.

WHO DOES IT BENEFIT?

Optically variable effects have been proven to be effective for public recognition and authentication. It is particularly suitable for ATM denominations owing to its security and durability.

RESISTANCE TO COUNTERFEITING

Designed within the banknote windows, Latitude® creates a synergy of security elements

Security through proven OVD technology

By creating foil effects across the banknote, the complexity for reproduction by counterfeiters is increased significantly

DESIGN INTEGRATION

OVD elements that can be used in Latitude® include colour, 2D, 3D, multi-channel, kinetic effects and more. As Latitude® is not laminated, applied or adhered to the banknote's surface, it is not restricted in its design by the limitations of traditional machine applications.

The design flexibility afforded by Latitude® means designers can integrate this feature into the overall banknote design in very attractive and imaginative ways.

HOW IT WORKS

LATITUDE® IS A FOIL-EFFECT FEATURE THAT WHEN TILTED, PROVIDES COLOUR SHIFTS AND MOVEMENT IN THE IMAGE. LATITUDE® CAN BE VIEWED ON BOTH SIDES OF THE NOTE MAKING IT AN EASY FEATURE FOR THE GENERAL PUBLIC TO VALIDATE. LATITUDE® IS AN ALTERNATIVE TO OVD FOILS PROVIDING FREEDOM AND INTEGRATION OF DESIGN AND INCREASING THE CHALLENGE TO THE COUNTERFEITER.

METALIX®

METALLIC EFFECTS LEVEL 1

Metalix® is a breakthrough metallic-effect that has a high resistance to chemicals and oxidisation; preventing the tarnishing of the metallic print colours over prolonged use. The substrate provides a smooth and non-porous surface which further enhances the metallic sheen of the Metalix® feature. With many colours available, one or more will be suited for the design requirements for any banknote.

Until now, metallic inks have been restricted to embedded banknote features such as threads and foils. Exposure to acids and alkaline substances such as washing detergent quickly breaks down the integrity of traditional metallic inks, making them unfit for printing on banknotes. With Metalix® these issues are nonexistent, making it suitable in the harshest conditions.

Metalix® can be distinctively integrated into the design of any banknote. It is plays an integral role in the application of the D-CODE™ security feature.

KEY BENEFITS

Striking Metallic Lustre – further enhancing the visual attractiveness of banknote designs. Metalix® offers the ability to print metallic colours not previously available on banknotes due to poor chemical resistance

Design Capabilities – Metalix® can be incorporated in any area of the note, including within a transparent window or half window and can be integrated with other Guardian® substrate security features such as Aurora™

WHO DOES IT BENEFIT?

Metalix® is easily observed allowing the general public to quickly recognise it. Viewed on both sides of the banknote when designed in a window, Metalix® is even easier to authenticate.

RESISTANCE TO COUNTERFEITING

Metalix® cannot be reproduced by digital printing techniques.

DESIGN INTEGRATION

Metalix® has eight colour options that can be used in a variety of designs, within any area of the banknote. Further enhancements to the Metalix® feature can be achieved with the addition of other Guardian® features such as: IRIswitch®, G-Switch®, Aurora™

HOW IT WORKS

METALIX® IS VIEWED IN REFLECTION, ENHANCING THE VISUAL ATTRACTIVENESS OF THE BANKNOTE. PREVIOUSLY GOLD WAS OFFERED ON GUARDIAN®, BUT NOW THERE IS AN EXPANDED OFFERING WHICH INCORPORATES A BROADER RANGE OF COLOURS WHICH INCREASES THE DESIGN AND SECURITY POSSIBILITIES FOR BANKNOTES USING GUARDIAN® SUBSTRATE. METALIX® CAN BE OFFSET (SIMULTAN) OVER PRINTED ADDING ADVANCED AND INTERESTING EFFECTS.

