

Product Data Sheet

NC-SMQ®71 Die Attach Solder Paste

Features

- Low residue
- Vacuum packed (bubble-free)
- Reliable miss-free, clog-free dispensing
- Consistent deposit size
- Halogen-free
- Compatible with all common metal finishes



Introduction

NC-SMQ®71 is a dispensing solder paste designed and formulated specifically for die attach processes. Considerable care has been taken to produce a product that gives reliable dispensing of a consistent size deposit in automated dispensing equipment.

NC-SMQ®71 is formulated for reflow in nitrogen atmospheres of 500ppm oxygen or less and leaves a completely benign residue of only 2% of paste or 20% to 25% of flux/vehicle. NC-SMQ®71 is halogen-free and meets ANSI/JSTD-004 and -005 criteria, as well as Bellcore electromigration specifications.

Alloys

Indium Corporation manufactures low oxide spherical powder composed of SnPb, SbSnPb, and SnPbAg in a standard Type 3 mesh size. Other non-standard mesh sizes are available upon request. The weight ratio of the solder powder to the solder paste is referred to as the metal load and is typically 86%-90% for standard alloy compositions.

Standard Dispensing Powder Specifications

Alloy	Metal Content			Particle Size		
	Type 3	Type 4	Type 5	Type 3	Type 4	Type 5
Sn10/Pb88/Ag2	86-88%	85.5-	85-87%	25 to	25 to	20 to
Sn5/Pb92.5/Ag2.5		87.5%		45µm	38µm	25µm
Sn5/Pb95						
Sn5/Pb85/Sb10						

Packaging

Standard packaging for dispensing applications includes airlessly filled (bubble-free) 10cc and 30cc EFD syringes (Semco syringes also available). Other packaging options may be available upon request.

Material Safety Data Sheets

The MSDS for this product can be found online at <http://www.indium.com/msds>

OVER→

BELLCORE & J-STD TESTS & RESULTS

Test	Result	Test	Result
J-STD-004A (IPC-TM-650)		J-STD-005 (IPC-TM-650)	
• Flux Type (per J-STD-004A)	ROLO	• Typical Solder Paste Viscosity (Pb92.5/Sn5/Ag2.5, Type 3, 89%)	430 kcps
• Presence of Halide Fluoride Spot Test	Pass	• Brookfield (TF 5 rpm)	Pass
• Elemental Analysis	0%	• Slump Test	Pass
• Post Reflow Flux Residue (ICA Test)	2% of solder paste	• Solder Ball Test	Pass
• Corrosion	Pass	• Wetting Test	Pass
• SIR (Post Clean)	Pass	• Standard Metal Load	86%-90%
• Acid Value (Typical)	26		

All information is for reference only. Not to be used as incoming product specifications.

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Storage and Handling Procedures

Refrigerated storage will prolong the shelf life of solder paste. The shelf life of **NC-SMQ®71** is 6 months at storage temperatures of -20° to +5 °C. When storing solder paste contained in syringes and cartridges, they should be stored tip down. Solder paste should be allowed to reach ambient working temperature prior to use. No heating should be employed.

Generally, paste should be removed from refrigeration at least 4 hours before use. Actual time to reach thermal equilibrium will vary with container size. Paste temperature should be verified before use. Cartridges or syringes should be labeled with date and time of opening.

Dispensing

NC-SMQ®71 is formulated to be applied using automated high speed, high reliability, single point or multi-point dispensing equipment, but will also function in hand-held applications. Highly accurate volumes can be dispensed using either pneumatic or positive displacement devices. Optimal dispensing performance is dependent on storage conditions, equipment type and set up.

Atmosphere

NC-SMQ®71 is designed for use in a nitrogen (500 ppm oxygen or less) atmosphere.

Cleaning

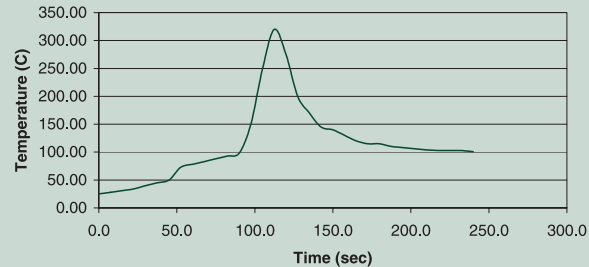
NC-SMQ®71 is designed for no-clean applications, however the flux residue can be removed if necessary by using a semi-aqueous system, saponified water, alcohols, and other CFC-free alternatives.

Quality

The Indium Corporation is dedicated to producing the highest quality die attach solder paste. **NC-SMQ®71** is vacuum packaged by highly trained operators under controlled conditions in unique, specially designed equipment to minimize air bubbles in every syringe and cartridge. Rheology and reflow characteristics as well as metal content and identity are carefully confirmed for each lot. Also, evaluations are performed on each lot to verify dispensing performance.

Reflow

Recommended Profile:



The typical profile above is designed for use with Sn10/Pb88/Ag2 or Sn5/Pb92.5/Ag2.5 alloy in a nitrogen atmosphere (500 ppm oxygen or less). It can serve as a general guideline for establishing a profile for your process and should be regarded as a typical example. Adjustments to this profile may be necessary based on assembly size, thermal density, and other factors. Use of other alloys with lower or higher liquidus temperatures will also require changes.

Heating and Liquidus Stage:

Establish a profile which provides a rapid heating of the assembly to the solder's liquidus temperature. Ramp rates of 1 to 4 °C/sec are recommended, but the nature of the assembly should govern the actual rate. To achieve acceptable wetting, and to minimize voiding and intermetallics formation, the profile must include a period of 15 to 30 seconds above the alloy's liquidus, and a peak temperature of 10 to 20 °C above liquidus. However, excessive time above liquidus (and/or excessively high temperatures above liquidus) can produce negative consequences including: charred residue, difficult residue removal, excessive intermetallics formation, voiding, and more.

Cooling Stage:

Cooling after reflow should be as fast as practical. This is desired to form a fine-grained metallic structure. Slow cooling will result in a coarse, large grain structure that will exhibit poor thermal cycling and fatigue resistance.

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.

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