



DeLaRue

CURRENCY

# *SAFEGUARD*<sup>®</sup> & Features





# De La Rue *Currency*

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De La Rue's purpose is to secure trust between people, businesses and governments. We provide highly secure solutions that underpin the integrity of economies and trade in 140 countries. We are the trusted partner of choice for central banks seeking to secure their cash cycles.

The transition of central banks and banknote issuing authorities to polymer banknotes has accelerated over the past decade. 5% of all banknotes are circulating on polymer and this number continues to grow.

De La Rue has played a fundamental role in this transition, enabling dual sourcing of substrate supply and unlocking new design and security feature possibilities with our SAFEGUARD® polymer substrate.

Polymer banknotes are cleaner, greener, highly secure and more durable compared to traditional paper substrates. They are the only substrate that is extensively proven to last significantly longer than paper banknotes. As well as new design and functional options they help central banks achieve their sustainability goals due to their low waste and total recyclability.

We have spent the past decade optimising SAFEGUARD® and supporting central banks transition to polymer banknotes. We are here to help you as you continue or embark on your polymer journey.



FEATURE SERIES HOUSENOTES  
SAFEGUARD®



## Polymer Expertise

De La Rue is the global leader in polymer banknote solutions, from substrate and security feature manufacture, to design and printing fully finished banknotes.

We support every stage of your polymer experience, from the initial cost-benefit analysis and environmental impact assessment through to the polymer design, production and recycling of used notes at the end of their useful life.

For state printing works and commercial printers, we provide knowledge transfer and technical support to smooth the transition and help realise the manufacturing benefits. To date we have supported fifteen external print partners whilst also printing on polymer at our international manufacturing sites.

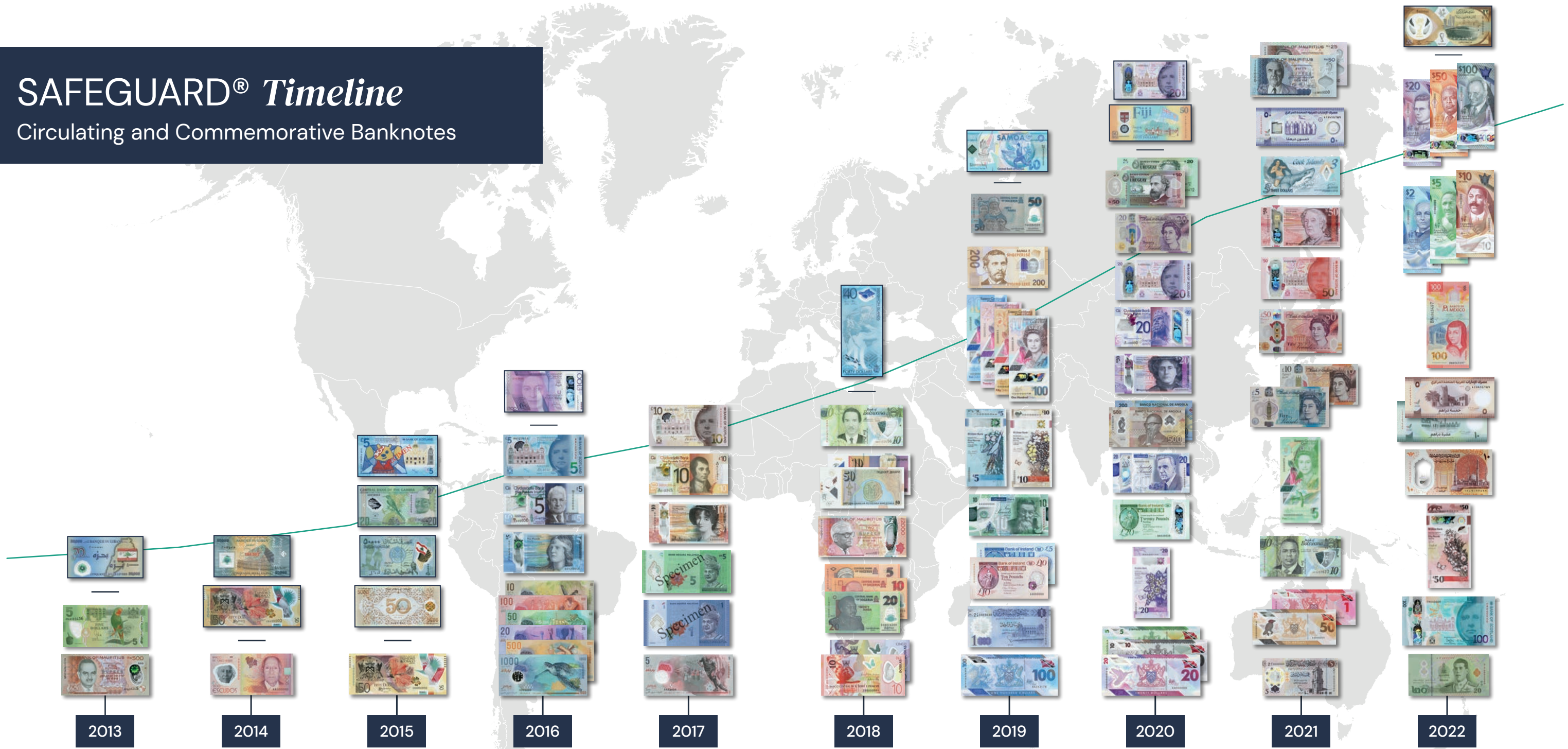
Today SAFEGUARD® circulates in a range of environments, offering a cleaner, greener, more secure and more durable option for banknote issuing authorities looking to upgrade their banknotes.

The security of banknotes printed on SAFEGUARD® is layered, combining the inherent security features of the substrate with public, machine readable and functional features creating distinct points of engagement, identification and authentication for the banknote throughout the cash cycle.



