Technical Data Sheet

SAC405 Lead-Free Solder Spheres — Sn95.5Ag4.0Cu0.5 | Rev. 8 — July 2026

Product Overview

EasySpheres Sn95.5Ag4.0Cu0.5 solder spheres are manufactured and designed to support optimized ball-attach applications for ball grid array (BGA) and chip scale package (CSP) components, as well as BGA rework and rebonding. Spheres are packaged to resist the surface darkening induced by transit tumbling, reducing machine-vision faults in automated ball placement systems. Product ships in medical-grade, ESD-safe containers, conforms to IPC J-STD-006, and is QR-coded for lot conformance traceability and shipping accuracy.

Alloy Composition Analysis (Wt%) — per IPC J-STD-006C

Item per J-STD-006	Physical Property			Main Component			Impurities (max)							
	Solidus °C	Liquidus °C	Spec. Wt.	Sn	Ag	Cu	Sb	Pb	Bi	Zn	Fe	Al	As	Cd
Standard Limits	217	220	7.40	95.5 ±0.5	4.0 ±0.5	0.5 ±0.5	0.2000	0.0700	0.1000	0.0030	0.0200	0.0050	0.0300	0.0020

Typical Alloy Properties — Sn95.5Ag4.0Cu0.5 (SAC405)

Density	7.44 g/cm^3	**Electrical Resistivity**	≈ 13.2 µΩ·cm
CTE (25°C)	≈ 21–23 ppm/°C	**Tensile Strength**	≈ 52 MPa (7,540 psi)
Thermal Conductivity	≈ 55–62 W/m·K	**Elongation**	≈ 17%

Typical published values for the alloy, provided for engineering reference; not a lot-specific certification. Lot-specific composition is certified on the Certificate of Conformance accompanying each shipment.

Dimensional Tolerances

Size Range (mm)	Max Dimensional Tolerance	Typical / Actual Measured Tolerance	Sphericity Deviation	Inspection Illuminance
0.050 – 0.450	±4%	±0.50%	< 1.5%	> 270 lux
0.500 – 0.550	±4%	±1%	< 1.5%	> 270 lux
0.600 – 0.889	±4%	±0.83%	< 1.5%	> 270 lux

Product Availability

SAC405 solder spheres are sold in a minimum order quantity of 10,000 spheres, with volume supply to hundreds of millions of spheres. Stock diameters range from 0.002" to 0.035" (0.050 mm – 0.889 mm) with tight, industry-standard dimensional tolerances. Bulk jars and tape-and-reel formats are available.

Product Quality & Traceability

All EasySpheres product conforms to rigorous inspection requirements including sphere size and tolerance uniformity, sphericity, alloy purity (per IPC J-STD-006C), manufacturing date-to-shelf viability, and storage history. Full product-lot traceability is maintained for all products sold worldwide, and a Certificate of Conformance ships with every order. EasySpheres operates to an internal quality system and provides standard quality documentation upon request.

Regulatory Compliance

RoHS: This product complies with Directive 2011/65/EU (RoHS 2), as amended by Commission Delegated Directive (EU) 2015/863, for all restricted substances.

REACH: Based on current SDS and supplier information, this product contains no Substance of Very High Concern (SVHC) above 0.1% w/w per the ECHA Candidate List.

Conflict Minerals: Tin is sourced through smelters conformant with the Responsible Minerals Assurance Process (RMAP); CMRT available upon request.

Executed REACH, RoHS, and Conflict Minerals declarations (July 2026) are available at www.easyspheres.com.

Product Packaging

Spheres are stored and packaged in anti-static polypropylene jars with color-coded screw-top lids. Each jar contains a moisture-desiccant barrier to protect against relative-humidity fluctuation. Product labels include part number (SKU), quantity per jar, alloy, diameter in inches and millimeters, date of expiry, lot code number, and a scannable QR code.



Storage, Handling, and Shelf Life

Shelf life is 2 years from the sealed-jar born-on date when stored in original sealed packaging under appropriate conditions. Refrigeration is not recommended and does not extend shelf life. Containers should remain unopened and un-agitated during storage; normal room-temperature fluctuation does not affect shelf life. Avoid contaminating spheres through contact with foreign objects, fingers, or moisture.

Reflow Profile and Placement

Follow the reflow profile recommended by the flux or solder-paste manufacturer. This product is used in semiconductor packaging processes worldwide and is most commonly applied in automatic ball placement machines.

Health and Safety

This product may be hazardous to health or the environment during handling or use. Read the corresponding Safety Data Sheet, available at www.easyspheres.com, and adhere to all specified safety procedures before using this product.

Ordering

Sales and quotations: Online, sales@easyspheres.com • (858) 486-4068 • www.easyspheres.com