

INCJ to invest in LINK-US, Co., Ltd. **Company develops and manufactures ultrasonic complex vibration bonding equipment**

- LINK-US is a venture company which is the only company in the world which develops and manufactures ultrasonic complex vibration bonding equipment for industrial use
- Ultrasonic complex vibration bonding minimizes damage to materials by using elliptical vibration and preventing spatter
- Investment helps maintain and improve the global competitiveness of Japan's manufacturing industry through cutting-edge, innovative bonding technology

Tokyo, February 22, 2018 – Innovation Network Corporation of Japan (INCJ) announced today its decision to invest in LINK-US Co., Ltd. (LINK-US), a company that develops and manufactures ultrasonic complex vibration bonding equipment.¹ INCJ will invest a maximum of JPY400 million in growth capital and has invested JPY350 million.

LINK-US was established in August 2014 as a venture company to develop, manufacture and market ultrasonic complex vibration bonding equipment. It delivered its first machine in 2015 and has already received orders for mass production equipment from Japanese companies including leading battery manufacturers. Currently, LINK-US is in the process of further strengthening and developing the organization to further expand its business.

Bonding is a method of fusing materials through the application of heat or pressure. It can be subdivided into pressure welding, fusion welding (arc welding, etc.) and brazing (soldering, etc.). In contrast with these methods which melt either the target material or the brazing material, ultrasonic bonding technology bonds the same metal or the metals having different melting points without melting and does not require inclusions in the air (brazing material). Therefore, it is a very clean, low environmental load and natural bonding method. Another feature of the method is that the bonding strength is almost the same as the material, because it bonds without melting the material and is done at the atomic level. Recently, it is often referred to "bonding" in order to

¹ Ultrasonic complex vibration welding entails the welding of either the same or different kinds of metals, using ultrasonic vibration, with an elliptical vibration path as the core technology. It was invented by Jiromaru Tsujino, a former professor at Kanagawa University's Faculty of Engineering. The fundamental IP has been acquired entirely by LINK-US.

distinguish it from welding.

In ultrasonic bonding, metals are fused through the local application of ultrasonic vibrations and the friction created between the metal materials. The technique can be used to weld metals of the same and different types. Ultrasonic vibration removes oxidation coating and contamination at the joint surface – as the crystal grains approach the interatomic distance, a strong gravitational force emerges between the joining metals and a metallurgic bond is created. Ultrasonic bonding is superior in many respects to electric resistance welding, as spatter does not occur and there are no changes in material property such as an increase in resistance due to alloy layers. Previous bonding methods using one-dimensional linear vibrations had limited application due to issues including bonding strength and impact on materials – for example, it was only possible to join extremely thin metal plates and therefore use was limited.

With LINK-US' ultrasonic complex vibration bonding equipment, linear vibration ultrasonic waves are converted into complex vibration through a slanted slit conversion structure. With the elliptical trajectory, the vibration path can create constant and stable bonding strength. As a result, stronger bonding is possible from all directions compared to linear vibration bonding, and any impact on parts other than the bonding area will be limited. There are expectations that this can be applied in various areas. Only the cutting-edge chip is considered a consumable good, and LINK-US has received strong positive feedback from customers on its safety, running cost and quality. LINK-US is the only company in the world that develops and manufactures bonding equipment using ultrasonic complex vibration technology.

Bonding is a fundamental technology in the manufacturing industry and the further development of LINK-US' bonding technology can support the global competitiveness of the small, thin and lightweight products that Japan's manufacturing industry is known for. INCJ made the decision to invest growth capital in LINK-US as this bonding technique is increasingly attracting attention amid expectations of growth in lithium ion batteries and increasing demand for smaller and lighter products such as power devices.

INCJ has decided to invest in LINK-US, and will also provide continued management support through the dispatch of external directors, strengthening the organizational structure and through support of strategic partnerships, with the hope that LINK-US' innovative technology will contribute to improving the international competitiveness of the manufacturing industry, as Japan's core industries.

About LINK-US Co., Ltd.

Established: August 2014
Representative: Jun Mitsuyuki, President and CEO
Headquarters: Yokohoma, Kanagawa Prefecture
Business Outline: Development, manufacture and marketing of metal bonding equipment using ultrasonic complex vibration

About Innovation Network Corporation of Japan (INCJ)

INCJ was established in July 2009 as a public-private investment company that provides financial, technological and management support for next-generation businesses. INCJ specifically supports those projects that combine technologies and varied expertise across industries and materialize open innovation. INCJ has the capacity to invest up to JPY2 trillion (approx. US\$20 billion).

