

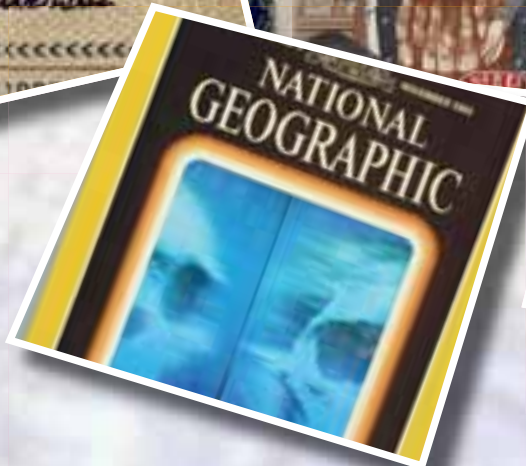
# The Holography Times

An endeavour to protect products and people



## Bank survey reaffirms hologram's role in BANKNOTES

From brand protection, document authentication, pharma, currency to personal ID's, hologram's growing in recognition as most secure overt feature.



# Viewpoint

**A**ttention magnet, impossible to put down, visual magic, these are just some phrases used to describe hologram by a layman.

In the last two months, several occurrences have strengthened the position of hologram in a layperson's life.

First, the Google doodle with hologram on June 5, 2010, that paid tribute to hologram inventor Dr. Dennis Gabor. The whole day, this hologram doodle was displayed on its search engine. This created a lot of buzz all across the world.

Second was the report of a bank survey, which re-affirmed the position of hologram as an effective visual device for banknotes. Although holograms have proved their importance in a bank note, being used by more than 100 issuing authorities and on over 250 banknote denominations worldwide, the findings have once again proved their acceptance.

At a time, when it's a challenge for bank note designers to find anti-counterfeiting features, which can deter counterfeiters as well as assist the visually impaired; the current issues talks on this line as "HOW GLOBAL CURRENCIES CONTINUE TO BANK ON THE BENEFITS OF HOLOGRAPHY".

Besides this, there are regular features like Newsbytes, Patent News, and Industry updates to keep you informed.

As always, we value your comments and suggestions on this issue of Holography Times.

With Best Wishes!

C S Jeena  
Editor



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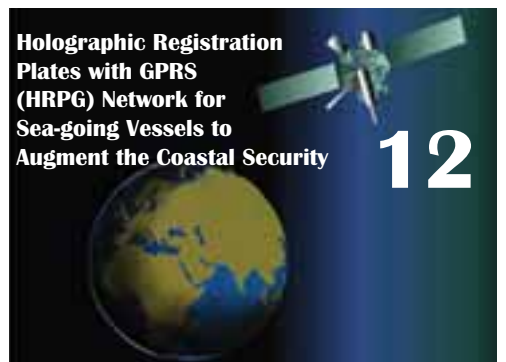
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# Bank survey reaffirms hologram's role in banknotes

The trade body representing the global hologram industry has welcomed a new finding which reaffirms the hologram's position as a pre-eminent security feature for banknotes.

The International Hologram Manufacturers Association (IHMA) says that more than half of the people (55 per cent) surveyed by The Dutch National Bank recognised holograms as an effective visual security device for banknotes, despite the introduction of other anti-counterfeiting technologies.

Holograms scored ahead of features like iridescent strips (2 per cent) and colour changing inks (3 per cent) in the survey, which examined people's recall of banknote security features.

Ian Lancaster, IHMA general secretary, said: "The findings are welcome news as they support the fact that holography continues to be a highly effective, highly flexible weapon in the ongoing battle to thwart banknote counterfeiters and fraudsters.

"People are still reassured by the presence of holograms on banknotes and recognise the benefits they provide. "Clearly, holography continues to hold a vital place in currency security while at the same time we are seeing strong interest from banks and central governments for new ways for this versatile and durable technology to be used."

The annual global volume of banknotes produced is more than 125 billion\*, so the reward for hologram producers capable of providing the technology to overcome the technical challenges is potentially highly lucrative. Projections suggest the market for banknote holograms will be worth \$205 million in 2010, which is 36 per cent increase on the 2007 figure – an average of 7 per cent per annum.

The IHMA believes the future will be largely determined by the ability of new forms of optically variable technologies to displace holograms as an effective yet low cost authentication device but other factors are in play too, including their continuing use on existing notes despite the emergence of competing technologies.

Here, the capacity for holography to hold its own against other technologies will depend on pushing the boundaries of innovation even further. For example, its ability to display effects on either side of the note through windows or threads will be a useful benefit. The biggest opportunity will come through growth in the overall usage of banknotes as larger issuing authorities either adopt holograms for the first time or extend their use to further denominations.

\* *The Holopack-Holoprint®*

*Industry updates*

*Source: www.ihma.org*



# Holograms to ensure safe liquor

The Meghalaya state government in India will ensure that holograms are pasted on liquor and beer bottles sold in the state for quality control. “The introduction of holograms on liquor bottles was aimed at preventing the entry of spurious liquor into the state. The move would help the state revenue department to achieve a target of generating Rs 100 crore revenue by March 2011, Commissioner of Excise Mr J A Lyngdoh said. “The excise revenue in 2009-10 was Rs 89 crore but with the introduction of hologram, the department may even cross Rs 110 crore”.

The step was come after Meghalaya Deputy Chief Minister, incharge of Finance, Dr Mukul Sangma, had recently proposed to introduce holograms in the state, to

check leakage of revenue during his presentation of Budget for 2010-11.

