

# TECHNOLOGICAL CAPABILITIES



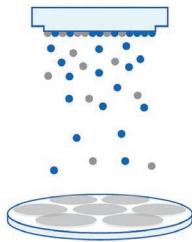
Altechna



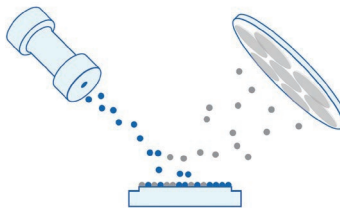
# Coating technologies

Altechna is equipped with various advanced in-house technologies for optics manufacturing, which fully cover the needs of a wide spectrum of customers. With over 28 years of accumulated know-how and a highly skilled team we are able to achieve impressive results in our custom-optimized optical elements and subassemblies.

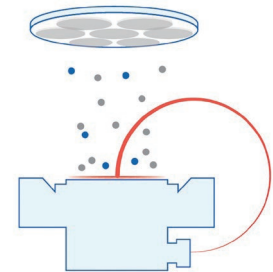
## Magnetron Sputtering



## Ion Beam Sputtering



## Ion Assisted Electron Beam Evaporation



### Key features

- Great solution for large coating batches (370 pcs. of 1" substrates)
- Outstanding spectral coating accuracy
- Low absorption coatings
- High contrast polarization coatings
- High performance bandpass and notch filters with over 200 layers or layers up to 20  $\mu\text{m}$  thick

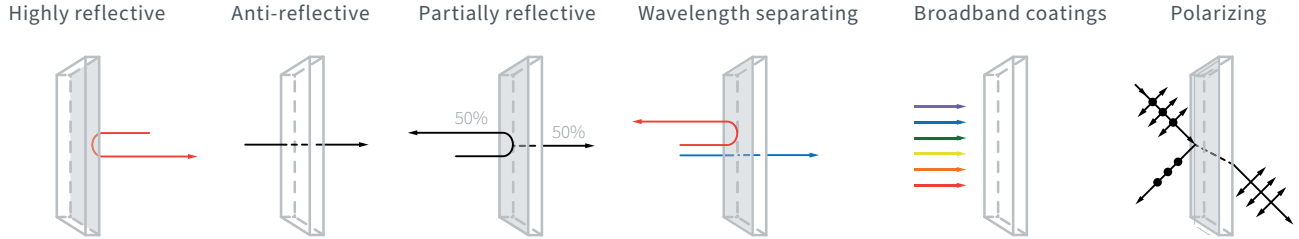
### Key features

- Complex and long lifetime coatings
- Very low absorption and scattering losses
- Very high spectral coating accuracy
- Stress-controlled by complementary processes
- Excellent stability and performance in harsh environments
- Exceptional LIDT: from ultrashort pulsed to continuous wave applications

### Key features

- Custom coatings design
- Low stress coatings
- Wide spectral range - from UV to IR
- High deposition rates
- Best cost-performance ratio
- Perfect solution for mass production (652 pcs of 1" substrates)
- Large area (up to  $\varnothing 300$  mm) coating

## Coating types



## Technology comparison

	MS	IBS	Ion assisted E-Beam
<b>Spectral range</b>	400-3000 nm	340-3000 nm	200-2600 nm
<b>Capacity 1**</b>	370	53	652
<b>Density</b>	Near bulk	Near bulk	Very dense
<b>Aging effects</b>	No	No	No
<b>Environmental resistance</b>	High	High	Mid
<b>Maximum reflectance</b>	>99.99%	>99.99%	>99.9%
<b>Minimum reflectance</b>	<0.1%	<0.1%	<0.1%
<b>Extinction ratio</b>	1:1000	1:1000	1:1000
<b>Price**</b>	● ● ○	● ● ●	● ○ ○

\* Maximum capacity varies depending on required spectral specifications.

