

Product Data Sheet

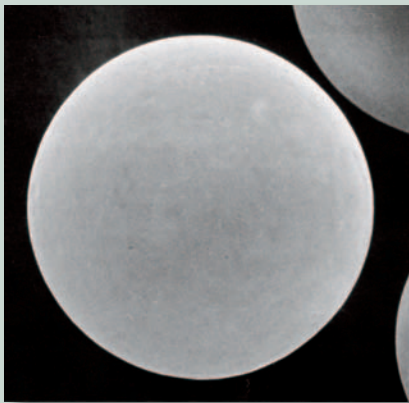
Precision Spheres

Features

- Accurate diameters
- Bright and shiny surface finishes
- Highly spherical shapes
- Made from pure metals

Introduction

Indium Corporation produces spheres with accurate diameters; bright, shiny surface finishes; and highly spherical shapes. Our spheres are made in dedicated manufacturing cells supported by Statistical Process Controls (SPC).



SEM Micrograph 350X

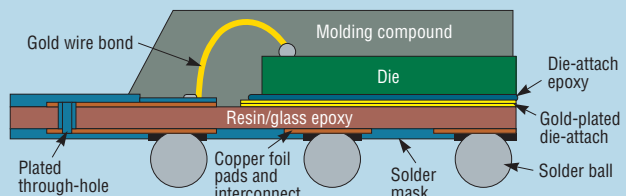
All spheres are made from pure metals, combined to produce exact alloy compositions. After forming, spheres are classified by size using an automated, high capacity process that results in smooth, bright surfaces.

Typical Alloys

The most commonly requested alloys for package assembly are listed below. Please contact us for other available alloys.

Alloy	Liquidus°C	Solidus°C
63Sn37Pb	183 Eutectic	—
90Pb10Sn	302	275
95.5Sn3.8Ag0.7Cu	220	217
96.5Sn3Ag0.5Cu	220	217
95.5Sn4Ag0.5Cu	220	217

Simplified ball-grid-array package cross section



Source: Motorola and Electronic Business Buyer

Typical Diameters

Typically requested sizes range from: 300µm (.0118") to 1270µm (.0500")

Other sizes, down to 100µm (.00394"), and tolerances, are available; please consult with our technical staff.

Tolerances:

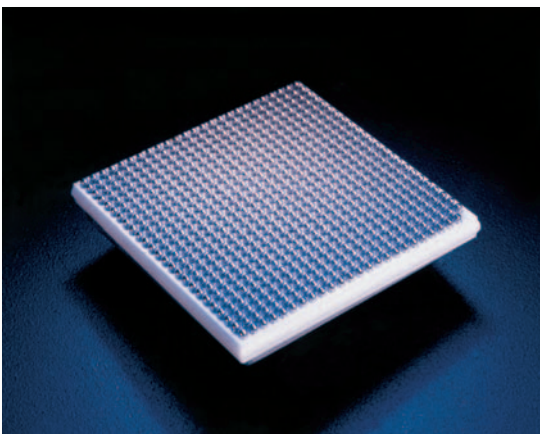
- 0.25mm-0.35mm ±10µm (0.00039")
- 0.40mm-0.50mm ±15µm (0.00059")
- 0.55mm-0.76mm ±20µm (0.00079")

Packaging

Various packaging is available based on customer needs, including non-contact desiccant in 40ml, 100ml and 200ml ESD jars. An inert argon atmosphere is available on request.

Technical Support

Indium Corporation's internationally experienced engineers provide in-depth technical assistance to our customers. Thoroughly knowledgeable in all facets of Material Science as it applies to the electronics and semiconductor sectors, Technical Support Engineers provide expert advice in solder properties, alloy compatibility and selection of solder preforms, wire, ribbon and paste. Indium Corporation's Technical Support engineers provide Rapid Response to all technical inquiries.



CBGA photo courtesy IBM®

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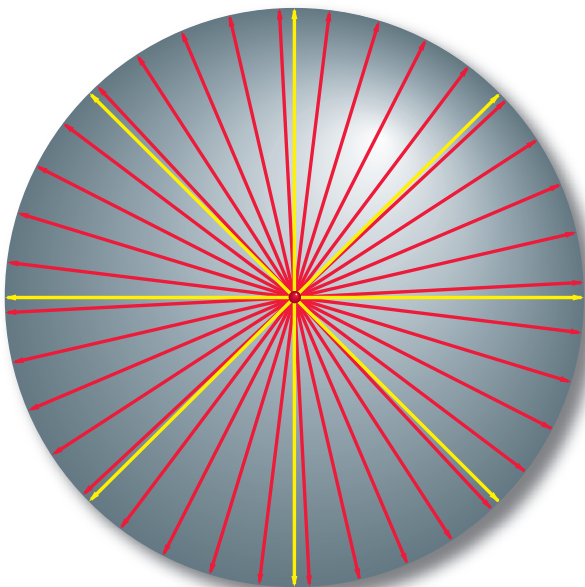
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Precision Spheres

Analytical Methods And Laboratory Support

Included with each product shipment is a standard Certificate of Analysis which indicates constituent chemical analysis and chemical purity. Other optional information, such as sphere diameter measurements, can be provided on customer request.

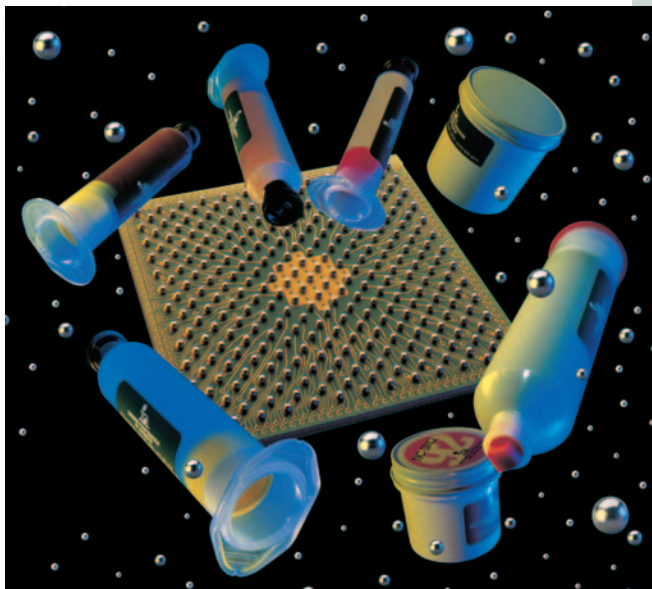


Sphere size distribution is measured by a computerized image analysis system and optical comparators. Depending on customer requirements, other equipment is used to ensure quality:

- AC/DC spark emission spectrophotometer
- Optical emission spectrograph
- Atomic absorption unit
- Differential scanning calorimeter
- Glow discharge mass spectrograph
- Scanning electron microscope
- Auger electron spectrometer

Compatible Products

Indium Corporation supplies a full range of chip-scale assembly products, including TACFLUX® high viscosity fluxes to hold spheres in place during the attachment process; our patented InTEGRATED™ Solder Preform Arrays, useful for BGA fabrication and repair applications; a complete selection of Flip-Chip Fluxes; Die-Attach Adhesives; and a full range of solder pastes for attachment and bumping applications. Please contact us to discuss your requirements.



Support products available from Indium Corporation

Material Safety Data Sheet

The MSDS for this product can be found online at <http://www.indium.com/techlibrary/msds.php>

This product data sheet is provided for general information only. It is not intended, described which are sold subject exclusively to written warranties and limitations and shall not be construed, to warrant or guarantee the performance of the products thereon included in product packaging and invoices.

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