Holograms are used globally, as they are highly versatile and essentially overt features that can be recognised and verified by the common man (public). As of 2007, more than 27 countries (46 per cent of total using tax stamp) are using hologram on their liquor stamps.

In India, Meghalaya is the only state in the North-East to introduce hologram on IMFL products after some other states like Uttar Pradesh, Orissa, Madhya Pradesh, Tamilnadu, Chhatisgarh and Rajasthan are already availing benefit of this technology.

Source: [www.telegraphindia.com](http://www.telegraphindia.com)



## Centre asks states to form panels to curb illegal mining

The Centre has asked all state governments to constitute high-level committees to crack down on illegal mining and intensify the drive against the menace. “In the wake of a large number of illegal mining cases coming to the fore, we have asked all states to immediately constitute coordination-cum-empowered committees,” Mines Secretary Santha Sheela Nair said. She said that these committees, in line with a similar panel at the Centre, would prepare action plans to prevent illegal mining.

So far, only nine states Andhra Pradesh, Chhattisgarh, Gujarat, Goa, Karnataka, Maharashtra, Orissa, Rajasthan and West Bengal have constituted committees to address issues such as illegal mining and faster processing of mineral concessions.

The states were told that the committees should be headed by either chief secretaries or additional chief secretaries. At present, there are not enough legal provisions for Central intervention in illegal mining

across the states, while the magnitude of the problem is so great that as many as 42,000 cases were detected in 11-mineral bearing states last year.

The states have also been asked to track the movement of vehicles carrying minerals, and use bar codes and holograms on transport permits.

The Centre has asked the states to report all instances of illegal mining and use satellite imagery to detect such activities. It had also asked for cells to be set up to monitor price trends, as a spurt in prices is usually linked to increased illegal mining activities. “We have directed states to set up cells to monitor iron and manganese ore prices, as a spurt in prices often indicates an increase in mining activities. We have found that a lot of mining takes place using legal licenses for mining in areas other than specified,” Ms. Nair said.

The states have also been asked to track the movement of vehicles carrying minerals, and use bar codes and holograms on transport permits. Other directions, she said, include the collection of information from ports, customs authorities and the Ministry of Commerce on export of ores and compulsory registration of all end-users to check payment of royalty before purchase of ores. The state governments have also been asked to finalize mineral concessions faster.

Ms. Nair said that though the move to curb illegal mining may result in a slight dip in iron ore production, it would increase in time due to the opening of new mines. The country produced 226 million tonnes of iron ore in the last fiscal. Meanwhile, a provision that has been added to the new mining legislation states that anyone found guilty of illegal mining will be debarred from doing it anywhere in the country.

Source: *Business Line, Delhi*

## NASA's anti-counterfeiting measures fall short



Portland, Ore., — While battling counterfeiters is nothing new for famous jewelry makers and popular video game companies, fake components have become a significant challenge for high-end electronic manufacturers, directly impacting NASA and the U.S. Department of Defense. At this year's NASA Project Management Challenge, presenters documented how counterfeit parts have impacted NASA's and the U.S. military's products and programs to the tune of higher project costs, reduced performance, product failure and extensive delays.

In 2009, a NASA probe project was delayed nine months and exceeded its budget by more than 20 percent, partly because of a counterfeit part. According to BrandWatch Technologies, a global leader in brand security and product authentication solutions, the problem extends beyond NASA's dollars and timelines — risking personal safety, diminishing confidence in U.S. aerospace programs,

and impacting the businesses of legitimate component manufacturers.

“The effort it takes to get astronauts one step further into space is immense, so the fact that counterfeiters have penetrated our space exploration and defense programs is a shock and certainly raises concerns,” said Phil Huff, chief executive officer of BrandWatch Technologies. “Unfortunately, globalization has made it more difficult than ever to control the millions of parts and sources within supply chains, including those that support NASA. The only way to truly protect legitimate companies and the integrity of their parts, and enforce NASA's compliance and safety standards, is through proactive product authentication.”

In response to its counterfeit problems, NASA adopted SAE AS5553, an aerospace parts standard issued in 2009. The standard intends to mitigate NASA's and the military's risk of “receiving and installing counterfeit electronic parts.” SAE AS5553 recommends that parts be subject to eight individual tests, including x-rays, thermal cycling and electrical testing, all designed to ensure the compliance of the products that the U.S. aerospace programs and military purchase. These tests, as well as the additional guidelines in SAE AS5553, are good first steps in the war against counterfeiters, but additional efforts are required to address a product's authenticity.

“Regardless of the industry, counterfeiters are in business to mimic the appearance and performance of original products,” added Huff. “Their fake products undermine the global economy, ruin businesses and put people at risk, so the question shouldn't be whether a product will work; rather, is it truly authentic?”

Source: [www.brandwatchtech.com](http://www.brandwatchtech.com)

## Google Celebrated 110 years of holography inventor

Internet Giant Google had celebrated the 110th birthday of Hungarian Engineer and inventor of holography Dennis Gabor. To mark his birthday on June 5, 2010 Google had put a special holography based Doodle on its logo. The Doodle is green in color owing to the Holography effect and sports “Google” inscribed against a black background.

Born on June 5, 1900 in Budapest (Hungary), a genius from childhood he received his first patent at the age of 11, and studied electrical engineering in his university life. He was the first one to have come up with the concept of holographic in 1947 while working to improve the resolution of an electronic microscope. He also received the 1971 Nobel Prize for his contribution to the field of physics.

