Dear Partner,

The outside temperatures tell us that the summer has started! Hence, just before the holiday season, a brief update on the latest developments of Solaris Optics!
The core event in the last quarter, which consumed lots of our energy was the "Laser World of Photonics" Trade Fair in Munich, Germany. We start the newsletter with a brief documentary of the trade fair.
Apart from the trade fair, we cover among others:

- Successful ISO:9001 audit
- Our new corporate video & brochure
- Short interview with our Key Employee: Grzegorz Fluder, Production Development Manager
- Recent publications & a publication premiere: "Custom optics vs catalogue optics supplier"

Have a good read and a relaxing summer!

DEVELOPMENTS IN SOLARIS OPTICS

Solaris Optics participated in Laser World of Photonics in Munich, Trade Fair

On April 26-29 in Munich, Solaris Optics team participated in the trade fair on a joint stand with companies Dorotek and Vigo. The core team of - Ms Monika Rżysko, Operations Director, Mr Grzegorz Fluder, Production Development Manager, Mr Piotr Nowak, Sales Manager was supported by the presence of Mr Michal Muniak, our CEO, Mr Hanno Schmidt, Managing Director of Dorotek (our partner for DACH markets) as well as our colleagues from VIGO.

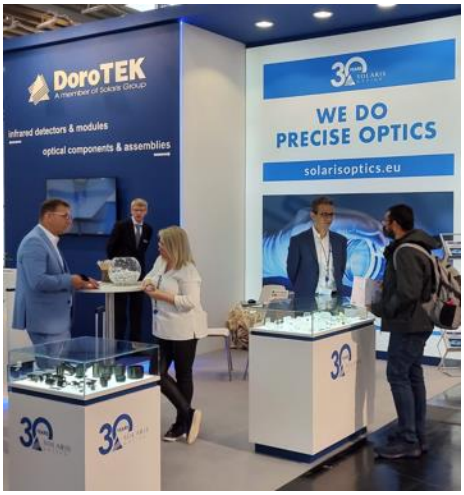
We had plenty of insightful client discussions on our stand as well as many assisting events.

We celebrated our 30-year anniversary with a glass of wine with our partners and visitors. Grzegorz gave a presentation during the European Photonics Industry Consortium EPIC's session on Photonics Applications titled "Applications of MRF Technology in Space-related Projects".

We indicated also our continuous support for Ukraine.

"*During 4 days of the trade fair, we had over 100 meetings, with clients and suppliers. With some. we are now in offering discussions or already started to realize orders. We gained also new distribution possibilities.*
We especially appreciated the direct contact, meetings, and possibility to learn from each other - something that has so much been missing in the last 1-2 years.
We also used this opportunity to learn about new optics manufacturing methods and concepts. The trade fair organization was in my opinion very good, the halls were organized thematically, which facilitated visiting.
To summarize - the trade fair was certainly relevant for us and the results we are already seeing!" – explained Monika Rżysko, Operations Director.

We would like to thank all visitors of our booth – clients, partners and friends! We are happy to continue discussions and looking forward to meeting you again at the latest at Laser World of Photonics 2023!



Successful ISO 9001: 2015 Certification Audit
In May 2022 we have been visited by experts from TÜV Rheinland and successfully audited to confirm our quality management system compliance with the ISO 9001: 2015.
"The organization has established and implemented an effective system to achieve its policy and purpose. The audit team confirms, according to the audit objectives, that the management system meeting the requirements of ISO 9001: 2015, is properly maintained and improving" says the report.

Solaris Optics New Corporate Video!
Please check our new corporate video, showing our company, production capabilities and quality processes as well as employees at work, accompanied with a chilling music! Two relaxing minutes to learn us better!

WATCH NOW!

Second Shift Opening
Along with new clients and growing order volumes from our existing clients we have been opening a second shift to better use our existing capacity!

Summer Shutdown
Solaris Optics planned yearly summer shutdown will start on Monday, **July 25 till Friday August 5, 2022**.

EMPLOYEES & KEY EMPLOYEE

KEY EMPLOYEE STAGE: Mr Grzegorz Fluder, Production Development Manager at Solaris Optics
In the Key Employee Stage, we introduce our colleagues by presenting their professional bio and asking 3 questions.

Professional Bio

Mr Grzegorz Fluder, graduated from the Warsaw University of Technology, Mechatronics Faculty, Specialized in Photonics. He was an active student, studied simultaneously at ITMO University, was a member of SPIE Chapter and participant of multiple scientific conferences. In 2016 he defended his master's thesis on "Design of low retrace error transmission sphere for Fizeau interferometer". He joined Solaris Optics already in 2015 as an Optical Engineer, taking care of the optical design, and supporting both clients and production colleagues. In February 2022 Grzegorz was promoted to Production Development Manager.

