Technical Data Sheet
S-Bond® 220-1/M

Recommended Information 2002

Description

S-Bond® 220-1/M is a Sn-Ag-Ti based active solder has been specifically optimized for joining to silicon and silicates. However, as an active solder, stemming from the S-Bond® 220-1/M alloy base, but with the addition 0.1 – 2w/o Mg, it can join a range of metals and ceramic materials. The magnesium addition promotes even more improved wetting of certain oxides that form on many semiconductors and glass.

Melting Range

- Solidus Temperature: 428º F (221º C)
- Liquidus Temperature: 447º F (232º C)
- Joining Temperature: 482 – 536º F (250 – 280º C)

Physical Properties

- Density: 0.264 lbs/in^3 (7.3 g/cc)
- Thermal Coefficient of Expansion from R.T. to 300º F (25 – 150º C): ~19 x 10^{-6}/ ºC
- Electrical Resistivity (ρ): 1.6µ–ohm-m
- Thermal Conductivity:
  - Intrinsic: 48 W/mK

Mechanical Properties

- Tensile Strengths: UTS 0.2%Y.S.
  - 25º C............. 7.8 ksi (53 MPa) 5.6 ksi (38 MPa)
  - 75º C............. 6.2 ksi (42 MPa) 4.7 ksi (32 MPa)
  - 175º C........... 3.9 ksi (26 MPa) 3.4 ksi (23 MPa)
  - 190º C........... 3.9 ksi (26 MPa) 3.0 ksi (20 MPa)
- Joint Strengths (R.T.):
  - Silicon 2.9 – 4.3 ksi (20 – 30 MPa)
  - Glass 2.9 – 7.5 ksi (20 – 52 MPa)
  - Al:SiC to Metals 4.4 – 6.0 ksi (30 – 41 MPa)
  - Glass to Metal 3.5 – 5.1 ksi (24 – 35 MPa)

Joint Sealing Capabilities

- Kovar to Alumina 3.8 x 10^{-9} atmospheres / cc sec
- SiC to Invar 5 x 10^{-10} mbar*L/sec (helium leak rate)
- Silicon ans Glass to metals 4.1 x 10^{-9} atmospheres / cc sec

EUROMAT GMBH does not guarantee the correctness of the above values. Values were determined in the laboratory and may vary depending on the batch. We recommend that you check the values yourself after receipt of the goods.

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