

ALPHA[®] Vaculoy SACX 0307,0300 HASL

LEAD FREE HOT AIR SOLDER LEVEL ALLOY

DESCRIPTION

ALPHA Vaculoy SACX0307 HASL is a lead-free alloy suitable for use as a replacement for Sn63 alloy in the hot air solder level process. The SACX0300 HASL variant is used to stabilize / reduce the copper content in the hot air solder level machine solder bath, this requirement will depend on process conditions. As with all Alpha Metals bar solder, Alpha'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 copper dissolution rates and improve the pad cosmetics.

FEATURES & BENEFITS

Features:

- ❑ COPPER DISSOLUTION RATE – Low copper dissolution rate, reduced solder-pot maintenance and improved bath life.
- ❑ 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.
- ❑ FLAT UNIFORM DEPOSITS – less thickness variance than Sn63/Pb37

Benefits:

- ❑ Lowers Total Cost of Ownership due to the lower material cost, high yields and low copper dissolution rates.
- ❑ Gives very good solderability due to the fast wetting speed.
- ❑ Compatible with all assembly SAC (Sn/Ag/Cu) based alloys SACX, SAC305 etc.
- ❑ Excellent shelf life and ultimate solderability – will improve hole fill on multiple reflow boards.

The proprietary Vaculoy process is a highly effective method for removing included 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

ALPHA VACULOY SACX0307 HASL is suitable for both vertical and horizontal hot air leveling processes.

AVAILABILITY

ALPHA VACULOY SACX0307/0300 HASL is available in 1kg (2.2lb) Bar , chunks , Feeder Ingots and Autofeed Wire

* US Patent 4929423

HEALTH & SAFETY

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



Cookson Electronics ASSEMBLY MATERIALS

Issue 2



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%**

US Patent 4929423

Material Property	Units	Vaculoy 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 0.1%

RECOMMENDED PROCESS SETTINGS

Vertical Hot Air Solder Level Machine	
Solder Temperature	260 - 265 °C
Total Contact Time Top	2.5 s
Total Contact Time Bottom	5 s
Air Pressure Front	38 psi
Air Pressure Back	40 psi
Knife Gap	11 mm
Knife off Set	5 mm
Knife Temperature	295 - 310 °C
Insertion Speed	40 cms ⁻¹
Withdrawal Speed	70 cms ⁻¹

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COPPER DISSOLUTION RATES

Management of the copper level in the hot air solder level machine is important to ensure consistent leveling. Testing shows that the SACX HASL alloy dissolves copper at a lower rate than SAC305.

COPPER DISSOLUTION TEST			
	SACX	SAC305	Units
Area of Copper Exposed	76	76	m ²
Copper % increase	0.14%	0.29%	
Mass of Solder in Bath	210	210	kg
Mass of Copper dissolved	0.294	0.609	kg
Density of copper	8.96	8.96	gcm ⁻³
Volume of Copper	32.81	67.968	cm ³
Thickness of Copper dissolved	0.43	0.89	Microns

To control Copper levels in the machine top up with copper free ALPHA Vaculoy SACX0300 HASL. Solder pot analysis service is available from **Cookson Electronics Assembly Materials**, contact your local office for details.

