

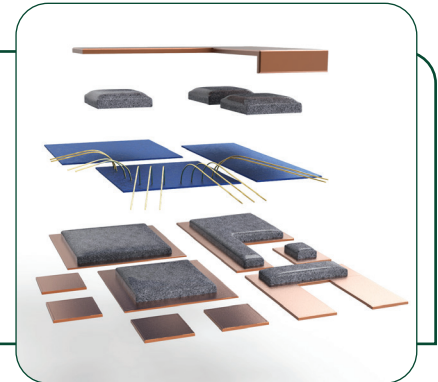
# PRODUCT DATA SHEET

# Durafuse® HT

## High-Temperature Pb-Free Solder Paste

### Introduction

**Durafuse® HT** has been designed as a Pb-free solder paste intended as a “drop-in” alternative to traditional high-Pb die-attach solders that require a re-melting temperature that is sufficiently above the PCBA reflow temperatures of up to 260°C. The mixed alloy system allows for shear strength >15MPa, even at temperatures around 280°C and has outstanding thermal cycling properties. Both the electrical and thermal properties of **Durafuse® HT** have been shown to be equal to or better than high-Pb solder.



### Features

- “Drop-in” replacement to high-Pb solder
- Pb-free (lead-free)
- Electrical and thermal properties ≥ high-Pb
- Shear strength >15MPa at 280°C

### Target Application

**Durafuse® HT** is intended for die-attach and clip-attach applications for discrete power devices and SMD multi-chip module power devices.

### Alloys

Indium Corporation manufactures high-quality, low-oxide, spherical powders. Standard powder size for **Durafuse® HT** is Type 4 (25–38µm) classification per IPC J-STD-005.

### Flux Vehicle

Indium 7.28 is a versatile, halogen-free flux system, capable of handling the high process temperatures needed for die-attach application. Flux residues can be removed with readily available cleaning solvents. Contact Indium Corporation’s technical support for advice or recommendations.

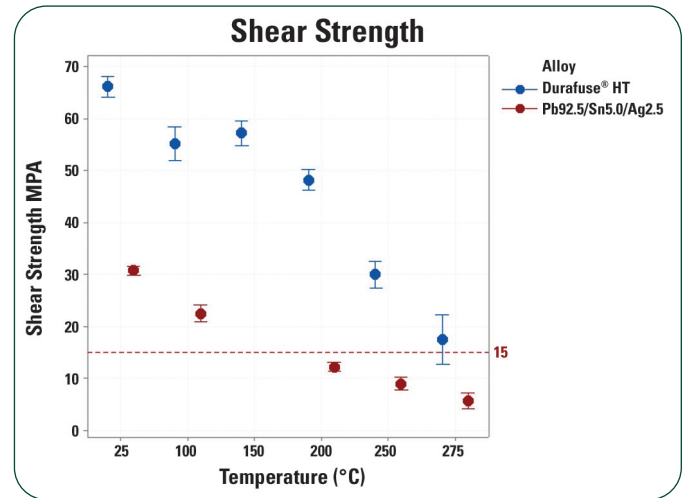
### Standard Product Configuration

Flux	Metal Load	Application	Packaging
7.28	84%	Dispensing	100g/syringe
	88%	Printing	250g/jar

Other packaging options may be available upon request.

### High-Temperature Shear Strength

**Durafuse® HT** maintains shear strength >15MPa, even at temperatures around 280°C, outperforming high-Pb solder.



### Product Characteristics

Test	Result	Test	Result
<b>J-STD-004 (IPC-TM-650)</b>		<b>J-STD-005 (IPC-TM-650)</b>	
Flux Type (per J-STD-004A)	ROLO	Typical Solder Paste Viscosity (Type 4, 88%) Malcolm (5min/10rpm)	920 poise
Presence of Halide	0%	Wetting Test	Pass
Fluoride Spot Test	Pass	Slump Test	Pass
SIR	Pass (after cleaning)	Solder Ball Test	Pass
		Tack (typical)	45 grams

