Press Release
OPTATEC 2012

Jenoptik´s Optical Systems division with new Technologies at Optatec 2012

Jenoptik´s Optical Systems division presents at Optatec 2012 optical systems and components from its Optics, Microoptics und Optoelectronic Systems business units. The company also shows new Hybrid-DLC-Coatings, CaF_2 Microoptics and Anti-reflection coated polymer optics produced by innovative technologies.

Visit us at OPTATEC in Frankfurt, from May 2012, 22nd to 25th, in hall 3, booth B12. Our Team is looking forward to welcome you!

Hybrid-DLC Coatings for Infrared Optics

Jenoptik´s Optical Systems division will be presenting its new product line of multispectral Hybrid-Diamond-Like-Carbon (DLC) coatings. Jenoptik´s technology launches a new technology generation of environmentally highly resistant optical coatings and components. Jenoptik's newly developed Hybrid-DLC-coating unites lasting resistance with the clearly improved transmittance of a dielectrical coating (Fig.1).

This places Jenoptik among those few companies worldwide, which have the capability to manufacture customized IR windows of highest durability and lowest residual spectral reflection. A sophisticated design and production process makes it possible to minimize internal coating tensions and, hence, warrant the durability and adhesive power in accordance with such established testing standards as TS 1888 (Windscreen-Wiper Test).
This successful product line will be extended by hybrid filter coatings in the future.

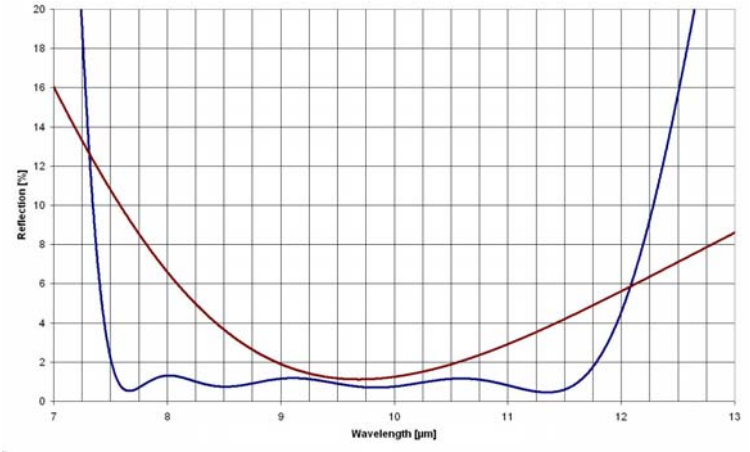

Figure 1: Anti-reflective coating of single-layer DLC coating (red) and Hybrid-DLC coating (blue)

In addition, these spectral properties can be achieved in two separate wavelength ranges (e.g. MWIR and LWIR). Multispectral coatings of this type provide users of coatings with new solutions in design and application. By way of example, Fig. 2 shows a multispectral Hybrid-DLC coating with optimized transmittance (Avg > 80%) between 2.7 µm and 11 µm.

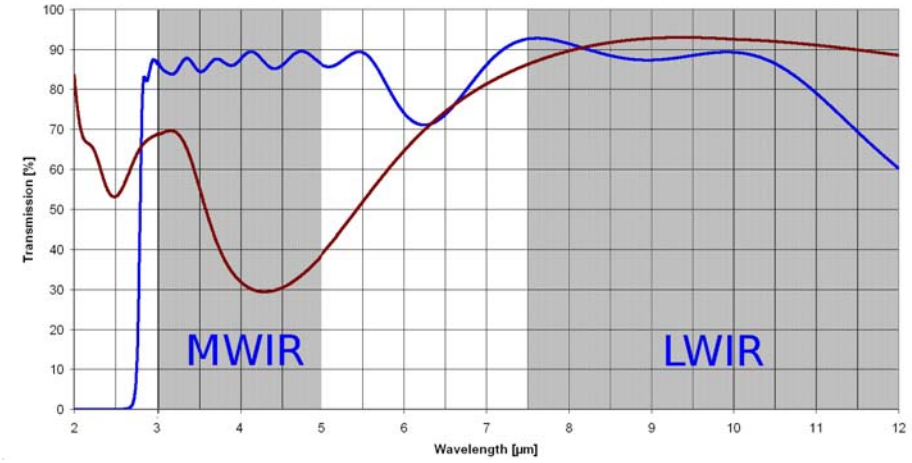

Figure 2: Multispectral anti-reflective coating of single-layer DLC coating (red) and Hybrid-DLC coating (blue)

Link to image database

Particularly interesting applications of multispectral and Hybrid-DLC coatings include optics for infrared systems of measuring, testing and monitoring systems for industrial, commercial and military applications.

Highly flexible manufacturing capabilities of DUV microoptics

At Optatec, Jenoptik is demonstrating it's highly flexible manufacturing capabilities for microoptical structures in CaF_2, especially for wavelength's in the range of 193-266 nm, presenting various CaF_2 homogenizer arrangements. With an advanced micro-structuring process in combination with grayscale technology and a sophisticated waferscale etching process, Jenoptik can fabricate customized refractive, diffractive and hybrid structures even with asymmetric shapes and radii. The advantage of this fabrication process is the generation of free geometries, as well as the accuracy and reproducibility of the microstructuring process. This enables a variety of beam distribution patterns and thus opens up new technical solutions where system performance of semiconductor manufacturing equipment needs to be optimized.