METALIX® COLOUR RANGE

RED SALMON GOLD COPPER GREEN BLUE SILVER VIOLET

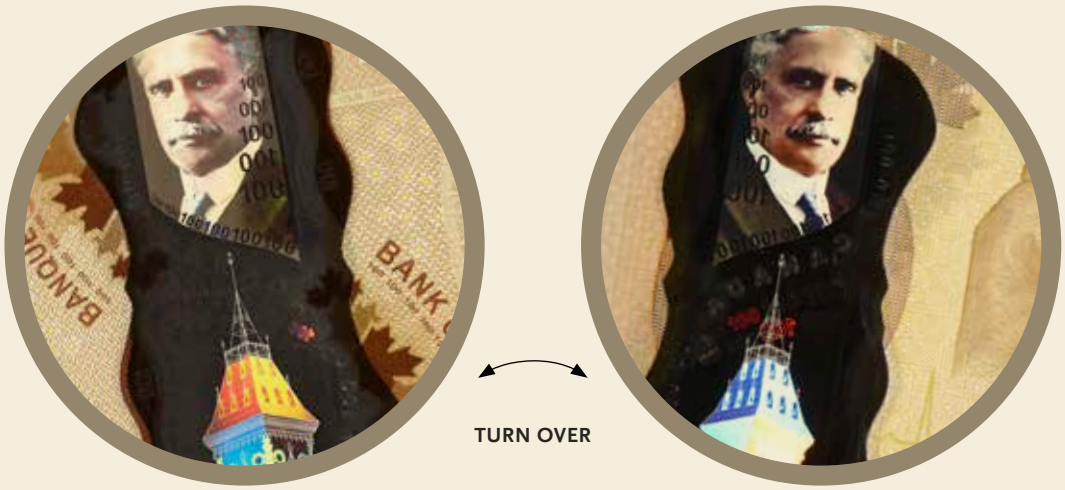
DOVDs Applied Dynamic Optically Variable Devices

METALLIC EFFECTS *LEVEL 1*

As a security feature platform, Guardian® can accommodate third party security features that includes dynamic optically variable devices (DOVDs or holographic foils). DOVDs are widely used anti-counterfeiting banknote features. This was first seen on the commemorative $10 Australian banknote issued in 1988, the first Guardian® banknote. DOVD technology provides one of the easiest ways for the general public to recognise an authentic banknote.

The DOVDs further enhance the security and aesthetics of the banknote and can be applied in prominent areas on the note to attract the attention of all users. Continuous innovation in DOVD technology ensures that banknotes remain secure. DOVDs are applied to the Guardian® substrate after the substrate manufacturing process and prior to intaglio printing.

Dynamic Optically Variable Devices can be viewed from both sides of the banknote, if designed in a window.



KEY BENEFITS

Known Feature – People are familiar with DOVDs, how they work and what to look for

Highly Obvious – Within a window, it can be viewed from both sides, enhancing the authentication opportunities

Enhanced Effect – The smooth surface of Guardian® polymer substrate creates a more striking appearance for DOVDs

WHO DOES IT BENEFIT?

The easy recognition of the DOVD makes it an ideal feature for public recognition. Further security features can be added with the DOVD to make it a highly secure banknote that can be further detected by cash handlers and used for forensic detection.

RESISTANCE TO COUNTERFEITING

DOVDs cannot be digitally printed which virtually eliminates the casual counterfeiter. When designed within a window, the DOVD offers advanced security through dual-style recognition.

DESIGN INTEGRATION

The DOVD can be placed on any area of the note both within a window or on an opaque surface as a stripe or a patch. The feature can also be integrated with other Guardian® security features making the overall banknote highly secure and aesthetically pleasing. The compatibility between applied DOVDs and Guardian® substrate creates opportunities to further enhance the security and aesthetics of a banknote. Due to the smooth surface of the substrate and transparent window, there is an improved clearer effect in the DOVD and ability to view it from either side of the banknote. Because multiple and large windows are possible on Guardian® substrate as opposed to restricted sizes on paper, Guardian® offers a more secure and a more front to back design integration option to applied DOVDs; such as a mirror image on either side of the banknote or different design on either side achieved through use of half windows or differing holographic detail.

