PRODUCT DATA SHEET

Indium9.72-HF

Die-Attach Solder Paste

Introduction

Indium9.72-HF is a dispensing solder paste designed and formulated specifically for die-attach processes. The flux vehicle is completely free of halides and halogens to eliminate halogen-corrosion of wirebond pads, and for improved environmental compliance.

Normally used with high-temperature alloys, **Indium9.72-HF** is designed for reflow in a forming gas or nitrogen atmosphere at less than 100ppm O_2. This product has superior wetting capabilities and offers low-voiding with minimal attention to profiling.

Features

- Ultra-low voiding with minimal profiling
- Halogen-free
- No corrosion of wirebond pads
- Bubble-free (airless)
- Reliable clog-free dispensing
- Consistent dispensing deposit size
- Superior wetting
- Excellent cleanability



Standard Product Specifications

Alloy	Metal Content	Mesh Size	Particle Size	Recommended Needle Size
Sn10/Pb88/Ag2 Sn5/Pb92.5/Ag2.5 Sn5/Pb95 Sn5/Pb85/Sb10	88.5%	Type 3	25–45 microns (Type 3)	20 gauge*

Note: 20 gauge needle - 0.58mm or 0.023".

Packaging

Standard packaging for dispensing applications includes 25g fill 10cc, and 100g fill 30cc airless syringes. Other packaging options may be available upon request.

Alloys

Indium Corporation manufactures low-oxide spherical powder in a standard Type 3 mesh size. Other mesh sizes are available upon request. The weight ratio of the solder powder to the solder paste is referred to as the metal load and is typically 88.5% for standard alloy compositions.

Shelf Life

Packaging	Condition	Shelf Life
Syringe	Store @ -20°C to 0°C	3 months
Syringe	Store @ -40 to -20°C	4 months
Syringe	Store @ <-40°C	6 months
All Other Packaging	Store @ <10°C	6 months

Bellcore and J-STD Tests and Results

Test	Result
J-STD-004 (IPC-TM-650)	
Flux Type Classification	ROM0
Presence of Halide Fluoride Spot Test	Pass
Halogen Elemental Analysis	Flux meets IEC 61249-2-21 definition of halogen-free
Post-Reflow Flux Residue (ICA Test)	<5% of solder paste
Corrosion	Pass
SIR (Post-Clean)	Pass, 10^8 Ohms
Acid Value (Typical)	92

Test	Result
J-STD-005 (IPC-TM-650)	
Typical Solder Paste Viscosity (Pb92.5/Sn5/Ag2.5, Type 3, 88.5%) Brookfield (TF 5rpm)	280kcps
Solder Ball Test	Pass
Wetting Test	Pass
Standard High-Pb Alloy Metal Load	88.5%

All information is for reference only.
Not to be used as incoming product specifications.

From One Engineer To Another®

INDIUM® CORPORATION®

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Storage and Handling Procedures

Refrigerated storage will prolong the shelf life of solder paste. If unopened/unused syringe paste is stored at different temperature, then the recommended maximum duration the syringe is exposed to such conditions should follow the table listed below.

Temperature	Maximum Duration
>0–10°C	1 month
22–25°C/Ambient	36 hours

When storing solder paste contained in syringes and cartridges, they should be stored tip down. Solder paste should be allowed to reach ambient working temperature prior to use. No heating should be employed. Generally, paste should be removed from refrigeration at least 4 hours before use. Actual time to reach thermal equilibrium will vary with container size. Paste temperature should be verified before use. Cartridges or syringes should be labeled with date and time of opening.

Dispensing

Indium9.72-HF is formulated to be applied using automated high-speed, high-reliability, single-point or multi-point dispensing equipment, but will also function in hand-held applications. Highly accurate volumes can be dispensed using either pneumatic or positive displacement devices. Optimal dispensing performance is dependent on storage conditions, equipment type, and setup.

Atmosphere

Indium9.72-HF is designed for use in a forming gas or nitrogen (100ppm oxygen or less) atmosphere.

Cleaning or Residue Removal

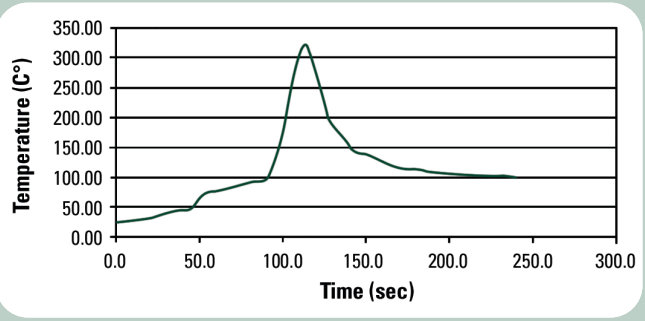
The post-reflow residue of **Indium9.72-HF** can be removed with commercially available solvents such as Kyzen HC-2. The vehicle is capable of high-temperature reflow without charring; but in case of overheating, any charred residue can be removed with the aid of ultrasonic or mechanical agitation.

Quality

Indium Corporation is dedicated to producing the highest quality die-attach solder paste. **Indium9.72-HF** is vacuum packaged by highly-trained operators under controlled conditions in specially designed equipment to minimize air bubbles in every syringe and cartridge. Rheology and reflow characteristics, as well as metal content and identity, are carefully confirmed for each lot.

Reflow

Recommended Profile (Pb-free):



The typical profile above is designed for use with high-Pb (lead content 80% or greater) alloy in a forming gas or nitrogen atmosphere (100ppm oxygen or less). It can serve as a general guideline for establishing a profile for your process and should be regarded as a typical example. Adjustments to this profile may be necessary based on assembly size, thermal density, and other factors. Use of other alloys with lower or higher liquidus temperatures will also require changes.

Heating and Liquidus Stage:

Establish a profile which provides a rapid heating of the assembly to the solder's liquidus temperature. To achieve acceptable wetting, and to minimize voiding and intermetallics formation, the profile must include a period of 15–30 seconds above the alloy's liquidus, and a peak temperature of 20–40°C above liquidus. However, excessive time above liquidus (and/or excessively high temperatures above liquidus) can produce negative consequences including: charred residue, increased difficulty in cleaning, excessive intermetallics formation, voiding, and more.

Cooling Stage:

Cooling after reflow should be as fast as practical. This is desired to form a fine-grained metallic structure. Slow cooling will result in a coarse, large-grain structure that will exhibit poor thermal cycling and fatigue resistance.

Safety Data Sheets

Please refer to the SDS document within the product shipment, or contact our local team to receive a copy.

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.

All of Indium Corporation's solder paste and preform manufacturing facilities are IATF 16949:2016 certified.
Indium Corporation is an ISO 9001:2015 registered company.

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