Mr Grzegorz Fluder Production Development Manager, Solaris Optics

Grzegorz, we are talking, 4 months after your promotion to Production Development Manager, what has changed in your responsibilities?
It definitely added more meetings to my schedule! Some part of the responsibilities stayed similar, including management of R&D projects, optical design or technical advisory to the other departments at Solaris. What has definitely changed is that now I am coordinating the work of four engineers who take care of different tasks at the company, among others preparing the technology for manufacturing of our products, technical support to the Sales department or operation of the MRF machine. I am also much more involved in the process of planning new investments to enhance our manufacturing capabilities.

Apart from daily work in Solaris you are also a PhD student. What are your main scientific interests?
In my PhD work, I am focusing on the design, analyses and tests of **hybrid telescopes consisting of both refractive and diffractive elements**. In this field, I can use a lot of experience that I gained from working on two projects that Solaris has been involved in. Because of that fact, the topic of designing and testing **hybrid optical components and systems** and the latest developments in that area is something that I've been following most closely over the past few years. I also like to follow the field of space exploration. But from time to time it is also interesting to read a paper from a field that is absolutely not related to what I am doing in my everyday life. For example, I have recently read a paper in which the authors found that mosquitos tend to be less aggressive and bite less when exposed to dubstep music.

The holidays are coming - how do you spend holidays?
As is often the case, I like to use the summertime for travelling. For this summer I have a trip to the lake with some high school friends planned. It will be fun to meet all of them. In August I might also visit a friend living in Portugal, I have never been there yet. Most summers I also go to some music festivals so I might do it again this year, although haven't decided yet which ones to visit. The plan for the next summer is to go to a Formula 1 race. I am a fan of that sport, so far I have been to a race in Hungary 3 years ago. In the past two years going to the races has been a bit more difficult due to the pandemic, some events got cancelled or were happening behind closed doors, but hopefully, I will be able to attend a Grand Prix in some interesting country next year.

NEW PUBLICATIONS

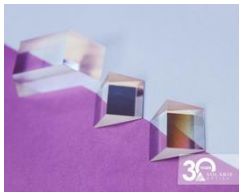
In the first quarter of 2022 our main publication was a **new company brochure.** We invite you also to check other articles!

New Solaris Optics Brochure!
A foreword from Michal Muniak, our CEO opens up our newest company brochure! The aim of the publication is to provide all relevant information about our company, including its size and structure, capabilities, clientele, target sectors and most relevant markets. We are happy to invite you to the electronic version of the brochure!

LEARN MORE

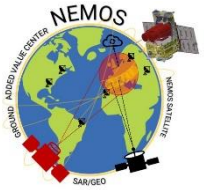
Spectrometer Prism – Typical Designs
Spectrometer prism is a core enabling element of optical spectrometry, which deals with wavelength spectrum analysis. An optical spectrometer deploys a dispersive element – a prism or a diffraction grating, to break down the incoming light into its wavelength components.

LEARN MORE



SWIR Lenses and SWIR Filters for Small Satellite
By the end of 2021 Solaris Optics became one of the 11 members of the "Novel Earth and Maritime Observation Satellite" project, acronym NEMOS. The project is carried out under the European Defense Industry Development Program - the first-ever EU funding program aimed at co-financing the development of defence solutions under cooperation projects.

LEARN MORE



Publication premiere:

CUSTOM OPTICS MANUFACTURE VS CATALOGUE OPTICS

Custom optics manufacture means the production of optical components, such as lenses, prisms, mirrors, etc. according to customer specifications, technical or application guidelines or other specific requirements.
Catalogue optics or off-the-shelf optics, compared to custom optics, are products that are purchased with predefined characteristics, where the customer shall take into consideration the specifications provided by the supplier.

We at Solaris Optics receive many inquiries regarding catalogue cards of products we manufacture. Such questions typically open the discussion about technical capabilities, however we realised that it is needed to explain the main differences between a catalogue supplier and a custom optics manufacturer. Hence we drafted an article to explain in more detail what to expect and what not to expect from a custom optics manufacturer. The contents have a form of discussion of the main advantages and disadvantages of catalogue and custom optics suppliers.

Custom optics manufacture - pros & cons

Both custom optics producers as well as catalogue optics suppliers complement each other and are successfully operating on the market. Some of the most known catalogue optics suppliers include e.g.

Edmund Optics or Thorlabs, whereas a good example of a custom optics manufacturer is Solaris Optics.

