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The Holography Times

An endeavour to protect products and people

When AUTO PIRACY is on rise,
be ahead against counterfeiters by using hi-tech

HOLOGRAM

Can you recognise, which is genuine?

The Holography Times is a quarterly newsletter published by Hologram Manufacturers Association of India (HoMAI)

COMPLETE SLITTING HOLOGRAPHY SOLUTIONS

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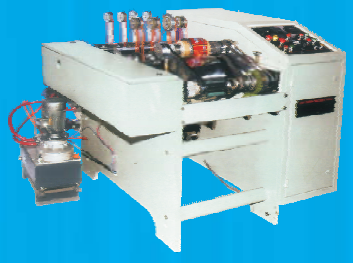
HoMAI
HOLOGRAM MANUFACTURERS ASSOCIATION OF INDIA

Slitting Machine


Slitting Machine


Narrow web Hologram
Embossing Machine NWH-30

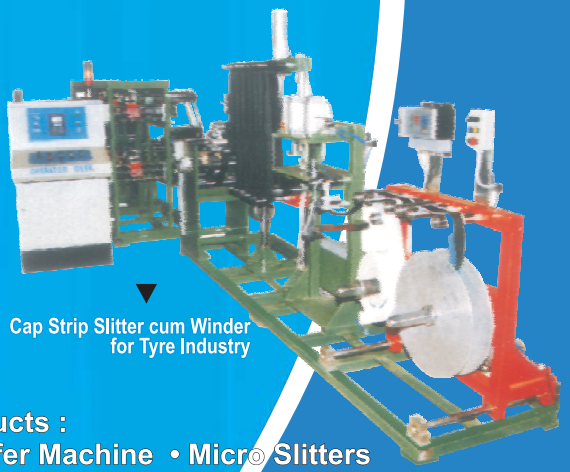

Hot Lamination Hologram
Transfer Machine


Coating & Lamination Machine


Slitting Machine
MMT-SM 30 Micro Slitter


Wide Web Soft Hologram
Embossing Machine
Model -60


Core Cutting
Machine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Viewpoint

Counterfeiting of auto parts are a big business in India. According to Automotive Component Manufacturers Association (ACMA) it account for close to 35 per cent with a market size of Rs 5300 crore (US $* 1.17 billion) in the Rs 16,500 crore (US $* 3.6 billion) replacement parts market.

Now, imagine servicing a vehicle with what you think are high-quality brake pads. But instead of friction material, the pads are made from compressed grass or sawdust. Or imagine installing an oil filter that contains crunched up newspapers or rags and no filter element.

The problem is how you will distinguish between genuine and counterfeit parts?

The current issues talks on this line as “AUTO PIRACY: A RISING BUSINESS”.

Besides this, there are regular features like News Bytes, 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

** 1 US $ = Rs. 45.00 (Average of last 3 month)*

In this issue

UK new holographic passport

The passport have been redesigned to help fight identity theft and fraud

The United Kingdom (UK) Government have unveiled a new design passport with enhanced security features to fight against identity theft and fraud. This new design passport is a combination of physical and electronic security features which will make it one of the most secure and trusted documents in the world, meeting rigorous international standards, said "Sarah Rapson, chief executive of the identity and passport service".

The enhanced security features include invisible security chip inside cover view and a person details section which is covered with a transparent film containing several holograms to protect the holder's personal details. The new 10 year passport will replace the version upgraded in 2006 and was to be issued from October 2010, with pages of the passport containing well-known UK scenes, including the White Cliffs of Dover, the Gower Peninsula, Ben Nevis and the Giant's Causeway. De La Rue takes over the contract for passport production in October 2010 when the current contract expires. The value of the 10-year contract is £400 million, representing value for money for the taxpayer by providing an upgraded product for less than the previous contract. ■

Source: www.bbc.co.uk

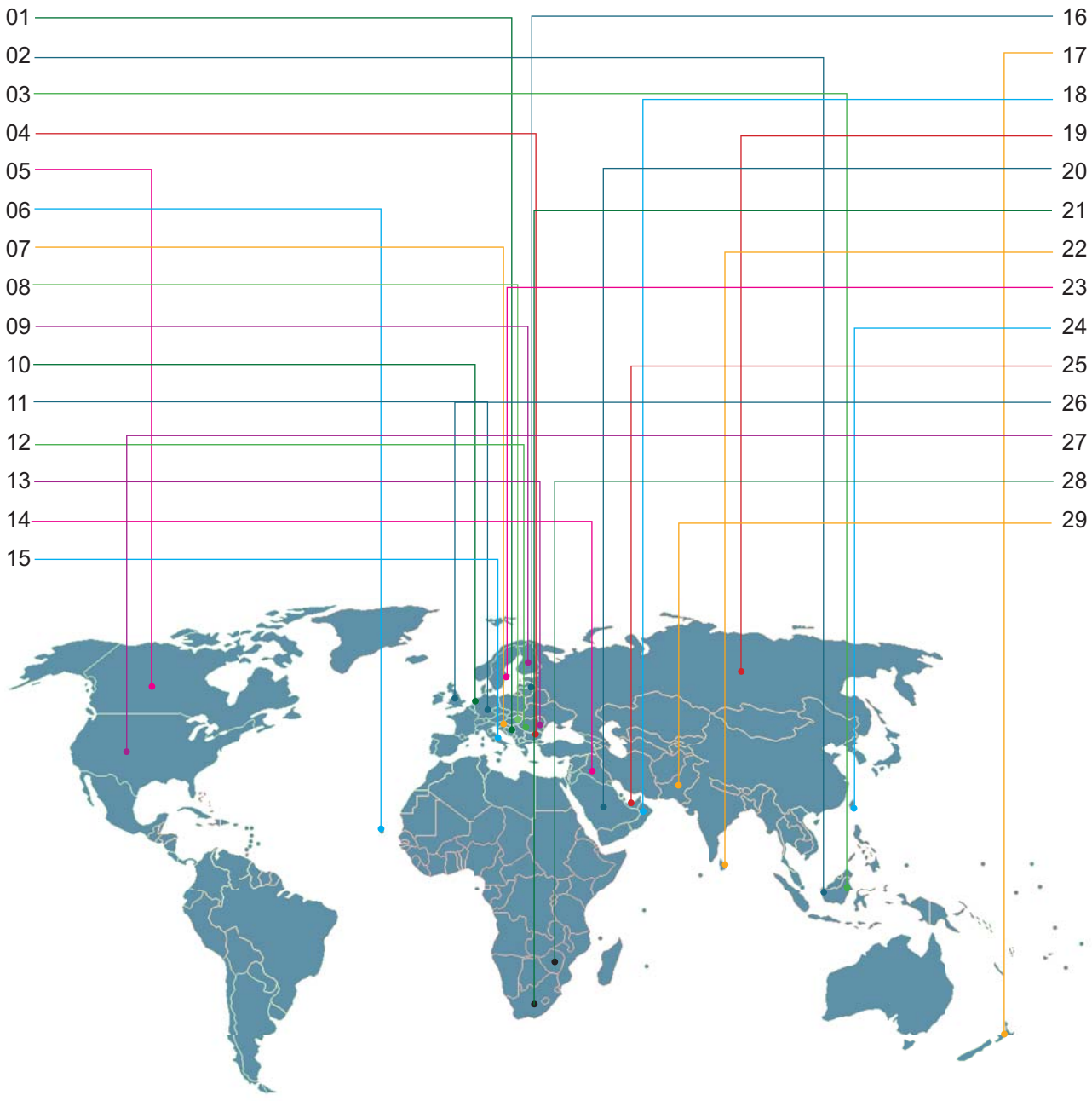
The anatomy: How the new passport will change?

