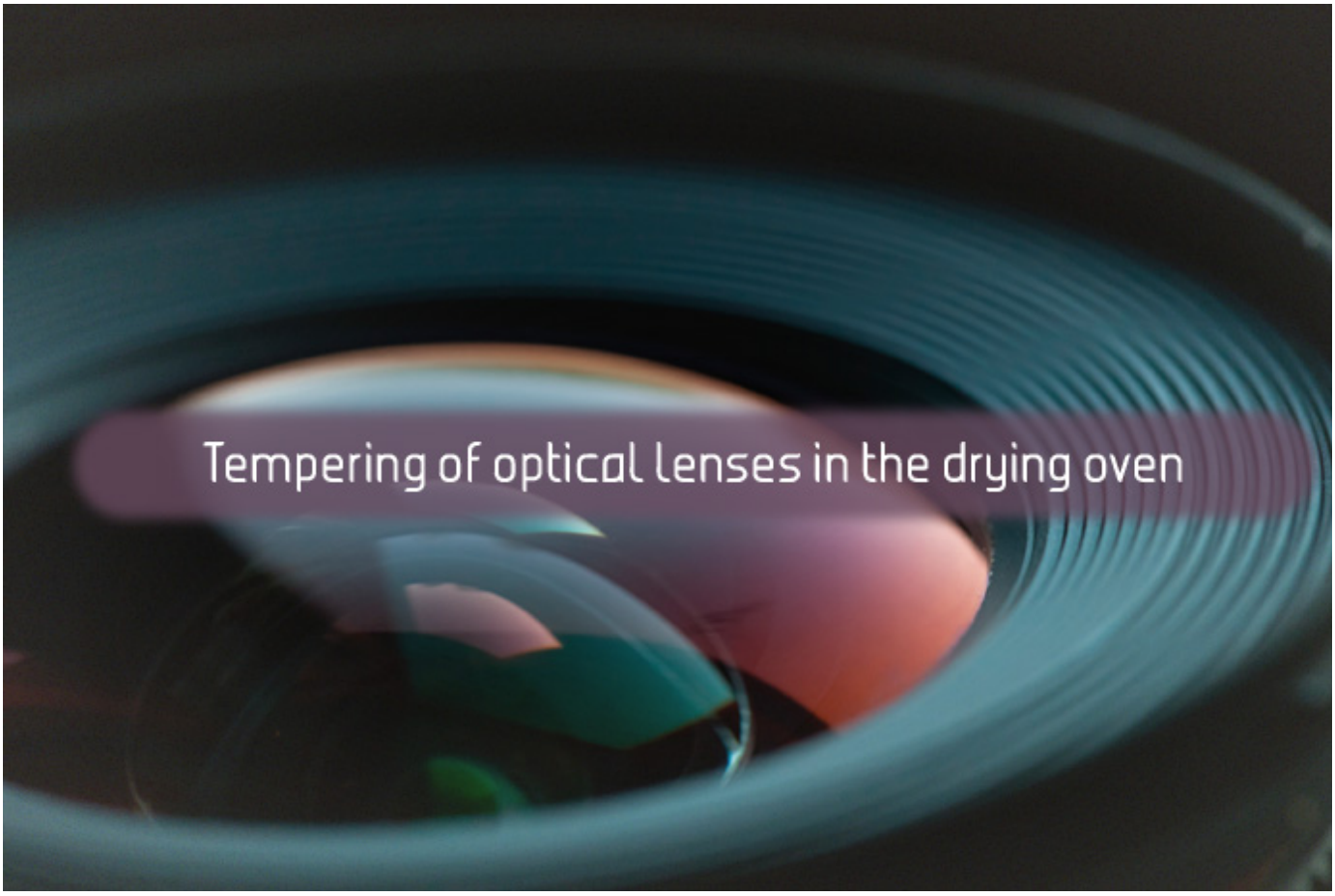

Tempern of optical lenses in the drying oven

The future of cameras, sensors, measuring equipment and other opto-electronic systems belongs to plastic optical lenses. The Nuremberg-based company UPT Optik Wodak GmbH has specialised in the development and manufacturing of these innovative optical components. After injection moulding, tempering is done in a Memmert cleanroom drying oven UFP 800 to increase form stability.

Optical plastic components are tempered and dried at UPT in Fuerth in a Memmert clean room drying oven

Over the last years, lower weight, miniaturisation, high resistance to breaking and the possibility to manufacture individual, complex forms in large quantities at competitive prices lead to plastics increasingly replacing glass in the manufacture of optics. While glass must be molten, burned and subsequently polished, plastic optics are produced with common methods like injection moulding. Optical components are used for ophthalmic optics, in opto-electronic systems such as scanners, in measuring

devices and optical sensors, but also in camera technology. The opportunity to manufacture freeform surfaces, i. e. surfaces that allow the surface geometry to be formed individually in contrast to symmetrical glass lenses, in particular opens a broad field for innovative applications. LED light systems, for example, can be used to illuminate certain surfaces since the light cannot only be refracted but also bent.

Tempering below the glass transition temperature

In order to defuse tensions in plastics, to increase form stability, to minimise the danger of crack formation and to degas undesired volatile substances, the plastic components are tempered for 24 hours in a Memmert drying oven after injection moulding and other processing steps such as coating. The average glass transition temperature of materials such as PMMA, polycarbonate, poly-cycloolefine polymers such as Zeonex or cycloolefine polymers such as Topas lies at 105 °C. If these plastics are exposed to higher temperatures for a prolonged period, they transform into a rubber-like, gooey substance. Tempering is thus done at temperatures between 90 and 95 °C, just below the glass transition temperature.

High user comfort

UPT GmbH is a certified manufacturer of medical products. In order to be able to dry and temper components for medical technology, they decided on purchasing a cleanroom suitable Memmert drying oven UFP 800. Viktor Götzinger, head of the coating department for plastic optics, appreciates his drying oven for its excellent controllability, its variable programming and the opportunity to log and read out the process parameters.

AtmoSAFE would like to thank UPT Optik Wodak GmbH and especially Mr Götzinger for their friendly support in creating this article.

Drying gold leaf

A manufacturer of gold leaf uses Memmert drying ovens to dry and store beaten intermediate material.

more information

An overview of the main topics

- Tempering of Plastics
- Drying of metal and plastic components
- Heating oven
- Drying oven
- Plastic optics
- Optical lenses, optical components

Laboratory equipment for tempering and drying

Oven (Drying oven) U
Cleanroom drying oven UF plus
Pass-through oven UFP TS
Vacuum drying oven VO
Cooled vacuum oven VOcool

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Autor: Memmert GmbH + Co. KG

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www.atmosafe.net > Applications > Tempering > plastic optics

Experts in Thermostatics