



Applied Nanotech, Inc.

a PEN Inc. company

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AI-PS4020

Aluminum Alloy Paste

ANI's AI-PS4020 is an aluminum alloy paste suitable for conductive applications in the silicon photovoltaic's industry. AI-PS4020 is specially formulated to obtain low contact resistance on n-type and p-type Si solar cells. Our aluminum alloy paste is lead and cadmium free.

Typical properties

Part Number	AI-PS4020
Sheet resistance	<1 Ω/sq*
Viscosity	100,000-200,000 cP**
Dried thickness	7-25 μm
Fired thickness	5- 20 μm

* Sheet resistance is function of firing temperature

** Measured at 10rpm and 25°C with Brookfield DV-E concentric cylinder viscometer. Can be tuned to specific customer requirements



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Application Notes:

Al-PS4020 Aluminum Alloy Paste

Description

ANI Al-PS4020 aluminum alloy paste is formulated for screen printing techniques. The aluminum alloy paste is designed for low-temperature processing of silicon photovoltaic devices. Al-PS4020 shows low contact resistivity on n-type and p-type Si solar cells.

Storage and Shelf Life

Al-PS4020 aluminum alloy paste should be stored in a tightly sealed leak proof container in a cool dry place. Al-PS4020 can be stored for at least 6 months.

Safety and Handling

When working with Al-PS4020 paste, use adequate ventilation and appropriate protective gear. Al-PS4020 paste can cause eye and skin irritation. The following precautions should be taken when handling Al-PS4020 aluminum alloy paste:

- Read the Material Safety Data Sheet (MSDS)
- Avoid prolonged breathing of vapor
- Use appropriate safety equipment such as gloves and eye protection
- Wash hands thoroughly after handling
- Keep the paste container closed when not in use to prevent drying and spilling

DISCLAIMER: Applied Nanotech, Inc. extends no warranties, makes no representations, and assumes no responsibility as to the accuracy of this information for this product for any use or for any consequence of its use. Users assume all risk of handling, whether or not in accordance with any statements or recommendation of Applied Nanotech, Inc.

Processing Procedures

Pre-processing

- A mixing process is recommended to obtain homogeneous paste before use.

Printing

- Printing can be done using a screen print or wire rod coating process.
- Recommended screen print parameters:
 - Screen Mesh – 250-325
 - Emulsion thickness – 12 micron (0.5mil)
 - Contact Force ~15 kg
 - Print speed ~100 mm/s
 - 60 deg trailing edge
 - 70-75A Durometer polyurethane squeegee
- Recommend wire rod #10

Drying

- Printed paste can be dried in a belt furnace at 230°C peak temperature, or in a convection oven at 100°C for 30 minutes in ambient atmosphere.

Sintering

- Low-temperature sintering: printed aluminum paste on silicon can be sintered as low as 550°C. Conditions will vary based on substrate.
- High-temperature sintering: printed aluminum paste on silicon can be sintered from 700-900°C for <1 minute in air. Conditions will vary based on substrate.

Clean-up

- Follow appropriate cleaning procedures for equipment used to print Al-PS4020 paste. Excess paste can be removed with ethanol, IPA, or acetone.