

October 1, 2019  
Nippon Electric Glass Co., Ltd.

## Establishment of a Joint-venture on LTCC Business

Nippon Electric Glass Co., Ltd. (Head Office: Otsu, Shiga, Japan; President: Motoharu Matsumoto; hereinafter, “the Company”) hereby announces that it has established LTCC Materials Co., Ltd., a joint venture, with Yokowo Co., Ltd. (hereinafter, “Yokowo”) with the aim of manufacturing and distributing Low Temperature Co-fired Ceramics (LTCC) (Note 1).

LTCC products are highly valued for their excellent electric characteristics (low dielectric and low electric resistance, etc.) and their capability to realize multilayer and high density wiring. Based on these characteristics, LTCC products are used in various applications such as LED packages, communication modules and probe cards (Note 2), as well as a wide range of fields including automobiles, communication devices and semiconductor processes. Therefore, market growth in the future is expected.

To date, the Company has been providing the market with high-quality powder glass and green sheets (Note 3) for LTCC. By combining the Company’s development technology for inorganic materials and production process technology that have been accumulated over the years, with Yokowo’s wiring design technology and LTCC’s manufacturing and processing technology and precision firing technology, we will be able to realize an integrated manufacturing system ranging from materials to LTCC products. We are determined to respond to the expanding global market through the provision of LTCC products of higher definition and higher density wiring.

The Company sets “Strategic investment” as one of the priorities of its Medium-term Business Plan “EGP2021.” The establishment of the joint venture represents its initiative to accelerate the expansion of optical and electronic device businesses through M&A.

### Overview of the joint venture

Name:	LTCC Materials Co., Ltd.
Location:	Tomioka City, Gunma Prefecture
Parties concerned:	The Company (Shareholding ratio: 70%) and Yokowo (Shareholding ratio: 30%)
Establishment:	October 1, 2019
Representative:	Akihiko Sakamoto, President
Capital:	315 million yen

<Overview of Yokowo Co., Ltd.>

Establishment: 1951  
Capital: 3.9 billion yen (as of March 31, 2019)  
Head Office: 5-11, Takinogawa 7-chome, Kita-ku, Tokyo, Japan  
Businesses: Manufacture and sale of automotive communication equipment, connectors for circuit testing and wireless communication device

Notes:

1. LTCC (Low Temperature Co-fired Ceramics): One category of multilayer circuit ceramics using silver or copper with low electric resistance as wiring. Due to their lower melting points, silver or copper are not suitable for application of the firing temperature (around 1,300°C) used with ordinary ceramics. Therefore, a multilayer circuit substrate, which is produced of special glass and ceramic materials, is needed to enable the ceramic to be fired at low temperature (around 900°C). LTCC are often used in automobiles which require heat resistance, and in communication devices which require downsizing and high performance through multilayered and high-density wiring.
2. Probe Card: A jig used for electric characteristic examinations of manufactured ICs and LSIs in the process of inspections of semiconductors.
3. Green sheet: Unfired sheets composed of powder glass and ceramic powder, which are formed with organic binder. The LTCC products are manufactured by stacking these sheets and co-firing them.