

High-Performance Solder Materials

SMIC Steps up Solder, FA Offering for Automotives

SMIC IS OFFERING SOLDER PASTE THAT CONTRIBUTES TO ELIMINATING VOID AND RESIDUE DURING SOLDERING, WHILE THE VACUUM REFLOW OVEN REMOVES FLUX RESIDUE OF DEVICES AND PROMOTES HIGH RADIATION PERFORMANCE.

In-car application areas

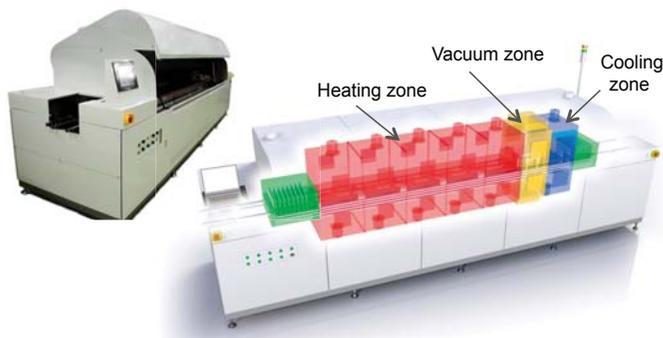
Senju Metal Industry Co., Ltd. (SMIC) has been putting strength into the development of solder materials and factory automation (FA) equipment for automotive application. SMIC has achieved void free and residue free soldering using the NRB Series solder paste and the SVR-625GTC vacuum reflow oven for the mounting of power devices, enabling devices without flux residue and with high radiation performance.

SVR-625GTC Vacuum Reflow Oven

SVR-625GTC is capable of controlling the degree of vacuum at the optimum melt state of solder, enabling suppression of splashing, and void occurrence rate of 1 percent or less.

NRB Series Solder Paste

The NRB Series suppresses the occurrence of voids through



SVR-625GTC vacuum reflow oven

For power devices

- Residue-free solder paste NRB Series
- Solder preform containing Ni balls
- Solder paste containing Ni balls

For automotive mounting

- Soft residue flux cored solder & solder paste MACROS Series

FA equipment

- Vacuum reflow oven SVR-625GTC
- Ultra-high-temperature-specification reflow oven SNR-615

For ECUs

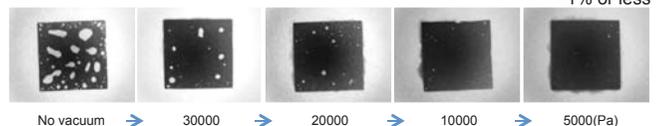
- Alloys with thermal fatigue resistance M794 M758
- Alloy with thermal fatigue resistance & drop impact resistance M770



the adoption of non-rosin-type flux, and at the same time has achieved ultralow residue by vaporizing 95 percent or more of flux in the reflow process.



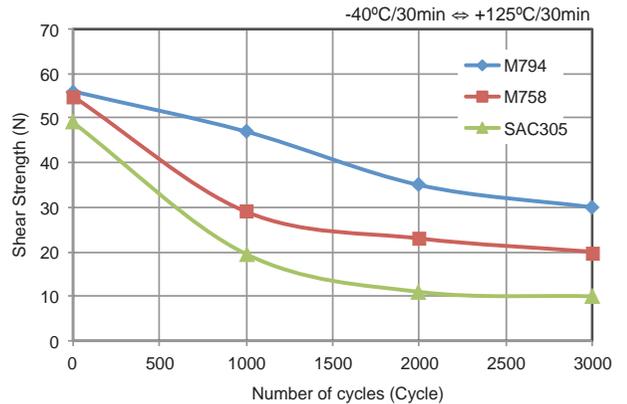
Achieve void-free using the vacuum reflow oven, SVR-625GTC



NRB Series residue-free paste

Preform, Paste Containing Ni Balls

Meanwhile, solder used for die bonding slants when melting and gets cooled, cracks easily develop due to temperature cycle, and an air layer is formed, which deteriorates heat dissipation effect. SMIC has solved this problem through the development of preform and paste containing Ni balls. SMIC has incorporated uniform Ni balls with high sphericity manufactured using the company's original manufacturing method into solder materials in order for the Ni balls to play a role of spacer, thereby achieving a solder layer with uniform thickness without inclination, and suppressed the development of cracks.