Further enhancements of DOVDs can be achieved through synergy with Guardian® features such as: Metalix®, Aurora™, G-Switch®, Windows, Horizon®

HOW IT WORKS

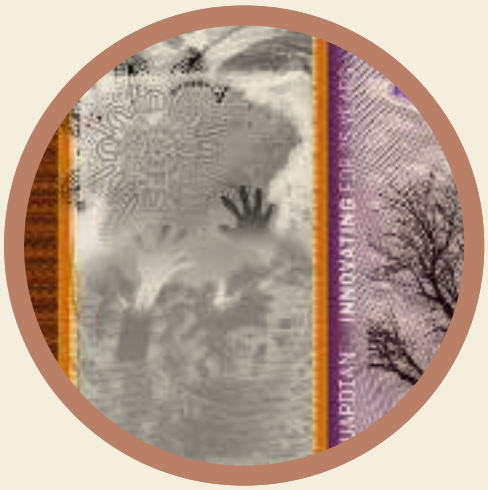
ABLE TO BE VIEWED IN ALL LIGHTING CONDITIONS, DOVDS ARE MOST EFFECTIVE WHEN THE USER TILTS THE BANKNOTE. DOVD FOILS ARE PRIMARILY A DIFFRACTIVE TECHNOLOGY; GUARDIAN® HAS THE CAPABILITY AS A CARRIER TO APPLY THESE AS BOTH STRIPES AND PATCHES. DOVDS CAN BE APPLIED TO BOTH TRANSPARENT WINDOW OR OPAQUE REGIONS OF THE BANKNOTE DESIGN. WHEN APPLIED TO THE WINDOW, THE DOVD CAN BE VIEWED FROM BOTH SIDES OF THE BANKNOTE PROVIDING ADVANCED DESIGN INTEGRATION AND BANKNOTE SECURITY.

HORIZON®

SWITCHING EFFECTS *LEVEL 1*

HORIZON® is an advanced lenticular-technology that enables an ultra-thin 12 micron lens to deliver a dynamic and eye-catching series of contrast-switching movements.

Horizon® – the use of lenses on polymer substrate is developing rapidly with advances enabled by nanotechnology as it is applied to films.



KEY BENEFITS

High Visual Impact – Exclusive to Guardian®, HORIZON® can be up to 20mm wide making it the largest lens-based feature available in the market. The size allows for large and obvious contrasting images and switching effects making authentication easy for the user.

Counterfeit Resistant – Unlike optical threads, HORIZON® uses the entire substrate depth making extraction or reapplication of the feature difficult in the extreme. In addition, the wide yet ultra-thin 12µ lens requires high tech capability beyond the capacities of the casual and semi-professional counterfeiter.

Highly Durable – HORIZON® offers outstanding durability due to the simplicity in approach. The ultra-thin lens delivers excellent mechanical strength and the opacification inks used in the print layer have a strong track record of durability.

WHO DOES IT BENEFIT?

Horizon® provides the general public with a strong overt security feature.

RESISTANCE TO COUNTERFEITING

By being fully integrated into the Guardian® substrate layer, HORIZON®'s micro-lens technology is extremely difficult to replicate. Requiring highly specialised knowledge and high tech equipment, lens thickness creates a significant point of difference in authentication. Currently the effect delivered by HORIZON® can only be achieved by much thicker profile lenses, making them impractical for use on a counterfeit note.

DESIGN INTEGRATION

After creating a design in which the visual impact is maximised by strong contrasts, the lens angle can be controlled to achieve a variety of effects that use this design to create contrast switching occurring at different movement lengths. The width of these images can be restricted to just 1µ in width if required.

For simple designs, large graphic segments of the HORIZON® image will switch at the same angle. For more complex designs a large number of elements within the HORIZON® image will switch at different angles.

