

## Technical Bulletin

### TSC PURALLOY SAC 0307 SOLDER ALLOY

#### DESCRIPTION

TSC PURALLOY SAC 0307 solder alloy is manufactured using a proprietary process which greatly reduces any dross inclusions and provides a highly pure, free flowing alloy which in turn reduces the risk of bridging and solder skips during wave and selective soldering. This low cost lead free silver bearing alloy has a wetting performance very much inline to other common lead free alloys in use today such as SAC305 alloy. Typical alloy composition is 0.3% Silver, 0.7% Copper, balance Tin.

TSC PURALLOY SAC 0307 solder alloy is available in 1 kg Bars, 3kg Ingots and Feed Wire. Chunks are also available to assist in new pot fills on request.

#### Product Features & Benefits

- Liquidus 228°C
- Low Cost Sn-Ag-Cu Alloy
- Excellent Solder Joint Reliability
- Fast Wetting Comparable to SAC305
- Excellent Fatigue Resistance
- Compatible with all Flux Types
- Complies with IPC J-STD-006

#### TYPICAL COMPOSITION

Typical Alloy Composition		
Sn: Balance	Ag: 0.3	Cu: 0.7

#### MELTING TEMPERATURE RANGE

Typical Melting Temperature	
Solidus: 217°C (423°F)	Liquidus: 228°C (441°F)

#### HANDLING & STORAGE

Indefinite shelf life applies to solid solder. For other product categories, refer to those specific TDSs. Consult SAC 0307 MSDS for additional handling procedures and precautions.

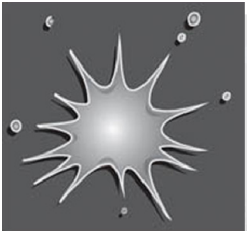
#### HEALTH & SAFETY

Use with adequate ventilation and proper personal protective equipment. Refer to the accompanying Safety Data Sheet for any specific emergency information. Do not dispose of any hazardous materials in non-approved containers.

#### COPPER LEVEL MANAGEMENT

Management of the copper level in the wave solder bath is critical to ensure low defects in the soldering process. There is a tendency for the copper levels of the SAC 0307 materials to increase due to the leaching effect of the solder wave on the board and components. This effect is at its most severe when using an OSP Copper finish on the PCB.

Studies have shown a typical leaching rate of 0.01% Cu per 1000 boards. Each process is unique this is an indication only of the leaching rate (based on actual data). It is recommended that the copper is controlled at between 0.7% and max 1.0% for SAC 0307 alloy. If the copper levels are higher than 1.0% then this will increase the liquidous temperature which in turn may mean that the solder bath temperature has to be increased to maintain the process yields.



# SOLDER CONNECTION

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## RECOMMENDED ACTION LEVELS

Please find below a list of recommended action levels for wave solder bath impurities. For information of specific action plans to bring your solder bath back to an acceptable condition please contact your local sales office.

Element	ACTION Levels %	Notes
Sn	BAL	No Action level.
Pb	<b>0.10</b>	RoHS Directive 2011/65/EU states a maximum Lead content of 0.1%.
As	<b>0.03</b>	Levels greater than 0.03% can cause de-wetting.
Cu	<b>1.0</b>	SAC 0307 is tolerant to copper levels up to 1.0%, SAC 0300 copper free should be added to maintain copper levels. Levels above 1.0% may cause more bridging.
Bi	<b>0.20</b>	Lead Free alloys are tolerant to Bi up to 1.0%, however if levels above 0.20% are detected this indicates some contamination issues that should be investigated.
Zn	<b>0.003</b>	Levels greater than 0.003% may cause increased bridging and icicing, as well as, increased dressing rates in the solder bath.
Fe	<b>0.02</b>	Greater than 0.02% Iron can be an indicator of pot erosion and may cause gritty joints and the formation of FeSn <sub>2</sub> IMC needles that can cause bridging.
Ag	<b>1.0</b>	Silver levels of 4% are used in some SAC alloys, however if the levels in SAC 0307 rise above 1.0% then some investigations should be held to establish the cause.
Sb	<b>0.20</b>	Lead Free alloys are tolerant to Sb up to 1.0%, however if levels above 0.20% are detected this indicates some contamination issues that should be investigated.
Ni	<b>0.05</b>	Levels greater than 0.05% may start to slow wetting and may reduce hole fill. Evaluate soldering performance if levels exceed 0.05%. Locate and eliminate source of high Ni levels.
Cd	<b>0.003</b>	RoHS Directive 2011/65/EU states a maximum Cadmium content of 0.01%. Levels of 0.003% may cause higher level of bridging and icicing.
Al	<b>0.002</b>	Levels greater than 0.002% may cause higher levels of bridging and icicing and a greater level of surface oxidation in the solder bath.
Au	<b>0.1</b>	At levels above 0.1% there may be some problems with joint strength.

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