

NC-SMQ®92J CASE STUDY

Achieving Higher Yields and Increasing Manufacturer Profits: A No-Clean Solder Paste Recipe for Success



Background

A Contract Equipment Manufacturer conducted an independent “live” production line test of two solder pastes and confirmed the age-old adage “You get what you pay for!” Today’s electronics industry derives its strength from global marketplace competitive pricing but beyond price is the overall impact of quality and production achieved by using technologically superior products — even if they cost a little more. Solder paste, an often-undervalued component necessary for electronics manufacturing, generated significant savings by achieving higher yields, reducing solder paste scrap, and eliminating nitrogen processing costs.

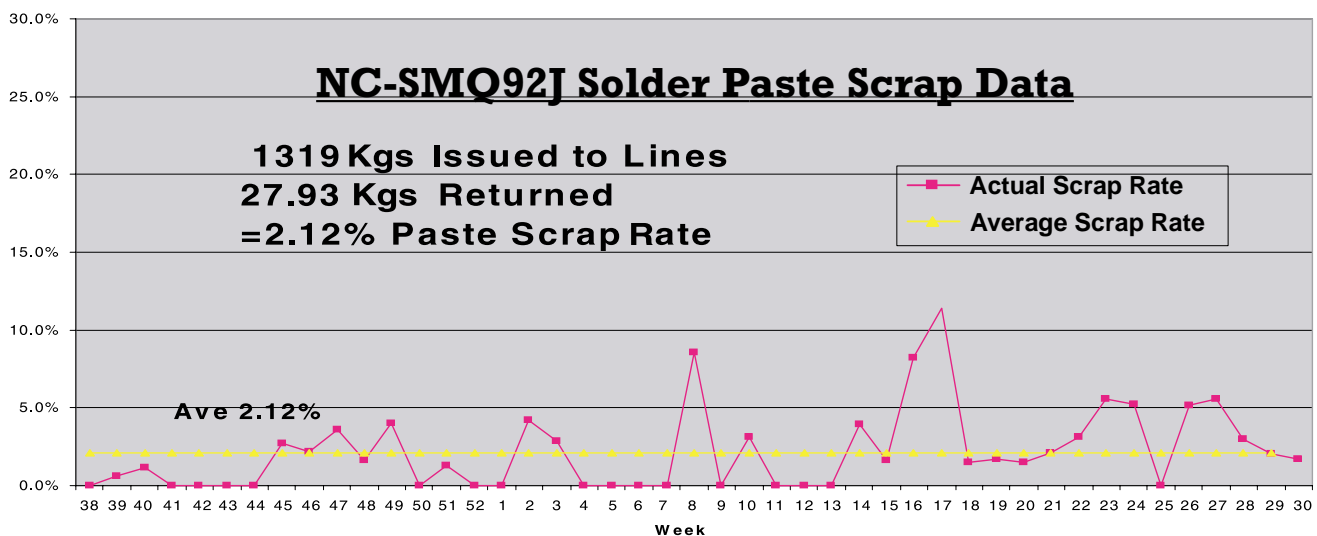
Indium Corporation of America (ICA) provided a formulation of its popular **NC-SMQ®92** Series for extensive evaluation with a key customer, a major CEM with a high product mix environment. The objectives were to demonstrate yield improvements by optimizing the SMT reflow soldering process while quantifying reductions in scrap rates, and eliminating the need for a nitrogen reflow atmosphere. Empowered with these valuable incentives, CEMs could boost their productivity and improve profitability.

Prior to the evaluation, the CEM was using a no-clean solder paste that required a nitrogen reflow atmosphere in order to optimize wetting and solder reliability.

NC-SMQ92J Provided a 3.87% In-Circuit Testing Yield Improvement Compared to the Previous Paste.

Evaluation

The CEM evaluated Indium’s **NC-SMQ92J**, a pin probe testable no-clean solder paste with some unique attributes that include the ability to reflow in air — no nitrogen needed — as well as extended open times, resulting in less scrap and waste at the stencil printer. The solder paste was evaluated for ten months on the manufacturing floor, with engineers constantly collecting and evaluating the data. The CEM was producing a small PCB for a mobile phone, with the most notable SMDs on the product being 0.4mm Pitch QFPs and 0402 chip components. The paste was printed through a 6 mil (150 micron) laser cut stencil, and production ran 24 hours per day, 5 days per week, with 7 SMT lines utilizing a similar product. Automatic 100% vision inspection was used on the finished product. Most notably, nitrogen feed to the reflow ovens was shut off during processing.