HOW IT WORKS

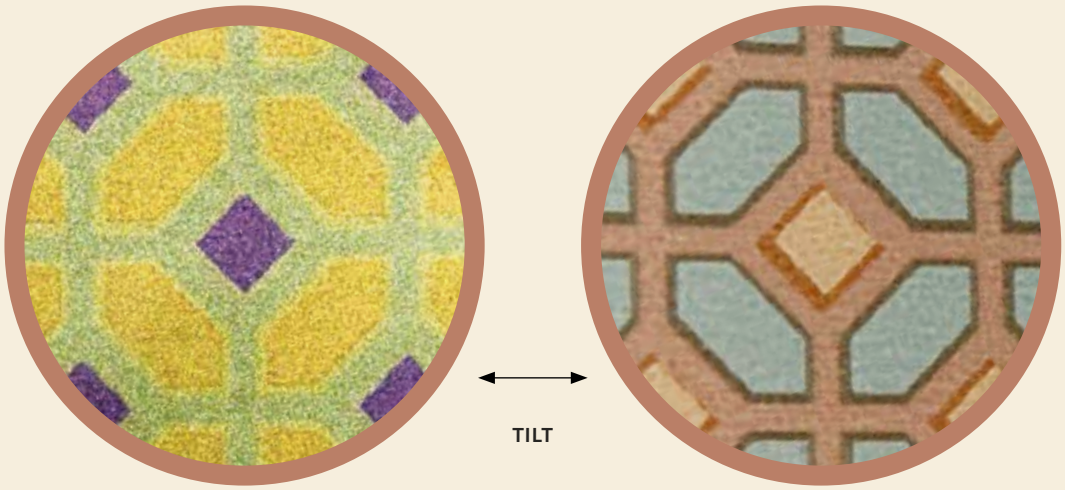
THE LENS IS INTEGRATED ON THE FRONT SIDE OF THE SUBSTRATE WHILE THE PRINTED LAYER IS ADDED TO THE OBVERSE SIDE. THE LENS PROJECTS DIFFERENT PRINTED IMAGES TO THE EYE AT DIFFERENT VIEWING ANGLES, THUS CREATING THE PHENOMENA OF HIGH CONTRASTING SWITCHES AS THE NOTE IS MOVED BACK AND FORTH IN A MANNER THAT CHANGES THE VIEWING ANGLE.

AURORA®

SWITCHING EFFECTS LEVEL 1

Aurora®, named after the vibrant colour shifts seen in the natural polar phenomenon, uses inks in specific colour combinations to create intriguing and distinct colour shifts that are highly difficult to replicate even with the most advanced digital printing machines.

Earlier developed security features such as G-Switch® exhibit a single colour pair - a colour pair is an ink that shifts from one colour to another when tilting the banknote. Aurora® on the other hand consists of multiple colour pairs designed together which offer advanced effects when tilting the banknote and when light is reflected from the feature.



KEY BENEFITS

Striking Colours – Aurora® consists of a palate of intense colours

Multi-Colour Shifts – Aurora® can be configured with two or three colour switches giving added security and aesthetic value

WHO DOES IT BENEFIT?

Aurora® provides the general public with a strong overt security feature. When designed in a window, Aurora® is able to be viewed from both sides of the banknote. Aurora® is easy to authenticate whilst still difficult to replicate.

RESISTANCE TO COUNTERFEITING

Increased security is achieved through colour shifting technology, specialised inks and smart design

Printed directly on the transparent window during the substrate opacification process, Aurora® becomes integrated into the banknote and adds a higher degree of security

Aurora® cannot be reproduced by digital printing and would require a professional skilled in both ink and printing technology to attempt to simulate the feature.

DESIGN INTEGRATION

Designed within the banknote windows, Aurora® is integrated into the substrate and banknote design.

HOW IT WORKS

AURORA™ APPEARS DIFFERENT WHEN VIEWED IN REFLECTION AND TRANSMISSION, AND WHEN DESIGNED IN A TRANSPARENT WINDOW APPEARS DIFFERENT FROM EITHER SIDE OF THE NOTE. WITH TWO AURORA™ COLOUR PAIRS, THE ADVANCED EFFECTS INCLUDE:

- A shift from two similar colours to two distinctly different colours, referred to as angular metamerism (e.g. two similar golds switch to brown and green)
- A shift from two dissimilar colours into two other dissimilar colours (e.g. indigo and blue switch to green and brown)
- A shift from two dissimilar colours when viewed in reflection into two similar colours when viewed in transmission (e.g. green and indigo both switch to brown) An alternate between two dissimilar colours when viewed in transmission (e.g. indigo and green switch to green and indigo)
- The use of a third colour (with either another Aurora™ colour pair or Metalix® colour) has a more striking effect, making it even more difficult to counterfeit.

AURORA® COLOUR RANGE

G-Switch®

SWITCHING EFFECTS LEVEL 1

G-Switch® is a colour shifting feature in which a specific area will change colour from one colour to another when tilted. Created during the substrate manufacturing process, the colour-shifting effect is observed within transparent or half windows. The colour change is easily observed, making it easy for the public to recognise.

