



News Release

February 20, 2024

Nippon Electric Glass Co., Ltd.

Nippon Electric Glass Starts Sample Shipment of All-solid-state Sodium(Na) Ion Secondary Batteries



All-solid-state sodium ion secondary battery (standard sample)

Nippon Electric Glass Co., Ltd. (Head Office: Otsu, Shiga, Japan; President: Akira Kishimoto; “NEG”) has started the sample shipment of all-solid-state sodium(Na) ion secondary batteries (“NIBs”).

The cathode, anode, and solid electrolyte of NEG’s NIBs are entirely made from stable oxides. They are firmly integrated by NEG’s proprietary crystallized glass technology to form batteries. NEG’s NIBs can operate in severe environments (–40°C to 200°C) and do not pose the risk of ignition or generation of toxic gases. They are innovative all-solid-state batteries using sodium, an abundant material for which there is no concern regarding resource availability.

The standard specifications of the products whose samples are shipped are 3 V and 200 mAh. NEG can also meet the individual needs of respective customers, such as higher capacity models.

NEG has steadily promoted the development of all-solid-state batteries since the successful operation at room temperature in 2017. Following the shipment of samples, NEG will start sales by the end of 2024.

■ Features of NEG’s NIBs (all-solid-state sodium(Na) ion secondary batteries)

Long operation at 3 V	NEG’s NIBs enable long operation at 3 V.
Operating temperature: –40°C to 200°C	NEG’s NIBs can drive industrial equipment and transfer large amounts of data even in severe environments, such as low and high temperatures and vacuum. The heat-resistant package can withstand the high-temperature range over 100°C (up to 200°C).

No risk of ignition or generation of toxic gases	Solid oxides characterized by excellent safety are used. There is no risk of ignition because liquid electrolyte is not used. There is no risk of generating toxic gases either because no sulfides, chlorides, fluorides, or the like are used.
Rare-metal-free	No rare metals, such as nickel or cobalt, are used.
High flexibility in designing batteries	The flexibility of battery design is high because it is easy to integrate and increase the area and capacity.
Chargeable with a low current	NEG's NIBs can be charged at a slow charging speed (trickle charged). Maintenance-free power generation and storage systems can be realized in combination with energy harvesting technology (which converts very small sources of energy into electricity for utilization).

■ **Expected applications of NEG's NIBs**

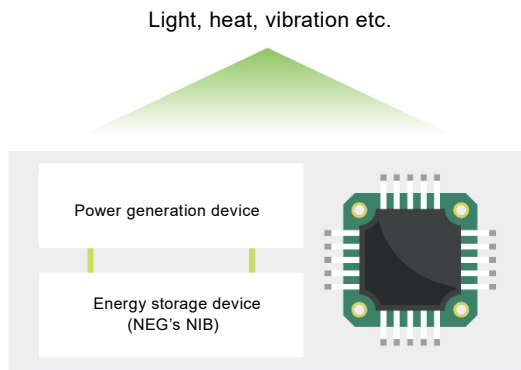
- Use under severe conditions, such as outer space (vacuum × low temperature), sea (high pressure × low temperature), and medical care (high temperature)



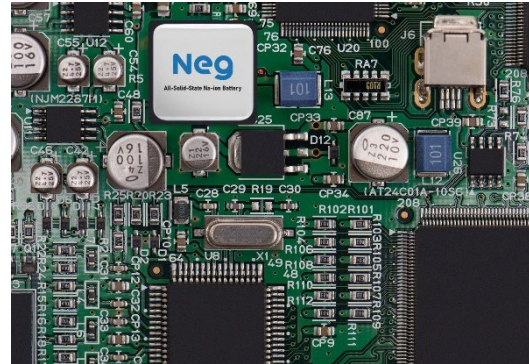
- Batteries for electronic equipment, mobility, and stationary use that require high levels of safety and flexibility in battery design



- Energy harvesting systems that use light, heat (temperature differences), vibration, etc. as energy sources



- Integration into electronic circuit boards: NEG's NIBs are not affected by reflow soldering at 300°C, making it possible to maintain stable charging/discharging characteristics.



*All the photos are images.