Source: [www.google.com](http://www.google.com)



**Dr. Dennis Gabor**  
*The Father of Holography*



# Global currencies continue to bank on the benefits of holography

*The annual global volume of banknotes produced is more than 125 billion\*, so the reward for hologram producers capable of providing the technology to overcome the technical challenges is potentially highly lucrative. Here, Ian Lancaster of the International Hologram Manufacturers Association traces the growth of holograms for banknotes and looks at the future for this highly versatile technology.*



**Ian Lancaster**  
General Secretary, IHMA

The history of holograms on banknotes can be traced to the 1980s when the Australian commemorative \$100 and the Austrian 500 Schilling were issued in 1988. The latter – a paper note on which a hologram was applied as a hot-stamped foil patch - is credited with paving the way for the subsequent development of the market.

These early successes were followed by Kuwait and Poland adopting holograms for their paper currencies before Bulgaria introduced the first holographic stripe on a banknote – on its the 2000 leva note. Over the last 15 years growth has been steady with patches initially the preferred method of applying holograms to notes before being overtaken by stripes. Holograms can also be incorporated into the windowed security threads that are

increasingly making an appearance in banknotes. (See Fig.1 and Fig. 2)

By the end of 2007, holographic patches and stripes accounted for more than 80percent of all holographic features on banknotes with more than 90 currencies featuring them on one or more circulating denominations. It is estimated that of the 125 billion notes produced in 2007, 42 billion featured a hologram as either a foil or a thread while the banknote market for hologram producers in the same year was worth \$136 million.

The success of holograms for banknotes has been primarily due to their role as a Level 1 security feature for recognition by the public, who are increasingly viewed by central banks as key participants in the fight against counterfeiting .

“The success of holograms for banknotes has been primarily due to their role as a Level 1 security feature for recognition by the public, who are increasingly viewed by central banks as key participants in the fight against counterfeiting.”



Fig.1: The new Bangladesh 1,000 Taka with 4mm wide holographic windowed thread. Bangladesh was one of the first countries to put holographic thread into its banknotes



Fig.2: This banknote produced for Bank of Guatemala shows two versions. The first with holographic stripe. The second, which replaced it just a couple of months ago, minus the holographic stripe but with a holographic thread instead.

Today the technology remains very much to the fore as part of an array of overt features which make it quick and easy for people, not only the general public and but also cashiers and those operating cash tills in stores, to recognise whether or not a banknote is bonafide.

The banknote market is something of a 'holy grail' for hologram producers due not only to the very large volume of notes produced but also the technical challenge it presents, requiring new techniques, many of which have been successfully adapted and reinforced holography's capacity for innovation and ability to find new commercial applications.

### Early challenges

The history of holograms for banknotes is one of quiet evolution. Once the early technical complexities of producing high volumes of foil with the necessary properties of adhesion and durability to bond the substrate and withstand the rigours of application and wear and tear in circulation were solved, it became easier for holograms to be integrated

into the overall banknote design. This required complex and sophisticated demetallisation to register along with overprinting and the development of ever wider threads and stripes for better visibility but nevertheless laid a platform for success. Nowadays, the shift is towards the development of optically variable features which not only change according to the viewing angle but can also be viewed from the front or the reverse of the note, or in reflected versus transmitted light. This development is being driven by the papermakers seeking to emulate the transparent window in polymer substrates - the patent on windows in banknotes has expired and a number of suppliers are now taking advantage by developing their own versions.

These involve an aperture on the banknote either formed during the papermaking process or cut afterwards, with an overlaid film to cover the aperture and create the window. If this film is holographic then demetallisation to register is vital to providing the required combination of diffractive effects together with their viewing access from either side of the banknote.

Louisenthal is a leading manufacturer of banknote and security paper for global markets, supplying over 100 countries worldwide with high-grade products as well as a major supplier of euro banknote paper to many central banks. It pioneered the use of holographic stripes on banknotes, and its range of holographic and related optically variable devices for banknotes now include Varifeye - a feature comprising an aperture which is created during the papermaking process with a film overlay, which can incorporate holographic effects. (See Fig.3a and Fig. 3b)

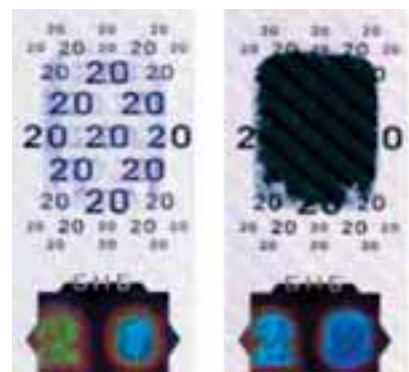


Fig.3a: The heart of varifeye: The design in the foil of the banknote window changes depending on the background.



Fig.3b:

Forgery-proof and high quality: To commemorate the 120th anniversary of the first issuance of lev bank notes, Bulgaria's 20-lev bank note was fitted with the new security feature varifeye® — thus creating a fusion of the historical with the modern.



Another technology is Optiks™ from De la Rue la Rue, the world's largest banknote printer. Optiks™ is a super wide thread (18mm) which contains a transparent area that is viewable from both sides of the note and can, if required, incorporate a hologram, (Fig.4). De La Rue, through its subsidiary De La Rue Holographics, is also a major supplier of 'conventional' holograms (patches, stripes and threads) for banknotes.



