



November 5, 2018

Press Release

## **Ball Wave Inc.**

Ball Wave Inc.—headquartered in the city of Sendai in Miyagi Prefecture and led by CEO Shingo Akao with the mission of revolutionizing the chemical sensing and the gas measurement—has raised 600 million yen in a round of Series-B funding to support business expansion.

Ball Wave Inc. was launched in November 2015—with support from the Program for Creating STart-ups from Advanced Research and Technology (START Program) initiative of Japan’s Ministry of Education, Culture, Sports, Science and Technology for fiscal year 2014 and the START Program initiative of Japan Science and Technology Agency for fiscal year 2015—to develop the *ball surface acoustic wave (SAW) sensor*, a revolutionary new sensor technology introduced by Tohoku University Professor Emeritus Kazushi Yamanaka and collaborators.

The international roadmap of the semiconductor industry, following rapidly-moving trends in device miniaturization and high-density integration, requires that the residual water content of material gases used in manufacturing processes has dew points of  $-100^{\circ}\text{C}$  or below. However, to date the only existing trace moisture analyzers with the sensitivity to detect such small quantities of water have been optical instruments, which are large and expensive, prohibiting their installation on manufacturing lines. This has created strong demand for small, high-sensitivity trace moisture analyzers with sufficiently rapid response to enable applications to the control of production lines.

Ball SAW sensors are high-speed, high-sensitivity gas sensors that exploit a phenomenon that seems to defy the laws of physics: long-distance propagation of SAWs on a spherical object. Trace moisture analyzers employing these sensors are capable of detecting moisture content at a dew point of  $-100^{\circ}\text{C}$  and are small enough (3.3 mm in diameter) to be installed on manufacturing lines for products such as semiconductors and lithium-ion batteries. Ball SAW sensors also offer promising potential for preventing damage due to dew condensation in natural-gas pipelines and liquefaction processes. In addition to Ball SAW sensors, Ball Wave Inc. is developing hydrogen gas sensors, palm-sized portable gas chromatographs, and other innovative gas-measurement technologies that will contribute to



realization of the hydrogen-based society of the future and to environmental safety and protection.

In this most recent funding round, Ball Wave Inc. has raised a total of 600 million yen — from Tohoku University Venture Partners Co., Ltd, Real Tech Fund, Daiwa Corporate Investment Co., Ltd., Mitsubishi UFJ Capital Co., Ltd., and SMBC Venture Capital Co., Ltd.— with the goals of **(1)** building a mass-production infrastructure for trace-moisture analyzers capable of responding nimbly to changing market demands, and **(2)** accelerating the development of hydrogen gas sensors and portable gas chromatographs.

**About Ball Wave Inc.**

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Capital: 437.08 million yen

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**Glossary of terms**

1. The *dew point* is the temperature at which a gas containing water vapor, cooled under atmospheric pressure, first exhibits condensation. A dew point of  $-100^{\circ}\text{C}$  at a pressure of 1 atmosphere corresponds to a moisture content of 14 ppb.