

PRELIMINARY PRODUCT DATA SHEET

InFORCE®29 (141-39-5)

Cu Sinter Paste

Introduction

InFORCE®29 (141-39-5) is a pressure copper sinter paste developed by Indium Corporation to be sinterable under nitrogen. This paste is formulated for high-power die-attach applications where high thermal and electrical conductivity is required. Capable of reliably handling high operating temperatures, this material is suited for die-attach of Si IGBTs, as well as wide band gap semiconductor devices, such as SiC MOSFETs and GaN HEMTs.

Features

- Pressure sinter
- Dispensable
- Printable
- Jar/syringe package
- Dry process
- Wet process
- RoHS-compliant
- Sinters to Cu (preferred), Ag, and Au



Paste in Jar



Post-Print

Processing of InFORCE®29 (141-39-5)

Paste should reach ambient temperature before use to ensure material stability. If stored under $\leq -15^{\circ}\text{C}$, allow for 4 hours of stabilization before use.

Properties

Metal	Cu
Metal Content (by weight)	85–87%
Max. Particle Size	10 μm
Paste Application	Printing, slot nozzle dispensing
Shear Strength (5x5mm)	>40MPa
Thermal Conductivity	>200W/mK
TCT (-65°C – 150°C), 1,500 cycles	Pass

Re-Homogenization

Before applying to the stencil, the paste should be re-homogenized using a planetary mixer at speeds between 700–1,200rpm for 90–120 seconds. The paste should be smooth and free from bubbles.

Dry Process



Dry Process – Stencil Printing

A slow printing speed of 20–30mm/s is recommended. Lower separation speeds with 0.1mm/s and 1mm of separation distance can be used to minimize lifted edges or “dog ears.” The print speed can be adjusted for good stencil clearing; 5–6kgf is recommended to start.

Dry Process – Pre-Dry After Printing

The actual profile depends on equipment capability. Ramp to 110°C (typically for 11–13 minutes), then keep the temperature at 110°C for 10 minutes. N_2 ($\text{O}_2 < 1,000\text{ppm}$) is required to resist the oxidation of Cu paste.

Dry Process – Pressure Sintering

InFORCE®29 (141-39-5) sinters most easily to Cu surfaces. Pre-heating to 130°C for 3 minutes is suggested before pressure sintering. Sintering with a pressure of 15–20MPa at 250°C for 5 minutes is suitable for 5x5mm SiC die, resulting in low porosity and a shear strength of >40MPa.

From One Engineer To Another®



Form No. 100431 R0



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Wet Process



Wet Process – Stencil Printing

A slow printing speed of 20–30mm/s is recommended. Lower separation speeds with 0.1mm/s and 1mm of separation distance can be used to minimize lifted edges or “dog ears.” The print speed can be adjusted for good stencil clearing, 5–6kgf is recommended to start.

Wet Process – Pre-Dry after Die-Attach

The actual profile depends on equipment capability. Ramp to 150°C (typically for 12–15 minutes), and keep the temperature at 150°C for 90 minutes, before starting the cool down. N₂ (O₂<1,000ppm) is required to resist the oxidation of Cu paste.

Wet Process – Pressure Sintering

InFORCE® 29 (141-39-5) sinters most easily to Cu surfaces. Pre-heating to 130°C for 3 minutes is suggested before pressure sintering. Sintering with a pressure of 15–20MPa at 250°C for ≥5 minutes is suitable for 5×5mm SiC die, resulting in low porosity and a shear strength of >40MPa.

Shelf Life / Storage Condition

InFORCE® 29 (141-39-5) will last more than 3 months at the recommended storage conditions (≤-15°C).

Handling Procedure

Refrigerated storage will prolong the shelf life of Cu sintering paste. Cu sintering paste should be allowed to reach ambient working temperature prior to use. Generally, paste should be removed from refrigeration at least 4 hours before use. The actual time to reach thermal equilibrium will vary with the container size.

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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