There are several good reasons to order optics from a devoted optics producer. The main advantages include:

- More flexibility when it comes to specifications - typically within its range of technical capabilities a custom optics manufacturer is flexible when it comes to its offered products, hence any inquiry within the manufacturing limits is a usual client case. Naturally one can never say that there are no limits when it comes to available specifications from a custom optics manufacturer. Any optics producer has its technical manufacturing limits which set the boundaries of what can be practically done - what materials and shapes can be processed, what thin film coatings can be deposited and what shapes, dimensions and surfaces can be measured.
- Own manufacturing facilities - typically a custom optics manufacturer is distinguished with its own production space, where the ordered products are manufactured; this allows clients to personally verify the production standards whenever needed, but also allows the manufacturer to adjust certain production standards for a given client when needed. This becomes especially relevant in the changing supplier paradigm, where the manufacturing is expected to be local or near as opposed to distant and price-prioritised.
- Economic competitiveness with increasing volumes - with lower volumes devoted optics producers are not able to compete against catalogue suppliers with a price. However, with larger volumes the cost structure of production and sales gets advantageous for optical components manufacturers; no intermediaries, as well as organisations, focused on production rather than sales & marketing allow the custom optics manufacturers to be fully competitive with price versus catalogue products.

The business characteristics of a custom optics producer brings, however, certain features, which can be seen as disadvantageous:

- Longer lead times - the necessity to process the inquiry, plan production, order substrates, manufacture and measure, makes it impossible for a custom optics producer to match the delivery times of catalogued products
- Limited possibility to manufacture small volumes - some custom optics manufacturers may find it difficult to execute small orders, such as 1, 5 or 10 pieces; such orders are usually a domain of off-the -shelf suppliers, as long as the predefined specs are suitable
- For small volumes higher production costs - with new product manufacture there are several costs to bear, e.g. design and purchase of product-specific tools for glass processing; when the volume is small, the production may come up uneconomical.

Catalogue optics - pros & cons

The advantages and disadvantages of catalogue optics as compared to custom optics are naturally mirroring each other.

Main advantages of catalogue optics:

- typically short lead time - usually the catalogue parts are available in stock, ready to send, so it is possible to get the needed parts within e.g. 3-4 days
- the possibility to order a single piece, but also larger volumes - the critical factor is oftentimes the possibility to order small amounts, e.g. 1, 5, 10 pieces, which is either not possible or costly from custom optics manufacturers; for higher volumes the situation may be a bit more complicated, as it may require production re-planning, so similar activities as typical custom optics manufacturers do
- competitive price especially at low volumes - while it takes several preparation steps to plan and execute a production process for a given component, for catalogue suppliers, all those steps are not necessary.

Nevertheless, some disadvantages of catalogue optics vendors include

- Limited specifications - it is possible to utilise the above-mentioned advantages as long as the product design assumptions can be adjusted to the already existing predefined specs in the supplier offer; this means component selection with optics catalogue and compromising on e.g. dimensions, spectral characteristics of the optical element or on the entire product final size and performance. Usually, catalogue optics suppliers try to adapt their warehouse offer to the most common market requirements, but this is not always possible.
- Unknown manufacturer - in many cases a catalogue optics supplier is actually a company that organises supplies and arranges sales, but is not a manufacturer itself; hence it has limited possibilities, or at least a longer way, to adjust the production to some specific requirements; this is oftentimes relevant when a customer seeks to place a larger order.
- Limited price competitiveness at larger volumes - with larger volumes the price advantage of catalogue suppliers starts to disappear, and the price can be higher as compared to an offer from a custom optics manufacturer.
- Limited flexibility - certain clients are interested to adjust not only the production process but also certain supplier operations standards; for a catalogue supplier, this may be either impossible or difficult to adhere to.

Custom optics or catalogue optics

Given the above brief analysis, there are several conclusions that can be drawn.
It is clear that as long as the developed optical product is of low volume or in the prototyping phase - it is economically advantageous to select a catalogue supplier for minimum costs and quick delivery.
When the needed product is of higher volumes then it is good to ask for offers also from custom optics producers.
For high-volume products, where the specs are beyond catalogue-available specifications it is likely that devoted optics suppliers will provide you with better offers and more flexibility than off-the-shelf suppliers.

While the above conclusions are in a majority of cases true, there are also other cases, where the answer is not obvious and the supplier selection will be case-specific. For instance, an order for 50-100 components can be economic from both a catalogue and a custom optics supplier. Perhaps in the most challenging situation are scientists or product developers who develop products which cannot accept compromises on optics specs. In such a case a custom optics supplier whose A - has the needed capabilities and B - has a suitable business situation to handle the inquiry shall be sought.

In the above article, we tried to explain the main differences between the two business models: catalogue supply and custom manufacture, looking from a customer perspective. We trust that with the time spent on reading the publication you will now save time on optics supplier or manufacturer selection. Should your choice be a custom optics manufacturer, kindly please consider Solaris Optics.

Solaris Optics is a custom optics manufacturer, based near Warsaw in Poland. We are happy to answer your questions!

Please also remember to follow our social media sites at Linkedin and Facebook!

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