KEY BENEFITS

Easy authentication – G-Switch® is easy to identify and seen easily from both sides of the banknote if designed in a transparent window

Durable – G-Switch® is highly durable and lasts the life of the banknote

WHO DOES IT BENEFIT?

G-Switch® is beneficial for the general public owing to its ease of use and the colour shifting effect which has been proven to be easily understood. When designed in a window, G-Switch® is able to be viewed on both sides of the banknote.

RESISTANCE TO COUNTERFEITING

G-Switch® cannot be replicated by digital printing therefore reducing the effects of the casual counterfeiter.

DESIGN INTEGRATION

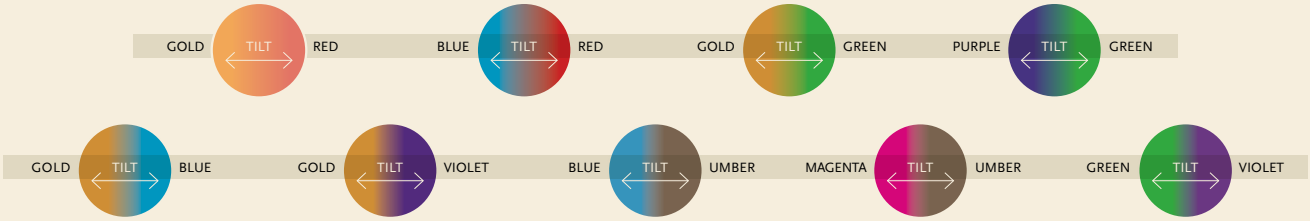
G-Switch® is designed within either a half window or full window, allowing the Guardian® substrate to further enhance and highlight the various colour options and sheen. Further enhancements to the G-Switch® feature can be achieved with the addition of other Guardian® features such as: Latitude®, Horizon®, Eclipse™, Metalix®, Windows.

HOW IT WORKS

G-SWITCH® IS A SPECIALLY FORMULATED INK BASED FEATURE THAT CHANGES COLOUR WHEN TILTING THE BANKNOTE. WHEN PLACED IN A WINDOW, G-SWITCH® CAN BE SEEN ON BOTH SIDES OF NOTE.

When tilting the banknote the colour changes. Multiple G-Switches® can be designed in the same banknote.

G-SWITCH® COLOUR RANGE



IRIswitch®

SWITCHING EFFECTS LEVEL 1

IRIswitch® offers a pearlescent sheen and is used in broad colour bands or images in the banknote design. When the banknote is viewed at different angles, the colour and the texture of the iridescent feature will switch from being hidden to being visible.

Iridescent features on banknotes are both strong and subtle visual features. IRIswitch® is available as both gold and blue iridescent prints that can be designed in many formats in the banknote design.

IRIswitch® – when the banknote is viewed at different angles, the colour of the iridescent feature will become visible.

KEY BENEFITS

Durable - IRIswitch® is durable and lasts the life of the banknote

Subtle authentication - IRIswitch® is noticeable only upon tilting the banknote

WHO DOES IT BENEFIT?

IRIswitch® is an easy to recognise visible security feature suitable for the general public. Cash handlers are also able to quickly authenticate the IRIswitch® feature.

RESISTANCE TO COUNTERFEITING

IRIswitch® cannot be digitally printed, making it effective in deterring the casual or semi-professional counterfeiter.

DESIGN INTEGRATION

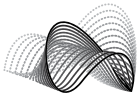
Iridescent features are typically printed using the screen printing process. By specifying IRIswitch® this additional process is not required. Alternatively, advanced screen printing can be used, incorporating features such as the combination of SPARK® by SICPA and OVIs such as Aurora® or G-Switch®.

HOW IT WORKS

IRISWITCH® IS NOTICEABLE WHEN THE USER TILTS THE BANKNOTE. THE PEARLESCENT COLOUR CATCHES IN THE LIGHT AND IS HIGHLY VISIBLE, HOWEVER WHEN TILTED FURTHER NO PEARLESCENT COLOUR CAN BE SEEN ON THE NOTE.

[1] + [2] Trademark of SICPA S.A.

IRIswitch® COLOUR RANGE



What will the DNA of your next banknote be made of?

To discuss the evolution of your banknote currency, contact:

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