

**TEST REPORT
CROSS SECTION AND EVALUATION**

Prepared for:

Prepared by:

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3603 Edison Place
Rolling Meadows, IL 60008**

**Best Job Number
Date Testing Completed
Samples Submitted**

Summary

The customer submitted three assemblies for evaluation of inner layer connections at the through holes. All three assemblies were received with documentation indicating the suspected failure locations. Cross section analysis was performed to evaluate the condition of the inner layer connections.

Findings

Serial numbers TB902038 and TB833036 were found to be non-remarkable. Serial number TB829199 exhibited an open where the inner layer pulled away from the barrel of the hole wall. It appears that epoxy smear removal was performed utilizing the negative etchback method. The degree of negative etchback was consistent with the target condition of IPC-A-600. The assembly that exhibited an open, also exhibited a slight degree of pad lifting. This could be indicative of excessive heat being applied locally, maybe as the result of a rework operation.

Recommendations

It should be determined if any inner layer opens are occurring during the manufacturing process or if they are occurring during some additional process steps. A review of all hand solder operations should be performed to ensure that the inner layers are not being damaged during these processes.

NOTE: Not all the images taken are included in this report. This is because the conditions shown in the images are so repetitive in nature that there is little value in commenting on each one. A complete set of the images taken are included in the CD that accompanies this report.