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

From One Engineer To Another®



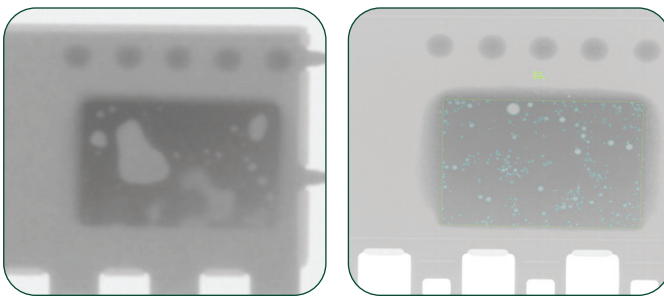
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## Durafuse® HT

### High-Temperature Pb-Free Solder Paste

#### Metallization Compatibility and Ni Leaching

**Durafuse® HT** works with most common die metallization schemes (e.g., Ti/NiV/Ag); however, attention should be paid to the layer thicknesses. NiV layers should be a minimum of 350nm to reduce the risk of Ni fully leaching into the solder which can result in de-wetting and large voids. Harsh reflow conditions such as long TALs and high peak temperature can also accelerate Ni leaching. Indium Corporation’s experienced technical support team can advise on metallization compatibility and process conditions.

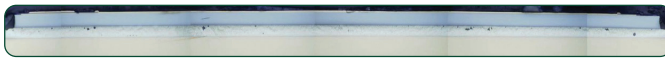


200nm NiV: Large voids due to Ni leaching and de-wetting.

500nm NiV: Very low-voiding.



0.2µm Ni – cross section of the voids revealed Ni leaching and interfacial de-wetting.



0.5µm Ni – cross section revealed Ni remaining at the interface with continuous IMC.

#### Storage and Handling Procedure

Refrigerated storage will prolong the shelf life of solder paste. Solder paste packaged in syringes and cartridges should be stored tip down. Solder paste should be allowed to reach ambient working temperature prior to use. Generally, paste should be removed from refrigeration at least 2 hours before use. Actual time to reach thermal equilibrium will vary with container size. Paste temperature should be verified before use. Jars and cartridges should be labeled with date and time of opening.

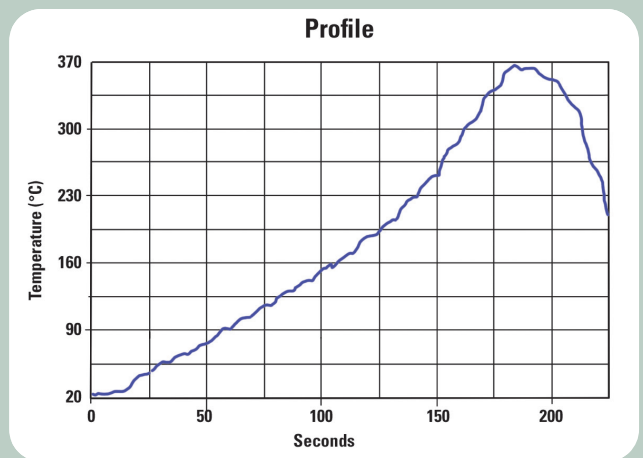
Packaging	Storage Temperature	Shelf Life
Syringe	<-10°C	6 months
Jar	<0°	

#### Recommended Printer Operation

Solder Paste Bead Size	20–30mm in diameter
Print Speed	25–100mm/second
Squeegee Pressure	0.02–0.03kg/mm of blade length
Underside Stencil Wipe	Start at once per every 5 prints and decrease frequency until optimum value is reached
Solder Paste Stencil Life	>8 hours

#### Reflow

##### Recommended Profile:



The profile above is designed for use with **Durafuse® HT** in a nitrogen atmosphere or forming gas (<100ppm O<sub>2</sub>). Recommended peak temperature is 350–385°C. 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.

#### Cleaning

**Durafuse® HT** is designed to be cleaned using standard cleaning chemistries. Indium Corporation’s Technical Support Engineers can recommend appropriate cleaning materials from leading suppliers that are suitable for the application.

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.

Contact our engineers: [askus@indium.com](mailto:askus@indium.com)

Learn more: [www.indium.com](http://www.indium.com)

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



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