UK passports have contained an electronic chip with the owner's details since 2006. This will now be invisibly embedded in a thicker front cover, rather than in a separate page as pictured. It means the chip will be harder to replace without damaging the cover.

The passport holder's details are now spread over two pages with two images, one of which is covered with a transparent film containing holograms. It also now appears at the front of the passport, in common with other countries in Europe to help speed up passage through border controls.

The inside pages now have a variety of 10 designs showing well-known UK landmarks including the Giant's Causeway (pictured right) which stretch across both pages. The paper used contains multi-coloured fibres which make it more difficult for anyone to copy.

The inside front cover also has a new design - regularly changing the images and making them more detailed makes it harder for forgers to copy, although there's been no change in the wording, which still requests permission for the bearer "to pass freely without let or hindrance".



Countries using hologram/OVD technology to protect their passport & Identity Document's

S.N.	COUNTRY	S.N.	COUNTRY	S.N.	COUNTRY	S.N.	COUNTRY
01.	Austria	09.	Finland	17.	New Zealand	25.	UAE
02.	Bosnia	10.	Holland	18.	Oman	26.	UK
03.	Brunei	11.	Germany	19.	Russian Federation	27.	USA
04.	Bulgaria	12.	Hungary	20.	Saudi Arabia	28.	Zimbabwe
05.	Canada	13.	Greek	21.	South Africa	29.	Pakistan
06.	Cape Verde	14.	Iraq	22.	Sri Lanka		
07.	Croatia	15.	Italy	23.	Sweden		
08.	Czech Republic	16.	Latvia	24.	Taiwan		

Hologram Industries receives the AGEFI prize "Corporate Governance" for mid caps

HOLOGRAM INDUSTRIES

Hologram. Industries has been awarded the "Corporate Governance" Grand Prize for the Mid Cap category organized by AGEFI, the French trade information and services group for the financial community.

This distinction recognizes the long-term commitment of Hologram's management and shareholders to implementing a balanced and effective system of corporate governance.

The Company applies the best practices for corporate governance of listed companies, adhering to, with respect to its size and organizational structure, the recommendations of the joint report of the French Private Companies Association (AFEP) and French Business Confederation (MEDEF) concerning notably:

- The accountability and integrity of directors and officers;
- Transparency and disclosure of information;
- Respecting the rights of shareholders.

Illustrating this commitment, the Group has a Board of Directors with four independent directors out of a total of six members. The Board of Directors is furthermore assisted by three special committees and namely the Audit, Nominating and Compensation, and Strategy & Development committees comprised of independent directors.

Hologram. Industries attaches considerable importance to the quality of information provided to shareholders and notably financial information. Hugues Souparis, Hologram. Industries Chairman and Chief Executive Officer, commented with satisfaction: *"We are particularly honoured to receive this Prize that recognizes our commitment to developing lasting relations between the Group and its stakeholders and provides further encouragement to continue our efforts in this area"*.

The **AGEFI Corporate Governance Grand Prize** is destined to recognize issuers, boards of directors and supervisory boards that effectively meet the expectations of investors (principals and agents) in this area, highlighting noteworthy initiatives in the field of corporate governance to strengthen confidence and promote the implementation of corporate governance rules and practices. ■

Source: www.hologram-industries.com

Holostik rank in top 500 best performing mid size firms in India

HOLOSTIK™ INDIA LTD
"YOUR PARTNER IN PRODUCT PROTECTION"
Holographers To The Globe

Holostik India, one of the leading hologram producer in India has been ranked as top 500 best performing mid size firms in a recent survey conducted by "Inc:, magazine.

Holostik which was founded in 1991 by Mr. U K Gupta have always being a progressive initiatives for the introduction and promotion of high security holograms across the globe.

Inc magazine has ranked Holostik India at 316. When 'Inc.' decided to wade into the unchartered waters of midsize enterprises in India, it had a choice to make between looking at sales growth over a period of time and studying the overall performance of a company. Sales, after all, isn't the only indicator of how well a company is doing. Eventually, to assess high growth, it chose companies with net sales between Rs. 50 crore (US $* 1.1 million) and Rs.1,500 (US $* 33.3 million) crore in the most recent year. To begin with, it created a master list of more than 3,000 companies across 35 sectors.

The set of companies went through a weighted analysis of the following financial parameters, annualized for comparison:

1. **Revenue growth**
2. **Net income growth**
3. **Profitability, and**
4. **Returns**

Inc. is a monthly magazine based in New York City written for the people who run growing companies. The magazine publishes an annual list of the 500 fastest-growing private companies. ■

Source: www.holostik.com

** 1US $ = Rs. 45.00*

OKI traceability system against counterfeiting of printer consumables

World's First System Combining a PCAS[1] Code and Lippmann Hologram[2]

OKI Data Corporation, an OKI Group company specializing in the printer business, had introduced a "brand protection system," realizing high-precision assessment of authenticity via cutting-edge technology, as a measure against counterfeit ink ribbons and toner cartridges. The system will first be introduced in Asia starting in November 2010, and will be subsequently introduced in other regions.

