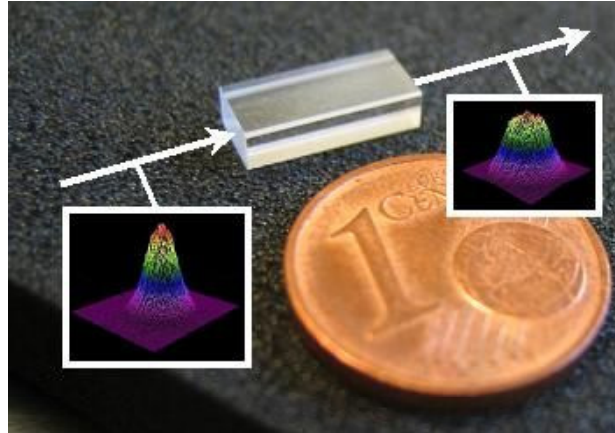


Laser beam shaping with only one element

For lots of modern laser applications the beam profile becomes more and more important. It means that a Gaussian beam sometimes is not the best solution any longer. Therefore the Gaussian beam often has to be transformed into another profile, which almost is a so called “flat top”. A flat top consists of a plane intensity profile with relatively steep edges, what is, for example, very helpful in material treatment or even data storage with laser beams. In the case of data storage it is important that the polarization states of the laser beam do not change. As the intensity peak of a Gaussian beam mostly contains twisted polarization states, a flat top would be much more suitable for this application. Up to today beam shaping is done either with diffractive or



MDT crystal transforms Gaussian beam into flat top under utilization of internal conical refraction

refractive optics. It is known that diffractive optics almost lead to intensity losses while refractive optics mostly consist of several single components, like a big number of micro lenses, whereby this product becomes quite expensive. The Vision Crystal Technology AG (VCT AG) from Germany

recently realized beam shaping with a small monoclinic double tungstate (MDT) element, which is specially oriented and cut for the effect of conical refraction. It means that under utilization of internal conical refraction within such a MDT element an incoming unpolarized or

circular polarized Gaussian beam can be transformed into a flat top or also other beam profiles. The resulting profile depends on the diameter of the incoming beam and the crystal length, so that for a given wavelength the desired beam profile will be achieved by either adapting the diameter of the input beam or the crystal length. Thus different beam profiles - from flat tops up to hollow light cylinders - can be generated. The required MDT material is directly grown, oriented, cut and polished by the VCT AG. As MDT is transparent from the UV to the near infrared region this kind of beam shaper could be interesting for many laser applications. Not at least it will be of much lower price than the mentioned conventional beam shapers.

Contact informations are on www.vct-ag.com.