

NEWS RELEASE

Dec. 15, 2025

Translation

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Kohoku Kogyo Co., Ltd.
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Start of Sales of PLZT Single-Crystal Thin Film Wafers

～Contributing to Innovation in Data Centers through Optoelectronic Integration～

EpiPhotonics Co., Ltd. (headquartered in Yamato City, Kanagawa Prefecture), a member of the Kohoku Kogyo Group, and its wholly owned subsidiary, EpiPhotonics USA, Inc. (headquartered in San Jose City, California, USA), have begun selling single-crystal PLZT thin film wafers grown using a proprietary solid-phase epitaxial growth* method. This PLZT* thin film has an electro-optic effect* 10 times greater than that of LN* materials currently used in optical devices such as optical modulators. Furthermore, while polycrystalline PLZT thin films formed using conventional sol-gel methods have an issue with high optical loss due to scattering, EpiPhotonics' single-crystal PLZT thin films significantly reduce optical loss, resulting in high light utilization efficiency.

By leveraging these characteristics, Kohoku Kogyo has developed an ultrafast optical switch capable of nanosecond switching by using PLZT thin film as an optical waveguide, and this is expected to contribute to improved computing power and reduced power consumption in AI data centers and optical quantum computers. Furthermore, last year, by optimizing materials and processes, Kohoku Kogyo developed an ultrafast optical modulator with a baud rate exceeding 100G which is expected to contribute to the innovation of optical networks toward Beyond 5G and optical integration with silicon photonics devices (photonics-electronics convergence).

Thus, Kohoku Kogyo's single-crystal PLZT thin-film technology will be essential for the optical communications-driven society of the future which will require ever-increasing speeds and capacities. By starting sales of single-crystal PLZT thin film wafers and promoting collaboration with telecommunications equipment manufacturers and research institutions both in Japan and overseas, Kohoku Kogyo will contribute to the innovation of optical network technology. Those achievements were obtained partly under the contract with the Ministry of Internal Affairs and Communications' project "Research and development of advanced optical transmission technology for a green society."

<Overview of PLZT single-crystal thin film wafer>

Substrate Materials	sapphire
Wafer size	2 inch, 4 inch (thickness: approximately 500 μm)
PLZT composition *1	9/65/35
PLZT film thickness	100 to 2,000 nm
PLZT refractive index*2	2.438 (wavelength 1550nm) 2.446 (wavelength 1310nm)
PLZT electro-optic effect	> 100-150 pm/V

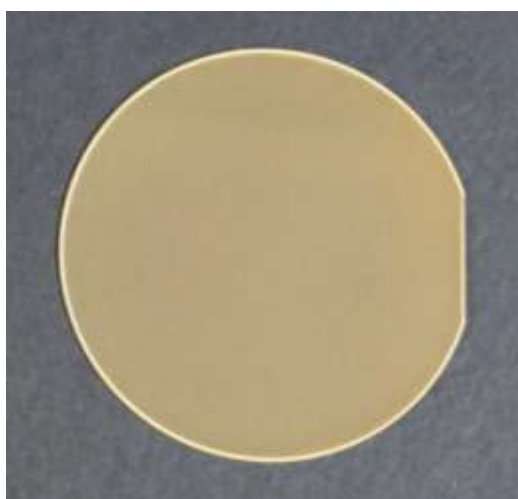
*1: Ratio of lanthanum (La), zirconium (Zr), and titanium (Ti)

*2: Change in PLZT refractive index when voltage is applied, picometer per volt

Kohoku Kogyo holds a dominant market share of over 50% in the optical isolator market, a key device for submarine cables. Beyond optical isolators for submarine cables, the company develops, manufactures, and sells various optical components and devices. These include optical circulators, optical filters, crystalline components such as Faraday rotators, high-purity quartz glass parts, and fiber/fiber array processed products utilizing quartz glass capillaries.

The optical communications market demands a dramatic expansion in data communication capacity to keep pace with the evolution of generative AI and IoT. We are advancing the development of photonics-related technologies to meet these needs. As the demand for faster and more power-efficient optical communications continues to grow, we intend to strengthen our development capabilities and enhance collaboration with industry-related companies to intensify our activities toward developing next-generation information and communication technologies.

<Single-crystal PLZT thin-film wafer (2 inches)>



*LN material: Lithium niobate. A material currently widely used in optical modulators and other applications.

*Solid-phase epitaxial growth: A method by which an epitaxial crystal are grown from a substrate surface after an amorphous thin film formation on the substrate rather than a conventional method growing thin film on a wafer in a vacuum.

*PLZT: An oxide of lead (Pb), lanthanum (La), zirconium (Zr) and titanium (Ti) that exhibits extremely high electro-optical effects by control of its composition and crystal orientation, and had been used practically as a nonvolatile memory material using its ferroelectric properties.

* Baud rate: A value that indicates how many times digital data can be modulated and demodulated per second.* Electro-optical effect: The effect that changes the refractive index by application of a voltage.

< Overview of Kohoku Kogyo Co., Ltd. >

Kohoku Kogyo Co., Ltd. was founded as a manufacturer of lead terminals for aluminum electrolytic capacitors in 1959, and later expanded into optical components and devices business in 2000. Today, lead terminal business accounts for 55% of sales, and optical components and devices business accounts for 45% of sales. In optical components and devices business, The Company has a 50% share of the market for optical isolators for submarine cables and has become a leading company in this field. In addition, The Company is advancing the commercialization of high-purity quartz glass business using the slurry casting method as a third growth business.

<Inquiries related to this news releasePLZT Single-Crystal Thin Film Wafers>

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