The system is the world's first to incorporate both assessment of authenticity as well as traceability. It uses a Product Control Authentication System (PCAS) from TÜV Rheinland Japan Ltd. and Lippmann hologram transfer printing technology from Dai Nippon Printing Co., Ltd.

The consumable packaging is sealed with a label on which a PCAS number—an encrypted 13-digit ID code intended to prevent counterfeiting—and a Lippmann hologram are printed. The Lippmann hologram, which is difficult to counterfeit, allows for simple assessment of authenticity with a single glance. Moreover, users can see instantly whether the PCAS number is a copy/forgery, or an official number unique to the product, simply by entering it on OKI Data's authenticity assessment service web page.

"OKI will be providing a simple authentication system to all end users where the label itself serves as both the seal and the counterfeit prevention measure," says Harushige Sugimoto, President of OKI Data. "In addition, the code and location entered into the authenticity assessment service enables traceability, not only for counterfeit goods but also for authentic items, allowing users to gain a better understanding of their consumables usage. OKI expects to see higher rates of recycling for used cartridges due to the introduction of this system."

[Glossary]

1. ***Product Control Authentication System (PCAS) :***
   An online system offering a variety of functions including product validation and traceability throughout the supply chain, with a randomly generated 13-digit alphanumeric code at its core. This system enforces secure control of products by issuing reports.

2. ***Lippmann hologram:***
   The surface of a film is coated with a special polymer layer, in which changes in the refractive index produce interference patterns. When light is projected onto these interference patterns, holographic images are reproduced via the diffraction phenomenon. ■

Source: www.oki.com

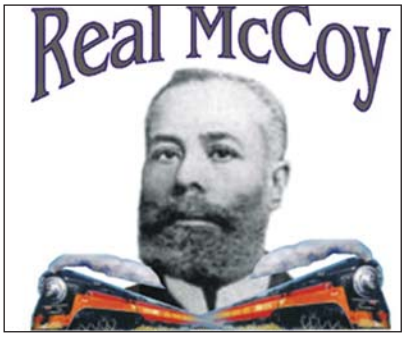
HOMAI welcome new member– Ester Industries Limited

The Hologram Manufacturers Association of India is pleased to welcome associate member Ester industries Limited to the association. Ester Industries Limited was incorporated in India in 1985. It is a widely held limited liability company. The main business activities are production and marketing of versatile ranges of polyester films and engineering plastics. Presently the companies have developed some new products like; a) Deformable Polyester Film for Toffee wrap application b) Antistatic Coated Film for Packaging, Electronic, Photographic and Radiographic high end application c) UV coating Film for Embossing Application. ■

For more information visit: www.esterindustries.com

Auto Piracy:
A rising business

The automobile sector across the globe is currently under attack from the counterfeit market. According to a survey conducted by the The Motor & Equipment Manufacturers Association (MEMA) the global automotive industry loses US $12 billion to counterfeiting.



Elijah McCoy, (1843-1929) Inventor of the automatic lubrication system used on trains and cars

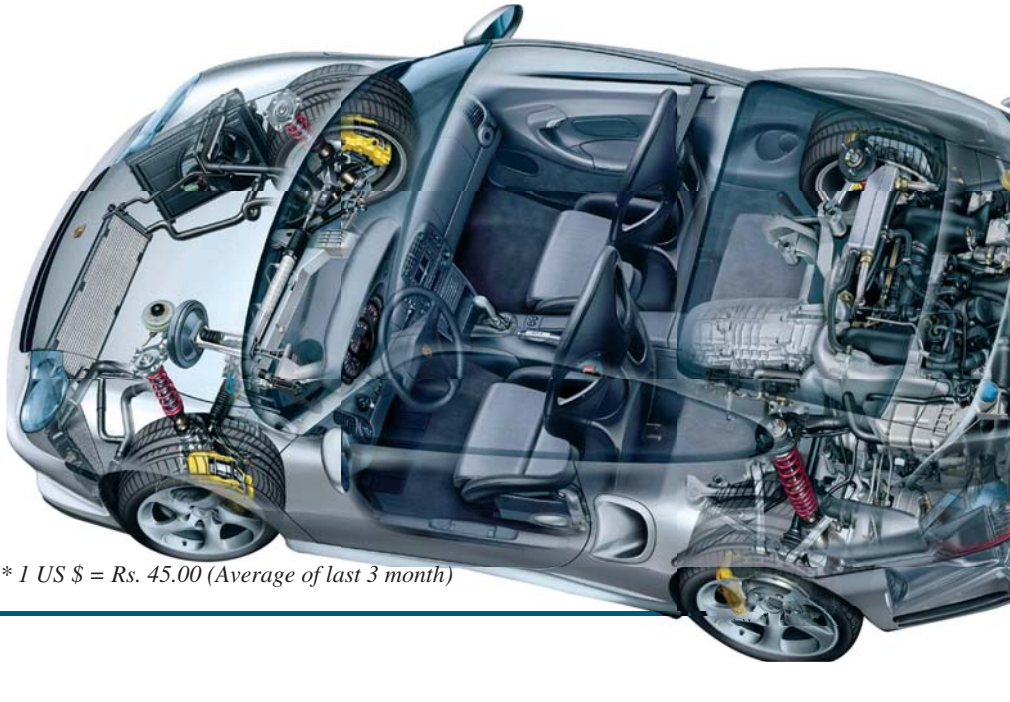
In 1872, inventor Elijah McCoy patented a lubricating system designed to prevent overheating and seizing on steam engines. His lubricants worked extremely well, saving the shipping lines and railroads lots of money. The success and popularity of McCoy's device soon brought many copies, which cost far less but didn't work nearly as well. These fakes created costly problems for purchasers, who believed they were saving the money. Those who wanted to use a genuine product to ensure quality and dependability asked for *McCoy's* product by name. Thus was born the phrase *"the real McCoy."* The story started in 1872, still exists today, in a much-much bigger form of automotive piracy. Today, counterfeiting in the automobile industry have become a real menace and a threat not only to the profits of automobile manufacturers but also to the lives of millions of vehicle users who end up using sub standard safety and performance parts.

