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KRYPTEN

DISCOVERING A NEW
WORLD FOR BANKNOTE
SECURITY WITH
HOLOTWINS™ AND
3D-GRAM™ SECURITY
STRIPES



Discovering a new world for banknote security with HoloTWINS™ and 3D-Gram™ security stripes

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Antarctica is the least explored part of the world, covered by 3000 m high ice. Many travelers dreamed of discovering this mysterious continent. But unsuccessful attempts to cross the Antarctic waters called into question the existence of the southern mainland.



Persistence and thirst for discoveries helped the Russian expedition to cope with the severe ice and finally reach the shores of the “Unknown Land of the South”. 200 years ago, in 1820, Faddej Bellingshausen and Mikhail Lazarev first saw the ice shelves of the cherished continent and proved the existence of Antarctica.

Persistence and search for new, non-standard technological solutions help us to create security elements with vibrant catchy effects and fast identification. On the “Antarctica 200” house banknotes we present our latest developments for banknote security – a two-sided HoloTWINS™ security stripe with the image change effect and a composite 3D-Gram™ stripe with photopolymer and demetallized elements.



BANKNOTE DESIGN DRAWING

"I have always been inspired by the era of explorers. So with particular interest, I began the work on the design of the banknote and studying the history of the Russian expedition to Antarctica. The gift was a book, a travel diary, which was kept by Faddej Bellingshausen, the head of the expedition. A first-person narrative takes you to the center of those distant events as if you become one of the sailors on the sloop. Such living evidence of the past is very valuable for the designer.

The "Antarctica 200" banknote is made in blue. The blue colour conveys the endless blue ocean and the unknown that awaits the brave sailors. The obverse shows a map of the South Pole with the secret continent located in the center. The ships of the navigators are eager to meet the long-awaited discovery. The steering wheel symbolizes the motion of life and the search for new knowledge. On the reverse the ships reach their destination. In front of the travelers in the seemingly lifeless cold desert, wildlife appears. They are watched by Antarctica itself in the image of a ghostly mermaid, whose hair resembles the Aurora Australis".

Andrey Rachkov, Designer

HOLOTWINS™. INTERACTIVE FEATURES FOR INTUITIVE IDENTIFICATION

HoloTWINS™ security stripe expands the two-sided security element series for window banknotes. HoloTWINS™ features use an intuitive effect of two-sided images. Turning over the banknote the user immediately identifies two different images on opposite sides of the security feature. The series includes a bimetallic two-sided hologram and a two-sided hologram with the image change effect.

On the "Antarctica 200" banknote we have complicated the technology. The HoloTWINS™ element in the banknote window is supplemented with demetallized images visualized only on the obverse. To produce such a combined feature the high-precision micro-demetalization technology (HPMD) is used. The sophisticated HPMD process creates two distinct images on opposite sides of the HoloTWINS™ element. The obverse features a compass framed by a monogram and an anniversary date. The reverse displays the numerals "200".

HOLOTWINS™. JEWELRY ACCURACY REST ASSURED

HPMD technology reproduces precise demetallized elements, displaying the smallest details, fine lines, and various shapes. HPMD allows creating any image design depending on the general concept of the banknote. Holographic elements on the security stripe exhibit vibrant optical effects which are easily identified upon tilting the banknote – dynamic colour change effect, tone flow effects, monochrome images with bas-relief effect.

"High-precision micro-demetalization is a complex technology, a multitasking process where the final result is determined by many factors. Each time the production of a holographic image begins with the optimization of the diffraction structures' parameters. It cannot be standardized. Each hologram has an individual design, hence a unique diffraction gratings profile. To reproduce the original design, every time we select the correct technical parameters. Moreover, defining the parameters is crucial at different stages of production. Both at the initial stage and throughout the

entire production cycle. But it is exactly high-precision micro-demetalization that enables us to create advanced elements that emphasize the optical effects, the depth of relief, and the microtexts that the HoloTWINS™ security stripe displays".

Andrey Akimenko, Lead Engineer

3D-GRAM™. TECHNOLOGY MIX AND STUNNING 3D EFFECTS

The security stripe on the "Antarctica 200 3D" house banknote combines two technologies in one element – 3D-Gram™ photopolymer images and elements made by the HPMD technology. To produce 3D-Gram™ elements a transparent ultra-thin photopolymer is used which allows to compliment them with other security features. As photopolymer holographic elements are originated in a transparent layer they maintain the visibility of other security features and images placed under them. As a result, developers get a wide range of opportunities to use them in conjunction with other elements.



HoloTWINS™ SECURITY STRIPE WITH THE IMAGE CHANGE EFFECT. OBTAINED ON THE REVERSE



3D-GRAM-C™ TWO-COLOUR IMAGES.
MONOCHROME BAS-RELIEF AND
MIRROR EFFECTS

The security stripe on the “Antarctica 200 3D” banknote includes a photopolymer layer with colour images made by 3D-Gram-C™ (Colour) technology in two contrasting colours – green and red. Stable intense colours, high angular, and spectral selectivity are the main advantages and differences between photopolymer elements and conventional, widespread rainbow holograms.

Another characteristic of 3D-Gram™ technology is creating three-dimensional mini-copies of real objects. The physical principles of analog holography used in 3D-Gram™ technology, generate elements with the visual effects of real objects such as full-parallax and volume effects. Examining the banknote, the user identifies bright 3D images of the whale and commemorative dates. The optical effects of photopolymer holograms are easily visualized in both diffused and point light sources.

