Teresa String Solder SEM-604

Outline

Today, it is common sense that materials must be environmental friendly (no-clean type). As a result of international competition, the manufacturing industry demands materials that are high in quality and low in cost.

Components are getting increasingly small and highly concentrated. The requirements by the PL law has created a heavy burden on the inspection process. Systems are also getting increasingly big.

To address these issues, Teresa has developed a high-quality and high-performance solder "SEM-604". It cuts down on the irregularities at the production line and reduces the burden on the inspection process.

Characteristics

1. SEM-604 of Teresa is a RMA-type, non-chlorine, no-clean solder that conforms to the Federal Standard ?# (now J-STD).
   RMA:
   1) Produces no reaction in the silver chromate test;
   2) Produces no dissolution of copper in the copper mirror test;
   3) Has an 1×10^5 Ω • cm or better resistance against water solution.
   That means there is no cleaning of flux residue. (There is no reactivity or dissolution of copper. Even if the moisture in air is absorbed, the insulation characteristic will not be affected.)

2. The wettability of the solder is superior. It can be worked on at a temperature lower than that required by normal solder.
   Flux activates at a relatively low temperature. At the same time, the thermal conductivity effect is stimulated to liquefy solder.

3. The solder breaks well. Super-fine chip components can be soldered without any prior application of flux. (Even tabs of 0.25 pitch can be soldered manually.)
   Flux activates at a relatively low temperature. At the same time, the thermal conductivity effect is stimulated to liquefy solder.

4. As it is difficult for the solder or flux to stay on the tip of the soldering iron, scorching flux is extremely rare.
   Flux activates at a relatively low temperature. At the same time, the thermal conductivity effect is stimulated to liquefy solder.

5. It is effective against scattering soldering balls and flux.

   Causes of soldering balls
   1. The activator in the flux explodes causing etched solder to fly in all directions.
   2. As the soldering iron is pulled out quickly, the amount of solder that gets stuck on the soldering iron increases and the solder drops subsequently.
   3. For solder with poor wettability, this problem occurs when more solder than necessary is provided.

   Reasons for less scattering
   1. Activator that does not explode is used.
   2. Compared with products of other makes

Maker	Wettability	Solder supply	Solder amount	Solder balls
Other makes	Bad	Must provide more than suitable	Excessive	Occur
Teresa	Superior	Provide suitable amount	Optimal	None

6. It is ideal as a countermeasure against the poor soldering effect produced by automatic soldering equipment (few variations even for pointed soldering.)
   The robot performs soldering at a constant speed regardless of the condition (oxidization or stain) of the substrate or component.

   Teresa's solder works in a wide temperature scope:
   1. Flux reacts quickly and cleans the soldering part. It is good at transmitting heat and it reliably expedites the fluidity of solder.
   2. As such, operations can be performed in stable manner and the effect of automatic soldering by robots (soft beam method) can be achieved fully.

   a. Improve production speed
   b. Enhance yield rate
   c. Adjustment not required
   d. Cost saving

7. It is highly effective for soft-beam soldering.

8. As flux residue is transparent, the inspection process becomes easy.

9. It enhances productivity for both manual and automatic operations. Process control becomes easy.

Application • Track Record
LCD tab attachment, SOP, PLCC, flex, connector, correction of mobile-phone chip, camera component, clock component, LED, motor part, IC card, PC, urethane wire, tuner, electronic component, TV and VTR.

Diameter of string	2.0	1.6	1.2	1.0	0.8	0.65	0.5	0.88
Weight/ roll	1kg	1kg	1kg	1kg	1kg	0.8kg	0.5kg	0.25kg
Length/ kg (approximately)		86m	160m	230m	315m	425m	950m	

Procedure for Replacing Cream Solder

Before replacing the current cream solder, please perform the following verification operations.

Operation Procedure

1) Setting up the temperature profile

If the current item is to be replaced, first substitute Teresa's products under exiting conditions and observe the following.