Fig.4: An 18 mm wide Optiks™ security thread on the Fiji \$ 100 note

Hot stamping specialist Leonhard Kurz is also an innovator in the field of holograms for banknotes. The company, which pioneered holographic hot stamping foils for currency and still retains the largest market share, has recently launched a number of new features specifically for use in conjunction

with windows or apertures. One example is Kinegram recolor®, which provides a fundamentally different, and unexpected, effect depending on whether the note is viewed from the front or reverse.

Also new is Kinegram voLume®. Images are mass produced by coating a laminating film with photopolymer, passing this through a unit where a laser exposes the image onto the film, UV curing this and then applying adhesive in the same way as conventional foil. This is then combined with surface relief features. The foil for the former is fully or partially demetallised to provide transparency and the voLume layer is applied underneath. The result is a kaleidoscope of images and effects offering dynamic movement, animation, pop-ups, impressive three-dimensionality, single and multiple colours.

These effects can be further enhanced by the combination of the Kinegram voLume with the company's zero. zero® technique, which offers an exceptionally precise level of demetallisation to register. The overall thickness of the film is less than 40 microns. Kurz has worked with Swiss papermaker Landqart on the integration of the Kinegram volume into the latter's new Durasafe paper, using the OptiNota-H from KBA GIORI for application.

Other developments include foils and threads from Louisenthal and Hueck Folien which combine colour shift and holograms and a new security thread

from Russia which is anchored in the paper down its edges rather than by the layer of paper fibres on its reverse. This means that it can be viewed from both sides of the note and, as with the window or aperture, offers the opportunity for different diffractive and other optically variable effects to be created that vary according to whether the note is viewed from the front or reverse.

### Future growth

Projections suggest the market for holograms used on banknotes will be worth \$205 million in 2010, which is 36percent increase on the 2007 figure – an average of 7percent per annum. The future of holograms for banknotes will be, to a large extent, determined by the ability of new forms of optically variable technologies to displace them as a highly effective and low cost authentication device but other factors are in play too, including their continuing use on existing notes despite the emergence of competing technologies. Here, the capacity for holography to hold its own against other technologies will depend on pushing the boundaries of innovation even further. For example, its ability to display effects on either side of the note through windows or threads will be a useful benefit.

The biggest opportunity will come through growth in the overall usage of banknotes as larger issuing authorities either adopt holograms for the first time or extend their use to further denominations. Countries like India, where the focus in recent years has



“ Holography was recognised in a 2007 special report by the US National Research Council as having a definitive role in the fight to combat banknote counterfeiting ”

been meeting the demand for clean banknotes for a rapidly expanding economy, also offers opportunities. Although self-sufficient in banknote printing, it currently imports more than 90percent of its paper requirements but with two new paper mills being built, the country may use the opportunity to install short formers for wide thread integration and/or foil application equipment.

India’s emergence as an Asian powerhouse could prompt the authorities to upgrade the security of the rupee in a bid to thwart criminals who will undoubtedly be tempted to fill the gap in banknote capacity with counterfeit ones. This is true of other fast growing economies as well as places like Russia, Iran, Indonesia and Brazil where the focus could switch from meeting banknote demand to greater security – opening up opportunities for holography.

Predictions that cash would be displaced by alternative transactional devices – mainly card and electronic payments, particularly in the more advanced Western economies, have failed to materialise and banknote volumes have averaged 5-7percent during the period of global economic growth over past 10 years or so. And, even as economies struggle to emerge from recession, there doesn’t appear to be a corresponding decline in banknote demand – indeed, year on year growth of around 3percent is predicted. Although lower than previous volumes, these is clearly good news for banknote hologram suppliers.

### Tackling counterfeiting

However the biggest incentive for keeping holograms on banknotes, and thereby offering reassurance that holography will have a role to play well into the future, remains their use in the on-going battle against counterfeiting. There are no global figures for counterfeit losses but, for example, the losses from counterfeit Euros in 2007 were around \$47 million and for the US \$ approximately \$62 million. So, although counterfeiting of banknotes in itself is not of particular grave concern, the real motivation for governments to keep the issue within sight is to maintain public confidence.

Currencies lubricant the wheels of industry and society and any loss of confidence – even

the slightest – can cause disproportionate amounts of damage which take years to rectify. That’s why banking authorities and governments go to huge lengths to maintain the integrity of their currency; devising sophisticated security and anti-counterfeiting strategies where the hologram has, and will undoubtedly continue to play, a significant role in preventing criminals from reproducing fake banknotes.

And to reinforce its importance, holography was recognised in a 2007 special report by the US National Research Council as having a definitive role in the fight to combat banknote counterfeiting. The report, entitled *A Path to the Next Generation of U.S. Banknotes: Keeping them Real*, ‘identifies’ 21st century materials and technologies to deter 21st century counterfeiting of banknotes. Included in the comments was a recommendation that currency features should be combined in different ways to provide a layered defence against counterfeiters. This included ‘the addition of high technology optical devices that produce dramatic visual effect, such as diffractive optical variable devices’ (the generic term for high security holograms).

The report further cemented the position of holograms and related devices as a fundamental security measure for banknotes and, by extension, other government issued documents that require protection against counterfeiters.

So, with the seemingly remorseless march of technology and the resolve of governments, anti-counterfeiting agencies and companies around the world to remain one step of the counterfeiters, as well as the casual opportunist, there’s no reason why the hologram will not continue to evolve and continue to be an instantly recognisable feature on today’s and future generations of banknotes.

