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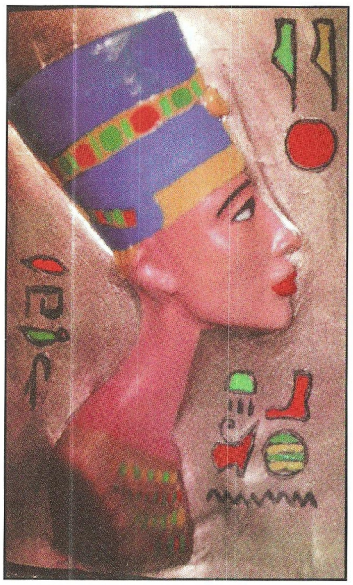
Gentet's Ultimate U-04 Achieves New Standard

Yves Gentet of the Art and Science Holography Atelier in Bordeaux, France, has introduced the latest version of his *Ultimate* silver halide hologram emulsion, *U-O4*, on which he has demonstrated new levels of resolution, diffraction efficiency and colour accuracy. However, in a conversation with *Holography News®* he pointed out that the quality of his holograms is a result of attention to the laser and the exposure conditions, the emulsion and the processing, so others using the material will have to find their own optimum use conditions. He does offer a technical support service, providing personal guidance through any issues that are encountered.

Sadly, the illustrations here only give an indication of the quality of these true-3D, full parallax holograms. That said, there is no doubt that – to this viewer at least – Gentet has achieved the best results so far in colour reflection holograms on silver halide, with subjectively excellent colour rendition and negligible haze. This means they are also suitable for extremely clear holographic optical elements, and Gentet sees these Ultimate holograms being used as masters for reproduction of images and HOEs on holographic photopolymer.



Gentet's Nefertiti reflection hologram on U-04

Real Image Solidity

One characteristic of Gentet's images that struck this viewer is that the real image component has a solidity of colour which is unusual, as most real-image holograms have a translucence to the projected image. This solidity results from the high resolution and diffraction efficiency.

U-O4 is only available on plates at present, in sizes 4 x 5" up to 60 x 80 cm. The former are supplied in packs of 18, at €330 per pack, the latter in packs of four at €640. Grain size is

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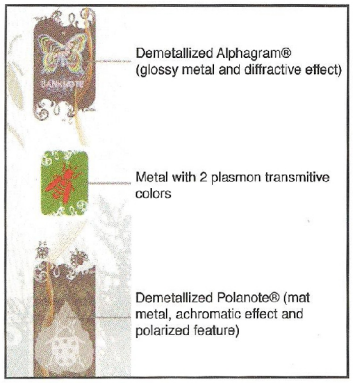
Hologram Industries Launches Plasmogram for Banknote Windows

Hologram Industries (HI) has launched the Plasmogram™ as an optically variable device for use in the windows of secured documents such as banknotes and ID cards. What distinguishes this device is that it uses *surface plasmons* to create the image, making HI the first company to launch a commercial product which exploits this phenomenon, although several others are known to be working on such products. HI describes the Plasmogram as 'a breakthrough in the world of optically variable security solutions.'



Plasmogram incorporated in to a demonstration banknote stripe

The Plasmogram is intrinsically a device viewed in transmission because surface plasmons work in transmission mode. Hence its suitability for use in the

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4 nm, sensitivity is 300 μJ/cm2 for recording with red, green and blue lasers (or 600 for monochrome), producing a resolution of 20000 lines/mm. The standard emulsion is tuned to 400-480 nm (blue), up to 540 nm (green), 610-660 nm (red), although Gentet can make product to order to suit different wavelengths. He also sells developer and bleach, and hopes to introduce film soon.

While Gentet points out that the results on his holograms are a combination of factors, he also credits Malasy Gentet, his wife, who is specialist in silver halide emulsions, has brought new levels of consistency (despite everything being hand-made) through stringent quality control procedures.

