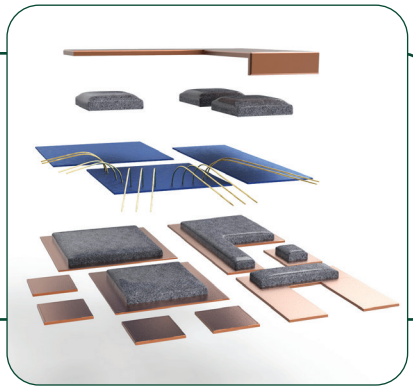
PRODUCT DATA SHEET

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

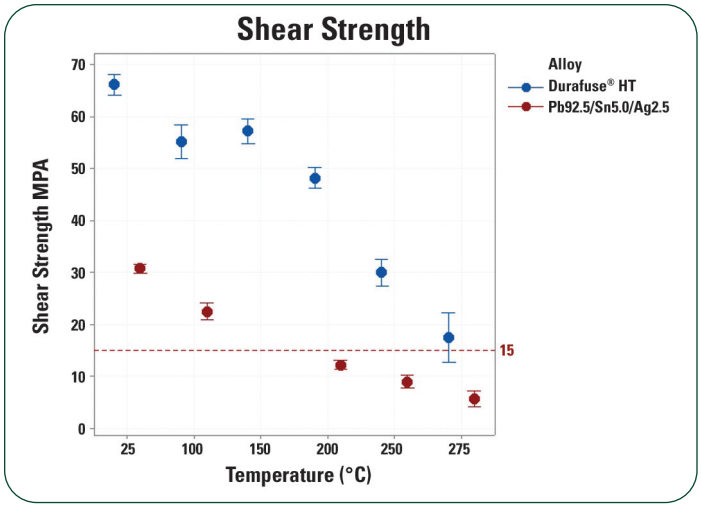
Indium Corporation manufactures high-quality, low-oxide, spherical powders. Standard powder size for **Durafuse® HT** is Type 4 (25–38µm) classification per IPC J-STD-005.

Flux Vehicle

Indium7.28 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.

High-Temperature Shear Strength

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



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.

Product Characteristics

Test	Result
J-STD-004 (IPC-TM-650)	
Flux Type (per J-STD-004A)	ROL0
Presence of Halide	0%
Fluoride Spot Test	Pass
SIR	Pass (after cleaning)

Test	Result
J-STD-005 (IPC-TM-650)	
Typical Solder Paste Viscosity (Type 4, 88%) Malcolm (5min/10rpm)	920 poise
Wetting Test	Pass
Slump Test	Pass
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®

INDIUM® CORPORATION®

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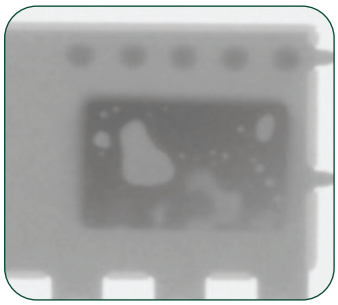
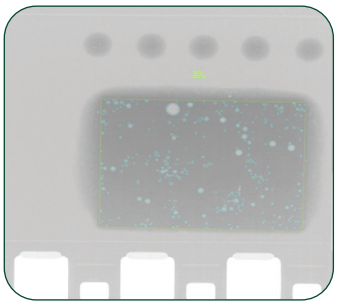
Metallization Compatibility and Ni Leaching

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.

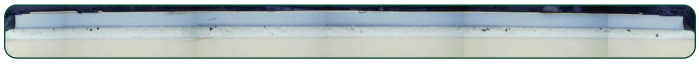


200nm NiV: Large voids due to Ni leaching and de-wetting.



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.

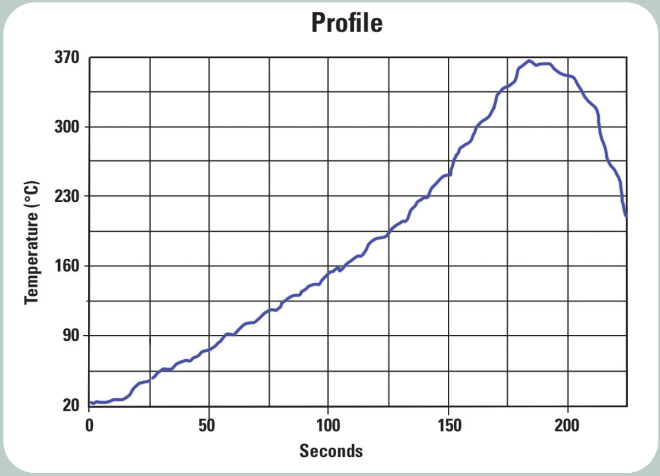
Packaging	Storage Temperature	Shelf Life
Syringe	<-10°C	6 months
Jar	<0°	

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_2). 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.

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
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