① Check the printing property (printing shape and uniformity of the cream)
② Preheat it and check for sags.
③ Check for soldering balls.
④ Check for bridges.
⑤ Check for floating chips.

2) When the study of the temperature profile setup returns NG result

① Check the causes if any of the above items fails.
② Identify the causes and determine the countermeasures. Then, set the temperature profile to match the condition.
③ If the mask precision is the cause of failure, remake the mask to improve the precision level.

Lead-time Required for Changes

This is the time required for replacing the solder cream.
It can be performed on Saturdays, Sundays or public holidays so that the line operation shutdown will not cause inconvenience to the customers.

① If soldering can be performed without any problem based on the study of the temperature profile setup.
Experiments can be completed in one day.
② If the experiments described in ① produce problem, study the causes and implement countermeasures as described in ②.
Usually, make use of Saturdays and Sundays. Alternatively, the guideline is approximately 4 times.
③ Test samples
Approximately 100 units × 4 times = approximately 400 units required.

Attachment- Technical Information 1

New Cream Solder Review

Please implement the following before reviewing the cream solder.

1. Pre-printing Operation
   - ① Cleaning the metal mask
     Please use our cleaning fluid for the metal mask. Please make sure that there is no residual cream in the opening in particular. Please check fine sections, such as 5mm pitch QFP 1005 chip, with a loupe.
   - ② Post-cleaning wiping
     Please wipe the inner and outer side of the metal mask with the SPICK T-3 paper (Asahi Kasei Kogyo). (Before wiping, use mir to blow away remaining cleaning fluid from the opening.)
   - ③ Please stir the cream solder according to our existing methods.
     At this point, please inform us if there is any concern.

2. Printing Operation
   - ① For the first few sheets, it is common that the solder will not attach well to the squeegee, surface of the metal mask or the opening. If the printing is patchy, or if the volume is insufficient of excessive due to the position of the plate or the size of the parts, please inform us.
   - ② If there is any problem in the external appearance (shape) of the cream solder during steady printing, please inform us.
     E.g.,

Patchy Insufficient

Diagram 1 Diagram 2 Diagram 3

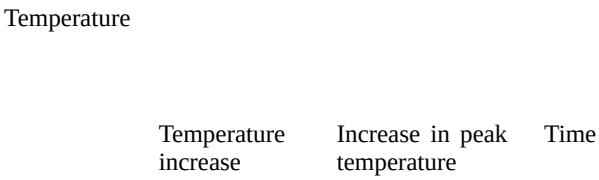
3. After Re-flow Operation
   - ① Deviation of parts
   - ② No parts (chip)… check if parts are mounted
   - ③ Chip soldering balls ?##
   - ④ Other soldering balls
   - ⑤ External appearance, luster, gloss
   - ⑥ Floating chip
   - ⑦ Bridge

   Reflow will be reviewed if defects occur to the above.
   The printing machine, mounter and reflow furnace may be the cause of defects. Therefore, the following must be checked when there is a defective reflow.

   - ① Insufficient heat (not soldered, luster, insufficient soldering circumference)
   - ② Excessive heat (bridge, luster)
   - ③ Steep temperature increase (soldering ball, deviated part)
   - ④ Steep increase in peak temperature (floating part, Manhattan)

Attachment- Technical Information 2

Temperature Profile



The temperature profile is determined by the heat source of the reflow furnace?###, fan, size of the substrate, size of mounted parts, oxidization of electrode, and density of parts, etc. Thus, there is no specified temperature profile for our cream solder.

4. Attending your review sessions on cream solder
The initial review of the cream solder requires the existing line to be shut down, which could cause inconvenience to the production activity. Thus, the day and time for the shutdown of the line operation is critical.

   On Saturdays, Sundays and public holidays, our engineers are able to attend your review sessions and will do so upon your request.

   Compared with traditional products, MST-1101 produces less bridge and better wettability. It is ideal for assembly products, such as motherboards.