

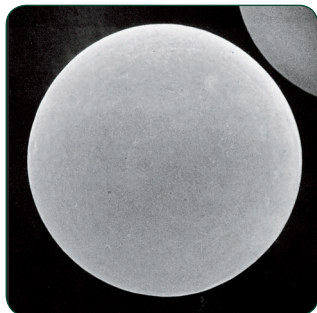
PRODUCT DATA SHEET

Specialty Solder Spheres

Introduction

Indium Corporation is a small- to mid-volume supplier of **specialty solder and brazing spheres**. We offer a very wide variety of alloys and size range capabilities from around 0.004" (100 microns) to 0.078" (1.98mm), depending on the alloy. Melting point ranges go from below 90 to over 700°C.

Our main customers are leading suppliers of medical, transportation and automotive, military and aerospace, high-end mobile, and computing equipment that are looking for consistently high-quality materials for precision assembly challenges.



SEM Micrograph.

Features

- Accurate diameters
- Wide range of alloys (<90 to >700°C)
- Capable of supplying quantities from 1 sphere to >20 million per month
- Clean manufacturing and processing ensures low-oxide levels with no organic contamination
- Whiteroom finishing and packaging ensures continuity of cleanliness
- Pure metals ensure high-quality finished spheres
- All spheres are manufactured in IATF-16949 certified facilities

Typical Alloys and Diameters

This is just a selection of the alloys and sizes we produce every year.

Alloy	Popular Name	Indalloy®#	Pb-Free?	Melting Point (°C)		Approximate Manufacturable Diameter Range			
						Inches		Microns	
				Solidus	Liquidus	Min	Max	Min	Max
InSn50	-	1	Yes	118	125	0.004	0.030	102	762
InSn48	In/Sn eutectic	1E	Yes	118		0.004	0.035	102	889
BiSn42	Bi/Sn eutectic	281	Yes	138		0.008	0.109	203	2,769
BiSn42Ag1	-	282	Yes	139	140	0.008	0.030	203	762
99.99%In	"Pure indium"	4	Yes	157		0.004	0.050	102	1,270
SnPb46Bi8	-	240	No	160	173	0.010	0.030	254	762
SnIn20.0Ag2.8	Pb-free "Sn63"	227	Yes	175	187	0.004	0.030	102	762
SnPb36Ag2	Sn62	Sn62	No	179	181	0.004	0.030	102	762
SnPb37	Sn63	106	No	183		0.004	0.050	102	1,270
PbIn25	-	110	No	183	192	0.004	0.027	102	686
PbIn40	-	206	No	197	231	0.004	0.020	102	508
SnAg3.0Cu0.5	SAC305	256	Yes	217	220	0.004	0.065	102	1,651
SnAg4.0Cu0.5	SAC405	252	Yes	217	225	0.004	0.035	102	889
SnAg4	-	121	Yes	221	228	0.004	0.021	102	533
SnAg5	-	132	Yes	221	240	0.004	0.032	102	800
PbSn10	-	159	No	275	302	0.004	0.040	102	1,016
AuSn20	Au/Sn eutectic	182	Yes	280		0.005	0.039	102	991

From One Engineer To Another®



Form No. 97549 R7

Specialty Solder Spheres

Tolerance

The tolerance is a measure of the size range variability expected to be seen in our **solder spheres**. A precision optical measurement process along with statistical process control (SPC) guarantees the spheres you receive will be exactly the size you need.

Our standard tolerance is $\pm 0.001''$ (± 25 microns) for spheres from 0.004–0.030" (102–762 microns) in diameter. We can also supply spheres at $+0.0005''$ (± 12 microns) at customer request, depending on the alloy and size.

Our alloys are guaranteed to be within customer specifications, as we inspect not just incoming and process materials, but also finished spheres before they are shipped to the customer.

Packaging

Typical Indium Corporation sphere packaging uses ESD-safe vials and a non-contact desiccant to ensure the spheres are kept dry; 40, 100, and 200ml jars are used. Argon purging can be carried out, at customer request. Tape & reel packaging is available for six sphere sizes.

Sphere Diameters	
Inches	Microns
0.020	508
0.024	610
0.028	711
0.030	762
0.035	889
0.062/0.063	1,588

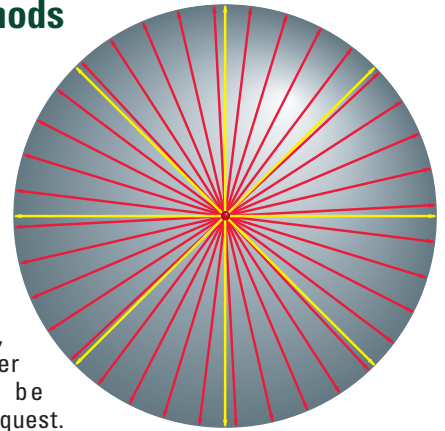
Compatible Fluxes and Solder Pastes

Indium Corporation offers a wide variety of fluxes and solder pastes that are designed to be compatible with the wide variety of solder alloys, die and component metallizations, and assembly processes that require **solder spheres** and similar engineered solder materials.

With over 500 flux and solder paste types available, including semiconductor-grade materials, our applications engineering team will be able to guide you to an appropriate material to suit your needs.

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 (OES)
- Atomic absorption (AA)
- Differential scanning calorimeter (DSC)
- Glow discharge mass spectrograph
- Scanning electron microscope (SEM)
- Auger electron spectrometer
- X-ray fluorescence (XRF)

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 thereon included in product packaging and invoices. All Indium Corporation's products and solutions are designed to be commercially available unless specifically stated otherwise.

Contact our engineers: askus@indium.com

Learn more: www.indium.com

ASIA +65 6268 8678 • CHINA +86 (0) 512 628 34900 • EUROPE +44 (0) 1908 580400 • USA +1 315 853 4900

