

Interview— **Tetsuro Nishimura, Nihon Superior**

Nihon Superior (NS) was founded in 1966 when it began marketing unique flux products imported from the United States. The company made its mark on society by gathering the most advanced soldering and brazing technologies and products from around the world, and supplying them to companies in the metal-joining industry. A turning point for the company came when it started developing its own soldering materials, and with the success of its unique SN100C lead-free solder alloy, Nihon Superior has become a major player in the global market. To support the growing demand for its products, Nihon Superior has established manufacturing and sales centers in Japan, China and other Asian countries as well as the United States, and formed business partnerships with companies in other markets. Our editor-in-chief recently spoke with Tetsuro Nishimura, president, to gauge the company's thoughts on current and future issues.



There remain concerns about Japanese suppliers. How has the earthquake and tsunami affected Nihon Superior?

First, we at Nihon Superior extend our heartfelt condolences to all those affected by the Great East Japan Earthquake and pray that the region will soon be able to begin the rebuilding and healing processes.

Although some suppliers were affected after the earthquake disaster, they have recovered and now are able to supply as before. The quick recovery of Japanese manufacturers such as the automotive industry reminds us of its latent energy. We also have recognized that it is necessary to share some of this risk.

China has become a major influence of the world's economy. What do you see taking shape in China?

China is the most important market for us, thus our subsidiary in China is very important. We need to continue investing in our Suzhou factory to increase productivity, continue expansion and continue introducing more varieties of products. Moreover, depending on the situation, we like to examine business connections, including the investigation of OEM production in the area. Additionally, staffing, training and human resources recruitment as well as correspondence of local circumstances are important factors.

How does Nihon Superior address emerging markets such as Brazil and India?

We recognize that both areas are going to be attractive markets in the near future, although the scale of both markets remains unknown at this time. Local production for local consumption has been a hot topic for us. However, for local production, we need to consider the local law, local business customs and the local tax system. After reviewing this information, we can distinguish the method of local production, whether it is by ourselves, by licensee or by OEM.

Conflict minerals have become popular for tin suppliers since the passage of the Dodd-Frank Act. Is Nihon Superior concerned about the supply of tin?

From the standpoint of social compliance, we recognize that this is a subject that we need to take seriously. Since we have established long-term relationships with our suppliers, we do not foresee any problems with this issue. Of course, we offer our products with confidence for our customers' use. However, we will follow the audit

to the major tin smelters by EICC and GeSI.

Nihon Superior is building a product portfolio based upon SN100C. What trends do you see that NS's new product developments address?

SN100C is an epochal solder with the addition of Nickel that provides long-term reliability of solder joints. As a supplier of metal-joining products, it is our duty to provide high-quality products by researching the industry, government agencies and educational institutions. In the beginning stages of development of halogen-free product, trade-off with solderability was concerned. However, the latest version of our improved halogen-free products offer the same performance as conventional products contained halogen, and we continue to try to develop more useful halogen-free products. The "SN100C advantage series" is the concept of developing new products from not only solder, but also any joining material that has the effect of SN100C.

High-current applications such as solar and electric vehicles place performance and reliability demands on a solder alloy. What is NS doing for these markets?

We propose products based on the levels of performance and reliability that are necessary for high-current applications. Currently, there are some areas of study that are in progress with other companies. In 2010, one of the biggest Eco-car events—the "Global Green Challenge"—with a 3000 km course across Australia, the solar car used SN100C. The car successfully finished the event and was received the award for "Small Size Electric Car." This proves the reliability of SN100C under tough environmental conditions as well as its ability to endure high current electric power, hard vibration and shocks. Follow this event, we continue to promote high value metal-joint products that only Nihon Superior can produce for these industries.

Where do you see Nihon Superior five years from now?

The target sales amount of the Nihon Superior group is more than 300 million US dollars for our mid-term business plan. To achieve this target, we acknowledge that the following strategies are essential: continued globalization, new products, smooth relations and internal communication with our global licensees, and marketing. We set a goal and investigate people, goods and money continuously.

Area ratios of 0.40 and 0.48 with nano-coated stencils—

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(6 mils). The paste deposit height shows the same height as the stencil thickness, in particular 150 μm . The diameter of the paste deposit is $d=220 \mu\text{m}$; the theoretical diameter of the stencil aperture is $d=215 \mu\text{m}$. The deposit shape is uniform and constant over the whole printing process.

Conclusion

Nano-technology is now in use in all fields of industries. Special sol-gel processes are widely spread to create surfaces with specific functional properties. Permanent hydrophobic finishes avoid adhesion, range from skillets to nano-coating on chip level. Hydrophobic finishes on stencils make it possible to solve the big conflict in stencil printing. Hydrophobic walls of apertures are no longer clogging. Particles from the solder paste don't adhere and can no longer reduce the transferred amount of solder paste.

The results

- Better transfer efficiency = significant lower failure rate on the SMD line.
- More flexibility in stencil design. On condition of a reliable aperture, filling area ratio values of 0.4 can be realized.
- Usage of nano-coated stencil offer a more uniform deposit shape and lower variances in transfer efficiency = more robust process. The bottom side stays longer clean without solder paste contamination. No smearing around solder paste deposits = less solder bridges. Less solder paste contamination = less cleaning materials—cost saving and environment protections without additional costs.
- Reduced cleaning frequency = better utilization of the whole SMD production. With an integrated holistic manager view, the slightly higher costs of nano-coated stencils outbalance cost savings in production and quality costs.