

CHOICE[®] Vaculoy SACX 0307,0300 *ULTRA LOW*

LEAD LEAD FREE WAVE SOLDER ALLOY

DESCRIPTION

CHOICE Vaculoy SACX0307 is a lead-free alloy suitable for use as a replacement for Sn63 alloy in the wave solder process. The SACX0300 variant is used to stabilize / reduce the copper content in the wave solder bath, this requirement will depend on process conditions. As with all Choice Metals bar solder, Choice's proprietary Vaculoy alloying process is used to remove certain impurities, particularly oxides. The product is further enhanced with the addition of 2 minor elements to reduce dross formation and improve the joint cosmetics.

FEATURES & BENEFITS

Features:

- YIELD – Comparable to SAC305, superior performance for bridging compared to Sn99.3/Cu0.7 based alloys.
- WETTING SPEED – 0.75 seconds typical wetting speed compares to SAC305 at 0.65 sec and superior to Sn99.3/Cu0.7 based alloys at 1.0 sec.
- DROSS GENERATION – lowest in class due to the Vaculoy process in conjunction with the addition of a dross reducing agent.

Benefits:

- Lowers Total Cost of Ownership due to the lower material cost, high yields and low dross generation.
- Gives very good solder ability due to the fast wetting speed.
- Gives very good drainage and hence lower levels of bridges due to the formulation containing Silver.
- Delivers good performance across a range of flux technologies.

The proprietary Vaculoy process is a highly effective method for removing oxides from solder. This is extremely important because included oxides generate excessive drossing and increase the viscosity of the solder. Solder with higher viscosity can result in increased soldering defects (i.e. solder bridging)

APPLICATION

CHOICE SACX0307 is suitable for wave soldering and surface mount applications for electronic assemblers interested in implementing a lead-free process. It is suited to single side and mixed technology boards. A solder pot temperature of 255 - 265° C (491 – 509F) is recommended with a contact time 2.3 – 3.5 seconds. For suitable wave solder fluxes, please see our selector guide. Lead free Reclaim services including dedicated lead free containers are also available; please consult your local sales office.

AVAILABILITY

CHOICE VACULOY is available in Bar and Wire form , PART CODE 21305050 with Sn 99% Ag 0.3% Cu 0.7% (SAC 0307)

HEALTH & SAFETY

Please refer to MSDS for advice on proper handling and safety instructions.



Choice Electronics Solder Alloy

Issue 2



Choice Electronic Solder Alloy

TECHNICAL SPECIFICATION

Complies with all requirements of RoHS Directive (Article 4.1 of the European Directive 2002/95/EC). Alloy specification for Maximum Lead (Pb) Content = 0.1%

Material Property	Units	SACX0307
Solidus	Celsius	217
Liquidus	Celsius	228
Hardness	HV	14.1
Density	g/cc	7.33
Specific Heat Capacity	J/kg C	0.17
Stress at MAX Load (N/mm²)	Mean	29.5
	Std Dev	0.64
Elongation at failure (%)	Mean	21.8
	Std Dev	8.8
Thermal Expansion Coefficient	(30 - 100C)/C x 10⁻⁵	1.79
	(100 - 150C)/C x 10⁻⁵	2.30
Silver Content	%	0.3 + 0.15 +/-0.05
Copper Content	%	0.70 +/-0.1
Lead Content	%	Max 0.03%

RECOMMENDED PROCESS SETTINGS

Wave Configuration	Process Parameter	Suggested Process Settings
Single Wave	Pot temperature	255 - 265 Celsius (491 - 509 F)
	Conveyor speed	1.0 - 1.5 m/min (3.3 - 5 ft/min)
	Contact time	2.3 - 2.8 seconds
	Wave Height	1/2 to 2/3 of board thickness
	Dross removal	Once per 4 hour run time
	Copper Check	Every 8,000 boards until 40,000
Dual Wave	Pot temperature	255 - 265 Celsius (491 - 509 F)
	Conveyor speed	1.0 - 1.5 m/min (3.3 - 5 ft/min)
	Contact time	3.0 - 3.5 seconds
	Wave Height	1/2 to 2/3 of board thickness
	Dross removal	Once per 4 hour run time
	Copper Check	Every 8,000 boards until 40,000

The information contained herein is based on data considered accurate and is offered at no charge. No warranty is expressed or implied regarding the accuracy of this data. Liability is expressly disclaimed for any loss or injury arising out of the use of this information or the use of any materials designate

MANAGEMENT OF COPPER LEVELS IN THE SOLDER BATH

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 SACX0307 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 SACX0307 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.

The copper levels in the bath can be controlled by means of adding SACX0300 to the wave solder pot. It may be the case that equilibrium can be attained by continuing with SACX0300 additions as the only means of solder top up, however each process is unique and we would recommend regular analysis of the solder bath so that good control of copper can be maintained.

This analysis service is available from CHOICE Electronics Assembly Materials; contact your local office for details.

RECOMMENDED ACTION LEVELS FOR WAVE /DIP SOLDER IMPURITIES

Please find below a list of PROBLEMS /DEFECTIVE JOINTS which may arise due to impurity level in excess than recommended levels for wave/ dip solder bath . For information of specific action plans to bring your solder bath back to an acceptable condition please contact your local sales office.

Aluminum*:	As little as 0.0005% may increase gross rate without affecting joint formation.
Arsenic:	Above 0.03% can cause dewetting.
Bismuth:	Levels of 1.0% are added to some wave solder alloys to improve wetting joint cosmetics and thermal fatigue resistance. At this level care should be taken over lead contamination as there is some evidence that this may increase the chances of Fillet lifting. Lead at<0.1% (RoHS) should not cause any problems.
Cadmium*:	At levels of 0.002% joint formation will be noticeably affected. At 0.005% there will be a high incidence of bridging and icicling, together with a reduction in joint strength.
Copper:	Copper levels will increase in many cases due to pick up from board surfaces. This causes the liquid us of the bath Material to increase slightly. Generally systems are tolerant to levels up to 1.0% Cu, but in some cases it may be Necessary to increase bath temperatures by a few degrees, or to correct the bath composition at an earlier state.
Iron:	0.02% of iron can make joint formation gritty.
Lead:	The current RoHS directive (restriction of certain hazardous substances) states a maximum of 0.1% Pb in the solder joints. the lead contamination level should be kept below this level to comply with legislation. If this level is exceeded please Consult with your local Cookson Electronics contacts for advice on how to rectify this problem.
Silver:	Silver is used as an alloying element in lead-free solders that enables wetting speed and thermal fatigue resistance.
Zinc*:	The presence of zinc can cause dulling and create bridging and circling. 0.005% can also cause lack of adhesion and grittiness.
Note:	*The effects of Al, Cd and Zn are cumulative. If more than one element is present the following lower maxima are suggested: 0.0005%, 0.002% and 0.001%

Choice Copier Pvt. Ltd.

Solder Division:-

- **B-30 Sec-63 Noida, UTTAR PRADESH, INDIA**
 - **D-91 Sec-10 Noida ,UTTARPRADESH , INDIA**
 - **Plot No.62 Sec-8A IIE SIDCUL Haridwar, UTTARAKHAND INDIA**
-

The information contained herein is based on data considered accurate and is offered at no charge. No warranty is expressed or implied regarding the accuracy of this data. Liability is expressly disclaimed for any loss or injury arising out of the use of this information or the use of any materials Designated.