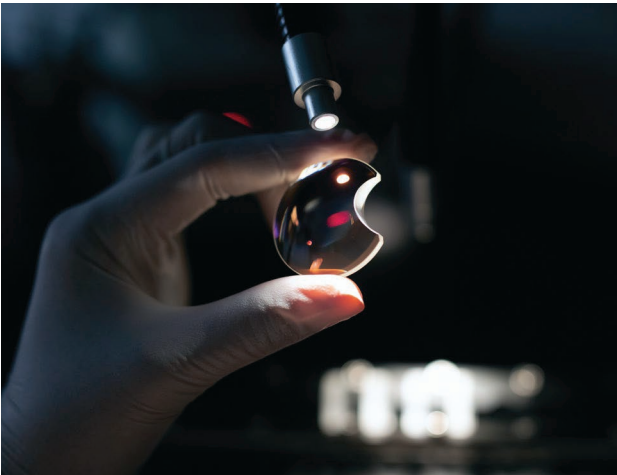
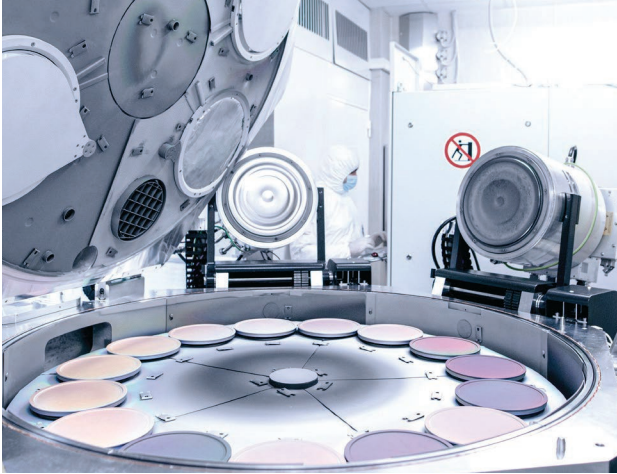
\*\* On a scale from 1 to 3. Number "1" marks the price as low.

## Spectral range by technology



# Magnetron Sputtering

Magnetron Sputtering (Bühler Helios 800 coater) ensures precise control of very thin layers at atomic scale, bringing you the top grade products and high yield.



## Performance

- Minimum reflectance <0.1%
- Maximum reflectance >99.99%
- Extinction ratio 1:1000
- Absorption <1 ppm

## Capacity

- 1300 pcs. of Ø12.7 mm
- 340 pcs. of Ø25.4 mm
- 80 pcs. of Ø50.8 mm
- 40 pcs. of Ø76.2 mm
- 10 pcs. of Ø101.6 mm
- 10 pcs. of Ø200 mm

## Spectral range

- 400-3000 nm

## Materials

- $\text{Nb}_2\text{O}_5$ ,  $\text{SiO}_2$ ,  $\text{Ta}_2\text{O}_5$

# Ion Beam Sputtering

Ion Beam Sputtering (Cutting Edge Coatings NAVIGATOR 700 coater) is the best option when extreme process control is required to achieve the highest lossless spectral performance possible in small volumes.



## Performance

- Minimum reflectance <math><0.1\%</math>
- Maximum reflectance >99.99%
- Extinction ratio 1:1000
- Absorption <math><1\text{ ppm}</math>

## LIDT

- >30 MW/cm<sup>2</sup> @ 1070 nm, CW
- >95 J/cm<sup>2</sup> @ 1064 nm, 10 ns
- >1.5 J/cm<sup>2</sup> @ 1030 nm, 500 fs

## Capacity

- 53 pcs. of Ø25.4 mm
- 11 pcs. of Ø50.8 mm
- 6 pcs. of Ø76.2 – 101.6 mm
- 3 pcs. of Ø101.6 mm
- 1 pcs. of Ø150 mm
- Coating and mechanical solutions for custom-shaped substrates possible.

## Spectral range

- 340-3000 nm

## Materials

- Al<sub>2</sub>O<sub>3</sub>, HfO<sub>2</sub>, Nb<sub>2</sub>O<sub>5</sub>, SiO<sub>2</sub>, Ta<sub>2</sub>O<sub>5</sub>, TiO<sub>2</sub>
- Materials mixture

# Ion Assisted Electron Beam Evaporation

Ion assisted electron beam evaporation (Bühler SYRUSpro 1350 coater) is excellent solution for mass production which produces excellent coatings at extremely competitive deposition rates for broad range of applications and wavelengths.



## Performance

- Minimum reflectance <math><0.2\%</math>
- Maximum reflectance >99.9%
- Extinction ratio 1:200

## Capacity

- 652 pcs. of  $\varnothing 25.4$  mm
- 160 pcs. of  $\varnothing 50.8$  mm
- 76 pcs. of  $\varnothing 76.2$  mm
- 36 pcs. of  $\varnothing 101.6$  mm
- 4 pcs. of  $\varnothing 200$  mm
- 4 pcs. of  $\varnothing 300$  mm
- Coating and mechanical solutions for custom-shaped substrates possible.

