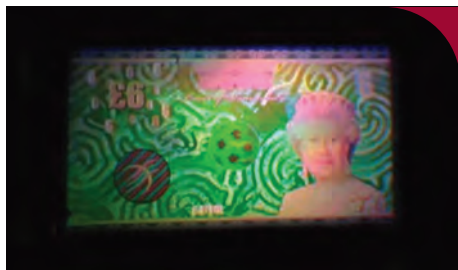


'World's Most Advanced 2D Barcode' and 'Next Generation Secure Hologram'

Two companies looking to enter the tax stamp market with their serialisation and secure hologram solutions are Complete Inspection Systems (CIS) from Florida and a new British company, Bowater Holographics. CIS claims its 2D barcode is the most advanced in the world, and Bowater has launched what it calls the 'next generation of industrially produced secure holograms'.

Bowater's Full Colour 3D Holograms

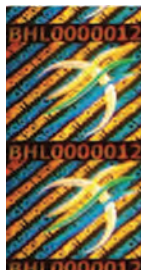
Bowater's new kinetic reflection volume holograms – *BowaterHologram™ Kinetic* – are 3D images in full colour, 'suspended' in a completely transparent polymer. The company says *BowaterHologram Kinetic* eliminates the potentially confusing rainbow effects of more common embossed holograms because the images are stable, full colour and switch between each other as the hologram is tilted (for example, its specimen £6 banknote switches between images of the Queen and Winston Churchill on completely different backgrounds).



BowaterHologram Kinetic

Tim Sandford, CEO of Bowater, claims this type of hologram is more difficult to counterfeit than the embossed variety; certainly, there are only two suppliers of the holographic photopolymer on which these holograms are made: DuPont and Bayer Material Science (Bowater uses Bayer's material), both of which have stringent supply controls. Also, the unambiguous on/off switch effect of the images makes it more difficult to deceive people with counterfeiting attempts.

In addition to the intrinsic holographic characteristics of its new technology, Bowater is currently developing covert security in the form of multi-spectral marking and imaging – together with requisite reader – that can be embedded in the hologram.



Furthermore, the company's *BowaterHologram™ Numeric* solution allows the holograms to be serialised with individualised data, whether biometric, alphanumeric, barcode or graphic.

BowaterHologram Numeric

All these technologies come together on the *BowaterHolotronic™ Seal*, a combined hologram/RFID chip designed to facilitate track and trace or other data-intensive requirements. The company aims to have this solution available later on in the year.



BowaterHolotronic Seal

Tim Sandford will be presenting Bowater's solutions as they relate to tax stamps and track and trace programmes, during September's *Tax Stamp Forum™* in Dubai, where the company will also be exhibiting as a gold sponsor.

Complete Inspection Systems' High Definition Barcode

CIS has become the exclusive developer, for HD Barcode LLC, of a new encrypted barcode – called *HD Barcode™* – which can hold 175 times more data than traditional 2D barcodes, such as datamatrix and QR. Whereas the traditional codes are limited to about 4 kilobytes of data, CIS claims the HD Barcode can encode up to 703 kilobytes. This means it can easily contain comprehensive information, including product specs, information for product use in multiple languages, full-colour images and HTML and Zip files.

For authentication purposes, a single HD Barcode can contain: information such as the stamp's alphanumeric serial number that matches the visible printed number; full colour images of a security feature on the stamp, such as a hologram (see Fig 1); covert features in the HD Barcode itself that distinguish it from a copy.



Fig 1 – a Bowater Numeric hologram image with text information below (used as an example only), contained in an HD Barcode

Although the amount of data contained in the HD Barcode compared to traditional codes is much larger, the physical size of the code does not have to be large. The code on the stamp in Fig 2 is about 5mm square and can contain about 60 characters. A recent new feature is the ability to provide the code as a 'dot pattern' only.



Fig 2 – HD Barcode for tax stamps with dot pattern

The scanning and decoding of the HD Barcode is carried out via smartphone using a proprietary reader application that is only available to authorised personnel. The code is a 'self-contained', autonomous feature in that it requires no database – and therefore no Internet connection to that database.

HD Barcode works well in a full-blown track and trace system, as it can hold the entire supply chain history of the product, from manufacturing to point-of-sale, without recourse to a database.

At the recent *Global Forum on Access to Safe Medicines*, Gary Parish, President of CIS, used the example of cases of pharmaceutical products to describe how the HD Barcode track and trace system work. The system consists of scanning, updating and reprinting the code onto different labels at different points in the supply chain, as follows:

- The first HD Barcode label, containing manufacturer and production details, is generated and applied to the cases with thermal transfer printing;
- At the manufacturer's warehouse, the label is scanned, warehouse and shipping data are added to the scanned information, and the code is reprinted on a second label applied on top of the first;
- When the goods arrive at the distributor's warehouse, the second label is scanned and new data – including that pertaining to the final point-of-sale – is added to create label 3, which is applied on top of label 2. Label 3 holds the full manufacturing and distribution history of the product.

Gary Parish is happy to report that CIS has already been approached by several potential customers interested in applying the HD Barcode technology to tax stamps.