

## SOLDER SPHERES

### Lead-Free

#### ALLOY COMPOSITION

All solder alloy composition is governed by the Joint Industry Standard ANSI/J-STD-006 issued January 1995. The general specification allows tolerances of  $\pm 0.20$  weight % on elements where the tabulated percentage is less than or equal to 5.0% and a tolerance of  $\pm 0.5$  wt. % when the tabulated percentage is above 5.0%.

Alloy: 95.5Sn/4Ag/0.5Cu Specification: J-STD-006 No Lead							
Element	Inspect to	Element	Inspect to	Element	Inspect to	Element	Inspect to
Sn	Balance	Al	0.005 Max	Cu	0.3 - 0.7	Zn	0.001 Max
Pb	0.1 Max	As	0.03 Max	Fe	0.02 Max	Au	0.05 Max
Sb	0.05 Max	Bi	0.03 Max	In	0.1 Max		
Ag	3.8 - 4.2	Cd	0.002 Max	Ni	0.01 Max		

Alloy: 96.5Sn/3.0Ag/0.5Cu Specification: J-STD-006 No Lead							
Element	Inspect to	Element	Inspect to	Element	Inspect to	Element	Inspect to
Sn	Balance	Al	0.005 Max	Cu	0.3 - 0.7	Zn	0.001 Max
Pb	0.1 Max	As	0.03 Max	Fe	0.02 Max	Au	0.05 Max
Sb	0.05 Max	Bi	0.03 Max	In	0.1 Max		
Ag	2.8 - 3.2	Cd	0.002 Max	Ni	0.01 Max		

Alloy: 96.5Sn/3.5Ag Specification: J-STD-006 No Lead							
Element	Inspect to	Element	Inspect to	Element	Inspect to	Element	Inspect to
Sn	Balance	Al	0.005 Max	Cu	0.005 Max	Zn	0.001 Max
Pb	0.1 Max	As	0.03 Max	Fe	0.02 Max	Au	0.05 Max
Sb	0.05 Max	Bi	0.03 Max	In	0.1 Max		
Ag	3.8 - 4.2	Cd	0.002 Max	Ni	0.01 Max		

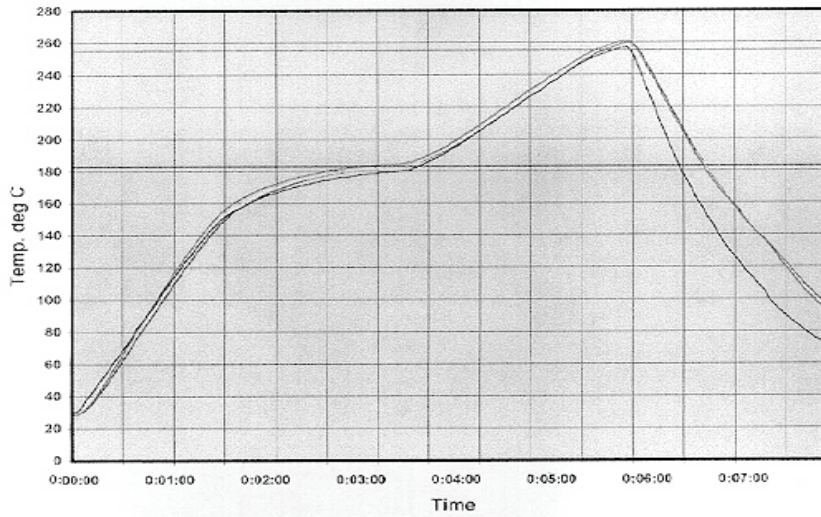
All solder alloys are manufactured using a proprietary alloying process to ensure very low levels of oxides or other impurities. Oxide levels in these products are lower than other industrial products sold elsewhere. The very low oxide levels promise strong, clean and well formed solder bumps and joints coupled with a suitable flux and process profile.

#### ALLOYS

	Tin (Sn)	Silver (Ag)	Copper (Cu)	Melting Point (°C)		
				Eutectic	Solidus	Liquidus
Lead-Free	96.5	3.5	--	221	--	--
	95.5	4	0.5	--	217	218
	96.5	3	0.5	--	217	218



## REFLOW PROFILE



This is a suggested reflow profile. Experimentation is recommended to optimize the process for your specific application.

## TYPICAL DIAMETERS & TOLERANCES

Diameter (mils)	Tolerance	Jars		Quantity/Jars (Kcps)	
		3oz	6oz	3oz	6oz
12	+/-0.39 mils	*		3,800	
13	+/-0.5 mils	*		3,000	
14	+/-0.5 mils	*		2,225	
16	+/-0.5 mils	*		1,600	
18	+/-0.5 mils	*		1,125	
20	+/-1.0 mils	*	*	800	2,000
24	+/-1.0 mils	*	*	450	1,200
25	+/-1.0 mils		*		1,000
30	+/-1.0 mils		*		500
35	+/-1.5 mils		*		300
Diameter (mm)	Tolerance	Jars		Quantity/Jars (Kcps)	
		3oz	6oz	3oz	6oz
0.300	+/-0.01mm	*		4,000	
0.330	+/-0.0127mm	*		3,000	
0.350	+/-0.0127mm	*		2,225	
0.457	+/-0.0127mm	*		1,125	
0.500	+/-0.0254mm	*	*	800	2,000
0.6096	+/-0.0254mm	*	*	450	1,200
0.762	+/-0.0254mm		*		500



**Cookson Electronics**

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## **STORAGE & HANDLING**

There are no special storage conditions required for solder spheres or segments other than a clean, dry environment. Typical room temperature changes do not affect the quality of the parts. The product should be stored in sealed containers and should not be refrigerated. Probing of spheres in jars with fingers or other implements can damage the material by changing its shape or scoring the sphere surface or skin oils contaminating the material. This could result in placement difficulties when the spheres are transferred to the bumping equipment. Shelf life of all solder spheres, stored in sealed ESD jars that are not agitated, is 2 years (24months).

The information contained herein is based upon 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. For additional safety information, consult the Material Safety Data Sheet (MSDS).

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