alpha

Technical Data Sheet

ALPHA® SOLDER SPHERES

HIGH QUALITY SOLDER SPHERES MANUFACTURED TO EXACTING STANDARDS

DESCRIPTION

ALPHA Solder Spheres are designed for BGA, CSP, and Flip Chip wafer bumping applications. **ALPHA Solder Spheres** are available in a wide range of lead-free, tin-lead, high-lead, low-silver, and custom alloys in a variety of common diameters. **ALPHA Solder Spheres** are made to the highest quality control standards to assure consistent sphere size, uniformity and alloy content.

FEATURES AND BENEFITS

- All common alloys and ball sizes readily available
- Custom alloys, micro-additives, and ball sizes available upon request
- Statistical process control on sphere manufacturing process
- Proprietary manufacturing process enables maximum alloy purity, dimensional consistency, and resistance to oxidation and/or darkening

ALLOY COMPOSITION

ALPHA Solder Sphere 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.

All solder alloys meet the general composition requirements outlined in the Joint Industry Standard IPC/EIA J-STD-006A. The general specification allows tolerances of ± 0.20 weight % on elements where the tabulated percentage is less than or equal to 5.0% and a tolerance of ± 0.5 wt. % when the tabulated percentage is above 5.0%.

	Alloy	Tin (Sn)	Lead (Pb)	Silver (Ag)	Copper (Cu)	Melting Point (°C)			Attribute
						Eutectic	Solidus	Liquidus	
Tin-Lead	Sn10/Pb90	10	90	--	--	--	275	302	High-Lead for high stand off
	Sn62/Pb36/Ag2	62	36	2.0	--	179	--	--	Eutectic Tin-Lead-Silver
	Sn63/Pb37	63	37	--	--	183	--	--	Eutectic Tin-Lead
Lead-Free	Sn96.5/Ag3.5	96.5	--	3.5	--	221	--	--	Eutectic Tin-Silver
	SAC405	95.5	--	4.0	0.5	--	217	225	Industry Standard Lead-Free
	SAC305	96.5	--	3.0	0.5		217	221	Industry Standard Lead-Free
	SAC105	98.5	--	1.0	0.5		217	228	Low-Silver Lead-Free alloys for optimal drop-shock resistance
	SAC101	98.9	--	1.0	0.1		217	228	
	SACX0307	98.9	--	0.3	0.7		217	228	
Non-Standard	Other Non-standard alloys are available. Please consult a CESP sales representative for details								

The information contained herein is based on data considered accurate and is offered at no charge. Data represent typical values and should not be considered specifications. 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.

Cookson Electronics
SEMICONDUCTOR PRODUCTS

Cookson Electronics
SEMICONDUCTOR PRODUCTS

APPLICATION

Reflow profiles are highly process and alloy dependant. Typical lead-free or tin-lead profiles can be used as appropriate starting points. Experimentation is recommended to optimize the process for your specific application. Please contact Cookson Electronics Semiconductor Materials to assist with optimizing a reflow profile for your process.

Cookson Electronics recommends **ALPHA WSX** water soluble and **ALPHA NCX** no-clean fluxes to meet the most demanding ball-attach requirements. These fluxes coupled with **ALPHA Solder Spheres** provide best in class, consistent joint formation while maintaining process stability.

SPHERE DIAMETER AND TOLERANCE

Diameter Mils	Tolerance	Diameter Equivalent (mm)	Quantity/Jar (Kpcs) 1oz	3oz	6oz
10	+/- 0.5 mils	0.254 +/- 0.0127 mm	2,000		
12	+/- 0.5 mils	0.305 +/- 0.0127 mm	1,000	3,000	
13	+/- 0.5 mils	0.330 +/- 0.0127 mm	1,000	3,000	
14	+/- 0.5 mils	0.356 +/- 0.0127 mm	500	2,500	
16	+/- 0.5 mils	0.406 +/- 0.0127 mm	500	1,500	
18	+/- 0.5 mils	0.457 +/- 0.0127 mm	250	1,000	
20	+/- 1.0 mils	0.508 +/- 0.0254 mm		500	2,000
22	+/- 1.0 mils	0.559 +/- 0.0254 mm		500	1,500
24	+/- 1.0 mils	0.610 +/- 0.0254 mm		500	1,200
25	+/- 1.0 mils	0.635 +/- 0.0254 mm		400	1,000
28	+/- 1.0 mils	0.711 +/- 0.0254 mm		250	500
30	+/- 1.0 mils	0.762 +/- 0.0254 mm		250	500
35	+/- 1.0 mils	0.889 +/- 0.0254 mm		150	300
Non-Standard		**Consult a CESP Sales Representative**			

Diameter mm	Tolerance	Diameter Equivalent (mils)	Quantity/Jar (Kpcs) 1oz	3oz	6oz
0.250	+/- .0127 mm	9.8 +/- 0.5 mils	2,000		
0.300	+/- .0127 mm	11.8 +/- 0.5 mils	1,000	4,000	
0.350	+/- .0127 mm	13.8 +/- 0.5 mils	500	2,500	
0.400	+/- .0127 mm	15.7 +/- 0.5 mils	500	1,500	
0.450	+/- .0127 mm	17.7 +/- 0.5 mils	250	1,000	
0.500	+/- .0254 mm	19.7 +/- 1.0 mils		500	2,000
0.600	+/- .0254 mm	23.6 +/- 1.0 mils		500	1,200
0.800	+/- .0254 mm	31.5 +/- 1.0 mils		250	500
Non-Standard		**Consult a CESP Sales Representative**			

STORAGE & HANDLING

There are no special storage conditions required for ALPHA Solder Spheres 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 by contaminating the material. This could result in sphere placement difficulties. Shelf life of all solder spheres, stored in sealed ESD jars that are not agitated, is 1 year.

The information contained herein is based on data considered accurate and is offered at no charge. Data represent typical values and should not be considered specifications. 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.

Americas
200 Technology Drive
Alpharetta, GA 30005
770.475.6100 **Phone**
770.442.1987 **Fax**

www.cooksonsemi.com

Asia
12 Joo Koon Road
Singapore 628975
(65)6861.0244 **Phone**
(65)6862.1138 **Fax**