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.

READ ENTIRE TECHNICAL DATA SHEET BEFORE USING THIS PRODUCT

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-006B. 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%.

	Commercial Alloy	Elemental Composition						Melting Point (C)			Attribute
		Tin (Sn)	Lead (Pb)	Silver (Ag)	Copper (Cu)	Nickel (Ni)	Bismuth (Bi)	Eutectic	Solidus	Liquids	
Tin-Lead	Sn63/Pb37	63	37	-	-	-	-	183	-	-	Eutectic Tin-lead
	Sn62/Pb36/Ag2	62	36	2	-	-	-	179	-	-	Eutectic Tin-lead Silver
Lead Free	SAC105	98.5	-	1	0.5	-	-		217	228	Industry standard low silver alloy
	SAC125 w/Ni	98.3	-	1.2	0.5	250-500 ppm	-		217	228	
	SAC305	96.5	-	3	0.5	-	-		217	221	Industry standard lead free
	SAC405	95.5	-	4	0.5	-	-		217	225	Industry standard lead free
	Sn96.5/Ag3.5	96.5	-	3.5	-	-	-	221	-	-	Industry standard lead free
	Sn42/Bi57.6/Ag0.4	42	-	0.4	-	-	57.6			138	Lead free low melting point
	SACX0307	98.9	-	0.3	0.7	-	0.1		217	228	Best in class drop shock reliability
	SACX0307 Plus	98.9	-	0.3	0.7		0.1		217	228	
	MaxRel	Proprietary							212	220	Best in class thermal cycle reliability and drop shock performance
	MaxRel Plus								209	220	
	HRL1								138	151	Best in class thermal cycle reliability and drop shock low temperature alloy
	HRL3								138	145	
Please Contact Product Manager For Other Alloys Not Listed Above											

APPLICATION

Reflow profiles are highly process and alloy dependent. 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 Alpha Advanced Materials to assist with optimizing a reflow profile for your process.

Alpha Advanced Materials 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

Size (mm)	Size (mil)	K Spheres /1oz. jar	K Spheres /3oz. jar	K Spheres /6oz. jar
0.23	9.1	3,500	11,000	23,000
0.25	9.8	2,800	8,500	18,000
0.3	11.8	1,500	5,000	10,000
0.33	13	1,200	3,500	7,500
0.35	13.8	1,000	3,200	6,500
0.4	15.7	650	2,100	4,400
0.457	18	450	1,400	3,000
0.508	20		1,000	2,200
0.559	22		750	1,500
0.609	24		600	1,300
0.635	25		500	1,100
0.66	26		450	1,000
0.711	28		350	800
0.762	30		300	650
0.8	31.5		250	500

SAFETY & WARNING

It is recommended that the company/operator read and review the Safety Data Sheets for the appropriate health and safety warnings before use. **Safety Data Sheets are available.**

STORAGE

There are no special storage conditions required for ALPHA Solder Spheres other than a cool, 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.

CONTACT INFORMATION

To confirm this document is the most recent version, please contact techinfo@MacDermidAlpha.com

www.macdermidalpha.com

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Also read carefully warning and safety information on the Safety Data Sheet. This data sheet contains technical information required for safe and economical operation of this product. READ IT THOROUGHLY PRIOR TO PRODUCT USE . Emergency safety directory assistance: US 1 202 464 2554, Europe + 44 1235 239 670, Asia + 65 3158 1074, Brazil 0800 707 7022 and 0800 172 020, Mexico 01800 002 1400 and (55) 5559 1588