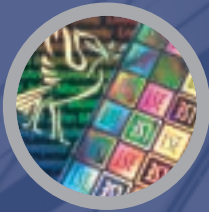


HAGUE
SPECIALISTS IN SECURITY PRINT TECHNOLOGY

HOLOGRAM



INFORMATION PACK

CONTENTS

A BRIEF HISTORY OF HAGUE	2
AN INTRODUCTION TO HOLOGRAMS	3
WHAT IS A HOLOGRAM?	3
HOLOGRAM ORIGATION & DESIGN	4
HOLOGRAM APPEARANCE	5
ID CARDS	5
SCRATCH-OFF FOILS	6
TAGGANTS IN FOIL	6
DESKTOP HOLOGRAM APPLICATION (THE HAGUE SECUROGRAM)	7
HOLOGRAM SAMPLES (REGISTERED IMAGE FOIL : 1 & 2 CHANNEL)	8
HOLOGRAM SAMPLES (WALLPAPER FOIL)	9
CONTACTS	10

A BRIEF HISTORY OF HAGUE

Established in 1980, Hague have grown to become one of the leading providers of security print, holograms and secure IT solutions worldwide.

With customers in over 30 countries Hague is the single source global provider of anti-counterfeiting and brand protection management solutions. With a heritage as a pioneer in security solutions no organization in the world has more client focused experience than Hague at protecting brands, cheques, certificates, government documents and licensed products.

Counterfeit of printed documents has become over the years easier and easier with the development of printing technologies and the involvement of crime organization. This is why it has become absolutely necessary to secure documents with state-of-the-art high technologies. Expert in the authentication and the protection of variable data of such documents, Hague proposes solutions for securing these documents.

AN INTRODUCTION TO HOLOGRAMS

Since their introduction on Mastercard and Visa payment cards in the early 1980s, holograms have become one of the most common overt or public security features on value documents and branded goods, their presence both indicating the authenticity of these items and providing a powerful deterrent to counterfeiting.

WHY A HOLOGRAM? BECAUSE THEY WORK!

Holograms cannot be copied by conventional reprographic means (copiers or scanners and printers). Their effects cannot be reproduced or simulated by conventional printing or finishing techniques. The skills, technology and investment involved in their design, origination and manufacture ensures that their production is beyond the reach of most would-be counterfeiters, while even the most determined forgers will be unlikely to produce holograms that are effective and accurate copies of the original.

Holograms are also highly versatile. They can be applied cost-effectively to a wide variety of substrates and products as part of conventional printing, packaging and labelling processes. And while they are essentially overt features that can be recognised and verified by the public, they can also be integrated with other security technologies – inks, taggants, numbering, RFID etc - to provide multi-layered security solutions combining overt and covert security with track and trace capabilities.

As a result, holograms are widely used on all manner of security documents including banknotes, personal identification documents such as passports and ID cards, fiscal stamps, tickets, vouchers, cheques, payment cards etc. They are also used to protect branded goods from counterfeiting, adulteration, substitution and parallel trading, featuring on many of the world's leading brands of pharmaceuticals, IT products, automotive components, luxury and consumer goods.

WHAT IS A HOLOGRAM?

The word hologram is derived from the Greek 'holo' for whole and 'gram' for message and in its simplest definition could be described as a recording of a three dimensional image on a two dimensional surface.

In fact a hologram does not contain an image as we know it, but an encoded pattern of the original subject which serves to bend and shape the light illuminating it into the image we eventually see.

This is perhaps best understood if it is imagined that the surface of the hologram comprises many millions of tiny lenses of different strengths and set at different angles. When light is shone through the hologram each lens focuses the light to a different spot and all the spots, when seen together, form the image that is visible.

Under a microscope, the hologram is revealed as a simple structure of lines, known as fringes. These are recorded onto the surface of the hologram during origination and have the focusing (lens) effects needed to render the image visible.

The detail recorded is very fine - in the region of 2,000 lines are typically recorded in every millimetre over the hologram surface. Each different colour effect on each element of an image is made from the fringes recorded at different orientations and thicknesses.

The final end product of the recording is a photoresist plate which, when processed, exhibits areas of exposure and non-exposure replayed as microscopic grooves in the surface of the plate. Further electrolytic processing of this plate eventually leads to the production of nickel shims (the holographic equivalent of printing plates) which are used to emboss the pattern into suitable substrates, such as metallised polyester film or film coated with thermo lacquers, which creates the holographic product.

In the final version, it is the diffraction and interference of incident light on the pattern of micro grooves embossed in the reflective materials which results in the original holographic visual effect being reproduced.