## Spectral range

- 200-2600 nm

## Materials

- $\text{HfO}_2$ ,  $\text{Nb}_2\text{O}_5$ ,  $\text{Ta}_2\text{O}_5$ ,  $\text{TiO}_2$ ,  $\text{ZrO}_2$ ,  $\text{SiO}_2$
- $\text{MgF}_2$ ,  $\text{LaF}_3$  (without IAD)



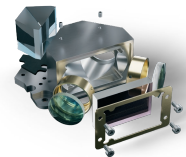
# Optomechanical assemblies

Altechna has opened a new chapter in its optical manufacturing journey: with an increase in demand for optomechanical and optical assemblies, the company is strengthening and expanding its service by introducing a new line – bespoke assemblies and subassemblies based on customers' designs.



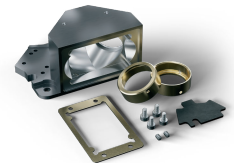
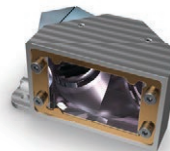
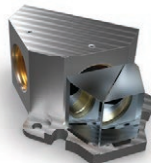
## Optical parts

- Prisms, waveplates, lenses and other glass parts optically contacted or cemented together.



## Optomechanical parts

- Optics mounted on various types of metal mounts and housings, either fixed or shifting.





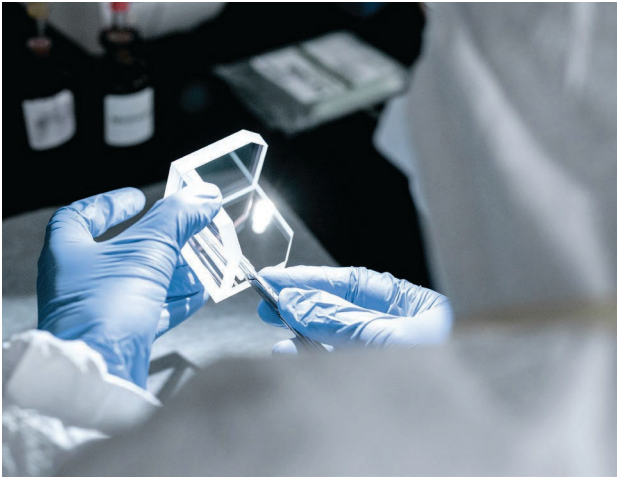
# Type of work offered

Altechna offers a variety of assembly and manufacturing solutions. Starting with exact build-to-print projects based on customer instructions, and ending with fully custom-designed solutions, these are tailored to fit the specific end-user needs.



## Any work is accompanied by

- Rapid reviews of project needs by a dedicated engineering team.
- A design-to-cost mentality.
- A clear information flow, strict deadlines, and full customer involvement.
- Quality control pre- and post-manufacturing, all carried out in-house.
- Full traceability of each manufacturing stage.

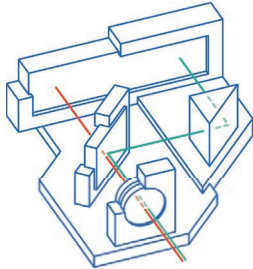


## Experienced team guarantee

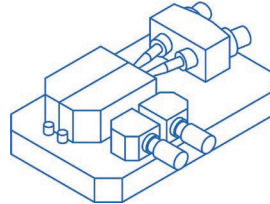
- Excellent tooling design, assembly processes and quality control all carried out in-house by experienced team.
- Experience working with a wide variety of metal, glass, and plastic materials.
- Strong emphasis on customer support to identify critical aspects of projects.

