

PRODUCT DATA SHEET

InBAKE 29 (76-29-6)

Cu Sinter Paste

Introduction

Indium Corporation's Cu sinter paste **InBAKE 29 (76-29-6)** is developed for high-power die-attach applications and for applications requiring high thermal conductivity, high electrical conductivity, and high service/operating temperature. **InBAKE 29** can be sintered either pressure-less or with pressure, under low oxygen atmospheres of $O_2 < 1,000\text{ppm}$. After 4,500 cycles TCT (-40°C – 175°C), the die shear strength increases compared to time zero. **InBAKE 29** target applications include high-power die-attach (SiC MOSFET and Si IGBT), RF die-attach, and power LED die-attach.



Features

- Pressure-less / Pressure sinter-able
- Used on Cu, Ag, Au, and Ni finished surfaces
- Stencil printing or dispensable
- High electrical conductivity
- High thermal conductivity
- RoHS compliant
- Long shelf life, long work life
- Metal load 82–85%
- Paste typical viscosity 20–30Kcp (5rpm, cone and plate viscometer)
- Shear strength $>25\text{MPa}$ (pressure-less sinter); $>50\text{MPa}$ (apply 5MPa sinter pressure)

Post-Sinter BLT

To achieve high shear strength, the minimum BLT post-sinter is $20\mu\text{m}$. Wet paste thickness to post-sintered thickness reduction is approximately 40%.

Typical Properties of Sintered Materials

Property comparison between Cu sintering and high-Pb solder (92.5Pb/5.0Sn/2.5Ag) joints.

| Property | Cu Sintering Paste InBAKE 29 (76-29-6) | 92.5Pb/5.0Sn/2.5Ag |
|--|---|--------------------|
| Melting Point ($^\circ\text{C}$) | 1,083.4 | 296 |
| Electrical Resistivity ($\mu\Omega\cdot\text{cm}$) | 8.8 | 20 |
| Thermal Conductivity (W/mK) | >120 | 25 |

Process Flow

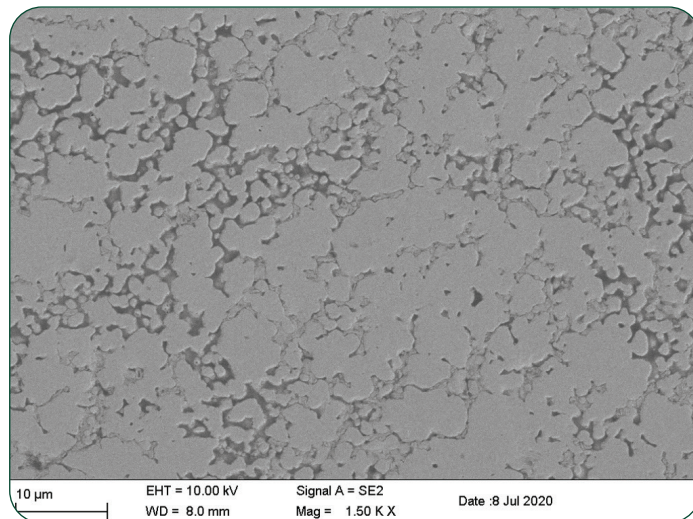
Mixing

Dispensing

Die-Attach

Sinter

- **Mixing**
 - 800rpm, 1min
- **Dispensing**
 - 0.3–0.4mm needle ID
- **Die-attach**
 - 50–100g of force or Z height control to ensure appropriate coverage/fillet
- **Pressure-less sinter profile**
 - Ramp from room temperature to 150°C – 10 minutes/depends on oven capability
 - Hold at 150°C – 10 minutes
 - Ramp from 150°C to 250°C – 10 minutes
 - Sinter at 250°C for 30 minutes ($<10\text{mm}^2$), Sinter for 45–60 minutes ($10\text{--}25\text{mm}^2$)
 - Cool down according to the capability of the oven
 - $O_2 < 1000\text{ppm}$
- **Low pressure sinter profile**
 - Pre-dry @ 110°C , 3–5min, N_2
 - Sinter @ 250°C , 5–10min, 5–10MPa, N_2 (O_2 : $<1,000\text{ppm}$)
- **Sinter atmospheres**
 - N_2 , H_2 , HCOOH, Vacuum
- **Allowable staging times**
 - After dispense, before die-attach: 30min (as short as possible)
 - After die-attach, before sinter: 3 hours (as short as possible, N_2 recommended)



SEM image of Cu sinter joint after sintering.
Conditions: $245^\circ\text{C}/30\text{ minutes}/N_2$ (pressureless).

From One Engineer To Another®



Form No. 99947 R1



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Packaging

InBAKE 29 is available in 5, 10, and 30CC syringes.

Storage and Handling Procedures

Refrigerated storage will prolong the shelf life of Cu sintering paste.

| Storage Conditions (unopened containers) | Shelf Life |
|---|------------|
| -25 to -15°C | 6 months |

Cu sintering paste should be allowed to reach ambient working temperature prior to use. Generally, paste should be removed from refrigeration at least 2–4 hours before use. Actual time to reach thermal equilibrium will vary with container size. Paste can also be transferred from -25/-15°C to 5°C in advance 1 day before testing. Syringes, jars, and cartridges should be labelled with date and time of opening.

Technical Support

Indium Corporation sets the industry standard in providing rapid response, onsite technical support for our customers worldwide. Indium Corporation's team of Technical Support Engineers can provide expertise in all aspects of Materials Science and Semiconductor Packaging process applications.

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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