

The Trioptics building in Wedel, near Hamburg.



A focus on customers

Trioptics has been offering test and measurement solutions for optics for more than 15 years, as **Warren Clark** discovers

The quality of optics in any photonics project is as fundamental to that project's success as any other element. Inferior or poorly aligned optical components can jeopardise the operation of a system. The team at Trioptics know this very well, and the company has built its success on providing optical test equipment across a range of fields, including photonics. Its range of products provides manufacturers and integrators with the tools they need to ensure the highest possible quality in their lenses and optical systems.

Trioptics, based in Wedel, in north Germany, close to Hamburg, was started in 1992 by Eugen Dumitrescu, who remains general manager. He had previously worked for another company in the field of optical test equipment, but saw an opportunity to drive the sector forward by developing PC-controlled instruments for

industrial and scientific use. PC-based systems were in their infancy then, so at the time this was seen as a major step forward, as it opened up the flexibility offered by software, rather than relying on mechanical and visual methods. With CCD cameras becoming cheaper, the PC-controlled, contact-free optical test system was now feasible.

Dumitrescu's first products were autocollimation telescopes for optical alignment, for use with mirrors, prisms, lenses and so on. At the time, the most popular application for this was the manufacture of CD and DVD players, which were among the largest devourers of optics (now, of course, it is mobile phones). The test equipment would look for angular errors and irregularities, allowing manufacturers to implement quality controls on the optics.

One of the earliest products, the Optomatic, is still being sold today. It was one of the first systems to offer fully-automated one-button operation, enabling the rapid and objective characterisation of optical components. Optomatic's successor, OptiSpheric, comes in a range of specs, according to the needs of the application.

The majority of the company's business today still centres on testing for classical optics, though photonics does represent a significant – and steady – portion of turnover. As well as the OptiSpheric multi-function optical test stations, the product range includes: OptiCentric for centring error measurement, optical alignment and lens bonding; OptiAngle and TriAngle for angle measurement; ImageMaster for MTF testing; PrismMaster for prism angle measurement; Spherometers for radius measurement; SpectroMaster for measurement of the refractive index of glass; and WaveMaster for wave front measurement of aspheric lenses.

The range of customers Trioptics serves includes leading names such as Zeiss, Qioptiq and Jenoptik. Stefan Krey, technical director and assistant general manager, joined the company in 2000, having previously worked for Philips. He says that many Trioptics products are still considered the best available for photonics.

'We do a lot of business with laser optic manufacturers for measuring aspherical and cylindrical lenses, for example, and in particular for measuring the displacement of the asphere or cylinder axis,' says Krey. 'There is also a major trend towards miniaturisation, particularly in

photonics, and that means that in most cases such miniature lenses are manufactured in arrays. We have developed optical test equipment that can effectively measure such arrays with incredible accuracy. 'This is a big issue for the optics and photonics industry,' continues Krey. 'Lenses, and therefore tolerances, are getting smaller, and visual inspection is no longer sufficient. Now, one has to rely on software-assisted measurement, including resolution enhancement, in order to evaluate the quality and accuracy of the optics effectively.'

A further trend is the employment of aspheric lenses in the photonics industry, which enables optics to be made with less weight and reduces the level of imaging errors. The production of aspheres is improving continuously and will become even more important in future. Trioptics has reacted by adapting its existing products to the requirements of aspheres, e.g. for OptiCentric, an AspheroCheck module was developed that can be used for centration error measurement of aspheres. Totally new solutions and products have also been developed, like the AspheroMaster for the 3D topography measurement of aspheres.

Establishing an ongoing relationship with customers is very much part of the Trioptics philosophy. 'We are always open to customer-specific developments and requirements,' says Krey. 'Many photonics applications are very specific – you can rarely buy something off the shelf and carry out a measurement in exactly the way you want. Our team can help customers develop an instrument that does exactly what they need. Examples of customer-specific developments are instruments to measure the



The demo room at Trioptics.

'Lenses are getting smaller and so visual inspection is no longer sufficient'

end surfaces of laser rods or to measure very huge optics for space applications.

'We have access to a large spectrum of different measurement technologies. We have expertise through in-house software development, as well as skills in mechanical design. Combine all these elements and we can achieve rapid development of any solution for fast-moving markets and customer-specific applications.'

The rapidity of development has emerged as a result of the company's involvement in the mobile phone market, which represents a

major chunk of its business. The speed with which that market moves means that those providing contracted services need to be able to adapt quickly.

'Certainly our involvement here means we are very good at providing instrumentation for mass production environments,' says Krey.

The company has now grown to a staff of more than 40, with regional offices and affiliates throughout the world boosting that number. As well as the main office in Germany, there are Trioptics companies in France, China and Japan, with plans to open another in the USA this year.

Krey is keen to underline the company's international credentials. 'The move to establish an international presence was put in motion very early on in the life of the company,' he says. 'The French branch opened way back in the mid-1990s. With much of our business being with manufacturers of optical components, it was important for us to establish a geographical presence in Japan and China where most of this market is based.'

Krey concludes: 'There is nothing in the optics test and measurement business that we cannot do. The vast majority of the staff has engineering qualifications, many to PhD level. We have a broad range of different products that is able to satisfy any need, and because we listen to our customers' ideas, we are always at the forefront of new developments.'



The ImageMaster Universal for MTF testing in the whole spectral range.

TRIOPTICS GmbH

www.trioptics.com
Hafenstrasse 35-39,
22880 Wedel/GERMANY

Reprinted with permission from *Electro Optics*, August/September 2009