■ M40 & M46 SP Series Solder Pastes

The M40 low silver-content solder paste has been adopted for TVs and other electronics products made by Panasonic Corp. for more than one year. The M40 has enabled cost reduction, while ensuring mounting conditions identical to those of the conventional 3%Ag (M705) solder, and features improved thermal fatigue properties.

Prices of raw materials keep rising and manufacturers have been intensifying their cost-reduction strategies. Against this backdrop, low-cost solder materials have been sought. One of the measures for reducing cost is the reduction of silver (Ag), which is expensive. Simply reducing the silver content from 3 percent results in the rise of melting points (liquidus temperatures), and it becomes necessary to raise the mounting temperature. This causes thermal fatigue properties to deteriorate. Senju Metal Industry Co., Ltd. (SMIC) has reduced the Ag content to 1 percent. Instead, the company has made a solid solution alloy by adding minute amounts of bismuth (Bi) and indium (In) to tin (Sn), then added a minute amount of antimony. This resulted in the improvement of thermal fatigue properties, while suppressing the rise of melting points.

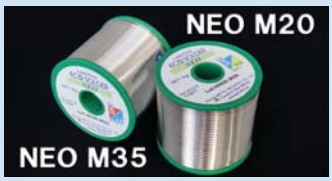
SMIC recommends the M46 with 0.3%Ag to customers who seek low-priced halogen-free low Ag-content solder pastes.

Although the M46 has a melting point about 5°C higher than that of the M40, it features a low melting point compared to similar products of other companies through the addition of minute amounts of Bi and In. Although it is necessary to slightly raise the mounting temperature, the M46 is very attractive for products with allowance in thermal resistance.

Many manufacturers also aim to reduce costs by improving production efficiency. Thus, SMIC has developed the SP Series, which enables high-speed printing and reflow in a short time, thereby increasing the production efficiency of mounting by about 30 percent.

■ Chip Solder

The trend towards smaller, thinner, and lighter components is parallel to the reduction of the amount of solder used. The mechanical strength of joining is proportional to the amount of solder, and therefore, the strength deterioration of points where mechanical strength is required is a major concern. SMIC has developed a chip solder that automatically mounts and melts chip solder on lands where insufficient solder supply is expected simultaneously with the mounting of components. The chip solder is of taping specification and allows automatic mounting. Conventionally, chips of the 0603 size and smaller caused a radius (R) to develop on the adhesive face due to their processing method and adhesion failure was developing. However, the newly developed chip solder provides smooth adhesion face with high precision and dramatically reduces short time breakdown in the production line due to adhesion failure, which was occurring in the process.



■ M35 & M20 NEO Resin Flux Cored Solders

Featuring even better workability over its predecessors, NEO resin flux cored solders suit next-generation mounting. The M35 is a low-silver type with 0.3%Ag, while the M20 does not include silver at all. Achieving cost reduction of 50 percent, both products are epoch-making low-cost products. Furthermore, as they feature quick initial wetting and wetting spreads smoothly, they allow soldering in a short time. Thus, they have reduced soldering time by about 33 percent from conventional products and contribute to improved workability. As general-purpose products, they serve a wide range of applications.

■ NSV300 Solder Paste for POPs

In semiconductor mounting, three-dimensional (3D) mounting, in which chips are soldered in the vertical direction, has been widely used. This has contributed to the development of many small, light, and thin products. Playing the central part in 3D mounting is solder balls. The NSV solder paste for transfer use, which prevents mounting defects such as incomplete soldering, is an outstanding support product. When transferring a solder to solder balls using ordinary solder paste, only small amount of solder is transferred due to the rheological behavior. However, the NSV300, which has been developed based on a superb rheological theory, enables the transfer of a sufficient amount of solder, eliminating joining defects such as incomplete soldering.