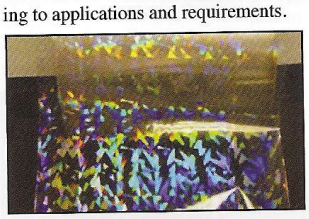
Awards

Idvac Wins The UK Technology Strategy Innovation Award

Idvac Ltd, a UK vacuum development specialist, is celebrating its ninth anniversary by winning an innovation award from the UK Technology Strategy Board. This is for developing and testing a multi-nano-layered, semi-transparent optical stack for infra-red heat reflection on polymeric film such as polyester. It can be used on embossed holographic film for many applications, including production of semi-transparent IR reflecting hologram, as a heat rejection film for windows, or as a semi-transparent electrically conducting film. The structural design of this semi-transparent conducting hologram allows for the tuning of the visible and IR transmission and reflection according to applications and requirements.



IR reflecting patterned holographic film; this photo shows that the brightness and visible-light transparency of the film are undiminished.

The existing HRI coating used for transparent holograms is mainly based on zinc sulphide (ZnS), which is semi-transparent in the visible region and highly transparent in the IR, with minimum reflectance. It is also a non-conducting dielectric. In comparison, Idvac's multi-layered stack is semi-transparent in the visible region but highly reflective in the IR. However, the absorption rate of this multi-layered stack in the visible region is slightly higher than that of ZnS.

The stack consists of layers laid down in a vacuum chamber, each from different evaporating material. Professor Nadir Ahmed, the founder and managing director of Idvac, told *Holography News®* that this is achieved by running a substrate film three times through a chamber, changing the evaporating metal each time, or through using a three-zone chamber, where the metals are placed in separated evaporation 'boats'. The cost of the material is determined by the capital cost of the chamber and the costs of running it – the material cost is minimal. The necessary equipment can be retrofitted to an existing vacuum chamber at a relatively small cost. This is with minimum modification to the metallizer and without affecting its ability for standard aluminium metallization.

Ahmed points out that the new heat reflecting hologram can offer many advantages over standard holograms, including those with HRI (ZnS) coatings. He summarised these advantages as:

1. Good spectral selectivity performance. The visible and IR transmissions and reflections can be tuned over particular wavelengths to give the hologram unique features such as selective see-through effect, selective reflectance in the visible wavelength and selective IR rejection rate at long wavelengths. It can be tuned to have high transparency in the visible wavelength and high reflectance in the infrared wavelength. Such a selection can also produce a colour shift effect.

2. It is possible to use the stack to produce semi-transparent holographic RFID antennas.

3. For packaging, the IR reflecting semi-transparent hologram, which acts as a heat mirror, can be used to reflect heat away from the package content.

4. The multi-layered stack can be used to produce semi-transparent holographic electrodes for electrochromic (EC) cells.

5. The stack can be tuned for each producer or user, thus creating a unique response profile that can be read by an optical sensor, such as a spectroscope, to determine the 'signature' of the film.

New On-Site Consultancy

Idvac is also offering a comprehensive on-site vacuum metallizing training workshop and troubleshooting to add extra informative and practical knowledge to metallizer operators and quality control staff, particularly for troubleshooting problems related to the vacuum metallizing process and quality control of holographic and packaging films.

Since its foundation in 2004, Idvac has developed several new coating processes or products for holographic materials, including HRI, copper, chrome alloy for outdoor holograms, gold finish (dry process) and many other coatings for the security and holographic packaging markets.

www.idvac.co.uk

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