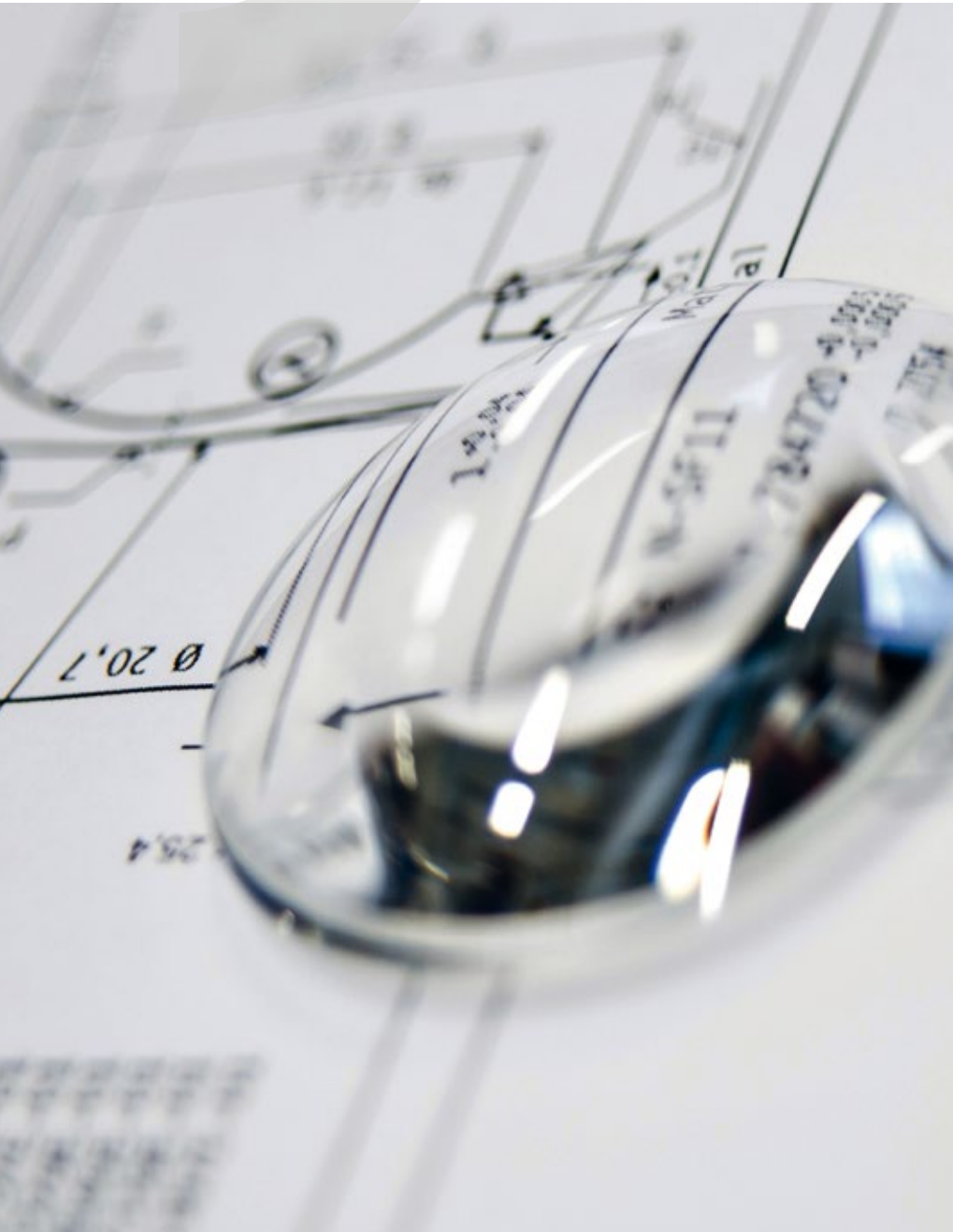


# OPTICS PRODUCTION



Senop is specialized in high-quality custom optics and optical components.

Our products are manufactured in Finland with high-precision, ranging from specialty quantities to large volume serial production with over 75 years of experience and expertise in optics.

We have complete in-house service and manufacturing chain from optical designing, measuring services and prototyping to completed devices.

Optical & Mechanical  
Design

Manufacturing  
& tooling

Assembly  
process

Complete  
Product

**SENOP**

# OPTICS PRODUCTION

## Production for aspherical, spherical and plano surfaces of different materials

- Fused silica
- Sapphire
- Zerodur
- Crystalline materials
- Optical glasses
- IR materials

## Specifications of aspherical optics

- Diameter: < 200 mm
- Local CC Radii: > 13 mm
- Form: > 0.3  $\mu\text{m}$
- Centering, ETD: > 3  $\mu\text{m}$
- Centering, Asph. decenter: > 3  $\mu\text{m}$
- Thickness tolerance: > 0,01 mm

## Specifications of spherical optics

- Diameter: < 200 mm
- Radii: > 2 mm
- Form: >  $\lambda/20$
- Centering: > 10"
- Thickness tolerance: > 0,01 mm

## Specifications of plano optics

- Dimensions: < 250 mm
- Form: >  $\lambda/20$
- Parallelism: > 1"
- Angle tolerances: > 1"

## R&D services for optics

Fast prototyping and delivery for test purposes

- Optical designing service
- 3D designing for precision mechanics
- Thin film designing services
- Environmental testing services
- Measuring services
- Capability for full system designs

## Coating services from UV to IR

Plasma Ion Assisted Deposition (PIAD) coating system with optical monitoring – hard coatings at low temperatures with all common used dielectric-, metal-, fluoride- and sulfidematerials.

## Examples of coatings

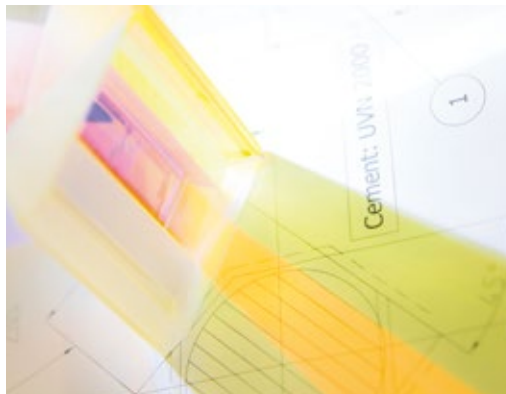
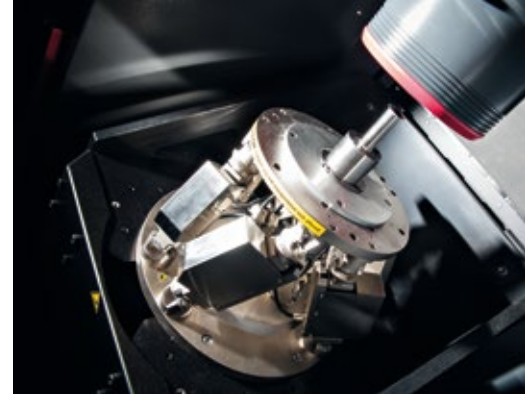
- Antireflective coatings
- Broadband filters
- Bandpass filters
- Metallic mirrors
- Dielectric mirrors
- Beam splitters
- Customized coatings

## Production of Subassemblies

- Assembly of systems – UV, VIS, NIR, LWIR
  - Gluing
  - Lacquering
  - Alignment
- System testing
- Documentation

## Quality measurement systems

- Interferometers
- Goniometers
- Autocollimators
- Spherometers
- Spectrophotometer
- 3D measurement system



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