

# ALPHA<sup>®</sup> 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

Revised 2/15/08



**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**

<b>Material Property</b>	<b>Units</b>	<b>Vaculoy SACX0307</b>
<b>Solidus</b>	<b>Celsius</b>	<b>217</b>
<b>Liquidus</b>	<b>Celsius</b>	<b>228</b>
<b>Hardness</b>	<b>HV</b>	<b>14.1</b>
<b>Density</b>	<b>g/cc</b>	<b>7.33</b>
<b>Specific Heat Capacity</b>	<b>J/kg C</b>	<b>0.17</b>
<b>Stress at MAX Load (N/mm<sup>2</sup>)</b>	<b>Mean</b>	<b>29.5</b>
	<b>Std Dev</b>	<b>0.64</b>
<b>Elongation at failure (%)</b>	<b>Mean</b>	<b>21.8</b>
	<b>Std Dev</b>	<b>8.8</b>
<b>Thermal Expansion Coefficient</b>	<b>(30 - 100C)/C x 10<sup>-5</sup></b>	<b>1.79</b>
	<b>(100 - 150C)/C x 10<sup>-5</sup></b>	<b>2.30</b>
<b>Silver Content</b>	<b>%</b>	<b>0.3 +0.15 / -0.05</b>
<b>Copper Content</b>	<b>%</b>	<b>0.70 +/-0.1</b>
<b>Lead Content</b>	<b>%</b>	<b>Max 0.1%</b>

**RECOMMENDED PROCESS SETTINGS**

<b>Vertical Hot Air Solder Level Machine</b>	
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 <sup>-1</sup>
Withdrawal Speed	70 cms <sup>-1</sup>

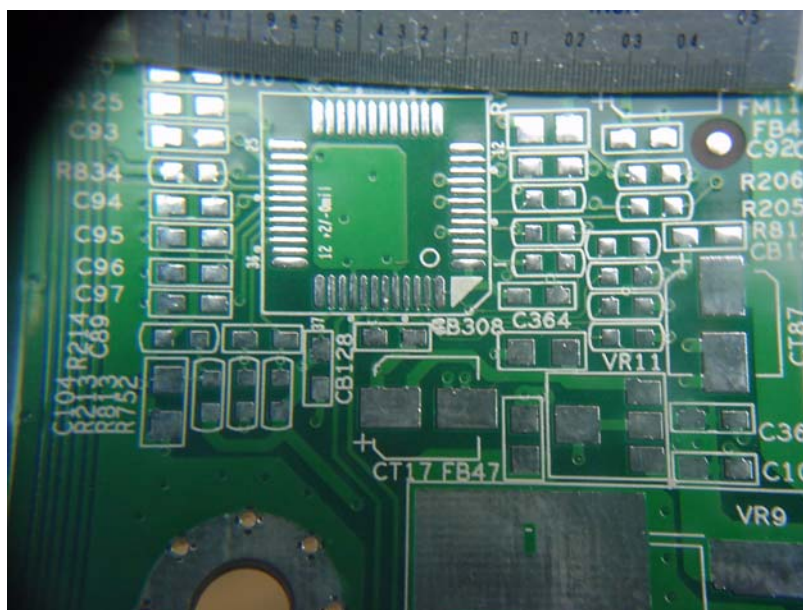


## COPPER DISSOLUTION RATES

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 <sup>2</sup>
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 <sup>-3</sup>
Volume of Copper	32.81	67.968	cm <sup>3</sup>
Thickness of Copper dissolved	<b>0.43</b>	<b>0.89</b>	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.



**Headquarters**  
 Cookson Electronics Assembly Materials  
 600 Route 440  
 Jersey City  
 NJ 07304, U.S.A.  
 Tel: +1 (201) 434 6778  
 Fax: +1 (201) 434 7508  
 www.alphametals.com

**Regional Sales Offices:**

Belgium: Tel: +32 (0) 14 44 50 00  
 Brazil: Tel: +55 11 4353 2500  
 France: Tel: +33 (0) 2 41 49 00 11  
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 UK: Tel: +44 (0) 1483 793100  
 USA - Elgin: Tel: +1 (847) 697 1735