Auto Piracy on Rise

The automobile sector across the globe is currently under attack from the counterfeit market. According to a survey conducted by the The Motor & Equipment Manufacturers Association (MEMA) the global automotive industry loses US $12 billion to counterfeiting. More specifically, in India as per Automotive Component Manufacturers Association (ACMA) the counterfeit accounts for close to 35 per cent with a market size of Rs 5,300 crore (US $ 1.17 billion)* in the Rs 16,500 crore (US $ 3.6 billion)* replacement parts market. Most of the manufacturers have experienced large problems with counterfeit brake pads. Given the huge and immediate problems with low-quality brake pads, the brand owner was understandably worried about the deadly consequences.

Impact of Auto Counterfeiting

Unfortunately, the reliability of automotive systems and components is increasingly being jeopardized by spare parts and after-market components produced by product pirates. The quality of pirated products and gray imports ranges from negligent to perfect, and both high- and low-grade counterfeiting presents a problem: While poor-quality fakes damage the image of the original equipment manufacturer and endanger the lives of vehicle occupants, highly accomplished pirated products deprive manufacturers, who invest a lot of money in research and development, of their legitimate earnings. It is also relevant to note that sales of counterfeit parts clinically affect the reputation and goodwill of manufacturers.



** 1 US $ = Rs. 45.00 (Average of last 3 month)*

Table: Most commonly counterfeit parts and accessories

PARTS		
Maintenance	**Collision / Repair**	**Suspension**
Oil filter	Bumpers	Steering Arms
Air Filter	Covers	Tie Rods
Brakes	Head Lamps	
Brake linings	Tail lamps	
Seals	Sheet Metal	
Rotors	Oil Pumps	
Flex Disks	Water Pumps	
	Mercedes Star	
	Windshields	

ACCESSORIES	
Automotive	**Collection / Vintage**
Alloy Wheels	Key Rings
Body striping	Caps
Decals	Lighters
Trim	Toys
Plates	Model Cars
Logos	Clothing

Impact of counterfeited auto parts

- Counterfeit oil filters cause sudden engine failure
- Counterfeit brake pads, made of grass clippings and saw dust, have caused fatal accidents
- Counterfeit windshields without safety shatterproof glass, cause injury or death

Impact of counterfeited auto parts

- Counterfeit and piracy undermine consumers confidence in these brands

Source: The Motor & Equipment Manufacturers Association (MEMA)

Solutions

While components originally installed in the vehicle by the manufacturer are not generally exposed to the risk of tampering and counterfeiting, spare parts and aftermarket components are. The manufacturers of auto parts need an effective authentication solution which can solve their problem;

1. **Protection against tampering**
2. **Proof of authenticity**
3. **Proof of origin**

The authenticity of a product must be easily and directly verifiable by laypersons. Covert features, which qualify as forensic proof of authenticity, are required as well. Only overt features are suitable for authentication by laypersons. That is why overt features are the first to be faked. To raise the hurdles for counterfeiters, various overt features should be combined. Available options range from attractive holograms and color shifting ink to special thermo reactive inks. These high grade solutions enhance the visual perception of the product and help promote sales.

Hologram – providing multi-layers security

Holograms increase protection against counterfeiting while simultaneously creating a high-grade brand image. Complex holograms are impossible to copy[1] as they not only represent a barrier that is virtually impossible for potential counterfeiters to overcome, but they also present an especially valuable appearance[2]. 2D designs or 2D/3D combinations with perspective effects, physically realistic 3D holograms or 3D/2D versions showing a three-dimensional object in front of a two-dimensional background – the versatility of the product range allows for many custom-tailored and eye-catching solutions. For instance, holograms can be equipped with customer-specific effects[3]. In addition, dynamic structures and text or artwork elements only discernable under a microscope can be integrated into them. The solutions are variable and can be used in form of holographic security labels, 2D-3D hologram or a customized hologram with track and trace technologies.

(See also news bytes on page no. 7)

Fig.: An Example of a high security holographic label with a KeySecure code for Bosch developed by Scheiner. This KeySecure code enables online authentications to be performed anywhere in the world.

Fig.: An Example of Mercedes-Benz Genuine Parts, hologram on the packaging.

Conclusion

While the trade of counterfeit parts has dramatically increased, tackling counterfeits is not impossible. Counterfeiting is a problem that needs to be addressed quickly and decisively. Ideally, as a first move, more effective partnerships should be built between law enforcement agencies and the private sector with focus on intelligence sharing, awareness and product identification training.

- Manufacturers should create a team that focuses on anti-counterfeiting strategy;
- Selection of right anti-counterfeiting strategy should be employed;
- At least use first level of authentication features ;
- Track supply chain at distributor end ;
- Information to customer.

However, the involvement of all segments of the automotive and heavy-duty industries cannot be undermined. ■

Case study

HYUNDAI MOBIS

Hyundai Mobis, one of the largest auto parts manufacturers in the country, learned imitated parts are being made and sold in the market. In case of auto parts, the consequence of forgery not only leads to loss of income but also may lead to loss of life if the consumer bought the imitated item unknowingly. Hyundai Mobis after a long contemplation discovered about hologram and decided apply it to protect its buyers from the counterfeits. The company has been using holograms on the inspection certificates since 1993. Holograms for Hyundai Mobis, if forcefully removed from the product, self-destructs and points up the word MOBIS¡ on the product, efficiently demonstrating its level of security.Since the introduction of hologram, Hyundai Mobis was able to expose the organization responsible for the forgery and distribution of fake parts, and even further, was able to earn even higher customer reliance and increased sales.

Footnotes

1 *Unique technology (impossible to copy): With 120,000 lines per inch of resolution, and visible features such as motion, color change and depth that cannot be reproduced with conventional imaging technology. "Uniqueness" is inherent in the very process of holographic recording. If the same holographer but at two different points of time or if two different holographer but at same point of time, were to carry out holographic recording from " the positive " of each layer, minute examination will reveal subtle differences between the two versions of the same hologram created by them. Thus, it is impossible to make an exact replica of the hologram and therefore it is regarded as virtually impossible to copy.*

2 *Best Publicly Recognized Overt Security: In a recent survey by Dutch National Bank to measure the public understanding of security features, it was revealed that out of seven selected features, the Hologram came out second with 55 per cent public recognition, beaten only by the watermark (76%). These prove the ability of hologram as the most easily identified overt security technology.*

3 *Provide three layers of Security: Holography or Optical variable technology is the only technology which can provide three level of security at one point / product. Hologram Manufacturers can provide additional security features within their hologram at the designing and developing stage such like nano-text, sequential numbering, specialized ink etc.*

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Shree Arihant Laminates is one of India's leading manufacturers of Release Papers and Label Stocks, in both roll and sheet form.