1 *The Holo-pack•Holo-print® Industry Study & Market Report 2007-2012, Reconnaissance International.*

2 “*A Path to the Next Generation of U.S. Banknotes: Keeping them Real*”, *Committee on Technologies to Deter Currency Counterfeiting, US National Research Council.*

The author, Ian Lancaster is General Secretary of International Hologram Manufacturers Association (IHMA). If you would like to respond to the contents of this article, please send an email to [info@homai.org](mailto:info@homai.org)

# Holographic Registration Plates with GPRS (HRPG) Network for Sea-going Vessels to Augment the Coastal Security

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**Abstract**— Unregistered fishing boats and those displaying fake registration numbers is being used for criminal activities in the coastal areas. Recent terrorist attacks in Mumbai and the warnings from the intelligence agencies necessitate tamper-proof Holographic Registration Plates with GPRS (HRPG) networking system on all sea going vessels to augment the coastal security. The (HRPG) networking system which includes several security features is a regular reflective tetrahedron in shape, designed with holographic, laser etched and embossed security features to protect against forgery. The system comprises of a GPRS (General Packet Radio Services) and GPS (Global Positioning System), along with a micro-chip containing the whole information regarding the vessels and sailors/fisherman. The location and identity of the seagoing vessels can be easily traced and tracked out by the enforcement authority. The paper reports in details about the Hologram preparation, related design considerations and its advantages.

**Index Terms**— Chromium holograms, registration system GPRS, GPS, satellite mapping

## Introduction

FISHING boats displaying fake registration numbers often just scrawled in paint on the hull or without any registration numbers as in figure 1, are being used for criminal activities in the coastal areas. The recent attacks in Mumbai, India reveal that “foreign” terrorists had used a fishing boat without any identity to arrive at their destination. Intelligence agencies also warned that many militant groups are using small sea-going vessels to use as light gunboats. In the light of the above, as requested by the Government, a tamper-proof Holographic Registration Plates with GPRS (HRPG) networking system for Sea-going vessels was proposed and demonstrated to augment the coastal security on all sea-going vessels.

There are several methods for the recording of security hologram. Nobukazu et al. developed a new multiplexing method for producing binary computergenerated holograms (CGH's) for security applications [1]. This method is based on double recording of two types of coding method upon binary CGH's. The CGH synthesized by the proposed method can have multiple image planes from the region close to the hologram (image region) to infinity (Fraunhofer region) without severe degradation of reconstructed images in the image region. Amit et al. reported a simple method for making dual beam encoded extended fractional Fourier transform (EFRT) security holograms<sup>2</sup>. The hologram possesses different stages of encoding so that security features are concealed and remain invisible to the counterfeiter. These concealed and encoded anticounterfeit security features in the security hologram can only be read through a key hologram. Raj Kumar et al. reported a new method is described to create secretcodes in the security holograms for enhancing their anticounterfeiting characteristics<sup>3</sup>. In the present investigation, security holograms have been designed and developed particularly for sea going vessels to be used as tamper free registration number plates. Holographic Registration Plates with GPRS (HRPG) networking system on all sea going vessels to augment the coastal security. The (HRPG) networking system which includes several security features is a regular reflective tetrahedron in shape, designed with holographic, laser etched and embossed security features to protect against forgery. The system comprises of a GPRS (General Packet Radio Services) and GPS (Global Positioning System), along with a micro-chip containing the whole information regarding the vessels and sailors/fisherman. The location and identity of the sea-going vessels can be easily traced and tracked out by the enforcement authority. The paper reports in details about the Hologram preparation, related design considerations and its advantages.

**Present registration marking on sea-going Vessels**

The on-going registration marking system of the sea going vessels in Kerala is as shown in the figure 1. Presently the registration mark is made on the hull of the boat or at the beading of the top of the Wheel house. From the figure 1, it is seen that none of the registration mark is conspicuous even at day time. As ordinary paint is used for marking the registration on the hull of the vessel, the wipe out possibility for the registration details are very high. Any counterfeiter can mark the fake registration number quite easily. Displaying fake registration numbers, often just scrawled in paint on the hull, is being used for criminal activities now days in the coastal areas. Recent Mumbai attack remains one of the painful examples for the same. In addition, as the registration mark is not clear even from the nearby point of view, the Law enforcement authorities face great difficulties to trace out the authoritative details of the sea going vessels.



Fig.1. On-going registration marking system

**Holographic registration plates with (HRPG) networking**

The Holographic Registration Plates with GPRS(HRPG) networking system is a regular reflective tetrahedron in shape, designed with holographic, laser etched and embossed security features to protect against forgery. The

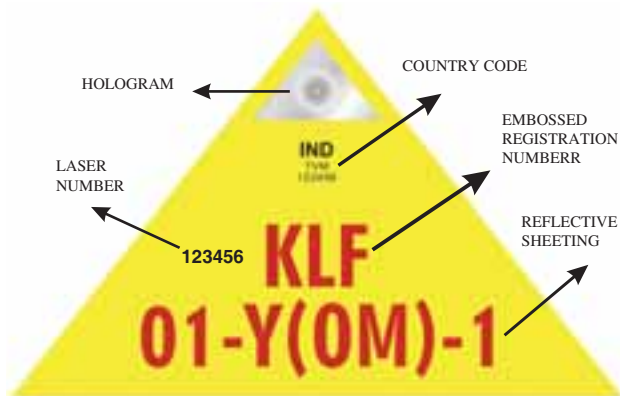


Fig.2. Side view of the proposed registration system

side view of the proposed registration system is shown in the figure 2. As the system comprises of a GPRS (General packet radio services) and GPS (Global positioning system), along with a micro-chip that contain the whole information regarding the vessel and sailors/fisherman, the location and identity of the sea-going vessels can be easily traced and tracked out. The HRPG system will be fixed on the sea going vessel at the top of the wheel house. The system is designed as a regular tetrahedron as in the figure 3, to ensure clear visibility from all sides as well as from the top. In addition this design can also withstand the strong winds and the harsh climate of the turbulent sea.