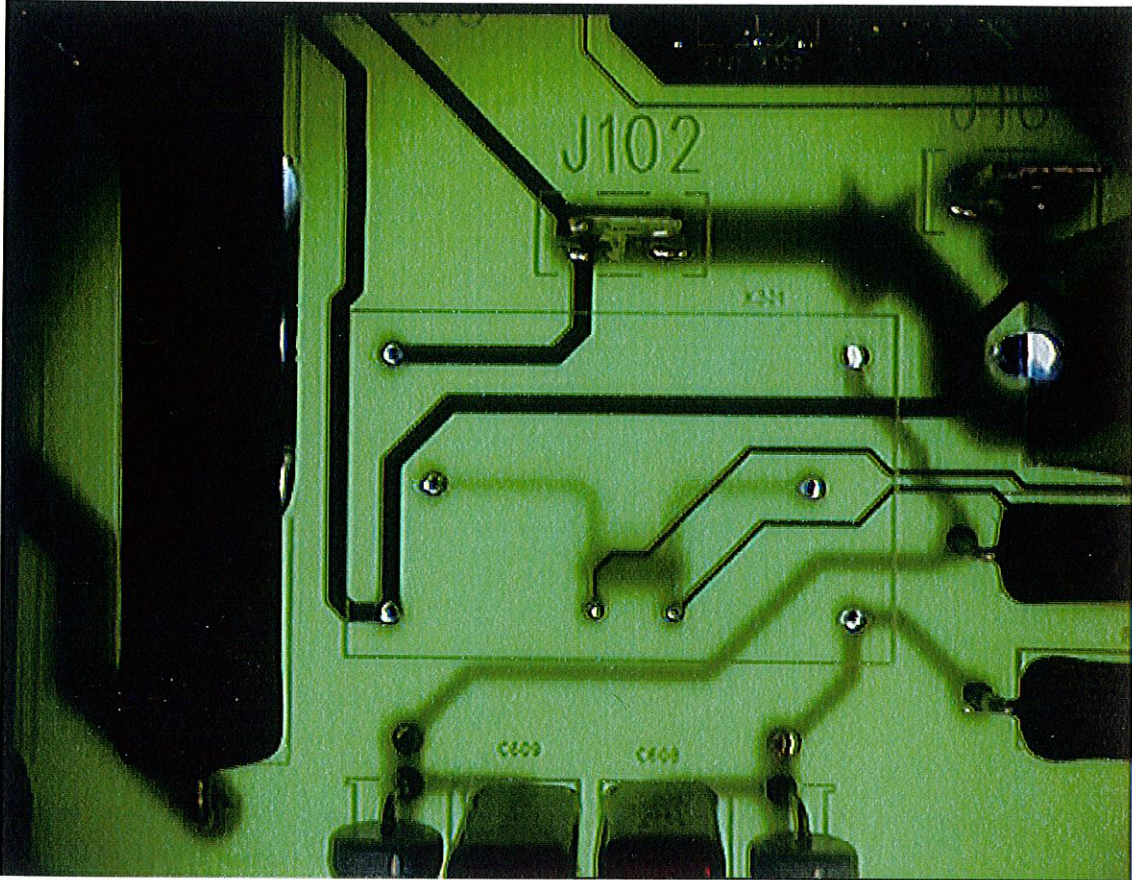


Illustration 1: S/N TB833036 was received with K301 removed. Back lighting reveals inner layer conductors.

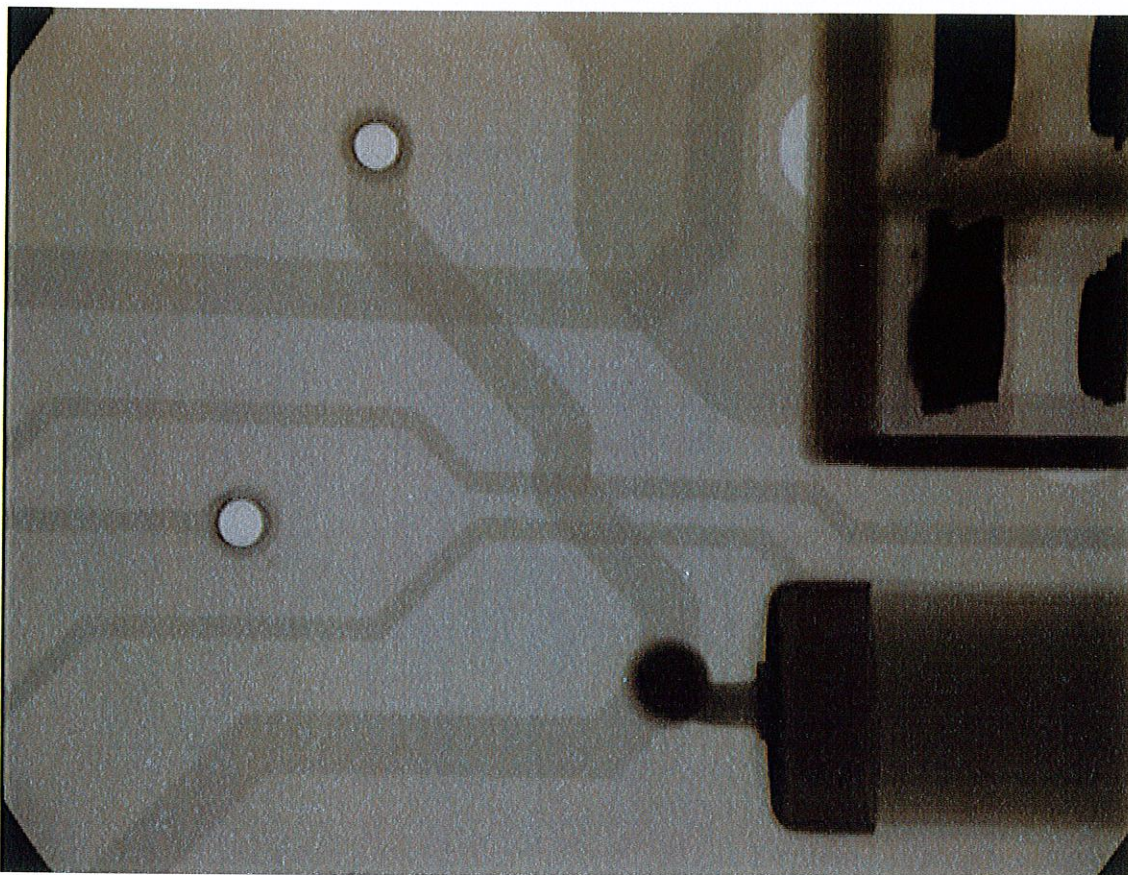


Illustration 2: S/N TB833036 was received with K301 removed. X-Ray image reveals inner layer conductors.