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Roll to roll UV embossing technology

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Nadir Ahmed is a Professor of Advanced Materials and Nanotechnology. He is a visiting professor at the Faculty of Science, Engineering & Environment, University of Salford and Founder of Idvac Ltd.

Prof Ahmed's main research interests are in smart materials using advanced thin film and nanotechnology to develop new security holograms, smart devices, smart window solar film, thin film batteries and thin film optical coatings for new applications.

Introduction

Continuous demand for display and optical storage devices is growing steadily in many applications. These devices are based mainly on functional polymer substrates such as flexible films to manufacture sensors, optical polarizers, micro lenses, nano storage systems such as holographic memory devices and holograms. To produce such films with high productivity and lower cost, novel patterning methods are introduced. This includes lithography and nano imprint lithography to fabricate nano patterns at lower cost. In general, lithography is a multi-step process that typically starts with the design of a pattern in the form of gratings, small features or data set. For holographic applications, laser or electron beam are used to make the gratings. Nano lithography represents the state of the art in high throughput nanofabrication. Such technology is based upon UV curable monomer resin to fabricate sharp, well defined nano imprints. This new process offers an alternative to standard method of hot embossing of polymer substrate, which requires high temperature and pressure and which was found to damage the nano imprints. Thus, nano imprint technology would be very useful in the production of high quality holograms.

What is a Hologram?

Optical holography is a process that can record the complete characteristics of a light wave as a three dimensional image. The present method of making a hologram is by using a laser beam which is split into reference and object beams to expose the object. The interference fringes, produced due to optical interference between the object beam and reference beam, are recorded when the two beams interact in a suitable photosensitive media such as silver halide coated glass plate. The bright and dark zones of the interference pattern create chemical and/or physical changes in the media. This, in turn, creates a replica of the interference pattern as a change in absorption, refractive index or thickness. When the recorded matrix is illuminated by a readout beam similar to the original reference beam, some of the light is diffracted to reconstruct a copy of the object beam. If the recording is done by using an object beam which comes from a 3-D object, then the reconstructed hologram makes the object appear in 3-D mode. The glass plate is then developed and a master shim is produced by electroplating nickel on the holographic glass substrate. The nickel shim is loaded onto an embossing roller to emboss the image onto a base coated film such as polyester. Finally, the film can either be metallised with aluminium for opaque silver finish or with high refractive index material (HRI) such as zinc sulphide or titanium oxide to fabricate a semi-transparent holograms for security documents. At present, there are two embossing methods employed to produce holographic image on a flexible film; soft and hard embossing. Soft embossing is mainly used for decorative holograms. Medium temperature and pressure are used to emboss the image onto the flexible substrate. On the other hand, hard embossing, which produce sharp, high quality holograms employ high temperature and pressure to emboss the holographic image. Hard embossing is mainly used for security documents and for high quality applications.

UV embossing technology

UV embossing is a new technique used for high volume manufacturing of micro-structures such as micro optical devices or holograms. It is different from standard embossing method in that the process is derived from nano imprint lithography (NIL) and involves a number

of distinct stages incorporated in a flexible film handling machine. UV embossing is a roll to roll nano manufacturing process. It consists of two processing steps: (1) the coating process and (2) the imprinting-curing process *(see Figure 1)*. First, a flexible substrate film such as polyester is unwound from a reel then a liquid phase UV curable resin is coated on top side of the film by two or three-step roller coating system. A drying stage can be added after coating stage to remove solvent from the resin. The coating system is synchronized with the main imprinting roller to ensure uniform coating thickness regardless of web speed. The film is then held in intimate contact with an embossing roller at constant pressure. The pressure is controlled by a pressure sensor. In this way, the microstructure defined on the roller is replicated in the resin coated onto the film. The resin should have some anti-sticking property to prevent sticking of UV resin on the shim. High power UV light source is used at the point of contact to cure and harden the resin. In the final stage the completely cured embossed microstructures film is rewound onto a reel.

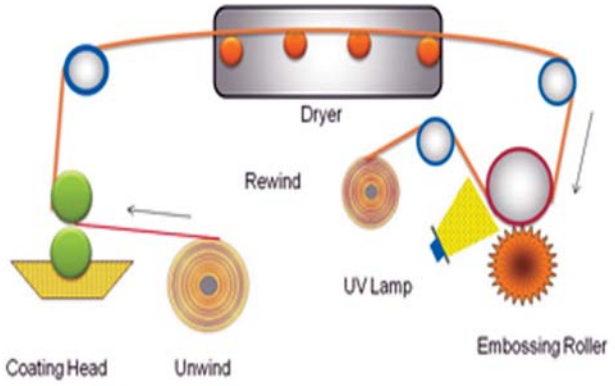

Figure 1 - UV Embossing Process

All of these processes take place on a single continuous machine, in a clean room environment. The front side of the machine can be housed in a class 100 clean room, while the rest of the machine can be located in a class 10,000 clean room to keep the process clean from any dust or other contamination. The process is mainly used for polymer film such as 12-350 micron PET, PES, Polypropylene, polycarbonate, cellulose di-acetate and cellulose tri acetate films. Foils and papers can also be handled. Recently, another version of UV embossing was developed. It is called UV cold transfer and uses an embossed holographic film as 'master' to transfer a holographic image onto substrate. This type of machines is developed mainly for paper or board. In this process *(see Figure 2)* the substrate, i.e. paper is coated with a liquid phase UV curable resist material by two or three roller coating system. The substrate is then partially cured by soft UV radiation and brought into contact under pressure with a reel of surface-relief holographic film. In this way the relief image is cast into the UV coating on the substrate. The paper substrate is then separated from the holographic film, which is rewound for further use. The paper substrate is further cured with UV to harden the holographic image.