# Tailored to fit the specific end-user needs

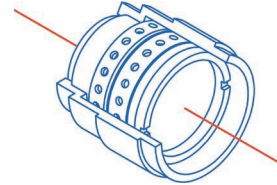
Complex optical and optomechanical assemblies



Custom tooling for serial production



Standard optomechanics



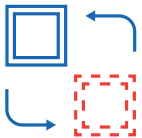
## Benefits



Time and resource saving



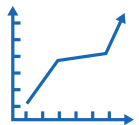
Space-saving



Pre-built and modules – ready to be incorporated into the system



Cost saving



Increased yield



Continuous post-manufacturing technical support

# Optomechanical assemblies

## Preparation

Dedicated engineers and project managers



## Special build-to-print dedicated team

- Mechanical and coating engineers solely responsible for the projects.
- Leading to a prompt assessment of the provided project data.
- Emphasis on communication: both during frequent visits and teleconferences.
- Both managerial and technical staff can communicate in English.

## During production

Made in EU



Complete traceability of the supply chain



Quality system



Customer involvement



## Reliability

- In-house production facility in Lithuania.
- Complete traceability of the supply chain.
- Flexibility in the production process: we are quick in implementing changes even for the ongoing manufacturing.
- Quality gates are implemented for each important step of the production.
- Complete dissemination of information, constant contact with the customer in all steps of our production processes.

## During production

Equipment dedicated to build-to-print projects



Staff training sessions



## Equipment and staff

- Equipment and premises are specially dedicated for build-to-print projects.
- Constant and repeated training sessions for our production staff.
- We are open to invest in and acquire the required equipment to ensure the smooth course of a project.

## Post-production

Trouble-free warranty process



Continuous post-manufacturing technical support



- All parameters described in the final item requirements are measured.
- The customer receives a quality warranty allowing them to be certain that they will be able to insert an item into their system directly after taking it out of the box.
- Continuous support: both managerial and technical support in a case where any issues occur.

# Equipment

In recent years, Altechna has strengthened by investing in areas of manufacturing, including a newly built cleanroom area and equipment as well as investing in team members' technical trainings.

## Our facilities include:

- 100 m<sup>2</sup> ISO 6 cleanroom working area.
- All the necessary equipment for optomechanical assembly work.
- A choice of various acrylic-based and epoxy adhesives.
- Custom measurement-system set-ups based on the final application.
- Experienced team of engineers and assemblers.

## One source

Altechna is your single source for all photonics solutions, reducing your supplier count to one.

## Established quality gates

After each manufacturing phase, all raw materials, sub-assemblies, sub-components, and parts are reviewed by the established quality gates.

The final optomechanical products leaving Altechna are of superior quality, pre-aligned, tested and certified in ISO 6 work areas.

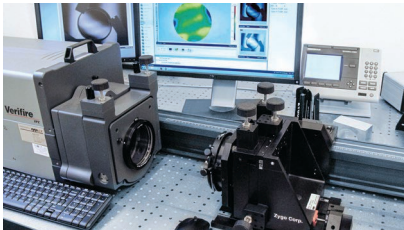
This leads to a reduction of your product's time-to-market to the bare minimum, and it is done with market-leading speed and quality that is second to none.



# Quality assurance

Our production capabilities, together with in-house quality control and a metrology laboratory let us offer top-notch quality and repeatability for each product we ship. Our goal is to ensure that after fabrication, every element passes the final steps of quality testing, such as those relating to shape, surface quality, surface figure, dimension tolerances, parallelism and spectral characteristics.

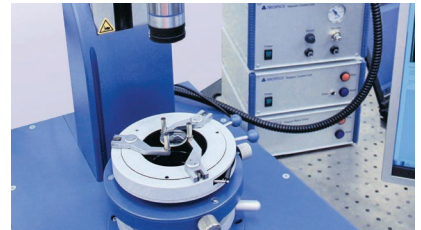
Interferometer



Goniometer



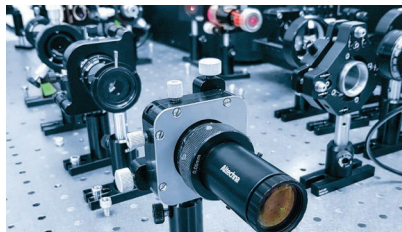
Spherometer



Dispersion measurement instrument



Set of CW lasers



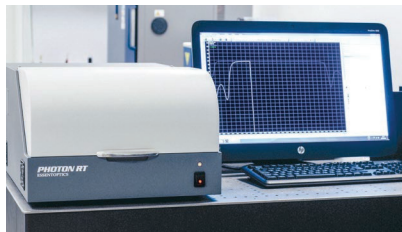
Temperature and humidity chamber



Surface quality inspection



Spectrophotometer



Automatic CNC vision system



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