

Applied Technology Review

APAC SPECIAL

ISSN 2836-5313
APPLIEDTECHNOLOGYREVIEW.COM
APRIL - 2023

**NANO
TECHNOLOGY**
E D I T I O N

Mr. Seiichiro Kitagawa,
President and CEO

LIGHTING THE
FUTURE WITH
NANO-OPTICS

NALUX



The annual listing of 10 companies in APAC that are at the forefront of providing Nanotechnology solutions and impacting the marketplace



NALUX

LIGHTING THE FUTURE WITH NANO-OPTICS

By Rachel Smith

Technology is advancing at an unprecedented pace, with high-speed data transmission, autonomous driving, and business process automation becoming essential. Photonics holds great promise for meeting these needs with a range of commercial and industrial applications that unlock the potential of next-generation products.

During the golden age of photonics, high-quality optical components played a significant role in driving the industry's success. However, as market requirements evolved, the need for compact, ultra-precision lenses has become increasingly crucial. This prompts the industry and business leaders to drive toward more precise optics, seeking the assistance of a reliable partner with hands-on experience in precision technologies to design, mold, and manufacture optical components, at scale.

A trusted name in the optical industry, Nalux has earned a sterling reputation in the fiercely competitive space by delivering turnkey solutions, from optical design to final products, all customized to a client's exact needs. It has relentlessly gathered in-depth expertise in various technologies, enabling it to make significant advancements in the space, study the true nature of optics, and realize ultra-fine processing in nanometers. Leveraging its decades of experience and expertise, Nalux has become a game changer in optics with its operation excellence passing the test of time, empowering it to align with dynamic needs and market paradigms.

In a world where speed and precision are the gold standards, Nalux is the go-to partner for businesses looking to excel in the photonics industry. Its expertise in designing, prototyping, manufacturing, and testing plastic and glass, ultra-high precision optical



Mr. Seiichiro Kitagawa,
President and CEO

elements is unmatched. The team's technical proficiency extends to precision lenses such as micro lens arrays, diffraction gratings, and free-form surfaces, making them ideal for a variety of applications such as automotive, optical communications, 3D sensing, LiDAR, and imaging.

"We are proud to be pioneers in the optical industry, co-creating the future of optical components with our clients," says Seiichiro Kitagawa, president and CEO of Nalux.

MASTERING THE ART OF INNOVATION

The roots of Nalux's innovative legacy go back to 1930, when Kitagawa's grandfather founded Kitagawa SeinosukeShoten, a salt packaging business. The team diversified its operations in 1960 to take a strategic turn toward plastic molding, which lead them to plastic lens molding. They were among the first to develop advanced injection molding technologies for plastic lenses, putting them at the top of the leaderboard in delivering products that meet everyone's needs. From basic goals to extreme dreams, Nalux is committed to the pursuit of perfection in fine processing and the science of light.

With its business model centered on the philosophy of lighting the way to the future with nano-optics, Nalux is pursuing trailblazing optical and processing technologies by engaging in joint research with academic institutes in Japan and overseas. One of Nalux's earliest innovations was the development of an optical lens for laser beam printers. These printers require a condensed light beam to operate at a constant speed, a task that was previously difficult with conventional spherical or aspherical lenses. Team Nalux identified this as a significant business impediment and responded with the first free-form lens and processing technologies, building lenses with three-dimensional surfaces without axial or rotational symmetry.

"We take pride in being the first to build this innovative f θ lens, which is a testament to our design and manufacturing capabilities and technologies," says Kitagawa.

The development of this free-form f θ lens has revolutionized the scanning optical systems industry. Laser printer manufacturers can use free-form lens to reduce the number of required lenses and make the system smaller and more affordable. Today, Nalux maintains its leadership position in f θ lens and does over a billion yen per year in business with this single technological product group.

Nalux's expertise in lithography technology has also enabled the development of optical pickups for CD,

DVD, and Blue ray disc drives. These tiny single optical elements can read and write three different wavelengths, utilizing beam-splitting and combining techniques. Nalux's technological breakthroughs have been the driving force behind their success, cementing their position as innovators in the optical industry.



THE "NALUX WAY" OF EXCELLENCE

Nalux's success story is built on a foundation of innovative technologies and a team of industry experts that they have onboarded over the years. With this winning combination, Nalux has become a one-stop shop for optics, serving clients, from R&D and design all the way to manufacturing and evaluation, all in-house. It excels at designing optical components, from geometrical to wave optics, with its best-in-class optical design capabilities to make client products reality. This is performed by a team of optical engineers, skilled and certified to design optical imaging, illumination, and scanning systems, all based on each client's unique requirements. The company can also provide optical design support for Diffractive Optical Elements (DOE) and Computer Generated Hologram (CGH), based on wave optics, with its proprietary optical design tool.