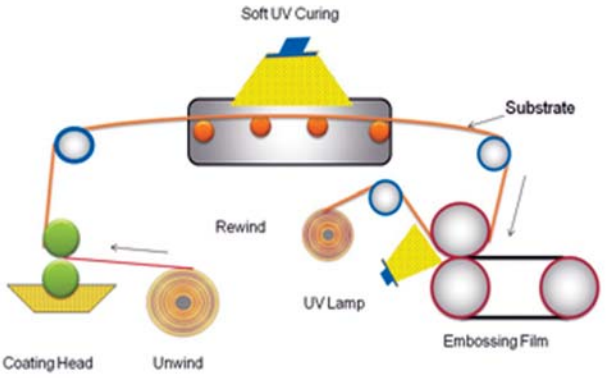

Figure 2: UV Cold Transfer process

Cold (UV) embossing may be preferred for critically dimensioned materials. It can be a room temperature process, eliminating the heating and cooling times and thermal expansions/contractions of hot embossing. It allows single or repeated multiple patterns to be layered on one or both sides of a substrate with accurate alignments. Both sides of the substrate may be embossed with identical or different patterns. For applications with more critical planarity, dimensional tolerances, or environmental requirements, cold embossing of photosensitive organic-inorganic sol-gel materials gives results close to those of glass.

In general, UV embossing is a low pressure, room temperature process, with little shrinkage of the pattern. It gives high quality polymer replication of the original holographic shim used. Structures with depths of 50 microns can be achieved using this technology, while holographic features of few microns and below can be embossed. Various products including holograms, micro lens arrays, polymer waveguides and diffraction gratings can be done.

UV Curing Principles

The UV process employs UV energy and light from the visible light spectrum in wavelength range from 200 to 480 nm. UV energy "cures" inks and varnishes in a fraction of a second. In the curing process, UV energy is produced by a mercury discharge lamp and is absorbed by a sensitizer, causing a reaction in the monomer which makes it hard and dry. The rate of the curing process depends on the following:

1. Monomer compounds in the UV resin - Each monomer cures at a different rate, depending on the amounts and compositions of sensitizer, pigment, and chemical additives.

2. Coating Thickness - The thickness of UV coating is not directly proportional to exposure time. The amount of UV energy inside a layer of coating decreases exponentially with depth. A two-fold increase in the thickness requires a ten-fold increase in UV intensity. For example, for a 50 micron thick UV coating, if 70% of the UV energy is absorbed in the top 25 micron of

coating, then 7% of the initial amount will be absorbed in the second 25 micron of coating.

3. Amount of UV per unit area - Normally, the curing speed will increase with the amount of UV energy per unit area at the non-linear rate. If a 100 watt per cm2 mercury lamp is increased to 200 watt per cm2, the curing speed would increase by tenfold. Furthermore, special metal halide lamps can trigger the receptor at an even faster rate with a standard 200 watt per inch lamp.

The sensitizer used in the UV resin should absorb UV in the range which is not absorbed by the monomer or pigment. The wavelength produced by a medium pressure mercury lamp or metal halide lamp should coincide with the wavelength absorbed by the sensitizer.

UV cured base coat

Specialty UV coatings can serve an important role in any off-line finishing product. The latest specialty UV coating technologies appeal to virtually all technologies, delivering tremendous visual and other sensory appeal to any finishing product. UV coatings have the benefit of instant curing, smoothness, hardness, etc.

The UV cured base coat is usually mixed with solvents such as MEK, Toluene and Ethyl Acetate. Photo-crosslinkable acrylate or methacrylate oligomeric resins are used as based coats. By choosing a resin with the appropriate chemical structure, the mechanical properties of the UV crosslinked resin can be modified. This includes brittleness and hardness. When optical properties are important, resins can be formulated to give specific refractive indices in the range of 1.44 to 1.6 (measured at 633nm). The UV resin is cured in a nitrogen atmosphere if oxygen inhibits the cross-linking process. Mercury UV source with an output power of 50-100 Watts/cm2 is used to cure the resin. However, UV power depends on type of resin used.

For a fast roll to roll process, UV curable low viscosity liquid resins are used. These are cured via cationic mechanism, thereby free from the oxygen inhibition issue when exposed in air. Furthermore, the property of very low shrinkage after curing allows excellent pattern replication. Owing to its low viscosity, the resin precursor can be imprinted (embossed) at low pressure and cured within very short time by focused UV light. High quality, low pressure and room temperature embossing are the advantages of roll to roll UV embossing process.

High Refractive Index Polymer

The development of high refractive index polymer would be an added advantage to UV holographic embossing technology since it would enable the production of high quality transparent holograms with brilliant colour refraction without the need of vacuum metallised HRI coating. So far, UV cured polymeric coatings with refractive index 1.5-1.6 have been produced. However, it was announced recently that a new thermosetting polymer with a high refractive index of 1.76 has been developed by a Japanese company. Furthermore, it was claimed that the addition of high refractive index nanoparticles such as titanium oxide, zirconia and other metal oxides would enable the design of new materials with even higher refractive index. The material is expected to be used in a wide range of applications including optical materials such as holograms. This material has the highest refractive index level of 1.76 as compared with other HRI polymers. However, this material is not UV cured but produced by thermal setting. Development work with new polymers is under way to achieve a refractive index level of >2.

Conclusion

UV embossing is a new technology employed to produce high quality holograms as compared with standard hard or soft embossing processes. Roll to Roll, large width UV embossing would enhance throughput and reduce the cost of high quality holographic products. It would also offer the opportunity to produce advanced polymeric micro-optical components and holograms of high quality at low cost.

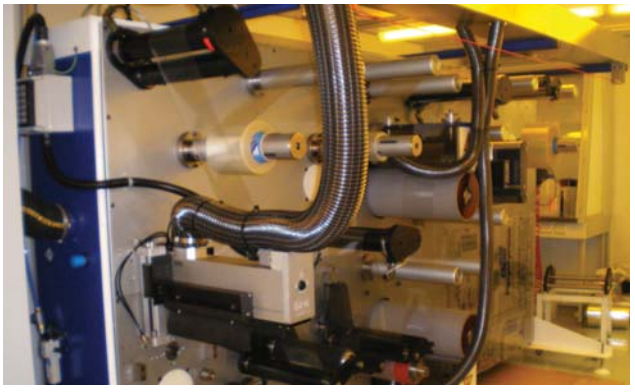

Figure 3 - UV Embossing Machine (Courtesy Carbonlite Converting Equipment Ltd., UK)