INCJ's management team is drawn from the private sector with diverse experience in investment, technologies and management. Through its Innovation Network Committee, INCJ assesses investment opportunities that contribute to industrial innovation in Japan in line with criteria set by the government.

Press contacts:

Innovation Network Corporation of Japan
Corporate Planning Group, Communications, Irie, Sakai
21st Floor, Marunouchi Eiraku Building
1-4-1 Marunouchi, Chiyoda-ku, Tokyo
Tel. (03) 5218-7202
URL : <http://www.incj.co.jp/>

Overview of new investment decision

Target: LINK-US Co., Ltd.

Established: August 2014

Representative: Jun Mitsuyuki, President and CEO

Headquarters: Yokohama, Kanagawa Prefecture

Business Outline: Development, manufacture and marketing of metal bonding equipment using ultrasonic complex vibration

Industry: Industrial Machinery

Commercialization Stage: Early stage

Overview of investment

Authorized Investment: JPY400 million maximum

Amount Invested: JPY350 million

Co-investors: Orient Corporation, Daiwa Corporate Investment Co., Ltd., Mitsubishi UFJ Capital, Co., Ltd.

Shareholding ratio: Not disclosed

Investment Structure Outline: See Appendix

Significance of investment

Supporting social needs:

- Issues with bonding technology such as product defects, contamination, and insufficient bonding strength due to spatter have driven demand for a new bonding technology.
- In addition to improving safety, LINK-US' technology offers promise for improving product performance in the manufacturing industry by enabling bonding without alloying and improving productivity with ease of maintenance.

Growth potential:

- As advances are made in EV and IoT, ultrasonic complex vibration bonding may emerge as a new bonding technology in the production of lithium ion batteries and products with smaller and lighter power devices, where future demand growth is expected.
- Sustainable business operations can be expected not only in equipment sales, but also in sales of consumable goods.

Innovation:

- LINK-US' ultrasonic complex vibration technology is the only technology in the world

available for industrial use.

- Investment in LINK-US can contribute to the improvement of international competitiveness of Japan's manufacturing industry by furthering the application of LINK-US' technology to resolve issues that previous bonding methods couldn't.

Target: LINK-US Co., Ltd.

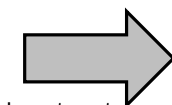
Business Outline: Development, manufacture and marketing of metal bonding equipment for either the same or different kinds of metals using ultrasonic complex vibration

Authorized Investment: JPY400 million (maximum)

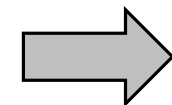
Date of Announcement: February, 22, 2018



Investment
Management
support
Dispatch of external
directors



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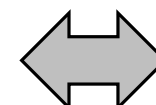
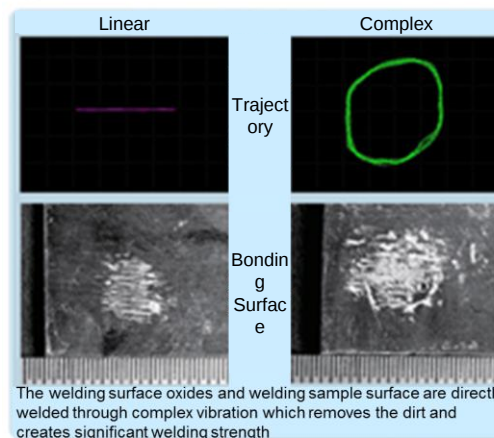


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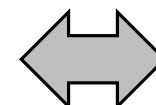
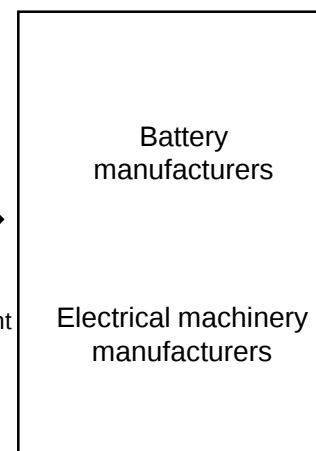


LINK-US Co., Ltd.

- Special surface treatment not required
- Energy saving as after-treatment not required
- Bonding possible at room temperature
- Short tact time



Joint
development
Equipment
supply



Joint
development
Business
collaboration



- Able to bond materials that were difficult or not possible to bond with previous technology
- Contribute to improving cost competitiveness and the quality of Japanese battery manufacturers in a competitive international battery market