

DEVELOPMENTAL PRODUCT All data is preliminary and subject to change.

QuickSinter® QS815-SD

Pressureless Silver Sintering Paste

Introduction

Indium Corporation's **QS815-SD Silver Sintering Paste** is a high metal-loading material designed to fit easily into a dispense process with no change of deposition equipment. The paste can also use fast "reflow-like" (RFL) sintering processes to form strong joints on many standard leadframe, DBC, and IPM pad finishes, and will bond strongly to die with Ag, Au, or Cu surfaces, depending on sinter atmosphere and sinter profile. **QS815-SD** is our easy-to-dispense pressureless silver sintering formulation.

Solder and many standard epoxy-silver materials are proving increasingly unsuitable for many discrete and small module device applications. They may, for example, be incapable of

surviving the ambient conditions seen from longer mission profiles for automotive applications. These mission profiles typically may drive longer high-temperature operating life (HTOL) and larger temperature swings in usage (thermal cycling).

Dispense: The silver sintering paste is capable of being dispensed at very high speed (>>3dots/second) using readily available needles and a variety of unique dispense patterns with ease. Needle gauges tested are 18–32G needles.

Sinter: Smaller die are typically better suited to faster-ramping RFL sintering, and guidelines are given below.

Features

- Die size $\leq 2 \times 2$ mm
- Pressureless sintering paste, but also suited to pressurized sintering
- Quick sinterable within 12 minutes, compatible with inline reflow oven
- Can be used on Cu-, Ag-, and Au-finished surface
- No or very low void (<2%) silver sintering joint with high shear strength (>30MPa)
- High electrical conductivity
- High thermal conductivity
- RoHS-compliant
- Long shelf life
- Long work life
- Not a nanomaterial per EU definition (2011/696/EU)

Typical Properties of Paste Before and After Sintering

Properties	QS815-SD
Before sintering	
Ag content, wt%	92
Viscosity, kcps, 5rpm at 25°C	12.6
Paste application method	Dispensing
After sintering	
Melting point (°C)	961
Electrical resistivity ($\mu\Omega$.cm)	5
Thermal conductivity (W/mK)	>200
CTE (ppm/K)	19

Application

The paste is used as die-attach materials in devices such as discrete, high power IGBT, MOSFET, and semiconductor diodes. It is designed for Pb-free joints requiring high thermal and electrical conductivity, as well as high service temperature. Silver sintering paste maintains high adhesion and tensile strength at operating temperatures >350°C.

From One Engineer To Another®



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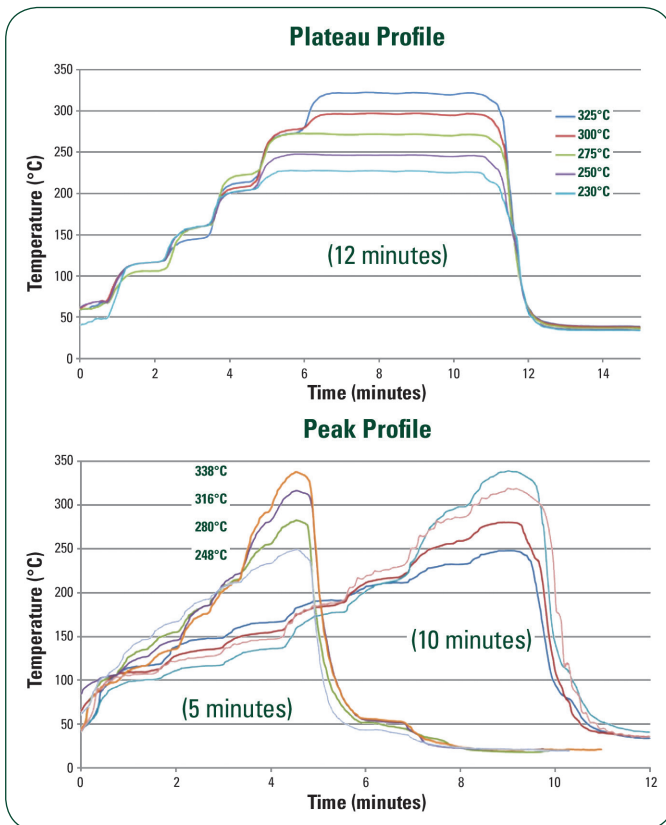
Pressureless Silver Sintering Paste

Sintering Example and Result

The profiles recommended below are guidelines. Temperatures are measured at joints.

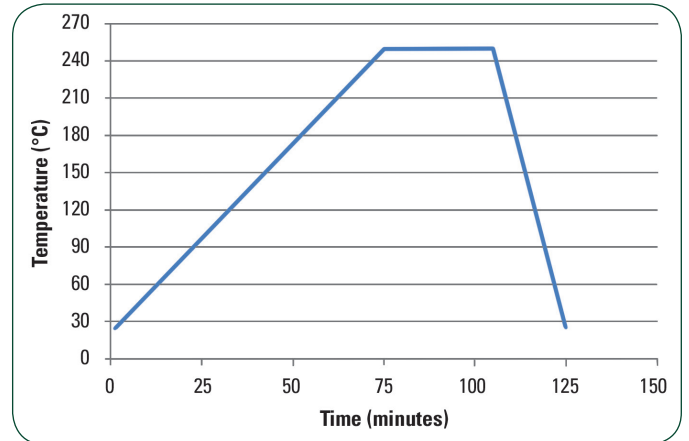
Quick Pressureless Sintering with BTU Reflow Oven

The experiments are conducted in BTU reflow oven in air using the following profiles:



Box Oven Pressureless Sintering

The experiments are conducted in air using the following profile:



Storage and Handling Procedure

Refrigerated storage will prolong the shelf life of Ag sintering paste (>6 months). The shelf life of the paste is 12 months when sealed tightly and stored at <-20°C. Ag sintering paste packaged in syringe should be stored tip down.

Ag sintering paste should be allowed to reach ambient working temperature prior to use. Generally, paste should be removed from refrigeration at least 1 hour before use. Actual time to reach thermal equilibrium will vary with container size. Paste temperature should be verified before use. Syringes and jars should be labeled with date and time of opening.

Packaging

Ag sintering paste is available in syringes or jars.

Technical Support

Indium Corporation's internationally experienced engineers provide in-depth technical assistance to our customers. Thoroughly knowledgeable in all facets of Materials Science as it applies to the electronics and semiconductor sectors, Technical Support Engineers provide expert advice on Ag sintering applications. Indium Corporation's Technical Support Engineers provide rapid response to all technical inquiries.

Safety Data Sheet

The SDS for this product is available by contacting askus@indium.com

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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