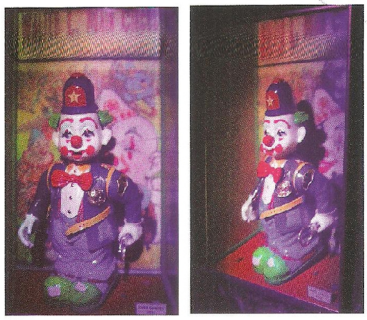
Expansion Plans

The Gentets have found new, expanded premises for the Atelier (studio) and will be moving in the next few months. He plans to expand capacity in the new premises, also installing a pulse laser portrait studio and an improved *3Dholoprinter*, their system which converts a digital file into a full-colour, full parallax, display hologram (see HN Vol 23 No 7). At one point Gentet became disillusioned with the digital system, preferring the intensity and greater 'solidity' of his Denysiuk or H2 transfer holograms, but he now sees new opportunities for it with the new emulsion, particularly with the ability to record scenes outside the studio or optical table and also to capture movement.

Ultimate U-04 seems exceptionally suitable for pulse portraits. As the Nefertiti image shows, it is not only good at reproducing intense, primary colours but also more subtle shades and gradations.

Gentet commented that he was stimulated to develop U-04 by working with museums and other groups over the last couple of years. Since he established the Atelier in 1995 he has tended to work in isolation, resisting requests to sell his plates. The exception to this is a research relationship he has developed with Michael Shevtsov of the State Optical Vavilov Institute in St Petersburg (where Denysiuk worked). Shevtsov spends time with him in Bordeaux as well as working on the development of emulsions back in St Petersburg.

Gentet relented in his reluctance to sell his emulsion six or seven years ago, licensing the Toronto company UHR (Ultimate Holography Research) to work on his emulsion, but was further put off by the failure of that company. But he has recently been working with the Hellenic Institute of Holography, providing plates for its project to capture Greek antiquities, as well as other historical sites (for example, Amiens Cathedral, see HN Vol 23 No 7) and other research groups. He mentioned that around 20 groups now regularly use his material, and the feedback from them has been invaluable. For example, the comment was made that while U-08, the previous formulation (still available), gave very good saturated colours across most of the spectrum, it was not so strong on blue. Accordingly he set out to rectify this, and has produced the Blue Clown Bobby hologram to show the results. (This mirrors the Clown hologram he produced in 2000/2001 from the same set of dolls.)



Two views of Blue Clown, showing the accuracy of colour and perspective from front and side.

The Atelier now produces and coats emulsions to order and specification, on glass and film, and also sells its own coating equipment which will lay down emulsion between 2μm and 100μm. In his commercial future, he doesn't envisage becoming a large-volume producer of Ultimate plates or film, but he sees the material as eminently suitable for the origination of masters for large volume reproduction on materials such as Bayer's holographic photopolymer.

The move to new premises seems to be re-energising the team, with Yves Gentet apparently more enthusiastic than ever.

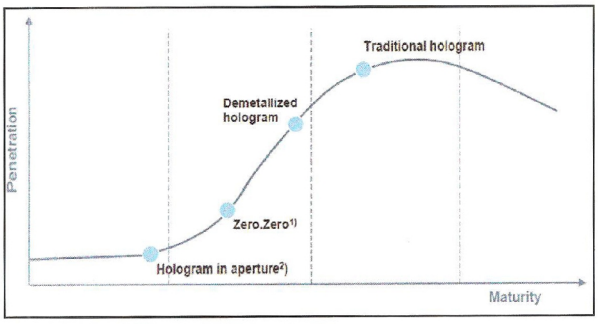
www.ultimate-holography.com

Review of Holograms for High Security

Applications

The French office of Roland Berger Strategy Consultants has drawn up a Market Review of *Holograms for high security applications*, presumably to provide information to its clients and others following the move at Hologram Industries for Surys to buy all its shares (see previous issue of HN). The Review is generally very positive about the future of holograms for high security, although it points out that the use of holograms in banknotes is mature so growth depends more on banknote numbers produced than any factor related to holograms.

Berger opens with a review of the history of high security holograms and an overview of holo-gram producers. The review says that holograms are used because they offer an "easy visual control' and are 'difficult to counterfeit', and it summarises Berger's interviews with specialists as concluding that 'holograms are one of the strongest features for high security documents.' It shows the



Berger's chart of hologram lifecycle on banknotes

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