Under the photopolymer layer, there is a layer with demetallized elements. The design and visual effects of demetallized holograms make up a harmonized composition with 3D-Gram™ photopolymer objects. The combination of the two technologies provides extreme resistance of the security stripe to counterfeiting.

“When working on the 3D-Gram™ composite security stripe, we focused on improving the technology for creating photopolymer images. The stripe demonstrates the latest effects of 3D-Gram™ technology. This is a monochrome bas-relief effect used to display three-dimensional images of the whale and commemorative dates. The second technologically complex effect reflected is two-colour images. For the 3D-Gram™ stripe we used a new method to copy two-colour holograms, which reproduces colours with maximum brightness”.

Stanislav Orlov, Senior Designer

3D-GRAM™ SECURITY STRIPE. IHMA PEOPLE’S CHOICE AWARD 2020

3D-Gram™ security stripe was voted the winner of the People's Choice Award at the prestigious International competition Excellence in Holography Awards 2020, organized by the International Hologram Manufacturers Association.

new product showing that photopolymer holograms are perfectly combined with other holographic elements and jointly create innovative security features with impressive visual effects”.

Andrey Smirnov, Head of Holographic Laboratory

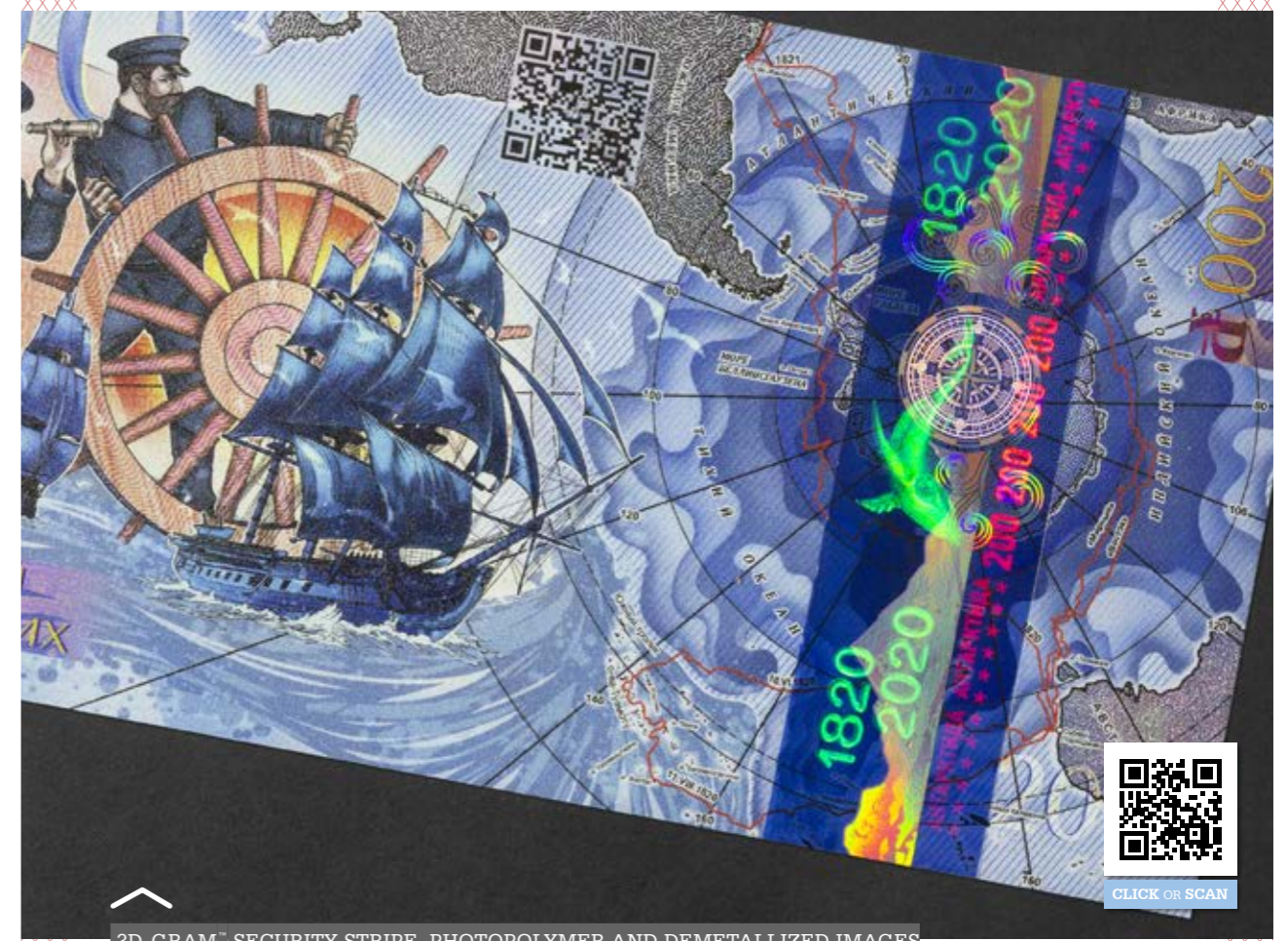
“We are honored to get this award in the premier international competition for the holography industry. It is even more valuable to become the first-ever winner of the People's Choice and get such high recognition from our colleagues. 3D-Gram™ security stripe is a completely

JSC RPC KRYPTEN

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3D-GRAM™ SECURITY STRIPE. PHOTOPOLYMER AND DEMETALLIZED IMAGES