# SAFEGUARD® *Timeline*

Circulating and Commemorative Banknotes



# SAFEGUARD®

1

## CLEANER

Polymer banknotes are non-porous which prevents dirt and moisture penetrating into the substrate. This means polymer notes stay cleaner and look better for longer.

2

## GREENER

Polymer substrate is 100% recyclable at the end of its life. De La Rue offers solutions and guidance for end of life banknote waste recycling.

3

## MORE SECURE

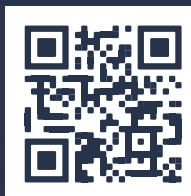
Polymer substrate is inherently secure. The substrate requires special techniques to make the ink adhere. Windows within polymer banknotes are complex and hard to replicate.

4

## MORE DURABLE

Polymer banknotes last on average two and a half times longer than paper notes and are in circulation in all types of climates.

Greater cleanliness and longer banknote life mean fewer banknotes need to be printed, reducing the overall cost and environmental impact when using polymer banknotes.



www.delarue.com

# SAFEGUARD®

## Benefits

### Better Banknotes

De La Rue is the only provider of polymer substrate and manufacturer of finished banknotes, combining substrate and print design for exceptional product integration.

SAFEGUARD® polymer banknotes were developed in response to central bank demand and first issued into circulation in 2013. As of January 2023 there are 83 circulating banknotes on SAFEGUARD®, from 26 issuing authorities..

The global transition to polymer banknotes has accelerated in recent years, supported by De La Rue's excellence in design, manufacturing capability and customer focus - central banks across Europe, Africa, Asia and the Americas have demonstrated that both polymer substrates can co-circulate and even be used for the same denomination.

Security, durability, cleanliness and environmental benefits are frequently cited as reasons that central banks transition to polymer.

### Cleaner

Polymer banknotes stay cleaner for longer. The non-porous surface of polymer means dirt is not visibly picked-up by the banknote over time. Polymer banknotes can also be easily wiped clean or sanitised.

Soiling is one of the primary reasons for paper banknotes failing. Heavily soiled banknotes can lead to a loss of confidence from the public. If a large number of heavily soiled banknotes are in circulation it can make it harder to authenticate a banknote and consequently easier for a counterfeit banknote to pass as a genuine note.

### Greener

The lower environmental impact of polymer is linked to their higher durability, remaining cleaner in circulation for longer and the ease of recycling. Polymer banknotes need replacing less frequently, meaning that fewer raw materials are consumed, and transport associated with replacing notes in the cash cycle is reduced.



#### Cleaner

Polymer notes stay *cleaner* for longer



#### Greener

SAFEGUARD® is more environmentally friendly



#### More Secure

Polymer substrate is inherently *secure*



#### More Durable

Polymer banknotes last *2.5 times longer\**

\*On average



# SAFEGUARD®

## Benefits (continued)

### More Secure

Banknote counterfeiting levels are typically so low that they are reported in parts per million. This is because currency issuing authorities and suppliers continue to invest in the latest security products. The central banks who publish their counterfeiting levels show a reduction in counterfeiting when their banknotes have transitioned to polymer substrate. Printing on polymer requires specialist materials, knowledge and equipment that is not readily available.

The security of banknotes printed on SAFEGUARD® is layered and combines the inherent security features of the substrate with integrated print features, creating multiple complementary and distinct points of engagement to aid identification and authentication of the banknote throughout the cash cycle.

### More Durable

Polymer banknotes have been recorded lasting up to 7.3 times longer than equivalent paper banknotes. On average, polymer notes last 2.5 times longer than paper banknotes, as quantified by 12,531 data points in DLR Analytics™. This is a statistically significant difference that stands out despite all the other factors that influence banknote lifetime.

Whilst it is possible to find single pieces of data suggesting a new substrate is giving a durability benefit this is not the same as extensively proving the durability benefit. Polymer is the only substrate that is extensively proven to be more durable than paper on billions of banknotes and across a range of circulating conditions.

The increased durability is due to the Biaxially Orientated Polypropylene (BOPP) core. BOPP has a range of physical and optical properties that benefit banknotes, for instance enabling secure windows. It also has superior tensile strength, stiffness and resistance to double folds that is comparable to paper.

Polymer banknotes last longer, requiring fewer notes to be printed, which reduces printing costs and greenhouse gas emissions from manufacturing.

Switching to a polymer substrate reduces the financial and environmental cost of banknotes. Polymer banknotes provide an economy with secure, modern banknotes that will endure repeated journeys through the cash cycle.



*“We have seen very low volumes of counterfeit attempts at £5 and £10 polymer notes and what we have seen have been quite easy to spot. We are hoping that with the move to the polymer £20, we will see another drop off in counterfeit levels. Polymer has proved to be much more difficult to counterfeit than paper.”*

