TANAKA
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January 8, 2014

Tanaka Precious Metals
Tanaka Holdings Co., Ltd.

Tanaka Precious Metals Commences Sales of High Heat-resistant Aluminum Alloy Bonding Wire on January 9

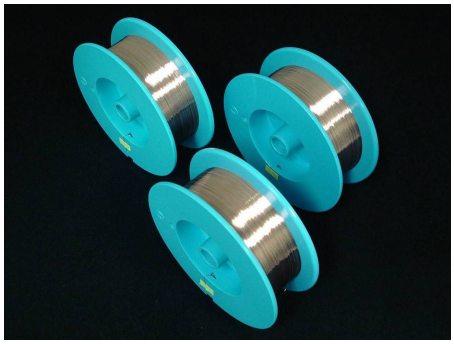
Mechanical strength is approx. 80% higher than the existing product, maintaining strength at high temperatures, supporting high heat resistance demand for power devices

Tanaka Holdings Co., Ltd. (a company of Tanaka Precious Metals, Head office: Chiyoda-ku, Tokyo; President & CEO: Hideya Okamoto) today announced that Tanaka Denshi Kogyo K.K. (Head office: Chiyoda-ku, Tokyo; President & CEO: Koichiro Tanaka) of Tanaka Precious Metals, which boasts the world's leading share in bonding wire (wiring material) manufacturing, has developed "TALF" aluminum alloy bonding wire with high heat resistance, and will commence sales on January 9.

In addition to mechanical strength being approximately 80% higher than the existing product, TALF can contribute to an increase in the heat resistance temperature of packages because of its recrystallization temperature 50°C higher than the existing product. Furthermore, although the existing product hardened and recrystallized in 30 minutes in the high-temperature shelf test (300°C) after bonding, resulting in shear strength decreasing by approximately 10%, TALF is not subject to a decrease in shear strength because recrystallization does not commence. Because of this, shear strength can maintain even at high temperatures.

Normally, bonding wire can prevent damage from thermal fatigue when mechanical strength is raised by hardening the material, but this simultaneously damages IC chip easily during bonding. TALF is an alloy containing 99% aluminum, and by optimizing the processing method using finer particles of aluminum crystals, the company succeeded in providing high strength and high heat resistance without damaging the chip.

Aluminum bonding wire is currently used as material for large-current semiconductors such as power devices. In recent years, there have been demands for development of high heat resistant materials as power devices have higher density, become more compact and have higher output, TALF can contribute to improve heat resistance temperature of packages. The features of TALF are as follows.



Appearance of TALF

- High mechanical strength

  TALF has improved mechanical strength by approximately 80% by optimizing the processing method using finer particles of aluminum crystals. The hardness of the cross-section of the wire contact after bonding is almost the same as the existing product, and does not damage the chip during bonding. This is due to an optimized material composition.

  * Comparison of Vickers hardness (Hv)

	TALF	Existing product
Wire cross-section Hv	25.1	20.0
Contact cross-section Hv	35.0	34.8

- High thermal fatigue strength

  In addition to mechanical strength being approximately 80% higher than the existing product, whereas the existing product has reduced shear strength due to early recrystallization in high-temperature shelf tests, TALF does not have reduced shear strength because it does not recrystallize due to the recrystallization temperature by 50°C and higher. This contributes to higher thermal resistance of power devices as the wire is able to suppress thermal fatigue damage in power cycle tests(*1) and thermal cycle tests(*2).

- Provides other excellent performances

  The bonding properties are the same as the existing product, enabling bonding under identical conditions. In addition, the corrosion resistance is the same as the existing product, and the wire has been confirmed no corrosion even after 1,000 hours in a pressure cooker test (PCT). Furthermore, despite having 99% purity, the specific resistance is almost the same as the existing product at 2.8 micro-ohm centimeters (μΩ・cm).

Tanaka Denshi Kogyo has a leading share in the global market for aluminum bonding wire, and has provided the existing product, TANW since 1988. TALF is the first new aluminum bonding wire product in 26 years. Tanaka Denshi Kogyo aims for TALF sales of 100 million yen per month in 3 years through the replacement of the existing product and the development of new demands.

Tanaka Denshi Kogyo has scheduled to exhibit TALF at the 15th IC Packaging Technology Expo to be held at Tokyo Big Sight (Koto-ku, Tokyo) for three days from January 15 (Wed) until January 17 (Fri). Technical staff will constantly be on-site in the exhibit booth (East 43-001) to respond to interviews.

(*1) Power Cycle Test: A test for evaluating the durability to thermal stress by raising and lowering chip temperature through repeated ON/OFF operation of power semiconductors.

(*2) Thermal cycle test: A test for evaluating the durability of materials to changes in temperature through repeated exposure of samples to high temperature and low temperature environments.

■Tanaka Holdings Co., Ltd. (Holding company of Tanaka Precious Metals)
Headquarters: 22F, Tokyo Building, 2-7-3 Marunouchi, Chiyoda-ku, Tokyo
Representative: Hideya Okamoto, President & CEO
Founded: 1885 Incorporated: 1918 Capital: 500 million yen
Employees in consolidated group: 3,895 (FY2012)
Net sales of consolidated group: 839.2 billion yen (FY2012)
Main businesses of the group:
Manufacture, sales, import and export of precious metals (platinum, gold, silver, and others) and various types of industrial precious metals products. Recycling and refining of precious metals.
Website: http://www.tanaka.co.jp/english (Tanaka Precious Metals),
http://pro.tanaka.co.jp/en (Industrial products)

■Tanaka Denshi Kogyo K.K.
Head office: 22F Tokyo Building, 2-7-3 Marunouchi, Chiyoda-ku, Tokyo
Representative: Koichiro Tanaka, President & CEO
Incorporated: 1961 Capital: 1,880 million yen
Employees: 151（FY2012）
Net sales: 32,323 million yen（FY2012）
Businesses: Manufacture of high-purity bonding wire (gold, gold alloy, aluminum, aluminum-silicon, copper, etc.)
Website: http://www.tanaka-bondingwire.com/

<About the Tanaka Precious Metals>

Established in 1885, the Tanaka Precious Metals has built a diversified range of business activities focused on the use of precious metals. On April 1, 2010, the group was reorganized with Tanaka Holdings Co., Ltd. as the holding company (parent company) of the Tanaka Precious Metals. In addition to strengthening corporate governance, the company aims to improve overall service to customers by ensuring efficient management and dynamic execution of operations. Tanaka Precious Metals is committed, as a specialist corporate entity, to providing a diverse range of products through cooperation among group companies.
Tanaka Precious Metals is in the top class in Japan in terms of the volume of precious metal handled, and for many years the group has developed and stably supplied industrial precious metals, in addition to providing accessories and savings commodities utilizing precious metals. As precious metal professionals, the Group will continue to contribute to enriching people's lives in the future.
The eight core companies in the Tanaka Precious Metals are as follows.

- Tanaka Holdings Co., Ltd. (pure holding company)
- Tanaka Kikinzoku Hanbai K.K.
- Tanaka Denshi Kogyo K.K.
- Tanaka Kikinzoku Jewelry K.K.
- Tanaka Kikinzoku Kogyo K.K.
- Tanaka Kikinzoku International K.K.
- Electroplating Engineers of Japan, Limited
- Tanaka Kikinzoku Business Service K.K.