HOLOGRAM ORIGATION & DESIGN

Holograms from Hague provide an attractive and cost-effective way to enhance a product. Various techniques are available to customise the hologram to your market requirements. At the same time the product becomes more difficult to counterfeit. The hologram is thus an effective means of strengthening brand identity.

APPLICATIONS

Hague holograms are produced in the form of hot stamping foil, laminating foil, self-adhesive labels, tear stripes, or other project-specific formats.

ORIGINATIONS

Hague has developed some unique optical technologies. Based on interferential microlithography and digital holography, these techniques enable etching of optical microstructures on areas of micrometric dimension. Moreover they can be combined, offering countless possibilities in terms of design and increasing the difficulty of imitation. Industries has employed its technologies to develop several origination techniques for different applications:

DESIGNS

Hague offers customized solutions for single-image and continuous designs.

The Hague design team provides their extensive experience in creation of holographic images to brand owners.

2D HOLOGRAMS



Based on a two-dimensional graphic image. All elements of the design appear in a single image plane.

2D/3D HOLOGRAMS



These show two or more two-dimensional images in parallel image planes, producing a "perspective" effect, creating the illusion of depth.

3D HOLOGRAMS



These are produced by capturing a three-dimensional model in a 1:1 size ratio. The hologram shows a realistic, in-depth image. A strong, direct light is required for optimal viewing.

ADDITIONAL FEATURES

Besides the various holographic origination techniques, a number of separate design components can be incorporated so as to increase the security value of the hologram and strengthen its optical effects.

Such design effects include:

image flip (2 channel*), colour separation, shading, prismatic components, microtext and hidden images.

* created by interlacing the graphics from two separate images - both images are one layer. In its final form, image "A" is visible, but with a slight change in the viewing angle, image "A" disappears and image "B" appears instead.

HOLOGRAM APPEARANCE

FILM APPEARANCE

Security holograms can have several aspects since it is possible to use different metalizing materials: aluminium, copper, chrome. Apart from their different appearances these materials have specific resistance properties.

DEMETALLIZATION

Demetallization is a technology used to create transparent parts in a hologram. These parts are created and integrated at precise positions in the image design and can serve as micro-elements. This technology adds an additional level of security since few companies in the world have mastered the techniques involved.

HIGH REFLECTIVE INDEX (HRI)

HRI is a special metalization technique that leaves the optical image completely transparent and very brilliant. It is used notably in identity document protection systems since it enables both authentication of the document and protection of the variable data covered by the image - but without degrading their legibility. HRI requires special equipment and know-how.

PRINTING

Microscopic letters or lines can be printed on holograms. Depending on the special inks or vanishes employed the printing may be visible or invisible (in the latter case a special reader is needed, such as a UV lamp or a luminescence reader).

ID CARDS

Blank ID cards are available with stock and custom hologram images already imprinted on the card. Adding a holographic logo to your identification card combats counterfeiting.

These blank cards are ready for printing using any standard ID card printer. Since the hologram imprint is integral to the ID card, they are convenient and easy to use. There is no additional labor or equipment needed to affix a hologram label or holographic overlay after the card is printed.

Typical applications include employee badges, membership badges, ski resort season pass, backstage credential, etc, or any other high-value identification or credential.

Typically, the holographic imprint is created using stock holographic foil in a custom size and shape to create your logo. Holographic foil imprints are available in stock patterns including silver metallic, colored metallic or transparent foil. For very high security applications, we can produce blank ID cards using custom holographic foil.

There are two types of holographic ID cards:

SURFACE FOIL IMPRINT - Holographic foil is applied directly to the surface of the card without any top lamination, leaving the foil exposed. To assure consistent printing, the printed information must be a minimum of 1/8 inch away from the foil area. Also, the exposed foil may shorten the life of the ID card print head.

EMBEDDED FOIL IMPRINT - After the holographic foil is applied, a clear film is applied on top. This top lamination allows consistent printing anywhere on the ID card without shortening the print head life. Also, printing over the metallic foil imprint can create an attractive and unique effect.

SCRATCH OFF FOILS

Our scratch-off foils serve as a tamper evident layer for personal authorization data on paper and plastic cards (i.e. passwords, PIN numbers, lottery ticket numbers etc.).

Scratch-off foils have two functions: they act as a visual barrier mask and as a validation seal. Only after the hot stamped foil has been scratched off, the secured information becomes visible.

The large variety of foil patterns provides attractive options for the creation of individualized card designs which can be tailored to specific target groups. On request, Hague creates customized designs according to client specifications.

- a wide variety of designs and qualities
- customized specific designs
- opaque
- highly suitable for prepaid cards and raffle tickets
- adheres to all commonly used industry substrates (PVC, PET & Cardboard)

As an option, scratch off holographic labels can be made with custom sizes and custom hologram images. The minimum order quantity is 1 million labels. Please call for more information.