Sarah John, Chief Cashier, Bank of England, 15th February 2020



# Secure, durable & sustainable

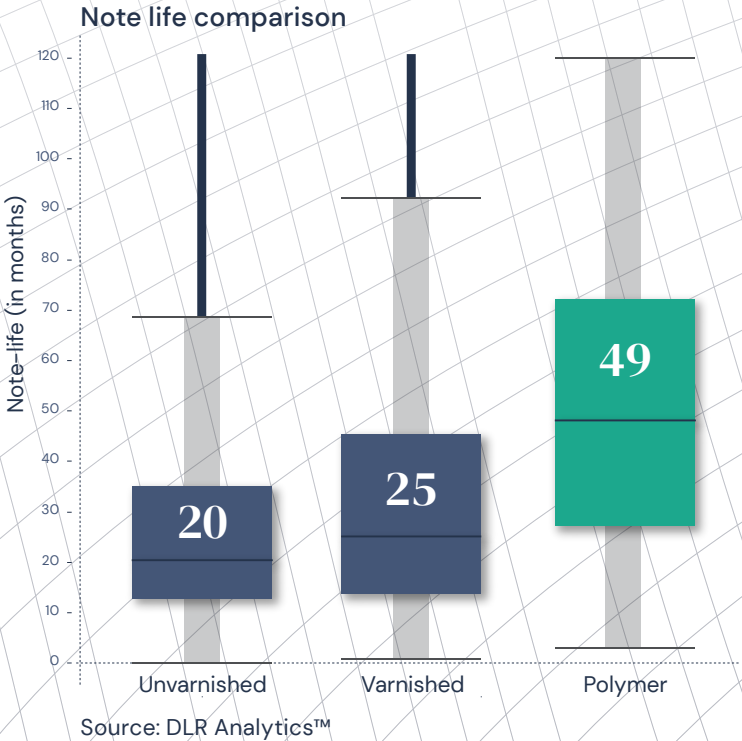
## Explained

Polymer substrate is difficult for counterfeiters to print on because digital inkjet and toner print do not adhere to the substrate surface. Many countries have reported a drop in counterfeiting levels following the introduction of polymer banknotes.

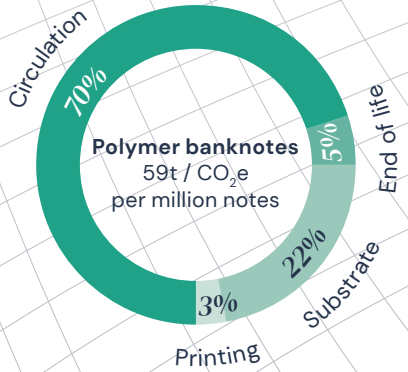
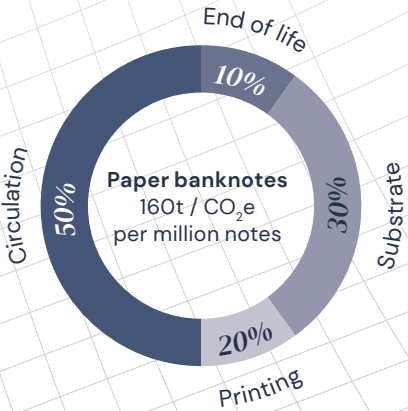
As the only integrated design, polymer substrate manufacturer and banknote printer in the industry, De La Rue has the ability to enhance the security of polymer banknotes by fully integrating the SAFEGUARD® substrate and features within the final banknote design.

Examples include windows in a building that are actual windows in the substrate, or a hummingbird in a hologram that appears to be feeding from a flower in the gravure layer.

There is a wide range of security features available for SAFEGUARD® that enhance the security and complement the aesthetics of the banknote or banknote series.



Carbon emission comparison  
paper vs polymer



Cleaner	SAFEGUARD® banknotes look better for longer
Greener	Reduced carbon footprint and 100% recyclable material
More secure	SAFEGUARD® substrate properties, design techniques and manufacturing processes make counterfeit attempts extremely difficult
More durable	Up to 2.5x times more durable than paper Greater cleanliness and longer banknote lifetimes mean that fewer banknotes need to be printed

**“SAFEGUARD®  
substrate raises  
barriers to  
counterfeiters  
and provides  
new design  
options for  
banknotes”**





# Measurable benefits

## Explained

### Cleaner and greener

Polymer banknotes have a much greater resistance to soiling as they are non-porous, meaning the dirt cannot penetrate the substrate. The notes look better for longer.

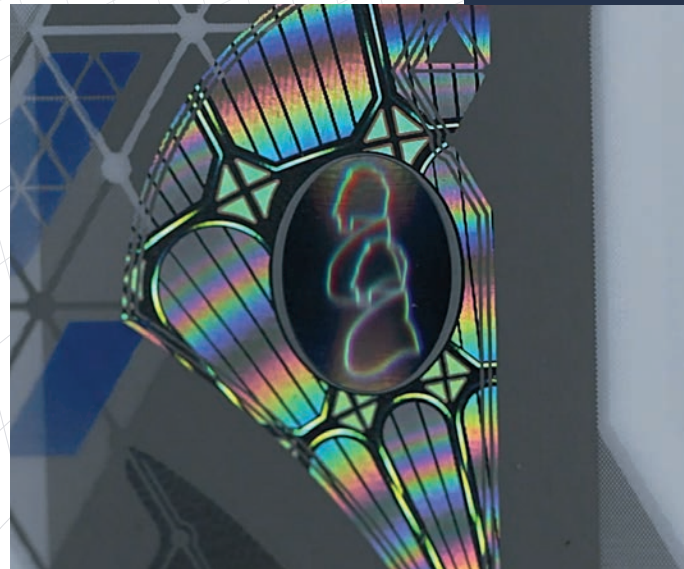
Polymer substrate is 100% recyclable and De La Rue is able to provide customer specific solutions and guidance for large and small volumes of banknote waste recycling.



### More secure

Polymer substrate is more difficult for counterfeiters to print on because digital inkjet and toner print do not adhere to it.

The window of the note can adopt different shapes and sizes, requiring specialist materials, inks and know-how. Integrating security features like holographic stripes, Illuminate™ and Argentum™ into the windows enhances the counterfeit resilience.



### More durable

The increased durability of polymer banknotes will mean significant cost savings over the lifetime of a new series.

Polymer banknotes last on average 2.5 times longer than paper notes and are circulating around the world in every type of climate.

Polymer is the only substrate extensively proven to last longer than paper.



### More cost-effective

Greater cleanliness and longer banknote lifetimes mean that fewer banknotes need to be printed and the notes look better in circulation for longer.

The durability, cleanliness, security and reduced environmental impact of polymer make it an economically sensible and ethical choice when considering changes to a substrate specification.





# SAFEGUARD® Windows

## Explained

### Unique to polymer

The layered construction of the SAFEGUARD® substrate allows the creation of distinctive and easily identifiable windows to be designed into the banknote. This is a feature unique to polymer banknote substrate.