“ WE TAKE PRIDE IN BEING THE FIRST TO BUILD THIS INNOVATIVE F θ LENS, WHICH IS A TESTAMENT TO OUR DESIGN AND MANUFACTURING CAPABILITIES AND TECHNOLOGIES ”

In addition to optical design, Nalux focuses on advanced tool processing technologies, which enables them to design and build molds with zero defects and variations. It works closely with processing machine manufacturers as well as Physics and chemistry equipment manufacturers to incorporate the latest technological pieces into their capabilities, advancing their mold processing. In-house tooling technologies, including ultra-precision diamond turning and electron beam lithography, enable them to process micro and nano structures in the most efficient manner. The company's various simulation capabilities, such as mold flow, temperature, and structure analysis, help minimize defects in production, allowing the team to work out optimum designs early in the project.

When it comes to production, advanced production technologies ensure consistent production quality. Nalux can perform in-house mass-production of plastic and glass optics and modules or subassembly with their fully automated production system. The smart production system, managed by data collected from tools, molding machines, peripheral apparatus, in-line inspection, and metrology equipment, ensures high speed, energy-saving production. State-of-the-art metrology systems ensure high-precision product quality. Ultra-high-precision shape measuring machines and dimension measuring and evaluating machines support quality assurance with optical functions, creating dedicated functional evaluations according to needs and applications.

THE FUTURE IS BRIGHT

At Nalux, innovation is not just a buzzword, but a driving force that underpins everything the company does. As Kitagawa, one of the company's leaders, explains, Nalux is always seeking new avenues of sustainable growth while continuing to provide its clients with the highest-quality products that meet their needs.


One such need is the rapidly growing demand for LiDAR technology, which is becoming an increasingly important space sensor for advanced driver-assistance systems (ADAS) in automobiles. Nalux has risen to this challenge by developing a flash-type LiDAR with no moving parts that incorporates a wide-angle diffuser with a divergence angle of over 170°. This component uses a microlens array with a large tangential angle and a unique light extraction technology that

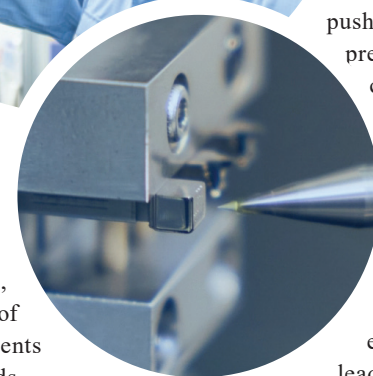
“ WE ARE PROUD TO BE PIONEERS IN THE OPTICAL INDUSTRY, CO-CREATING THE FUTURE OF OPTICAL COMPONENTS WITH OUR CLIENTS ”

optimizes the irradiation intensity distribution, increasing light intensity in the top hat and outer circumference, which are indispensable components for 3D camera.

Nalux's innovative spirit extends beyond LiDAR technology, as the company offers fabrication services for optical elements using lithography technology. It has implemented a unique patent strategy that provides clients with the assurance that they will not infringe on third-party patents. This strategy involves conducting a thorough patent survey starting from the optical design, which is a crucial step in studying patented technologies.

As a forward-thinking company guided by an unwavering management philosophy that revolves around the "Tricentennial Enterprise," Nalux is constantly pushing the boundaries of optics and precision. The company is deeply committed to enhancing its in-house capabilities, providing a solid foundation for the development of even more advanced technologies and products. By continually pursuing optics and nano-technology, its commitment to innovation and excellence has enabled the company to become a leading provider of high-quality optics solutions.

Through its cutting-edge technologies, expert team of industry professionals, and strategic patent strategy, Nalux is well-positioned to continue pushing the boundaries of optics and precision. As the company looks towards the future, it remains dedicated to delivering innovative products and services that exceed customer expectations and drive sustainable growth. 



Applied Technology Review

APAC SPECIAL

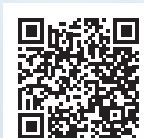
APPLIEDTECHNOLOGYREVIEW.COM

ISSN 2691-4069

NANOTECHNOLOGY
EDITION



AWARDED BY
**Applied
Technology
Review**



Applied Technology Review

Published from
(ISSN 2836-5011)
600 S ANDREWS AVE STE 405,
FT LAUDERDALE, FL 33301

www.appliedtechnologyreview.com