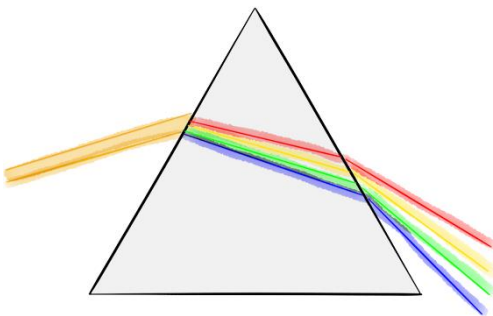


Quick, low-cost refractometer

Dispersion ascertainment for optical components

Invention

In optical component development, and especially for plastic lens systems, it is critical that material properties be known as precisely as possible – properties such as dispersion, or the frequency-dependent refractive index. But these material properties depend on such factors as manufacturing processes – on injection molding parameters such as temperature and pressure, for instance. Since quality requirements are very high in the mass production of smartphone cameras, optical



Dispersion in a prism

sensors for automobiles, and the like, material properties resulting from temperature and production parameters must be monitored.

The new method ascertains dispersion (refractive index wavelength dependency) with a simplified setup that features no moving parts and does not even have a wavelength scan. The resulting precision is lower than that of current commercial refractometers, but the movement-free setup and high measurement speed allow parameter studies that could not previously be achieved. Further information is available in the patent granted. (DE 10 2020 109 742 A1).

Commercial Opportunities

A major advantage is that the material properties are easy to monitor in production and work processes, so that the effects of preset production machinery on the final product's optical quality can be assessed. Large measurement series with lots of samples and various production parameters can also be used to create a robust material database – which could include a spectrum expanded into the IR range. This may also be commercially attractive to manufacturers.

Current Status

A functional prototype is currently being created. Initial simulation results have verified process effectiveness. The German patent has been granted (DE 10 2020 109 742 A1). Other total refractometer developments have been submitted for German Patent and Trade Mark Office registration. On behalf of the Hochschule Düsseldorf – University of Applied Sciences, we are offering interested companies the opportunity to license this technology and jointly refine it.

An invention from the Hochschule Düsseldorf – University of Applied Sciences.

Competitive Advantages

- Quick, low-cost measurement procedure
- Suitable for establishing a material database

Technology Readiness Level

1 2 3 4 5 6 7 8 9

Experimental proof of concept

Industries

- Manufacturers of optical measurement and manufacturing systems
- Lens and objective manufacturers
- Camera module producers

Ref. No.

5821

Contact

Martin van Ackeren
E-Mail: ma@provendis.info
Phone: +49(0)208-94105-34