Modern windows are complex and hard to replicate.

They can appear fully transparent, as half windows, embossed or include a vignette or portrait. When combined with security features and design details, the security features become more distinctive and much harder to copy.

Creating a window requires the correct substrate and techniques and it is obvious if the window is lacking. This feature of the substrate raises the threshold for the counterfeiter forcing them to use new materials and techniques.

### Framing

SAFEGUARD® windows act as a frame for primary security features like holographic stripes or gravure effects. Pseudo-relief imagery and dynamic effects mean that the next generation of holographic stripes are more secure and more engaging than ever before.

Holographic stripes in windows are a very popular choice for mid to high tier denominations. They can capture people, animals and objects in high resolution and full three dimensions, creating secure art within the feature. Other denominations can use the same window shape and design elements to carry a thematic element, using other security features such as gravure or ARGENTUM™, a mirror-like free form print effect.

### Integrated security

De La Rue is the only fully integrated provider of polymer banknote substrate, security features, designer and printer in the world. We leverage our knowledge and experience to create remarkable banknotes.

SAFEGUARD® provides De La Rue's banknote designers with a platform to create polymer specific designs that take full advantage of the SAFEGUARD® substrate and enable the creation of a secure, pleasing and consistently themed series.

Banknotes designed on SAFEGUARD® can adopt a more modern aesthetic to stand out or blend into an existing series of banknotes.

*“Modern windows are complex and hard to replicate”*



SAFEGUARD®  
WITH ARGENTUM™



# SAFEGUARD® Core features

## Specifications

### Gravure Design

Complex, high resolution images can be designed and printed into the polymer window. Detailed portraits, imagery and patterns serve as primary features with unique and recognisable designs for intuitive public authentication

### Printmark

A simulated watermark image that is visible when held up to the light, but not in reflected light. This can be designed to match paper watermarks helping with the conversion from paper to polymer substrate.

PRINTMARK exists within the substrate so has a high durability. It is easy to explain and recognise, whilst being difficult to accurately reproduce.

### Blind Emboss

Blind emboss is a simple and effective way of customising the transparent areas of the SAFEGUARD® window.

The use of non-inked intaglio artwork creates an embossed image that can be seen when reflected in daylight. This can be used to add denominations, text or imagery to the window, allowing customisation across the SAFEGUARD® banknote family or individually to further integrate with the overall banknote design.

### Iridescence

A print applied feature which gives the appearance of a reflective golden sheen when the note is tilted.

### Gravure Design



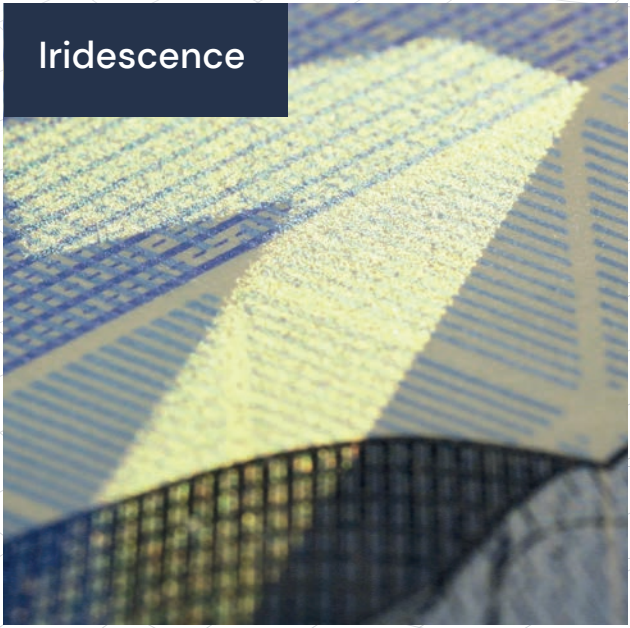
### Printmark



### Blind Emboss



### Iridescence





# SAFEGUARD® Core features

## Specifications (continued)

### SAFEGUARD® Magnetics™

A printed machine-readable thread effect, SAFEGUARD® Magnetics™ is applied using a modification of the gravure inks to include machine readable elements into the banknote design.

The feature provides level 1 and level 2b functionality whilst retaining a fully flexible shape and utilising the CLEARTEXT™ demetallisation which appears when viewed in transmission. The thread effect can be printed in a variety of widths and can appear in different shapes and patterns around the CLEARTEXT™.

SAFEGUARD® Magnetics™ is an ideal crossover feature when migrating a banknote design from paper to polymer substrate as it offers similar elements of functionality and the same level of machine readability as the paper substrate MAGFORM™ feature.

### Colour Gravure

Coloured gravure can be used both in the polymer window and embedded in the white areas allowing full integration with the print design.

There is a wide spectrum of matt colours available to use within SAFEGUARD®. These can be designed in solid and gradated tones enabling aesthetic flexibility and sophisticated design.

### Half Window

A reflective appearance for symbols, text or patterns is created by removing the white ink from one side of the substrate allowing the transparent core to show through.

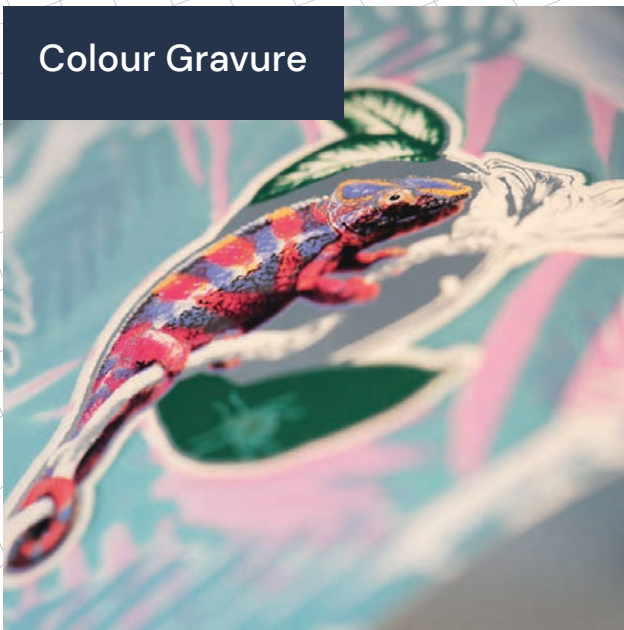
These designs extend the security of the transparent window, acting as a reflective form of watermark in the SAFEGUARD® substrate.

