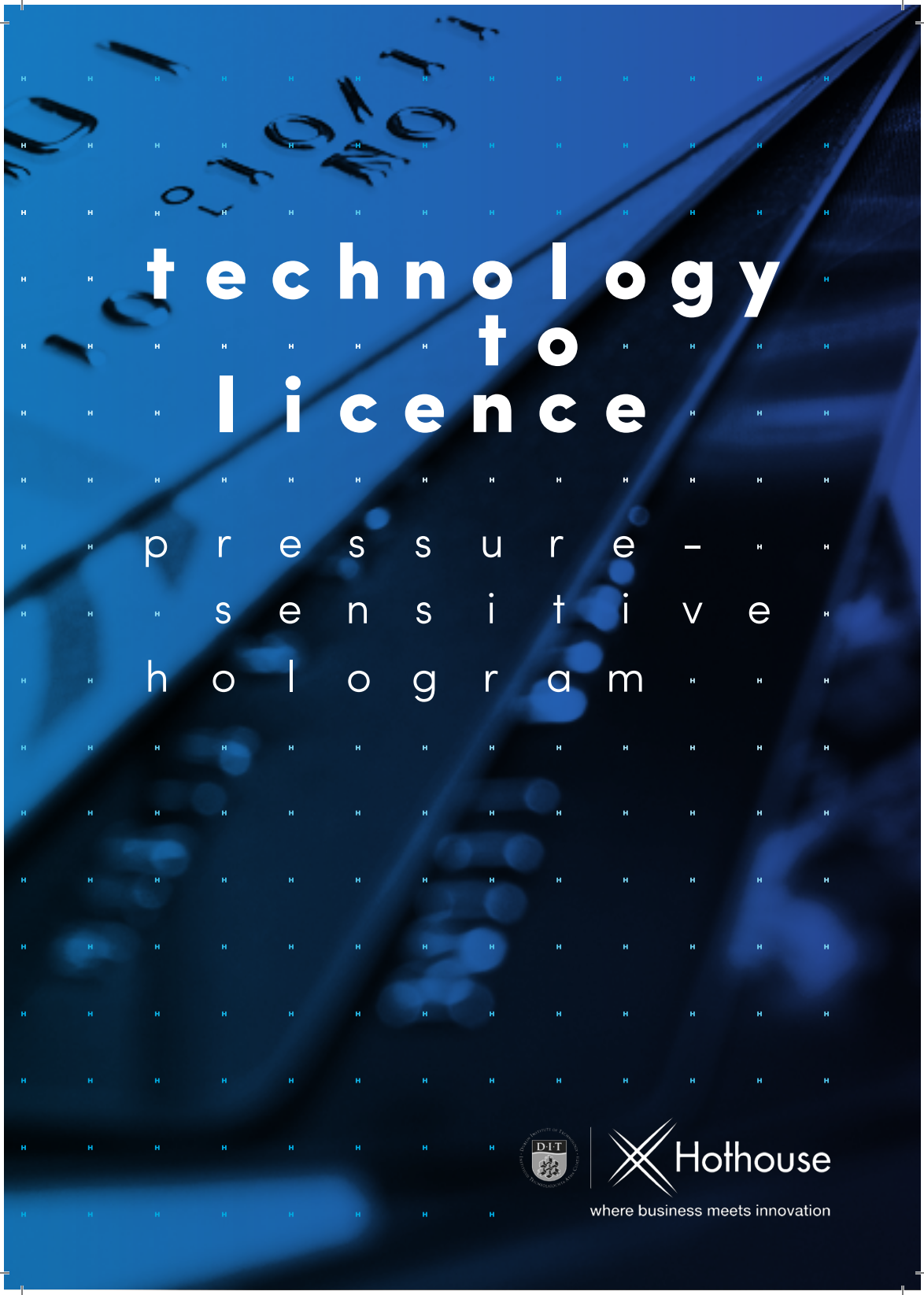

technology
to
licence
pressure-
sensitive
hologram
D·I·T
Hothouse
where business meets innovation

