Mina™ Aluminum Surface Treatment Paste

Description

Mina™ is a flux paste that enables direct soldering to various aluminum alloys. Mina™ can be screen printed, stencil printed, or dispensed with a syringe. Once cured over an aluminum surface, Mina™ enables most solder pastes to adhere directly to the aluminum after reflow.

Application

A typical application is to apply Mina™ to your aluminum pads and cure it, for example, in an oven at 85 °C for three minutes or less. This prepares the pads for soldering. Print the solder paste onto the pads, place the components on the paste, and perform your regular reflow process.

Properties

Mina™ exhibits the following properties:

PROPERTY	VALUE	UNITS	COMMENTS
Appearance	• Gel: translucent • Cured: white to off-white		
Density	0.90 +/- 0.05	g/cm^3	gel
Viscosity	15,000 @ 10 rpm 19,000 @ 20 rpm	cP	• DV-2T viscometer (or equivalent) • 1 – 20 rpm • 25 °C water bath • 30 sec avg.
pH	• Gel: 6.83 +/- 0.05		measured in pH 7 H_2O

Product Performance/Characteristics

- Applying Mina by stencil
  - Mixing and Consistency:
    - The mixing can take place, for example, on the stencil with a spatula
    - Mina™ paste falls from a squeegee very smoothly once it is fully mixed
  - Stencil: stainless steel 50 µm thick
  - Print speed: 250-300 mm/sec (10-12 inches/sec) speed @45° angle tilt
  - Cleaning the stencil: pure Mina™ can be removed using IPA and a lint-free cloth

- Curing Mina™:
  - Convection oven (85°C, ≤ 3 min, depending on oven type and air-flow)
  - Hot-air knife (seconds)

- Solder types:
  - Mina™ is compatible with many solders, including:
    - Lead-free solders, such as SAC 305
    - Leaded solders
    - Low-temperature solders
    - Clean and no-clean solder pastes
  - For low-temperature solder paste applications, Taiyo America recommends the following:
    - Indium Corp:
      — 5.7LT-1 (Alloy: 57Bi/41Sn/1-2%Ag)
      — Indalloy #227 (Alloy: 77.2Sn/20In/2.8Ag)
    - Alpha:
      — OM-535 and OM-550
  - Solder wire of the above compositions will also work

- Aluminum types:
  - Mina™ can be used to solder to aluminum alloys such as Al 1100, Al 1145, Al 1235, Al 5052, and Al 6061, among others.

- Mechanical behavior of joint after solder:
  - The solder shear strength of Mina™ with solder 5.7LT-1 from Indium ranges from 15—40 N/mm^2 with typical failures occurring at the Al/PET interface.

RoHS Compliance

This product meets the requirements of the Restriction of Hazardous Substances (ROHS) Directive. Additional RoHS information is available upon request.

Storage, Shelf, and Stencil Life

- Storage:
  - Mina™ is flammable. Use a sealed and airtight container. Store under cool and dry conditions in controlled area and comply with local laws and regulations.
  - No refrigeration is needed. Do not freeze. A dry temperature range of 20–25 °C is recommended.
- Shelf life:
  - A storage temperature of 20—25 °C gives a 6-month period of shelf life from Date of Manufacture
- Stencil life:
  - Once Mina™ is dispensed on a stencil, it has a stencil life of 4—8 hours
  - After print and cure (before SMT), it is stable up to 45 days
  - Printed and cured Mina™ panels should be stored under similar conditions

Health and Safety

This product, during handing or use, may be hazardous to your health or the environment. Read the Safety Data Sheet and wear necessary personal protective equipment (PPE), such as gloves, closed shoes, lab coat, and face mask. All spent Mina™ should be disposed of according to local regulations.