This ability to add custom designs into the banknote can carry themes across a series or when transitioning across substrates.

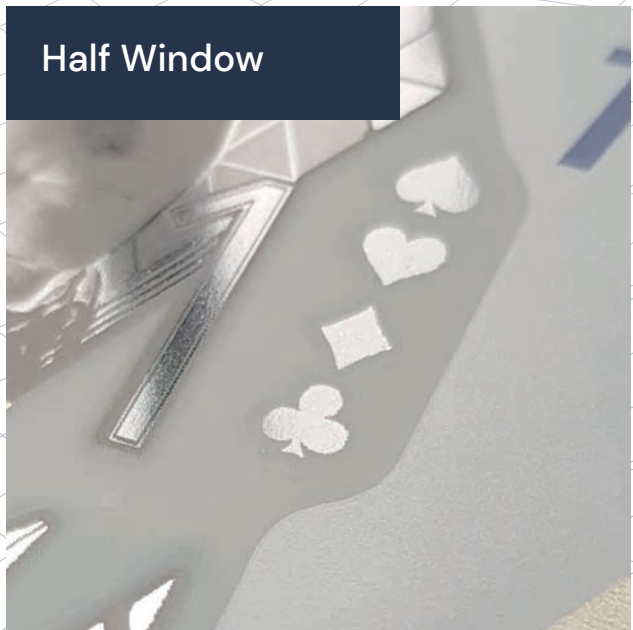
### SAFEGUARD® Magnetics™



### Colour Gravure



### Half Window





# SAFEGUARD® Enhanced features

## Specifications

### ARGENTUM™

A specialist silver ink that creates a highly reflective and visually striking image. Through sophisticated design the silver can be used as a standalone effect or incorporated into the ILLUMINATE™ and INTEGRATE™ features, creating eye-catching designs that are intricate and difficult to replicate.

### ILLUMINATE™

Integration of different inks into the polymer window, building up different textures, colours and sheen effects to create a complex and striking window.

### MASK™

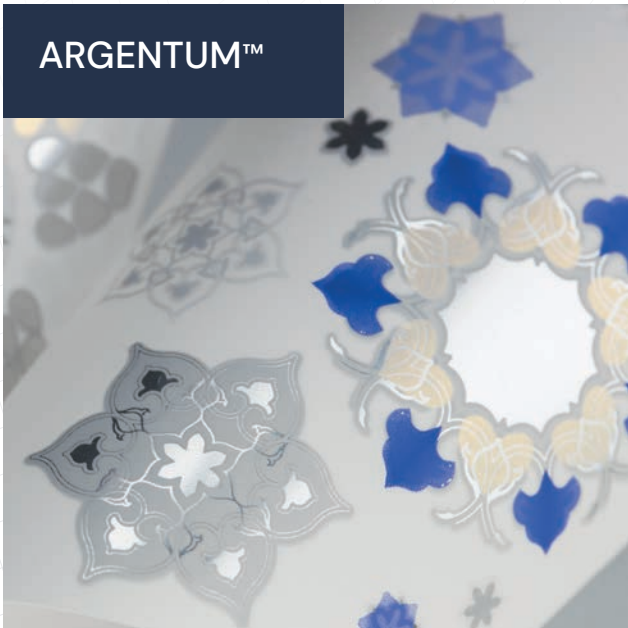
A hide and reveal print feature for polymer (and paper) substrates. It uses secure print processes to transform from a simple pattern to a hidden image when held up to the light.

MASK™ is a cost-effective means of visually linking banknotes in the same series, appearing as coloured or shape variants in a similar position on the note throughout the series.

### Tactile Emboss

A polymer only feature, denomination specific raised patterns are added to the polymer substrate to aid identification by visually impaired users.