OVERVIEW

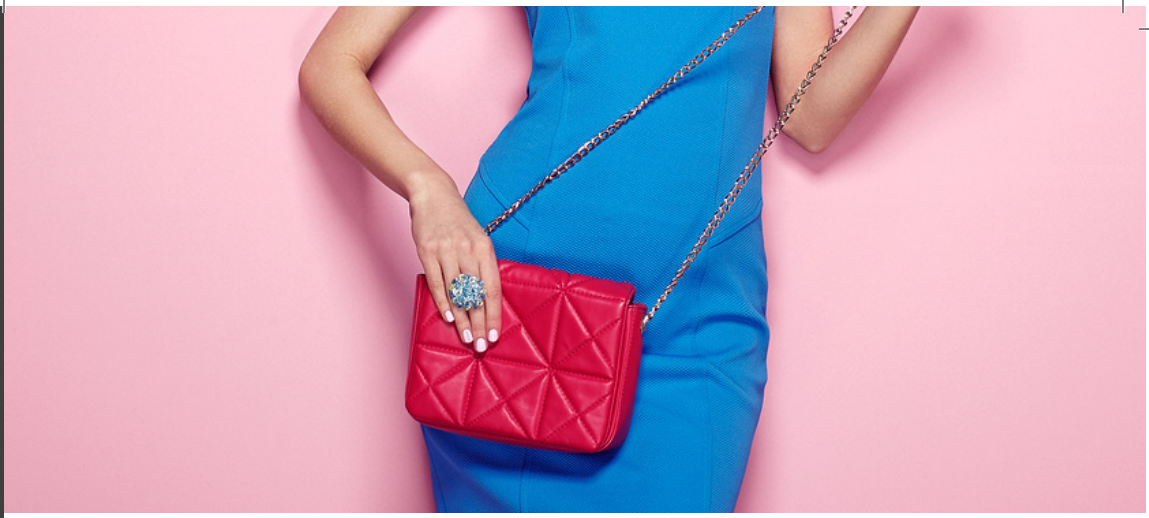
Dublin Institute of Technology (DIT) researchers have invented a unique, patented hologram that changes colour under pressure and has widespread applications for security, authentication and environmental sensing.

Holograms are frequently used for security and authentication, and are commonly found on credit cards, bank notes, passports and concert tickets, as well as on a number of high value goods such as pharmaceutical drugs, clothing and accessories. They can also be used as sensors if the hologram is sensitive to changes in its environment, and for tamper detection for document security.

Current holographic solutions are usually mass produced from a single master hologram, resulting in identical holograms, with serialisation applied via standard overprinting, allowing the holograms to be either tampered or copied.

The pressure-sensitive optical device developed at DIT allows the production of true individual holograms. Specific customer codes can be embedded into the actual hologram during manufacture, making them extremely difficult to copy but very easy for the end user authentication through a pressure-induced colour change of the hologram. The colour change can be either temporary or permanent, depending on specific requirements.

This optical device can be a purely visual feature to be used for authentication by the end customer/consumer using thumb pressure, or it can also be designed to be machine readable for automated checking within the supply chain.



APPLICATIONS

The pressure-sensitive holograms recorded using this technology can be used as a visual feature for authentication by an end customer or consumer. Also, in machine-readable form they are suitable for use at all stages within the product supply chain.

Such pressure-sensitive holograms may ultimately be used for data storage, authentication, security and the creation of individualised holograms. They could also be used as sensors to monitor factors such as pressure, deformation or strain.

The pressure-sensitive holograms have numerous potential applications in industry, including (but not limited to) packaging for pharmaceutical products, robotics, semiconductor manufacturing, sports equipment, the automotive industry and medical devices. They can also be used on high-end consumer goods such as clothing and accessories, fragrances and alcohol as well as for authentication and tamper-proofing of secure documents such as examination papers and Government-issued certificates.

