



EUROPEAN
COMMISSION

Community Research



New frontiers in authentication

Project HOLAUTHENTIC

In the current context, there is a specific need and scope to develop a new anti-fraud technology and methodology and improve European standards in the field of authenticity identification, to the level beyond the abilities of current and potential frauds. The objective of this project is to develop a Holographic Authentication methodology and associated instrumentation enabling direct hologram recording on the surface of the item of interest, by means of laser microetching.

A 2D pattern is engraved in one step with a UV pulsed laser by means of a versatile and programmable approach. The spatial light modulation is actually performed by a reflective liquid crystal display instead of a mask. As these devices are unable to withstand the high-energy throughput required for etching, the modulated beam is amplified by two-wave mixing in a non-linear optical medium optimised for the UV interaction. This technique provides a faster and more flexible alternative to laser marking with pixel by pixel raster-scan or fixed mask projection mode and e.g. can be applied to identify valuable items by imprinting a code onto the surface.

With this setup, we are able to etch a 250 μm square 2D pattern into a microscopic droplet of photoresist resin which has been deposited beforehand on the artwork surface. This pattern is a Computer Generated Hologram which contains coded information describing some artwork data (name, date, origin, owner, restoration date, etc...). The detection and the reconstruction of the engraved information are dedicated to an incoherent reader based on a white light illumination source and a CCD matrix sensor.

This system is a complete and reliable holographic authenticity sensor which will be the central part of a new anti-fraud methodology. This method has been developed for the authentication of works-of-art, antiquities and precious items but can also be used for anti-counterfeiting applications such as pharmaceutical packages marking.