### ARGENTUM™



### ILLUMINATE™



### MASK™



### Tactile Emboss



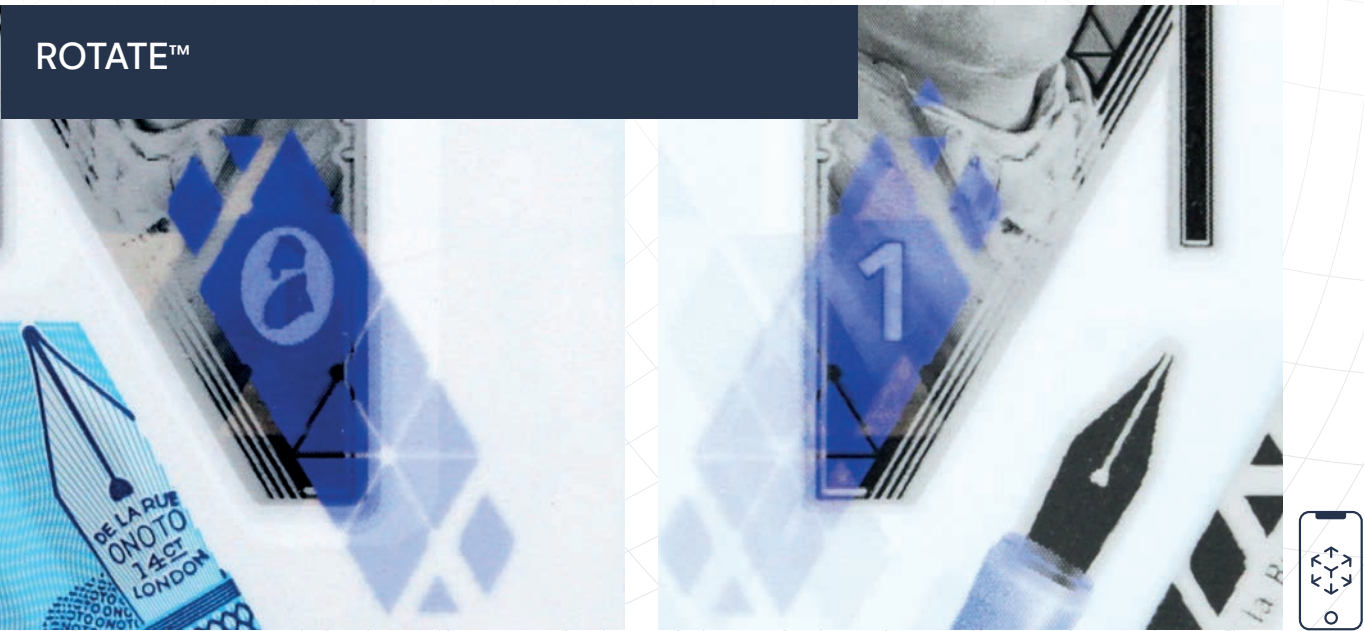


# SAFEGUARD® Enhanced features

## Specifications *(continued)*

### ROTATE™

A fully registered image pairing on both sides of the polymer note. The two image outlines are perfectly aligned, front and back, but with non-identical images within the outline.



### INTEGRATE™

This feature lays colour directly into the print layers of the substrate, allowing different depths of colour and shade to emerge through the note, depending on where the colour has been applied. Utilising the full colour palette, creating tonal variation and depth within the design.

### Colour Effect

Colour effect inks have novel colour changing properties which enhance the design and provide simple colour changing authentication.





# Enhanced GEMINI™

## Specifications

### Instantaneous impact

Enhanced GEMINI™ is a distinctive and versatile level 2 print feature that reveals itself under ultra-violet (UV) light for cashiers, and tellers to validate. The hidden image appears as two colours when illuminated with UV and is intricately linked to the image or pattern work of the visible print. The UV effects make it easy for the bank teller to verify using a standard UV lamp. The combination of one visible colour and two fluorescent colours provides greater resistance to simulation and counterfeit attempts.

Complex and detailed designs are incorporated using different design techniques, such as blocks, lines and microtext which are used to make up complex designs distinct to each denomination.

### Easy integration

Enhanced GEMINI™ is applied in the lithographic printing stages, allowing it to easily integrate with other security features in the overall banknote design. It can be used with polymer and paper substrate.

### Variety of effects

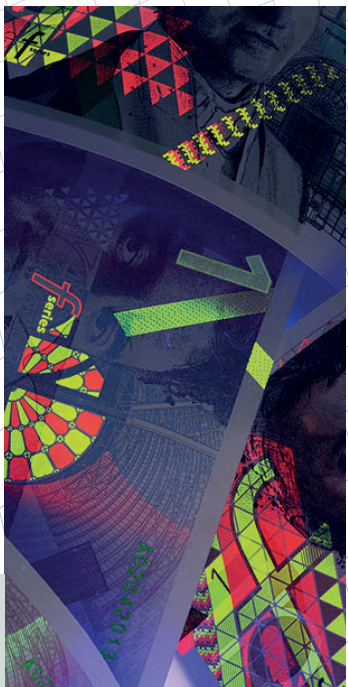
The variants of Enhanced GEMINI™ that are available are “Enhanced GEMINI™ Blocks”, “Enhanced GEMINI™ Lines” and “Enhanced GEMINI™ Microtext” or a combination of these effects to create distinct patterns and fine detailing to compose the UV variants of the feature.



UV view image

### Recognisable and popular

GEMINI™ variants have been chosen to appear on over 150 different denominations of all values. It can be easily retrofitted onto existing designs when updating a series. It is De La Rue's most popular print feature.



## Enhanced GEMINI™







## Holographic Expertise

De La Rue Currency has created one of the most diverse and comprehensive holographic feature portfolios commercially available.

Our holographic origination techniques have created features and effects that are clear, visually striking and secure.

Classical, image based holography offers the ability to display detailed images and effects that provide a unique security barrier to counterfeiters. This proprietary technology is ideal for creating secure art and imagery that can't be replicated with commercially available equipment.

De La Rue's advanced digital origination creates unique and intuitive movement effects that are increasing in popularity. These utilise movement, animation and colour, producing vibrant effects that are easy to explain and understand.

Combinational holograms maximise the benefits of both classical and digital origination techniques in holographic stripes. This combinational approach requires entirely different equipment and know-how to replicate, ensuring a particularly secure security feature.



# Holographic features

## Colour and movement

### SPOTLIGHT™

An interactive effect with rotating images that appear above and below a plane, the rotating images are blurred under a diffused light and sharpen under a focussed light such as a mobile phone torch. Movement appears when tilted on any axis and with a wide viewing angle.

### PUREIMAGE™

A new dynamic effect utilising the latest high-resolution origination techniques to produce unique movement and animation effects that can include contraction and expanding effects.

Movement appears when tilted and with a wide viewing angle. PUREIMAGE™ is available for threads, patches and stripes.

