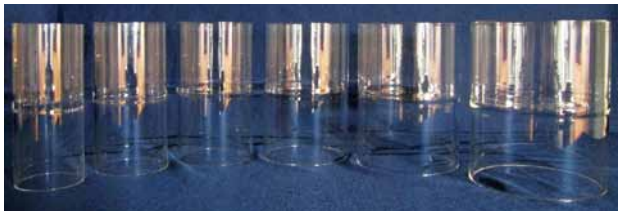
EXAMPLES

- laser-fused glass tubes
- d = 50 ... 100 mm
- t = 1.8 ... 3 mm



FURTHER APPLICATIONS

- chemical apparatus
- thermometer
- lamps etc.

PROJECT CONSORTIUM

ilis

advanced infrared cameras
IRcam

Kollektorfabrik

LZH
LASER ZENTRUM HANNOVER e.V.

ARNOLD GRUPPE

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The LZH is a not-for-profit research institute and focuses on:

- R&D projects in the field of laser development and laser applications
- Technical and scientific consulting to link research and practice
- Industry-oriented training of experts for applying and operating laser systems

Through the close cooperation between production engineers, material scientists, and physicists we find interdisciplinary solutions for all fields of laser applications.

LASER-BASED FUSING OF GLASS TUBES

- FOR SOLAR THERMAL COLLECTORS

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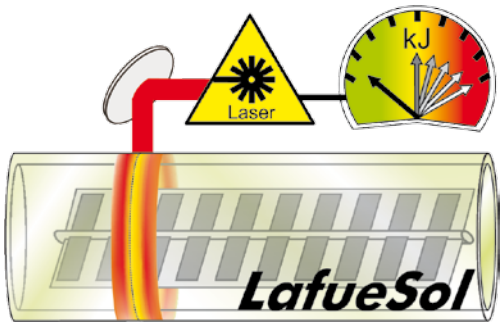
Energy efficiency I High productivity I Full automatable

LZH
LASER ZENTRUM HANNOVER e.V.

AIM OF THE PROJECT

Process and system technology for energy-efficient fusing of glass tubes.

- energy saving in the production
- automated fusing processes
- reduction of cycle time
- process reproducibility
- development of an online stress analyzer
  - reproducible stress level
  - optimization of tempering process
- adapted temperature field detection for glass



APPROACH

Efficient use of CO_2-laser radiation for glass tube fusing.

- applicable to all glass types
- only small amount of losses during heating
- no chemical influences to the glass
- no emissions during heating
- effective range of intensity / heating
- controllability / precision of the temperature
- process reliabilty

PROCESS SETUP

HANDLING

- automatic glass lathe

CO_2-LASER

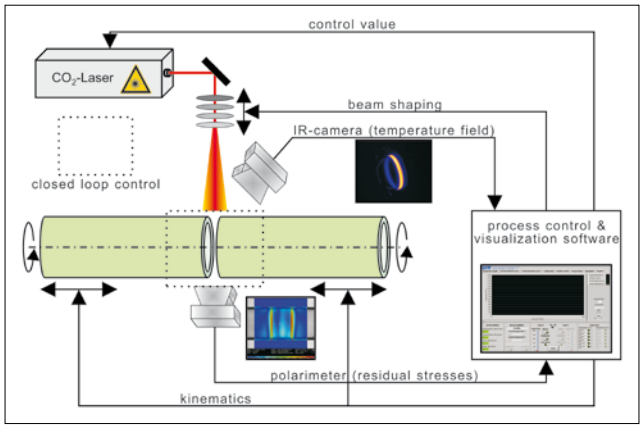
- λ = 10.6 µm
- P = 2500 W, cw-mode

IR-CAMERA

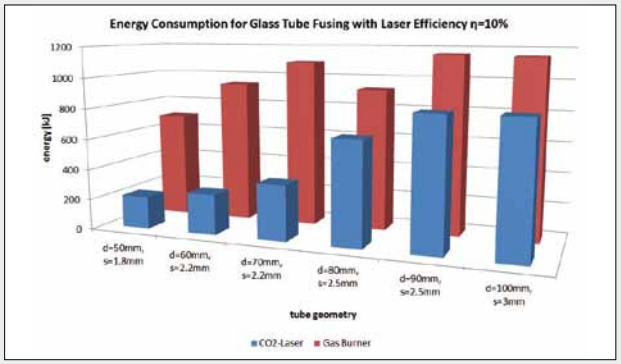
- control loop for temperature control

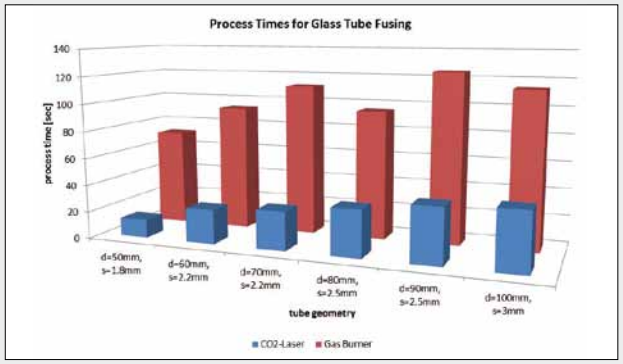
POLARIMETER

- online detection of stresses within the glass



RESULTS





RESIDUAL STRESSES

- adjustable stress level, f(d_{beam})
- position & amplitude