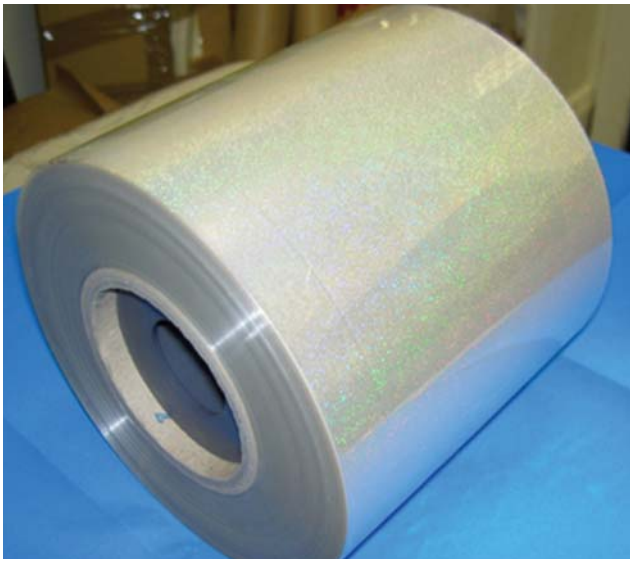

Figure 4 - UV Embossing

Tender Updates

Organisation	Date	State (Country)	Details
Department of Mines and Technology	July 13, 2010	Bihar (India)	Hologram for mineral transit pass
Istituto Poligrafico e zecca dello stato spa	July 19, 2010	Rome (Italy)	Holographic foil for E-passport
Transport Department	July 21, 2010	Gujarat (India)	Hologram for RC and permit
Dakshinanchal Vidyut Vitran Nigam Limited	July 23, 2010	Uttar Pradesh (India)	Holographic seal for electric meter
PR Department, Chhattisgarh	July 26, 2010	Chhattisgarh (India)	Supply of security hologram
Comision nacional de areas naturales protegidas	July 27, 2010	Mexico	Cinta De Barniz holograma genuine secure overlay
Instituto de recreacion de los trabajadores irtra	July 30, 2010	Guatemala	Supply of 100 rolling tape for protection of security hologram of printed in the meat department headquarters
Dirección : General de carabineros de chile	August 4, 2010	Chile	Acquisition of 19 000 id cards with pre-printed hologram
Madhya Pradesh Hastashilp Evam	August 6, 2010	Madhya Pradesh	Printing of holograms for sticking
Surface Contracts and Procurement	August 16, 2010	United Kingdom	Security paper which includes anti-forgery features and other security materials including holograms
Excise Department	August 16, 2010	Rajasthan (India)	Supply of security hologram stickers
I T I Limited	August 23, 2010	Banglore (India)	Supply of hot stamping hologram Machine
Universitatea din oradea	August 26, 2010	Romania	Supply of barcode holographic label
Act procurement solutions	August 31, 2010	Australia	Production Of photo licences & secure government identification cards with hologram
Opération des nations unies en côte d ivoire	September 9, 2010		Laminate, UN holographic ID cards, UN secure cards with HI-CO magnetic Stripe with UV ink printed “United Nations” on the front and a hot stamped UN hologram (similar to Visa Bank card holographic insert)
Dakshin Haryana Bijli Vitran Nigam	September 9, 2010	Haryana (India)	Self adhesive security seal having high security hologram
Arequipa - Direccion Regional De Transportes	September 13, 2010	Peru	Preprinted cards with holograms
Trt genel Müdürlügü	September 13, 2010	Turkey	Supply of TP 18.6 million PCS holographic stickers
India Trade Promotion Organisation	Sep 18, 2010	New Delhi (India)	Holograms on entry tickets & passes for IITF 2010

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Notable Transactions – Globally

License agreement

Month	First Party	Second Party	Outcome	Market targeting
August 2010	Document Security Systems, INC *(A technology company in the security and protection services sector which develops and manufactures products and packaging containing patented and patent pending optical deterrent technologies).*	ATL, Inc a security label manufacturer ATL *(formerly Ad Tape & Label Co) establish in 1951 specialize in anti-counterfeiting security labels, multi-panel booklet labels, custom die-cut components, disposable medical devices, direct mail, and product labels).*	ATL will manufacture security labels for its pharmaceutical industry clients containing Document Security Systems, Inc.'s AuthentiGuard® suite of technologies. This agreement is a non-exclusive US license and revenue is based on a percentage of sales. This highly scalable relationship provides Document Security Systems with an established sales partner for its enhanced solutions in the secure label market, as well as access to major pharmaceutical companies through ATL.	The global trade in bogus pharmaceuticals will be worth an estimated $75 billion in 2010, according to the US-based Center for Medicine in the Public Interest (CMPI).

Acquisition

Month	Acquirer	Target	Outcome	Market Targeting
September 2010	SICPA Security Inks and Systems USA, INC *(A leading global provider of banknote security inks and integrated government security systems on high excise tax products)*	Meyercord Revenue Inc from Illionios *(Company with an expertise in developing anti-counterfeiting strategies, processes and products to satisfy product authentication and tracking challenges)*	The transaction will combine SICPA international government tax platform expertise with Meyercord's experience in producing and distributing tobacco tax stamps for U.S. States and municipalities	According to 2009 statistics from the Bureau of Alcohol, Tobacco, Firearms and Explosives, the United States loses $5 billion per year in state taxes due to counterfeit tobacco.

Joint Venture

Month	First Party	Second Party	Outcome	Market targeting
September, 2010	Shiner International, Inc (SI) *(An emerging global supplier of anti-counterfeiting and advanced flexible packaging solutions)*	Shanghai Shifu Film Material Co. Ltd (SSFMCL) *(A Shanghai based sales company specialising in films for various industrial and consumer applications)*	Shanghai Juneng is a joint venture between SI and SSFMCL in which Shiner will own 70 per cent of the joint venture. It will helped Shiner in enhancing the market share in the Chinese Domestic food packaging industry and will strengthen Shiner position as one of China leading packaging film manufacturer.	According to market research firm RNCOS China processed food industry will grow at a CAGR of approximately 33 per cent through 2013.