### RGB Photo realistic portrait

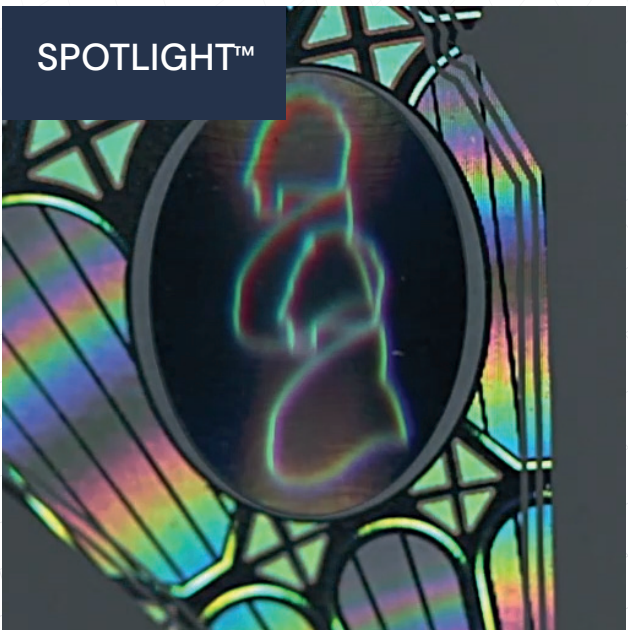
Used for creating highly detailed and accurate colour representations of iconic figures, the photo realism within the effect serves as a point of crossover between the holographic and the print design elements of the banknote.

These portraits can be combined with various other holographic effects, including DEPTH™, DUAL™ and MULTI™. The quality of the image and combination with other effects facilitates public recognition and creates a point of engagement and authentication.

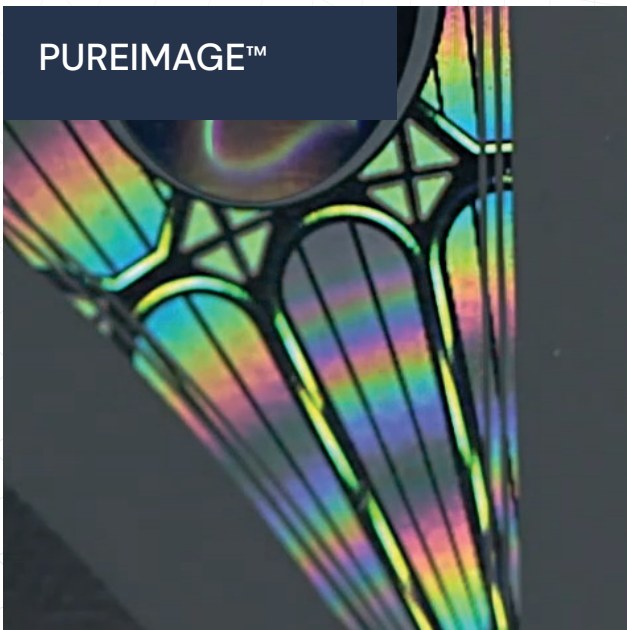
### Fresnel

An intuitive effect with patterns that are linked and rotate above and below a pivot point. It is made particularly secure by designing with PUREIMAGE™ or achromatic colours as a combinational effect.

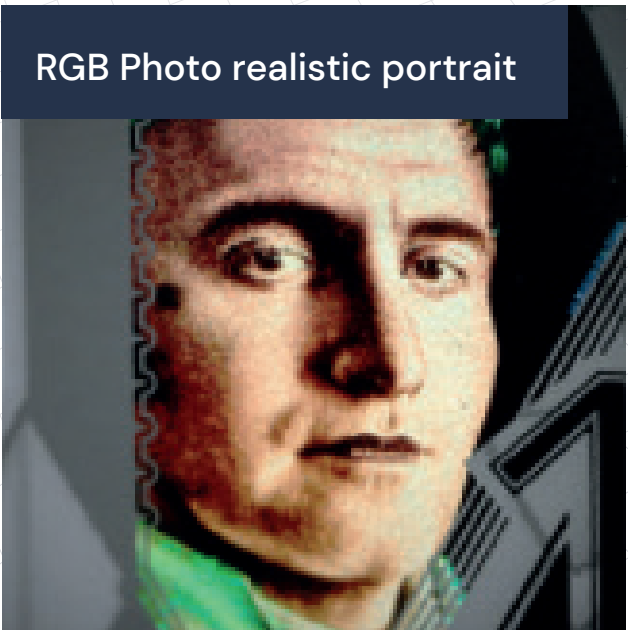
### SPOTLIGHT™



### PUREIMAGE™



### RGB Photo realistic portrait



### Fresnel





# Holographic features

## 3D effects

### DEPTH™ Image

A major effect that simulates the appearance of three dimensional movement below the surface plane of the hologram. e.g cloud movement behind an image. DEPTH™ simulates real-life perception of depth by ensuring that images appear to move more slowly when further away

### TRUEIMAGE™

A very high resolution image with cinematographic animation effects used to capture people, animals and objects in full three dimension. The perfect effect to incorporate a three dimensional artistic representation of a person or an object

### Pseudo Relief

A high resolution effect which creates an optical illusion of raised surfaces. This feature can incorporate achromatic or colour effects, or Fresnel effects to bring images to life.

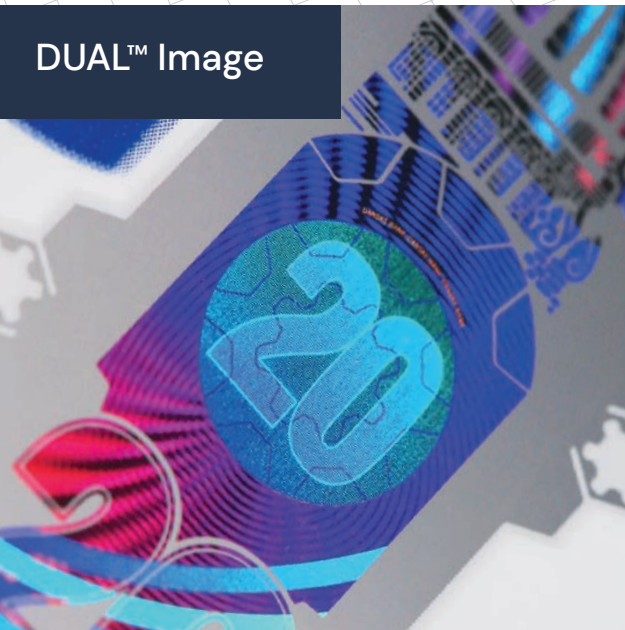
## Switching

### DUAL™ Image

Displays a clear switch between two distinct images in the same position on a hologram. The user can see one of the two images, that switch when the banknote is tilted. With a simple switch between two strong images, this feature is easy to explain and easy to understand.