Homogenizers, such as microlens arrays or diffractive optical elements (DOE), are used in optical systems of semiconductor and flat panel display manufacturing and inspection equipment (e.g. wafer, mask and panel inspection systems, lithography systems for high precision fabrication of small structures).

Homogenizers play a prominent role in illumination systems and serve the well defined distribution of light over a particular area in a certain plane of the optical beam path. The optical and microoptical components used for this purpose also have to meet requirements for a long life time and optimum transmission for short wavelength high energy laser radiation. Compared to other optical materials, CaF_2 features a higher damage threshold and thus a better long-time stability of optical performance.

In addition, standard manufacturing processes are available for a range of different optical materials such as SiO_2, GaAs, GaP, Al_2O_3, ZnS, ZnSe, Ge, Chalcogenide, etc. Qualified testing at operating wavelength guarantees the quality of optical product properties.

By investing in a modern fabrication environment and specially trained professionals, Jenoptik is recognized as an important development and fabrication partner, offering support throughout the entire development and production process – from design work and prototype manufacturing to the point of serial production.

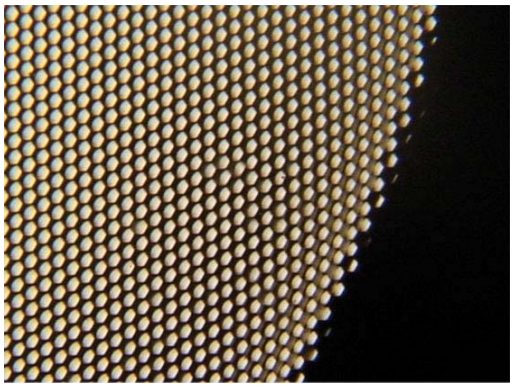

Figure: CaF_2 Refractive Homogeniser
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Anti-reflection coated plastic optics for images of higher contrast

Jenoptik is making its first presentation of polymer optics with an innovative antireflective surface coating to suit a multitude of applications at Optatec. One of the few vendors in this business worldwide, the Optical Systems Division puts the special AR-plas® plasma-etching process for plastic optical surfaces with antireflective properties to industrial use. The main advantage of this method is that it can equally be applied to plane parts and to strongly curved optical lenses or also to irregular structures such as diffractive, refractive microoptics or microlens arrays. Even with strongly curved surfaces, reflection is suppressed uniformly and in a color-neutral fashion up to the very edge, especially where the angle of light incidence is greater. The process thus yields an enhanced anti-reflection effect against conventional anti-reflection coatings, while requiring little time and cost for implementation.

In an AR-plas® process, high-energy particles create nanostructures smaller than 100 nm under vacuum. These nanostructures offer reflectance-diminishing properties. Because there are no additional optical losses due to the structured nature of their surfaces, the transmittance of AR coated optics is clearly much better, which facilitates images of higher contrast and free of noise impacts.

The AR-plas® plasma-etch process has been developed by the Fraunhofer Institute for Applied Optics and Precision Engineering in Jena to be productionized at Jenoptik. This achievement of the team of scientists has been honoured with the 2012 Thuringian Research Award.

Potential applications of AR-coated optics include display covers in car dash boards or covers for head-up displays, phone displays and medical-engineering applications like endoscopy or monitoring cameras.

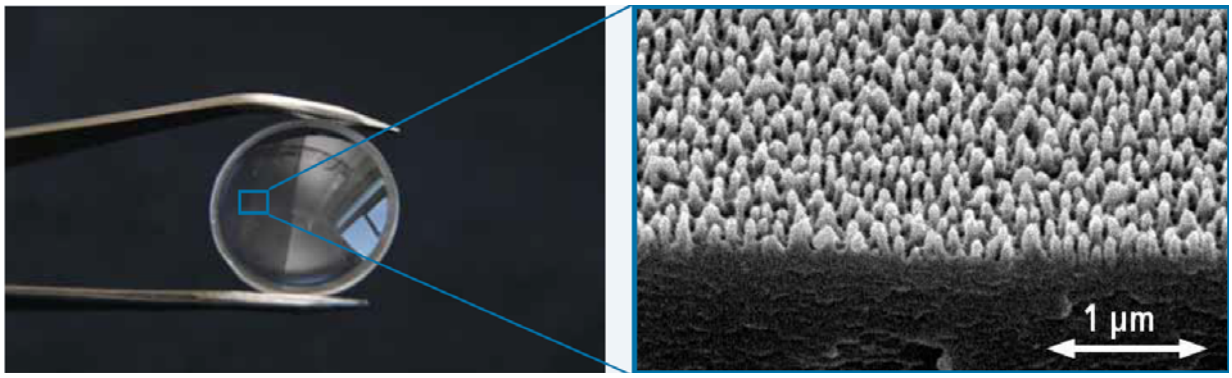

Image ©Fraunhofer IOF Jena: anti-reflective surface, view under the electron microscope
Link to image database

About Jenoptik Optical Systems division

Through its Optical Systems division, the Jenoptik Group delivers world class precision optics and systems designed and manufactured to the highest quality standards.

Besides offering customized systems, modules and assemblies, the Optical Systems division is a development and production partner for optical, microoptical and coated optical components - made of optical glasses, IR materials as well as polymers.
It possesses outstanding expertise in the development and manufacture of optics and microoptics for beam shaping used in the semiconductor industry and laser material processing.

The product portfolio also includes optical and opto-electronic systems and components for applications in defense & security, health care & life science, digital imaging, machine vision as well as lighting.

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