**PRODUCT DATA SHEET**

**Pb-Free Precision Spheres**

**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).

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.

**Features**

- Generate high yield results
- Accurate diameters
- Bright and shiny surface finishes
- Highly spherical shapes
- Made from pure metal
- Unique packaging preserves individual spheres and avoids clumps

**Typical Alloys**

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

<table>
<thead>
<tr>
<th>Alloy</th>
<th>Liquidus (°C)</th>
<th>Solidus (°C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>95.5Sn/3.8Ag/0.7Cu</td>
<td>220</td>
<td>217</td>
</tr>
<tr>
<td>96.5Sn/3Ag/0.5Cu</td>
<td>220</td>
<td>217</td>
</tr>
<tr>
<td>95.5Sn/4Ag/0.5Cu</td>
<td>220</td>
<td>217</td>
</tr>
<tr>
<td>100In</td>
<td>157</td>
<td>—</td>
</tr>
</tbody>
</table>

**Simplified Ball Grid Array Package Cross-Section**

Source: Motorola and Electronic Business Buyer.

**Typical Diameters**

Typically requested sizes range from 300µm (.0118”) to 1,270µm (.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”)
- 0.36mm–0.50mm ± 15µm (0.00059”)
- 0.51mm–0.76mm ± 20µm (0.00079”)

**Packaging**

Various packaging is available based on customer needs, including non-contact desiccant in 40, 100, and 200ml ESD jars. An inert argon atmosphere is available on request.
PRODUCT DATA SHEET
Pb-Free 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 spectrophotograph
- 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
- InTEGRATED® solder preform arrays—useful for BGA fabrication and repair applications
- A complete selection of flip-chip fluxes
- A variety of die-attach adhesives
- A full range of solder pastes for attachment and bumping applications

Please contact us to discuss your requirements.

Support products available from Indium Corporation.

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.

Safety Data Sheets
The SDS for this product can be found online at http://www.indium.com/sds

This product data sheet is provided for general information only. It is not intended, and shall not be construed, to warrant or guarantee the performance of the products described which are sold subject exclusively to written warranties and limitations therein included in product packaging and invoices. All Indium Corporation’s products and solutions are designed to be commercially available unless specifically stated otherwise.