Global Patents

Publication Date	Title	Int. Class	Application Number	Applicant
02.09.2010	(WO 2010/096914) Security device	B44F1/12	PCT/CA2010/000248	Bank of Canada
17.06.2010	(WO 2010/094948) Security and sensing elements with volume holograms	G)3H1/00	PCT/GB2010/050245	Smart Holograms Ltd.imited
26.08.2010	(WO 2010/094441) Surface relief structures related devices and method of making them	G02B5/18	PCT/EP2010/000909	Rolic AG
19.08.2010	(WO 2010/092392) Diffractive optical elements	B42D15/10	PCT/GB2010/050222	Conductive Inkjet Technology Limited
12.08.2010	(WO 2010/089399) Micro relief structures	B32B3/30	PCT/EP2010/051521	Optaglio S.R.O.
05.08.2010	(WO 2010/086827) Improvements relating to multi-function authentication systems	H04L9/32	PCT/IB2010/050413	OMAR, Ralph, Mahmoud
05.08.2010	(WO 2010/086522) Customized secure document and procedure for securing a document	B42D15/00	PCT/FR2010/000041	Hologram Industries (S.A.)
08.07.2010	(WO 2010/078000) Disc structure for Bit-wise holographic storage	G11B7/0065	PCT/US2009/068341	General electric company
08.07.2010	(WO 2010/077221) Dynamically reconfigurable holograms	G03H1/04	PCT/US2008/014085	Hewlett-Packard Development Company L.P.
01.07.2010	(WO 2010/072318) method and device for producing security documents (particularly ID Cards)	B42D15/10	PCT/EP2009/008643	Muehlbauer
01.07.2010	(WO 2010/072065) Hologram three-dimensional image information collecting device and method reproduction device and method	G02B27/22	PCT/CN2009/072452	AFC Technology Co. Ltd.

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Shiner Received Patent for Proprietary BOPP Film Technology

SHINER INTERNATIONAL
NASDAQ Listed:BEST

HAIKOU, China, Shiner International, Inc. (Nasdaq: BEST) ("Shiner" or the "Company"), an emerging global supplier of anti-counterfeiting and advanced packaging products, had received its sixteenth National Invention Patent covering the product and production process for its proprietary bi-axially oriented polypropylene (BOPP) film with superior-strength heat seal properties.

The Company's BOPP film, incorporating its patented high-strength heat seal technology, is a new type of environmentally friendly flexible plastic packaging material and can replace certain complex and coated films, such as CPP and multilayer BOPP complex films. This technology can be applied to packaging for the food, medical, and consumer products industries. The material not only reduces packaging costs for Shiner's customers, but it also eliminates the environmental problems created by the utilization of adhesives and solvents in the manufacturing of complex and coated films.

Mr. Qingtao Xing, President and CEO of Shiner International, commented, "We are very proud to have received our sixteenth invention patent on our proprietary BOPP film, which incorporates our superior high-strength heat seal technology. Shiner's product innovation and robust research and development efforts have provided us with a broad product portfolio to meet the requirements of our diverse customer base. The superior heat seal strength and low environmental impact of the material will provide a solid foundation for our future sales and marketing effort. We expect this product to materially contribute to our revenues in 2010."

The international market for BOPP film is expected to grow at 6% to 7% annually over the next three to four years, driven by economic growth in developing parts of the world such as China, Russia, Brazil, and Eastern Europe. Rising food safety and hygiene standards, increased demand for convenience and packaged foods, and the demands of feeding the world's growing population are expected to contribute to growth in the global BOPP film market. ■

Source: www.shinerinc.com

Upcoming Events

Holopack-Holoprint 2010
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, Web: www.holopackholoprint.info

9th Asian High Security Printer Conference
November 17-19, 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; Web: www.cross-conferences.com

Pack Plus 2010
December 3-6, 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; Web: www.packplus.in

Brief Review: Label Expo 2010

8-11 December, New Delhi
LABELEXPO India 2010
www.labelexpo-india.com

Labelexpo India is the largest event for the label, product decoration and converting industry in India. It will be held in New Delhi at the Pragati Maidan Exhibition Centre from December 8 to 11, 2010. The event offers visitors and media the unique chance to see more machinery and live demonstrations than any other show in India. Over 150 international and local exhibitors will present their latest developments in technology and materials, launch new products and give live demonstrations to visitors over three days. Having changed its name from the India Label Show to Labelexpo India, there are great expectations riding on the event. Already, the show is attracting more interest from leading European press manufacturers than last year's Labelexpo Asia show in Shanghai, China. Labelexpo India 2010 now has a very wide base of support from associations within the country, including the Hologram Manufacturers Association India, All India Federation of Master Printers (AIFMP), LMAI and the Delhi Printers' Association.

For more details contact
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Fax: +44 (0)20 8846 2801
Email: mhatton@labelexpo.com;
Web: www.indialabelshow.com

The Hologram Manufacturers Association of India (HOMAI) is a non-profit organization established in 1998 to represents and promotes the interest of hologram industry in India as well as to fight against counterfeiting. Affiliated with International Hologram Manufacturers Association (IHMA), UK it is the only second body of its type in world. It encourage 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

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The editorial team welcomes your news, contributions and comments. Please send your product updates, press releases, conference announcements or other contributions to **HoMAI**:

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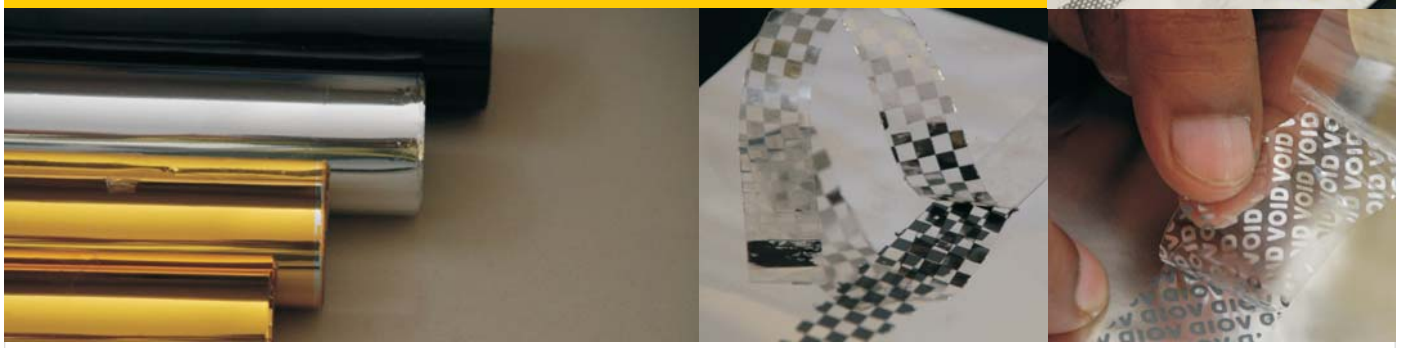

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