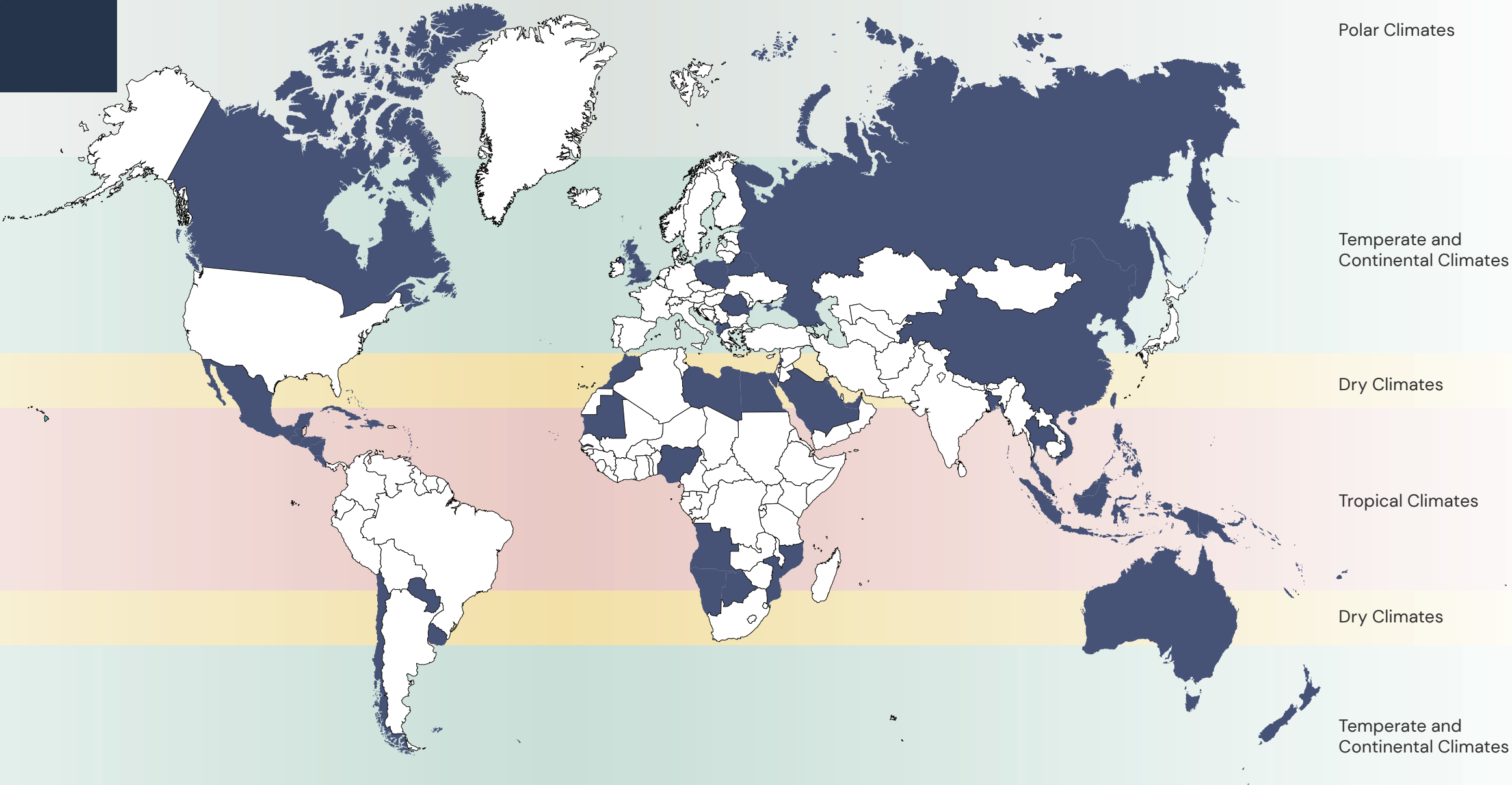
### MULTI™ Image

Used in combination with DUAL™ Image. MULTI™ Image provides a clear colour switch using a repeating pattern of icons or numerals. These change colour when the banknote is tilted giving a further layer of authentication with the DUAL™ Image switch. The MULTI™ Image repeating pattern additionally adds a larger area of holographic effect giving greater resistance to circulation damage.





*Circulating polymer*  
by climate zone



*Climate zones defined by the Met Office*



# Currency: View

Scan the QR code to use our augmented reality app.

Look for the 'AR ICON' and scan the trigger image or object to see our products come to life.



Currency: View is available for download on the Apple App Store and Google Play Store

## Contact us

[currency@delarue.com](mailto:currency@delarue.com)  
[www.delarue.com](http://www.delarue.com)

De La Rue International Limited  
De La Rue House, Jays Close, Basingstoke,  
Hampshire, RG22 4BS, UK  
Registration no: 720284

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MKT-COO3N02

1

## DOWNLOAD

Scan the QR code and download the app from your app store.

2

## SIGN UP

Create an account to begin using the app.

3

## SCAN

Look for the icon in the corner of a picture and scan the image or object to see our work come to life.



4

## VIEW

Watch our products come to life on the page.

5

## SHARE

Tap the camera icon in the app to share a screenshot.

**CENTRAL  
BANKING**

AWARDS 2022

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**CLIMATE  
LEADERS  
2022**

**CLIMATE  
LEADERS  
2021**