OVER →



CORPORATE HEADQUARTERS USA: 1676 Lincoln Avenue, Utica, NY, 13502, USA • askus@indium.com • 315-853-4900 or 800-4 INDIUM • FAX 315-853-1000 or 800-221-5759
ASIA-PACIFIC OPERATIONS SINGAPORE: 29 Kian Teck Avenue, 628908, Singapore • asiapac@indium.com • +65 268-8678 • FAX +65 268-5646
INDIUM CORPORATION OF EUROPE UK: 7 Newmarket Court, Kingston, Milton Keynes, MK10 0AG, UK • europe@indium.com • +44 (0)1908 580400 • FAX +44 (0)1908 580411
www.indium.com

CASE STUDY PROFILE

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Results

1. Yield Improvement Data

Overall, **NC-SMQ92J** provided a 3.87% ICT Yield Improvement compared to the previous paste (Average 10 Month data = 97.03%). Cost savings associated with the yield improvement are as follows:

- Reduced circuit assemblies routed to rework/repair
- Reduced circuit assemblies scrapped
- A reduction of 0.5% of circuit assemblies that must ultimately be scrapped due to poor repair or excessive debug = \$640/Wk x 52 weeks

2. Solder Paste Scrap Savings

Solder paste scrap was dramatically reduced, in large part due to the extended open times. Solder paste that did not dry out between setups and shift changes, for example, was used without losing its robust printing and stenciling characteristics.

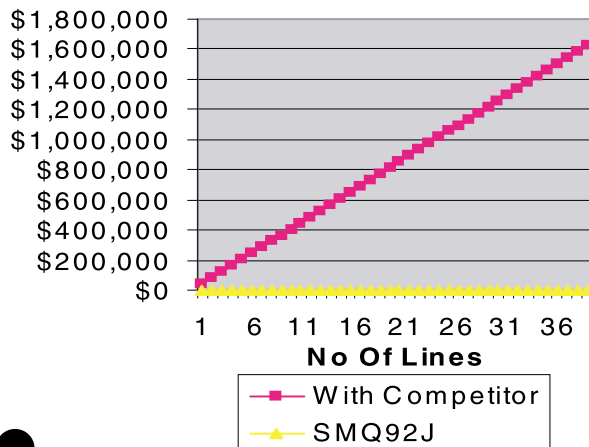
3. Nitrogen Cost Savings

In trials employing an air atmosphere, **NC-SMQ92J** successfully increased yields and produced significant savings by eliminating nitrogen. These savings were tabulated as follows:

- Based on a model "Y" oven, the nitrogen costs were \$6.5/Hr.
- \$6.5 x 24 Hrs x 5 Days x 52 Wks = savings of \$40,560 per Line per Year.

Nitrogen Elimination Costs

Based on 40 Lines \$1.622Million/Year



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Total Savings Per Line
Moving to Indium NC-SMQ92J:
\$77,928 (If you currently use nitrogen)
\$37,368 (If N2 is not currently required)

Conclusion

During a 10-month evaluation period, the use of **NC-SMQ92J** (based on 10Kg/Line/Wk) dramatically boosted yields, reduced scrap rates and eliminated the demand for costly nitrogen generating increased profits for the CEM.

Ultimately, savings per Line per Year using **NC-SMQ92J** distilled out as follows:

- Yield Improvement Costs = \$33,000
- Paste scrap rate reduction = \$4,368
- TOTAL – \$77,928 ON N2 LINES**
- TOTAL – \$37,368 ON AIR LINES**
- Total savings Per Line moving to Indium **NC-SMQ92J** = \$77,928 on nitrogen reflow lines and \$37,368 on air reflow lines.
- Solder paste, which typically represents less than 1% of board build costs, can result in significant savings and increase profitability for each assembly line.

Create your own Recipe for Success
by adding NC-SMQ92J Value
to your Bottom Line!

NOTE:

For more information, contact us at:

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