Fig.3. Reflective regular tetrahedron in shape

From the security angle, it will help rescuers in avoiding delay in operations. The rescue and law enforcement agencies can trace the microchip-implanted (HRPG) vessel, via a satellite at anytime from anywhere. The radio signals automatically activate immediately as the vessel start to sail and the position of the vessels will be regularly updates in the database via satellite. The precompiled database of all the registered boats contains all the identity information including engine and hull numbers, its owner’s name, operating state, details regarding the dimensions, capacities and power along with fishing technique undertaken. The

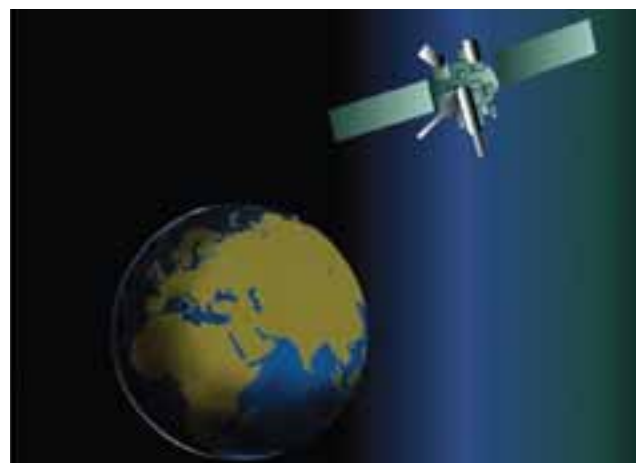


Fig.4. Satellite mapping of the Sea-going vessels

entire registered vessel will have specific area, scope and duration to fish. This will be regularly updated in the database along with current status and condition of the vessel. This information will be easily accessible to the law enforcing authorities either via the satellite phone or through the internet. The Schematic representation of the satellite mapping of the sea-going vessels is as shown in the figure. 4.

## Typical security features of the HRPG Networking system

Various security features of HRPG networking system are given below

### Shape, Size and Color Scheme

Reflective regular tetrahedron in shape with side of length 100 cm for Specimen 1 & 60 cm for specimen 2. The shape of the System is designed in such a way to protect the system from the heavy wind while traveling in sea. The letter and numerals is embossed and hot stamped in red color on Yellow background and white back ground for enforcement authorities' sea going vessel.

### Embossed Registration Numbers

In Holographic Registration Plates with GPRS (HRPG) networking system, the letters and numerals will be embossed on aluminum sheets as in the figure. The use of Aluminum reduces weight and also adds corrosion resistance, thereby increasing the life of the plate.

### Background Retro-reflective Sheeting

This feature is to improve the visibility, particularly during the night as well as in the foggy condition. Further white and yellow back ground is chosen as these colors exhibit maximum reflectance and the red letters on this background present maximum contrast in the long vision.

### Security Hologram

A chromium based hologram is embossed on the number plate by hot stamping process. Chromium based hologram makes it possible for the registration system to withstand the inclemency of the weather for many years. Holograms cannot be duplicated and the same is applied in the system in different pattern as shown in the picture. The hologram will carry the image of national emblem which will increase the national pride. Being hot stamped with high pressure at 220° Celsius, this hologram can not be tampered or removed or replaced. Once the hologram embedded in to the sheeting they become the integral part of the system. Hologram on registration plate is easily visible with naked eye so that they give a direct hit about possible fraud if they are missing or destroyed/tampered with.

### Laser etched Identification Numbers

It is unique number for each plate which makes it possible for personalization of the registration plate. It acts as a



*Experimental setup for the preparation of security holograms used for the proposed holographic Registration Plates with HRPG Networking*

watermark and cannot be erased. Any unauthorized use can be detected easily. The laser branded number enables easy tractability.

### 'STATE NAME' Inscription Foil

The hot stamping film bearing "STATE NAME" will be applied on the embossed letters/numerals on the registration system which is not easy to duplicate.

### Country and State Code

The registration system will carry country and state code providing for the national and state identification.

## Conclusion

The Holographic Registration Plates with GPRS (HRPG) networking system is basically for improving the security and to assist the law enforcing authorities in tracking sea going vessels. The HRPG networking system provides the better visibility and conspicuousness and ensure enhanced night visibility enabling reading the number plate and identifying the vehicles. It also prevent multiple vessel registration on a single number, and can further regulates the transfer of vessel ownership, hitting at the root of the gray market. The proposed system prevents tax evasions and hence an increase in state revenues.

