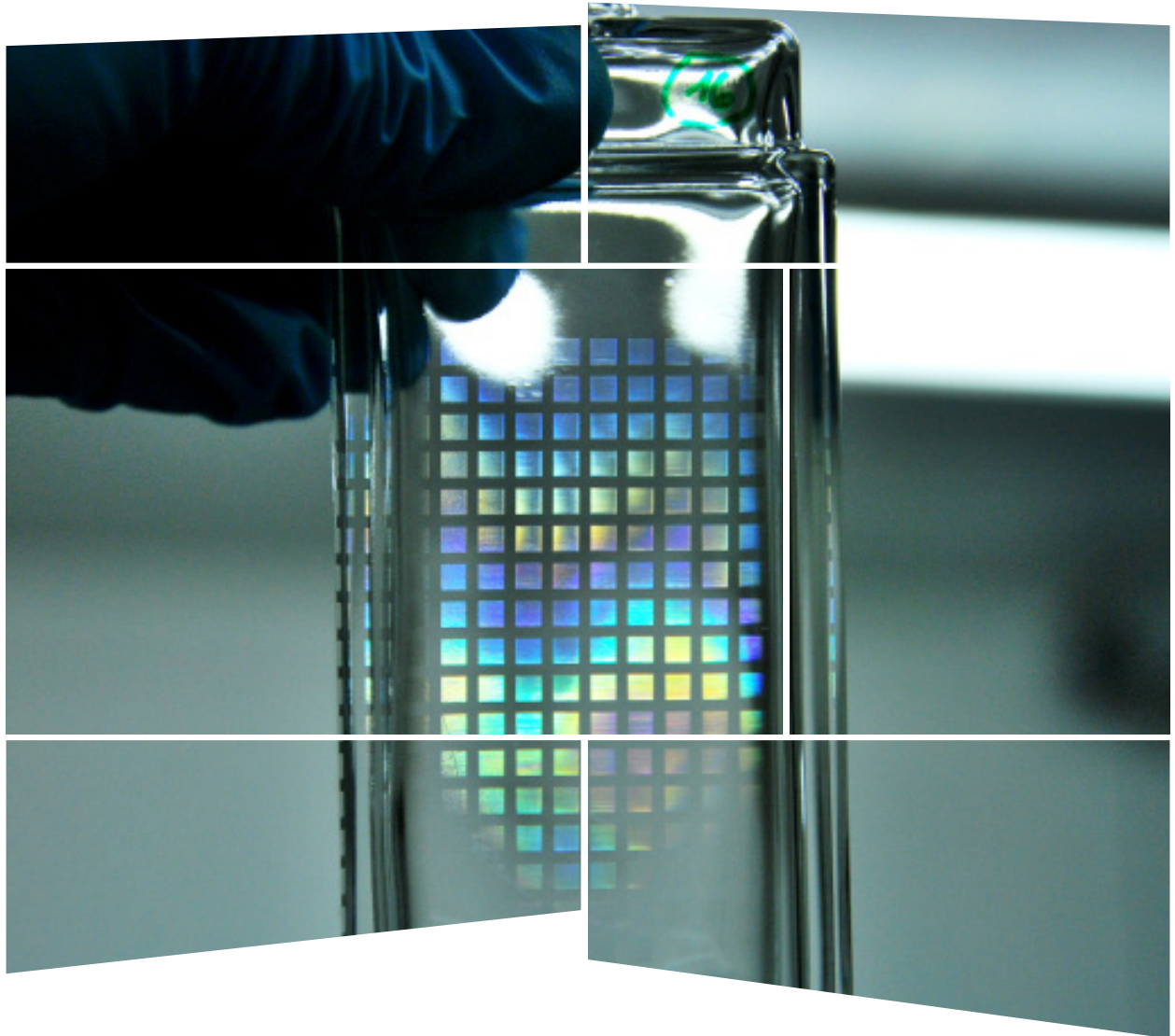


Intra-volume marking

Local modification of the refractive index in transparent materials



ALPhA **NOV**

Optics & Lasers Technology Center

Intra-volume marking

Local modification of the refractive index in transparent materials

Intra-volume laser marking makes it possible to locally modify the refractive index of transparent materials. This modification allows you to inscribe 3D patterns to functionalize or to create a decorative effect in the material.



Intra-volume marking



Intra-volume colouring of a doped glass

MATERIALS

- Polymer
- Organic glass
- Doped glass
- Industrial glass



BENEFITS

- Localized
- Dust free
- High 3D resolution
- Colour variation



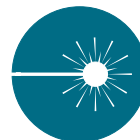
PERFORMANCE

- Variation in index up to 0.01 depending on the materials
- Precision of 1 μm in XYZ directions
- Custom 3D patterns



THROUGHPUT

- Processing speed: up to 100 mm.s^{-1} for index change
- Colouring process speed: 1.5 m.s^{-1}



LASER WORKSTATION

- Pulses: femtosecond, picosecond and nanosecond
- Wavelengths: infrared and visible
- Numerical aperture from 0.2 to 0.4
- DXF, JPEG implementation



SURFACE CONDITION

Unmodified surface



AREAS OF APPLICATION

- Phase mask
- Optical microscopy
- Ophthalmic optics
- Anti-counterfeiting
- Bottle making
- Watchmaking
- Automobile