NC-SMQ®92 Series No-Clean Solder Paste

INTRODUCTION

NC-SMQ®92 is a halide free, air reflow No-Clean solder paste formulated to leave a *probe testable residue.* The residue is easily penetrated and will not clog multipoint probes. This product has other qualities such as consistent fine-pitch paste deposition, long stencil and tack life, and excellent wetting. NC-SMQ®92 will perform well on high speed surface mount lines with fast printing and rapid chip placement. NC-SMQ®92 meets or surpasses all ANSI/J-STD-004 and -005 specifications.

AVAILABLE ALLOYS

Indium Corporation manufactures low oxide spherical powder composed of Sn-Pb, Sn-Pb-Ag, and many other alloys covering a wide temperature range. Typical metal loads range from 85%-92% for standard alloy compositions. The actual metal % is application dependent and varies with alloy density. Solder powder is available in Type 1 through 6 classifications per ANSI/J-STD-005 for printing and dispensing applications. Please call us for information on non-standard mesh sizes and alloys.

			Solder Powder Diameter	
Type	Pitch	Mesh Size	Microns	Inches
1	STD	-100/+200	75-150	.0030-.0059
2	STD	-200/+325	45-75	.0018-.0030
3	Fine	-325/+500	25-45	.0010-.0018
4	Ultra-Fine	-400/+635*	20-38	.0008-.0015
5	Ultra-Fine	-500/+635	20-25	.0008-.0010
6	Ultra-Fine	-635	<20	<.0008

*-400/+500 also available

Product Handling Recommendations

PRINTING

Stencil Material:

Stainless Steel, Brass, or Nickel Plated

Stencil Thickness:

0.050"/1.27mm pitch:	0.010"/0.254mm to 0.008"/0.203mm
0.025"/0.635mm pitch:	0.008"/0.203mm to 0.006"/0.152mm
0.020"/0.508mm pitch:	0.006"/0.152mm to 0.004"/0.102mm
0.016"/0.406mm pitch:	0.005"/0.127mm to 0.004"/0.102mm
0.012"/0.305mm pitch:	0.004"/0.102mm to 0.003"/0.076mm

Squeegee:

80-90 Shore A Durometer Rubber or Stainless Steel Blade

Squeegee Speed:

1.0" (25.4 mm) to 6.0" (152.4 mm) per second for typical fine-pitch printing. Faster or slower speeds can be used depending on process requirements.

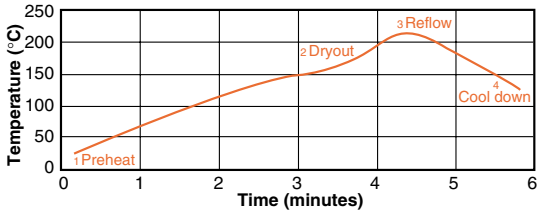
Squeegee Pressure:

0.5 lb - 1.5 lb per inch (89-268 gms/cm) squeegee length

REFLOW METHODS

Convection, IR, Vapor Phase, Conduction, Laser, etc.

Recommended Profile:



This profile is for use with Sn63Pb37 & Sn62Pb36Ag2 alloys and will serve as a general guideline in establishing a reflow profile for your process. Adjustments will be necessary for use with other alloys. Various board geometries, densities, and oven types may require further profile adjustments.

The typical reflow profile encompasses four basic stages:

1. **Preheat:** 0.5°C to 1.0°C/second rate of rise
2. **Soak or Dryout:** 30 to 60 seconds
3. **Reflow:** Peak temperature should be 30°C to 40°C above the liquidus of the alloy for 30 to 60 seconds.
4. **Cool down:** <4°C/second

CLEANING

NC-SMQ®92 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.

Spray Pressure:

30 psi (2 bar) minimum recommended.

Stencil Cleaning:

Cleaning is best performed using isopropyl alcohol (IPA) as a solvent. Conventional cleaning solvents, saponification, and other CFC-free alternatives are also effective.

SHELF LIFE, RECOMMENDED STORAGE AND USE

3 months at 5°C to 25°C; 6 months at -20°C to 5°C

Solder paste should be allowed to reach ambient working temperature prior to use. Actual time to reach thermal equilibrium will vary with container size. In order to maximize the opened-jar paste performance, the paste should be covered when not in use.

OVER→

INDIUM CORPORATION OF AMERICA®

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PRODUCT DATA SHEET

Solder Paste Family

J-STD-004 & Flux Testing:	NC-SMQ®92	NC-SMQ®92J	NC-SMQ®92H	NC-SMQ®92TK
Flux Type Classification	L0	L0	L0	L0
Flux Induced Corrosion (Copper Mirror)	Pass	Pass	Pass	Pass
Presence of Halide: Fluoride Spot	Pass	Pass	Pass	Pass
Elemental Analysis (Br, Cl, F)	0%	0%	0%	0%
Non-Volatile Content (Solids Content)	90%	90%	90%	90%
Post Reflow Flux Residue (ICA Test)	45%	45%	46%	47%
Corrosion	Pass	Pass	Pass	Pass
SIR Test	Pass	Pass	Pass	Pass
Electromigration Test (Bellcore)	Pass	Pass	Pass	Pass
Acid Value	113	115	128	121

J-STD-005 & Solder Paste Testing:	NC-SMQ®92	NC-SMQ®92J	NC-SMQ®92H	NC-SMQ®92TK
Typical Alloys	Sn63/Sn62	Sn63/Sn62	Sn63/Sn62	Sn63/Sn62
Typical Printing Metal Load	90.0%	90.25%	90.0%	90.0%
Viscosity: Brookfield (5rpm)	870 ± 100 kcps	900 ± 100 kcps	850 ± 100 kcps	870 ± 100 kcps
Viscosity: Malcom (10rpm)	2000±300 poise	2000±300 poise	1400±300 poise	2000±300 poise
Thixotropic Index; SSF (ICA Test)	-0.65±0.10	-0.75±0.10	-0.75±0.05	-0.66±0.10
Slump Test	Pass	Pass	Pass	Pass
Solder Ball Test	Pass	Pass	Pass	Pass
Tackiness Test	35g	38g	34g	38g
Wetting Test	Pass	Pass	Pass	Pass

Functional Features	NC-SMQ®92	NC-SMQ®92J	NC-SMQ92®H	NC-SMQ92®TK
Residue	Soft	Soft	Medium Hard	Soft
Printing (SMT)	12 mil pitch	12 mil pitch	12 mil pitch	12 mil pitch
Printing (wafer bumping)	8 mil pitch	8 mil pitch	8 mil pitch	8 mil pitch

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