Intelligent Lighting Solutions

Polymer-based optical components in medical devices

iNNOVATION fORUM

Medical Technology

Tuttlingen, June, 23rd, 2009

Agenda

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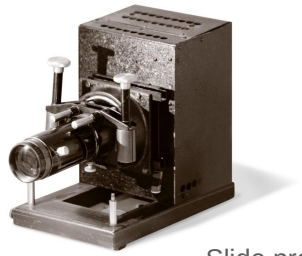
Summary

Company Profile

1928	Zett Projektion GmbH established for manufacturing of slide projectors
1982	Start of manufacturing of cold light sources for microscopy as expert location for projectors/lighting technology of Zeiss Ikon AG
1990	Business Unit responsible for development and manufacturing of slide projectors worldwide
2004	Independent company, established as ZETT OPTICS GmbH, focus on lighting technology applications in medical and laboratory technology, introduction of LED technology
2006	Finalisation of new focus on lighting technology applications for medical and laboratory technology. Establishment of scientific advisory council
2007	Certification in compliance with medical technology standard ISO 13485 (in addition to ISO 9001)

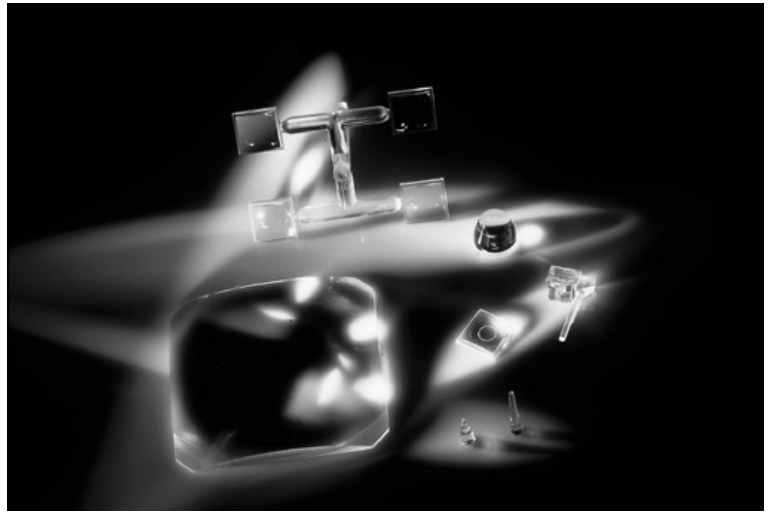


Slide projector in 1928

Applications

Current application fields

– Light-guides
– Lenses and reflectors for illumination
– Optical components for sensors
– Complete modules for operation field luminaries



Potential new applications

– Optical elements for single-use surgical instruments

Characteristics of Optical Polymers

- High transmission: up to 92 % (at 3 mm thickness, uncoated)
- Deformation temperature under load (0.45 MPa): 95 °C – 195 °C
- UL listing
- Biological compatibility:
  - Materials with ISO 10 993-1 / USP XXIII class VI certificate
- Sterilisation:
  - Autoclave to 143 °C, hot air, γ-radiation

Examples of optical plastics: COC, COP, PC, PMMA, PS, SAN

Optical Solutions

- Spherical and aspherical lenses
- Light-guiding elements
- Complex optical structures
- Embedded mechanical fixation

Optical element with 17 active surfaces

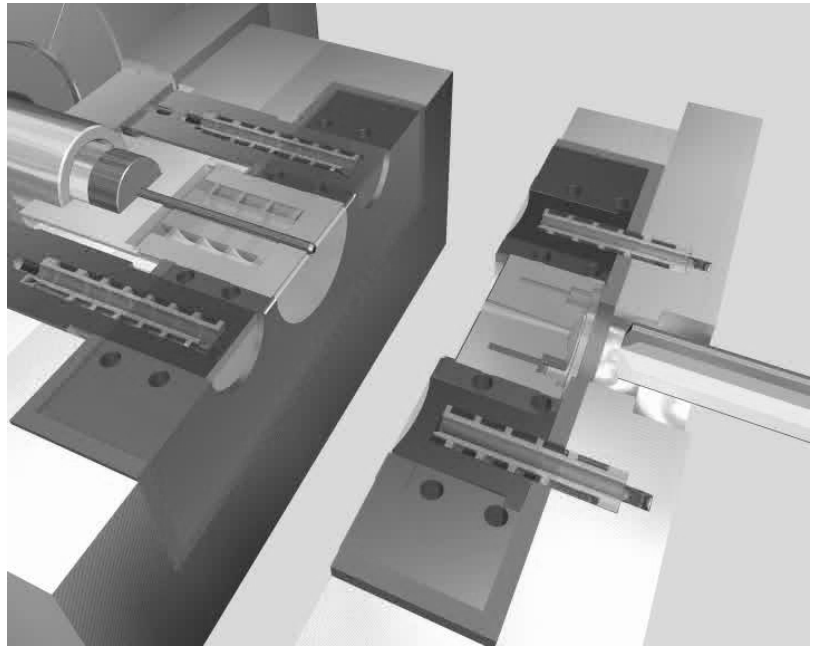
Core Technology: Injection Compression Moulding

Injection compression moulding - a development in cooperation injection moulding machine manufacturer Engel Austria GmbH and the Fraunhofer Institute for material mechanics.

Motivation:

- Improved dimensional stability
- Avoidance of birefringence
- More structured surfaces

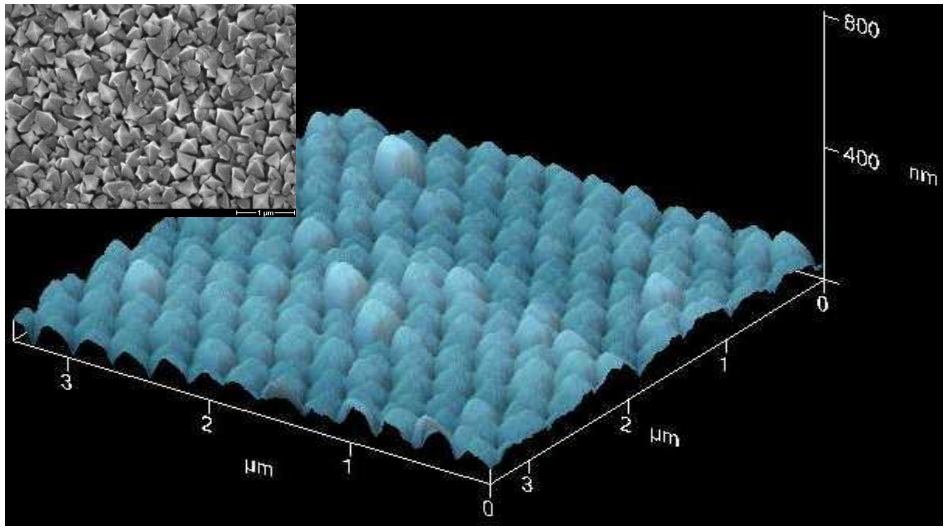
The process and machines were presented at the K 2004 trade fair in Düsseldorf



Injection Compression Moulding

Benefits

- Highest precision / low tolerances
- Low internal tensions
- Isotropic optical characteristics
- Low birefringence
- Without sprue, ready for assembly
- Microstructures applied during injection



ZETT OPTICS:
Your Partner for Plastic Optical Components

- Vertical integration
  (R&D, tooling, manufacture)
- Flexible tooling
- High-precision manufacturing technology
  (injection compression moulding)
- Cost-effective production
  (also for small and medium-size batches)
- Certification acc. to ISO 13485

Intelligent Lighting Solutions

Thank you for your attention