TAGGANTS IN FOIL

Combining security technologies provides maximum protection to combat counterfeiting, diversion, and other supply chain issues.

For higher security applications, we offer an optional taggant technology which can be used in conjunction with custom holograms. The custom hologram provides visible anti-counterfeiting protection; the taggants, which are invisible to the naked eye, are machine-read to quickly and reliably identify and authenticate products.

Taggants are microscopic particles, which are mixed with inks to create a unique formula which is traceable and machine-readable. The unique formula can be printed on demand as clear or colored inks; the flexibility of printing on demand provides versatility and enhanced security for both short and long production runs.

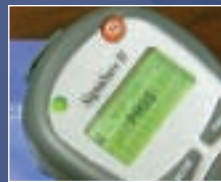
Hague offers custom taggant formulations on our custom holograms. We have one formulation which was custom-made for use by Hague only. We offer this taggant formulation for use on small and medium custom hologram projects, which allows for quick turnaround and affordable security. Taggants are machine-readable using a portable, hand-held verifier, which is simple and easy-to-use.



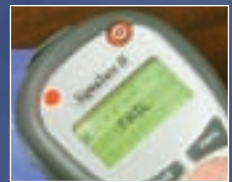
The taggant verifier must be placed directly on top of the hologram area.



Then, press one button - in less than 5 seconds the reader will authenticate the hologram label.



If both the taggant and hologram are authentic, the reader will illuminate a green light and the word "PASS" will show in the display.



If the taggant formula or hologram is different from the programmed limits (or if either is missing), a red light will illuminate and the word "FAIL" appears in the display.

For large projects where higher security is needed, we also offer custom taggant formulations for use with one specific customer. Customer-specific formulations can be used on any type of label - holographic or non-holographic.

TYPICAL APPLICATIONS INCLUDE:

- Brand Protection • High Value Collectibles • High Security ID Products • Warranty Claims • Security Documents

Holographic Security

The complex production technology and optical variability of the holographic images form a *security feature* which can not be copied, forged or imitated.

Hague Securogram

Produces a *low cost solution* to point of issue security by applying a sophisticated *holographic image* onto your document.

Enhanced Security

Documents can be personalised with variable data, or signed. Securogram *protects against forgery, counterfeiting, duplication and alteration* - providing immediate *document authentication*.

Multiplicity Of Application

For *point of issue documents*, and *documents produced on demand* - such as cheques, insurance certificates, entrance tickets, transport passes, customs forms, travel documents, ID cards, visas, licenses, logbooks, vouchers, diplomas, bonds, savings books, warranty or brand certificates, etc. In fact, any document that is negotiable, *has a face value or contains important information*.

Variety of Materials

Paper from 80gsm up to Plastic Cards can be foiled by the H A G U E SECUROGRAM.

Impression Block

The shape as well as the relief of the block can be *engraved to suit specific needs*, for example to represent a *company logo or complex design*. The block may be easily changed.

Security

The unit has integral security that comprises of *two key control*. This together with a *non-resettable meter and register* ensures total operator and audit control. A third key is used to gain access into the machine.

Options

Registered holographic image. Continuous, Sheet and ID Card Feeders.



Technical Specification

Weight	32 Kilos
Shipping Weight	35 Kilos
Dimensions	34cm x 34cm x 35cm
Shipping Dimensions	44cm x 55cm x 60cm
Impression Area	Maximum area available 37mm x 78mm
Speed	2000 documents p/h
Foil Dimensions	Length 305 metres x width 25mm up to 60mm
Impressions	Dependent on block size between 15,000 and 17,000 per roll of foil

Securogram

DESKTOP HOLOGRAPHIC FOIL APPLICATOR



The Hague Securogram provides sophisticated holographic Point of Issue Security to protect:

Variable Data Protection

Plastic Credit Cards

ID Cards

Cheques

Bank Books

Degree Certificates

Shipping & Customs Documents

Visas

Passports

Vehicle Licences

Parking Permits

Gift Vouchers

Share Certificates

Company Holo-Seals

Transport Passes

Insurance Forms

Receipts



CONTACT

HEAD OFFICE

Thomas House
Normanton Industrial Estate
Normanton, West Yorkshire
United Kingdom WF6 1TD

T: +44 (0) 1924 244555

F: +44 (0) 1924 244567

SIMON HAYWARD

Security Print Manager

E: simon@hagueprint.com

M: +44 (0) 7960 530567

T: +44 (0) 1924 244555

F: +44 (0) 1924 244567

RICHARD MORGAN

Technology Division Manager

E: richard.morgan@hagueprint.com

M: +44 (0) 7973 310066

T: +44 (0) 1924 244555

F: +44 (0) 1924 244567