### References

- [1] Nobukazu Yoshikawa, Masahide Itoh, and Toyohiko Yatagai, "Binary computer-generated holograms for security applications from a synthetic double-exposure method by electron-beam lithography", *Optics Letters*, Vol. 23, Issue 18, pp. 1483-1485, doi:10.1364/OL.23.001483.
- [2] Amit K Sharma, D P Chhachhia, C G Mahajan, "Dual beam encoded extended fractional Fourier transform security hologram with in-built repositioning", *Pramana Journal of Physics*, Vol. 70, No. 1, pp131-139, 2008.
- [3] Raj Kumar, D Mohan and A K Aggarwal, "Interferometric key readable security holograms with secreta-codes", *Pramana Journal of Physics*, Vol. 68, No. 3, pp443-450, 2007

## Tender Updates

Organisation	Date	State (Country)	Details
Department of Sports & Youth Welfare	23.06.2010	Madhya Pradesh (India)	Holograms
Istanbul Metropolitan Municipality	21.06.2010	Istanbul (Turkey)	Supply of IBB logo hologram tape of Supply and Property
Directorate General of Supplies and Disposals	02.06.2010	Chandigarh (India)	Supply of hologram/excise adhesive labels (EALs).
Government of Rajasthan, Excise	25.05.2010	Rajasthan (India)	Supply of security hologram stickers
Commonwealth Games 2010, Delhi	24.05.2010	New Delhi (India)	Supply of high security hologram
Indian Oil Corporation Limited	21.05.2010	Maharashtra (India)	Supply of 60mm HDPE screw caps of 12.5 gms each with 3D holographic induction sealing wads
Ministry of Justice, Kuwait	18.05.2010	Kuwait	Supply of the hologram revenue stamps
National Security Guard	14.05.2010	New Delhi (India)	Supply of holographic reflex sight/reflex sight Qty: 2002 Nos
Medicare Relief Society	12.05.2010	Rajasthan (India)	Hologram sticker for stitching on drugs
National Highway Authority of India	07.05.2010	West Bengal (India)	Supply of printed toll ticket with hologram and numbering
Government of Karnataka	01.05.2010	Karnataka (India)	Supply of security holograms for bhoomi (Karnataka land records computerisation)
Asamblea Nacional De Rectores –	26.04.2010	Peru	Acquisition of 200,000 units holographic security label
Government of Uttar Pradesh	20.04.2010	Uttar Pradesh (India)	Supply of holograms of 02 cms diameter circular with nation emblem
ITI Limited	13.04.2010	Kerala (India)	Supply of two numbers of hologram hot stamping machine
Ministerio Da Ciencia E Tecnologia	10.04.2010	Brazil	Supply of holographic reader
Choudhury Charan Singh University	07.04.2010	Uttar Pradesh (India)	Mark sheets consisting holographic 4 color security feature
Prohibition Excise and Taxation Department	06.04.2010	Andhra Pradesh (India)	Supply of hologram / excise adhesive labels

For latest tender updates e-mail at [info@homai.org](mailto:info@homai.org)

\*International Patent Applications filed in 2009  
**155900**

## Intenational Patent Applications filed by India in 2009

**761**

Panasonic Corporation of Japan top the list of PCT applications, as it had 1,891 PCT applications published in 2009.

### Recent Patents in India

#### Granted

Patent No / Title of the Invention	Publication Date	Journal No	Patent Application Number	Applicant (s)
239607) Method of manufacturing solvent destructible, heat destructible, tamper evident duplex laminate for meter security seal and the product manufactured thereof	02.04.2010	14/2010	1898/MUM/2006	PRS Soultions Pvt Ltd

#### Abstract:

A method of manufacturing “solvent destructible, heat destructible, tamper evident duplex laminate meter security label” comprising coating the formulated compound to constitute a film on a double sided silicone resin coated substrate, thereafter coated with high tack adhesive on double side silicone resin coated substrate followed by lamination of adhesive coated holographic metallised film and/or a tamper evident semigloss, white co-extuded film made of vinylic polymer and printed with conventional flexographic and other inks, UV and/or IR readable inks, barcodes, serial numbers etc. followed by punching to desired shape and size.

#### Published

Title of the Invention	Publication Date	Journal No	Application Number	Applicant (s)
A process for preparing a combination holographic transparent and aluminium demetallized film for packaging and the product thereof	05.06.2009	23/2009	806/DEL/2009	Ajay Kapoor

#### Abstract:

A process for preparing a combination of holographic transparent and aluminium demetallized film for packaging is disclosed wherein the process comprises selecting an biaxially oriented substrate film and coating it's surface with a lacquer coat to produce a layer with embossable / hologram receiving properties on the surface of the substrate film, embossing the said layer on the surface of the substrate film with a single or multiple of holographic images of desired fashion, text or design, metalizing the said surface of substrate film having said layer embossed with single or multiple holographic images with zinc sulphide to produce a high refractive index (HRI) holographic film, selecting a biaxially oriented base film and coating it with a release coat to produce a layer of anti-scratch, non-adhesive and embossable / hologram receiving properties on the surface of the base images of desired fashion, text or design, metalizing the said surface of base film with aluminium metal to obtain a aluminium metallized holographic base-film, coating the said high refractive index (HRI) holographic film with a solvent adhesive on the said aluminium metallized holographic base film, allowing the laminate to be dried / cured for 24 hours, delaminating the laminate to produce the combination holographic transparent and aluminium demetallized film, slitting and cutting the film in required shapes and sizes for packaging.

#### Some other facts

- The United States of America top the ranking, filing 45,790 patent, followed by Japan (29,827 applications), Germany (16,736 applications), Republic of Korea (8,066 applications) and China (7,946 applications)
- Developing Countries
- Developing countries make up over 78 percent of the membership of PCT, representing 112 of the 142 countries that have signed up to the treaty and accounted for 14 per cent of the total number of filings.

#### Fields of Technology

- Micro-Structural and nano-technology (+10.2 per cent), semi-conductors (+10 per cent) and thermal prcesses and appratus (+7.2 percent) are the fields which experienced the largest growth.

