

Application Note

SAC4-325GM5 (dispense)**Description product**

SAC4-325GM5 is a next generation lead-free solder paste. The SAC 305 alloy is a tin, silver copper alloy which is eutectic (TE = 217 °C).

SAC4 stands for the alloy composition Sn95.5Ag4.0Cu0.5.

The **325GM5** flux system is halide containing and classified REL1 according IPC-J-STD-004. The medium is specially developed for dispensing applications

See the Product Data Sheet (PDS) for the specification of the product concerned. Read the Safety Data Sheet (SDS) before handling and/or using this product.

Receiving and storage

Store unopened syringes in a refrigerator, when the solder paste will not be used or inspected within the next 10 days. Recommended storage temperature is 4-10 °C.

DO NOT: store the solder paste at temperatures below 4 °C

DO NOT: exceed storage temperatures above 25 °C.

Syringes should be stored in a horizontal position. To eliminate flux segregation it is advised to rotate the syringes once a month.

DO NOT: store the syringes in a vertical position

Handling

Solder paste is a shelf-life item and should be managed as a FIFO-supply. After taking the solder paste out of the fridge allow the solder paste to reach the ambient temperature at the dispenser before use. This will take at least 4 hours for a syringe.

DO NOT: open cold syringes as moisture may condense on the product and affect performance.

DO NOT: place the solder paste on a hot plate, furnace, reflow oven or any other artificial means to accelerate heating up.

Solder paste is a shelf-life item and should be managed as a FIFO-supply.
Keep the syringes tightly sealed when not used.

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Handling after first use

Store the paste in the fridge in case it will not be re-used within the next 10 days.

If re-used within the next 10 days, just store the paste at room temperature.

DO NOT: store the paste near to a window

DO NOT: store the paste in the sun as this will warm up the paste to too high temperatures.

DO NOT: Store the paste near to or on top of a heating source (e.g. reflow oven)

Too short period between cooling down and heating up might introduce humidity by condensation in the solder paste which can cause corrosion of the metal powder particles. This can result in an increase of solder ball formation and decreasing soldering performance.

Optimal time to use solder paste: 1-2 days.

Dispense recommendations – dispensing

There are many methodologies of dispensing and different types of dispensing equipment, pistons and needles. Therefore the following recommendation should be considered as a guideline for the initial setting up of the process.

Dispense	Value / comment
Pitch (minimum)	0.5mm
Pattern	dual or multiple dot, depending on square surface of pads
Method	PDP (Positive Displacement Pump)
Pressure (feed)	0.3 – 1.0 bar

Dispense recommendations – Needle

Since there are many different needles available the below mentioned recommendations are generic and subjective.

Needle	Value / comment
Material	SST (Stainless Steel)
length	< 65 mm
Inner diameter	0.26 (acc. 7 ball rule)
Needle/substrate distance	0.1 mm
Dwell time	a) 50 ms b) 10-20 ms
Needle tip	chamfered

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Recommended operating temperature is between 22-28 °C and 30-70 %RH.

In case no dispensing has been done for more than four hours, it is highly recommended to perform a total purge of the system prior to re-start.

Tack time

It is recommended to place components within 8 hours after dispensing and reflow the assembly no longer than 24 hours after printing.

Reflow profile

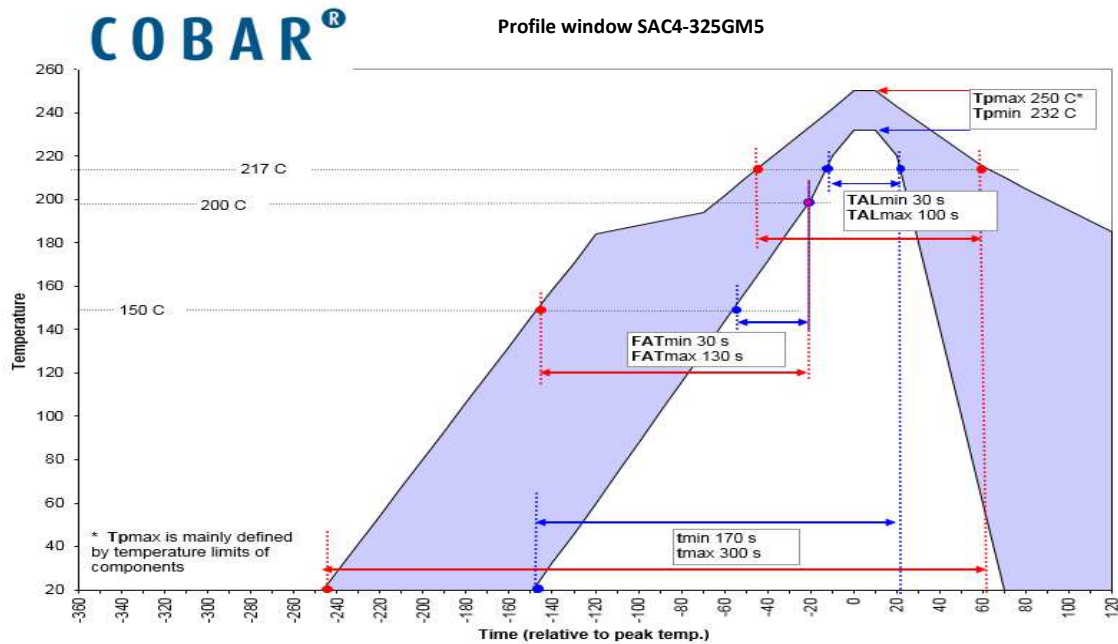
The printed boards can be reflowed up to 24 hours after printing without adverse effects. The recommended profile can only be considered as a guideline for the initial setting of the equipment. Set up the profile on actual production boards with a profiling system. Thermocouple should be attached to the most interesting thermal spots.

- Define coldest spot on the PCB (dependent on components and lay-out design). Attach thermocouple
- Define hottest spot on the PCB (dependent on components and lay-out design). Attach thermocouple
- Define critical components (heat sensitive devices / BGAs / CSP etc.). Use PSL levels acc. IPC-J-STD-075. Attach thermocouple

DO NOT: Set up the process with a general “golden board” or with a general device like a “reflow rider”.

DO NOT: Attach thermocouple on an inadequate manner this will influence the measured results.

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FAT = Flux Activation Time (time between 150 and 200 °C)

TAL = Time Above Liquidus (time above 219 °C)

T_p = Peak Temperature (maximum temperature)

NOTE:

Although the solder paste has a very wide process window, a linear reflow profile is preferred in case of poor wettable components/board finishes.

For vapor phase or inert reflow soldering a longer soak and/or time above liquidus are less critical.

Residues/cleaning

SAC4-325GM5 is a no-clean formulation. Residues that remain on the assembly after soldering are chemically inert and not meant to be cleaned. The residues on the PBA can however be cleaned with Cobar MCA-1424 Aqueous cleaner or better the Cobar MCI-2330 semi alcoholic cleaner

The residues the tools as well as misprints may be cleaned with cleaner MCI-2330 or SCE-5561.

Disclaimer:

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