Solder alloys with excellent thermal fatigue resistance

SNR-615 Reflow Oven

Besides the above, SMIC has also developed SNR-615 reflow oven with ultrahigh temperature specification. It can han-

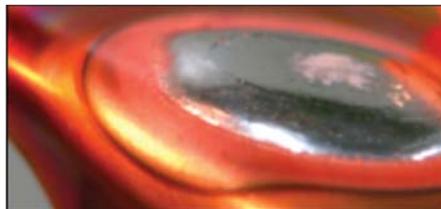
dle temperatures up to 400°C, thereby facilitating the mounting of power devices using solders with a melting point of 360°C or higher.

Solder Alloys for In-Car PCB

Residue does not crack even by mechanical bending and under thermal stress, and the solder exhibits excellent migration resistance.



Thermal stress



Mechanical bending

In particular, printed circuit boards that are incorporated in an engine room require solder alloys with excellent thermal fatigue resistance and drop impact resistance. SMIC has developed solder alloys, M794, M758, and M770. The company has made full use of the technology to reinforce alloys through the combined use of precipitation strengthening and solid solution strengthening, as well as the interface reaction control technology, and the technology to suppress the coarsening of crystal grains. The company lets its customers choose materials in accordance with their usages.

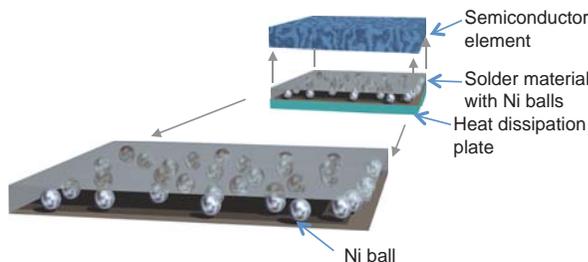


MACROS Series soft residue flux cored solder

Optimum for die-bonding materials for power devices



Preform containing Ni balls



Cracks-Free Soft Residue Flux

Solders for automotive application emit moisture that causes dew condensation on the cracked flux residue due to day and night temperature cycle, and electro-ion migration easily develops, leading to the occurrence of short-circuit defects. SMIC has developed soft residue flux, which does not crack even by mechanical bending or under temperature shock, and used it in MACROS flux cored solder and paste, thereby solving the problem of electro-ion migration. This flux also features excellent adhesion to substrates and water-repellent property, and prevents the development of electro-ion migration even under high temperature and high humidity load conditions. □

SMIC Talks About Value Propositions in China Market



Tomohide Hasegawa, President, Senju Metal Group (China)

Offering next generation materials for automotive and semiconductor markets in China.

Senju Metal Industry Co., Ltd. (SMIC) has strong business result by establishing sustainable supporting organizations, focusing the final product goals and application usages in China market. SMIC has sales office at Beijing, Dalian, Shanghai, Suzhou, Guangzhou, and production sites at Beijing, Shanghai, Huizhou, Tianjin and Hong Kong as a global company who has footprints in major countries in Americas, Europe and Asia.

Solutions-Driven Offering

Tomohide Hasegawa, President, Senju Metal Group(China), who manages all operations in China says, “China market of solder materials has been changed and evolved in a few years, and industry for smartphones is leading the market trend. Automotive industry is glowing well as on top with majority of business for home appliance and office automation (OA) products from Americas and European customers who are requiring final material approval at home countries.”

Partnership for Peoples

During the continuous offering of solder materials to satisfy the market change and customer’s needs, Hasegawa pursues the improvement of SMIC brand power.

“Focusing to establish the partnership with customers should be paramount to success to do business in China. For example, it is hard to cultivate the number of engineers in pro-

duction sites at the chronic environment of labor shortage and low retention rate. Facility Automation with soldering robotics application is implementing as a part of advanced technology, however, there are strong demands to cultivate the engineers who have equipped the knowledge on soldering materials and control the automation systems”.

“We are establishing the customer support system to provide the specific solutions by cultivating the circuit packaging engineers with strong supports from SMIC headquarters. I believe this approach can generate the trust to SMIC, and the improvement of value proposition of our products could enhance our brand strength,” notes Hasegawa.

Declaration for “Conflict-Free”

He says, “SMIC has declared “Conflict-Free” which means no usage of conflict solder materials by spending our efforts of auditing to all smelters in the world. This solutions could be a valuable advantage and will protect brand of customer.”

At present, leading products in China market are Low-Silver contents solder pastes that use small powder particle size called Type-5, and Flux Cored Solder wires that fit for soldering robots.

Offering for Next Generation

Regarding to the value proposition of SMIC in China market for the future, Hasegawa points, “I believe that automotive and semiconductor markets should be key growing markets. SMIC has the business success in Unites States and Taiwan. With cultivating this business know-how, SMIC as leading company in the industry will provide the solutions of materials for next generation.” □

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NRB Series residue-free paste