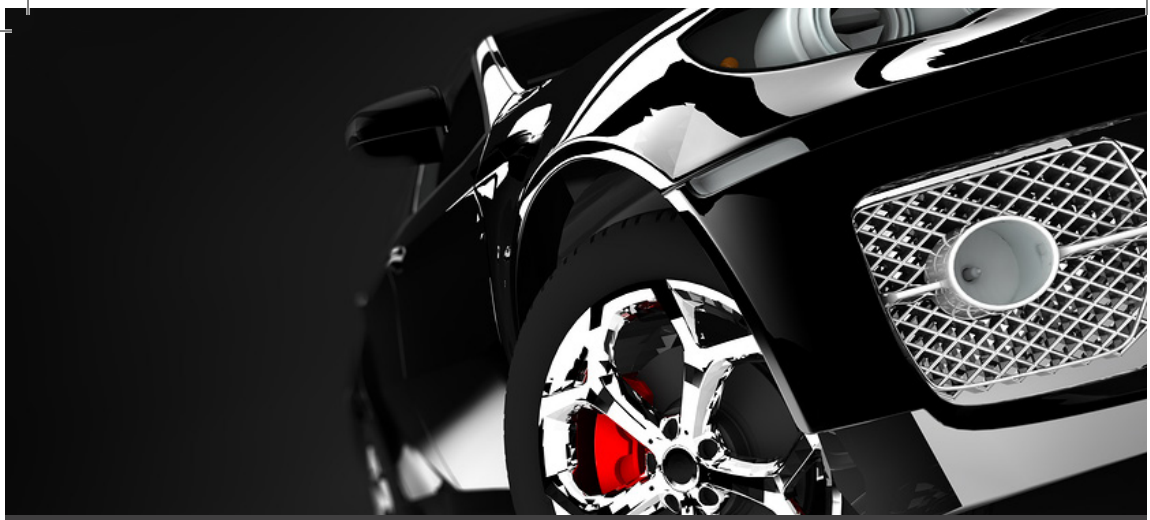
STAGE OF DEVELOPMENT

Current small lab batch prototypes are available for evaluation, with further testing and development required to ensure the technology is application ready. The technology is protected with a granted UK patent (GB2527769). European and US applications are pending. DIT are seeking interested commercial parties to bring this innovative technology to market. The ideal partner will ideally be an existing holographic manufacturer or potential end user, and have existing key contacts/distribution networks in the target market.

ADVANTAGES

The pressure-sensitive hologram developed at DIT offers many advantages for overt authentication and for sensing environmental change.

· It represents a low-cost method of making truly serialised, pressure-induced colour-changing holograms, with high levels of embedded security, making them difficult to counterfeit, but easily to customise.
· The hologram technology can be deployed across a wide range of applications, from clothing and fragrances labelling to security documents, with the colour change being either covert or overt and reversible or permanent.
· The composition to record the hologram is environmentally friendly and has been shown to be low in toxicity.
· The hologram is durable, the optical change in response to pressure is instant and it is easy to use yet difficult to replicate.
· The hologram can be tuned to achieve the desired characteristics, and a wide range of pressure sensitivity is achievable.



OPPORTUNITY

Pressure-sensitive holograms can offer either covert or overt authentication for products and packaging and a method for sensing the environment.

Anti-counterfeiting is a global issue and the anti-counterfeit packaging market size alone is projected to grow from USD 107.26 Billion in 2016 to USD 206.57 Billion by 2021, at a CAGR of 14%.

In order to be effective, anti-counterfeiting approaches must outpace the technology of 'fake' authentication.

Holograms are frequently used in security and anti-counterfeiting on products and packaging, yet despite developments in the field of holographic recording materials, there remains a need for improved holographic recording compositions for improved anti-counterfeit purposes and to include additional secure manufacturer information, such as batch number or date/location of manufacturing.

The composition developed at DIT represents an improvement in holographic recording to make pressure-sensitive holograms with features that suit anti-counterfeiting and environmental sensing needs. The hologram changes colour when pressure is applied, and the colour change can either be reversible or permanent. The hologram can be produced on paper or labels and can operate in both covert and overt domains.

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