For more information, visit <http://www.wipo.int/pressroom/en/>

## Global Patents

Publication Date	Title	Int. Class	Application Number	Applicant
17.06.2010	(WO 2010/068820) System and method for color motion holography	G03H 1/10	PCT/US2009/067588	Holorad, LLC
17.06.2010	(WO 2010/067100) Hologram reproducing method and hologram devices	G11B7/004	PCT/JP2008/072428	Pioneer Corporation
17.06.2010	(WO 2010/067100) Holographic image projection systems	G03H1/22	PCT/GB2009/051647	Light Blue Optics Ltd
03.06.2010	(WO 2010/061835) Image display device and head-mounted display	G02B27/02	PCT/JP2009/069831	Konica Minolta Opto Inc
27.05.2010	(WO 2010/058809) Embossed hologram chip and manufacturing method therefore	G03H1/18	PCT/JP2009/069603	International Frontier Technology Laboratory Inc.
20.05.2010	(WO 2010/054636) Method and apparatus for the production of volume transmission and / or reflection holograms	G03H1/20	PCT/DE2009/001589	Hologram Industries Research GMBH
20.05.2010	(WO 2010/054611) Method for producing a multi-colour volume hologram, and holographic photopolymer film with cross diffusion barrier	G03H1/02	PCT/DE2009/001288	Hologram Industries Research GMBH
14.05.2010	(WO 2010/052851) Photosensitive composition for volume hologram recording and method for producing same	G03H1/02	PCT/JP2009/005688	Daicel Chemical Industries Ltd
14.05.2010	(WO 2010/052331) Holographic color display	G02B27/22	PCT/EP2009/064896	Seereal Technologies S.A.
29.04.2010	(WO 2010/046687) Hologram including a covert image	G03H1/00	PCT/GB2009/051387	TSSI
22.04.2010	(WO 2010/043403) Volume hologram comprising expansion agent layer or contraction agent layer for creating color patents	G03H1/00	PCT/EP2009/007429	OVD Kinegram AG
15.04.2010	(WO 2010/041762) Film for gap layer of hologram recording medium and hologram recording medium	G03H1/02	PCT/JP2009/067818	Teijin Chemicals Ltd

For more information, visit [www.wipo.int](http://www.wipo.int) - Gateway to Patent Scope – Database Search – PCT Applications



### International Applications (PCT)

This search tool allows you to search around published International Patent Applications and to view the latest information and documents available to the International Bureau. This facility features: full-text search in Descriptions and Claims; search using unlimited keywords; bibliographic search; Boolean operators; and graphical results

## Upcoming Events

### Product Authentication and Security Summit (PASS)

September 14-15, 2010, New Brunswick, NJ, USA

Learn about strategies and solutions for illicit diversion, warranty fraud, cargo theft, and counterfeiting. The knowledge and contacts you gain will give you tools to create strategies and programs to authenticate products and secure your supply chain

For more information contact: Tel: +44 (0)1932 785 680,

Fax: +44 (0)1932 780 790, Email: [info@reconnaissance-intl.com](mailto:info@reconnaissance-intl.com)

Web: [www.product-authentication.com](http://www.product-authentication.com)

### IndiaPack 2010

September 30-October 3, 2010, India

An event on International packaging exhibition and conference, organized by Indian Institute of Packaging

For more details contact: Tel: +91 (22) 2821 9803,

Fax: +91 (22) 2837 5302, Email: [iipend@iip-in.com](mailto:iipend@iip-in.com)

### Abu Dhabi International Anti-Counterfeiting Conference & Exhibition 2010

October 10 - 12, 2010, Abu Dhabi

Focuses on the displaying of counterfeit goods and identifying to the general public, trading companies and brand companies the difference between genuine goods and counterfeit goods.

For more information visit: Web: [www.zonegroupuae.ae](http://www.zonegroupuae.ae)

### Holopack-Holoprint 2010

November 14-16, 2010, Le Meridien Hotel, Kuala Lumpur, Malaysia

A must attend event for all holography community, the venue for the Annual General Meeting of International Hologram Manufacturers Association and a place where the best industry work was awarded with Annual Excellence Holography Awards.

For more details contact: Tel: +44 (0) 1932 785680,

Fax: +44 (0) 1932 780790, Email: [info@reconnaissance-intl.com](mailto:info@reconnaissance-intl.com)

Web: [www.holopackholoprint](http://www.holopackholoprint)

### 9th Asian High Security Printer Conference

17-19 November 2010, Kuala Lumpur, Malaysia

For more details contact: Tel: +44 (0) 1932 785 680,

Fax: +44 (0) 1932 780 790, Email: [info@cross-conferences.com](mailto:info@cross-conferences.com)

Web: [www.cross-conferences.com](http://www.cross-conferences.com)

### Pack Plus 2010

3-6 December 2010, Pragati Maidan, New Delhi, India

A mega event that encompasses all the segments related to packaging, processing and supply chain.

For more details contact Tel: +91 (11) 29812833,

Fax: +91 (11) 41722130,

Email: [info@packplus.in](mailto:info@packplus.in); Web: [www.packplus.in](http://www.packplus.in)



The Hologram Manufacturers Association of India (HOMAI) is a non-profit organization established in 1998 to represent and promote the interest of the hologram industry in India as well as to fight against counterfeiting. Affiliated with the International Hologram Manufacturers Association (IHMA), UK it is the only second body of its type in the world. It encourages adoption of current technologies and standards for high security so as to stay ahead of the counterfeiters.

For more details please visit us at [www.homai.org](http://www.homai.org)

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