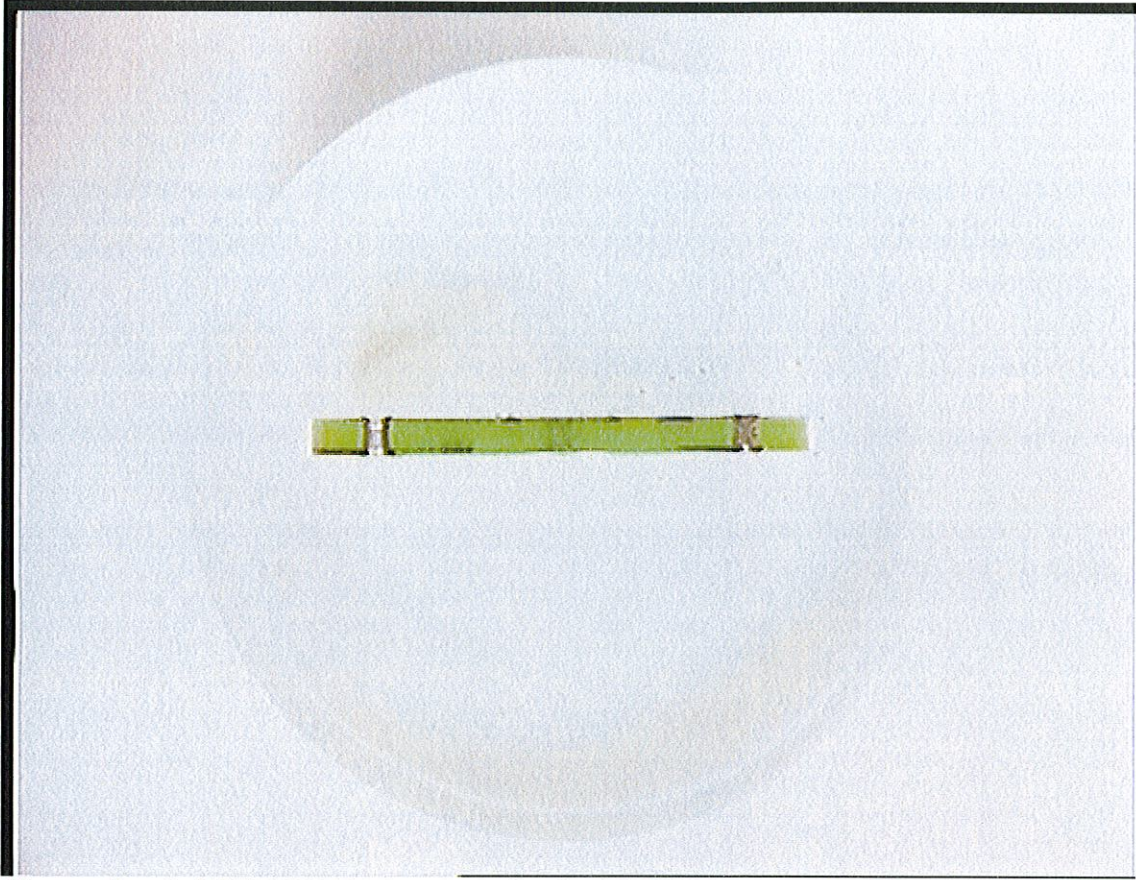


Illustration 3: S/N TB833036 was received with K301 removed. The plated through hole on the right is the targeted hole with a connection to R605.



Illustration 4: S/N TB833036 50X magnification. Inner layer connection looks good.

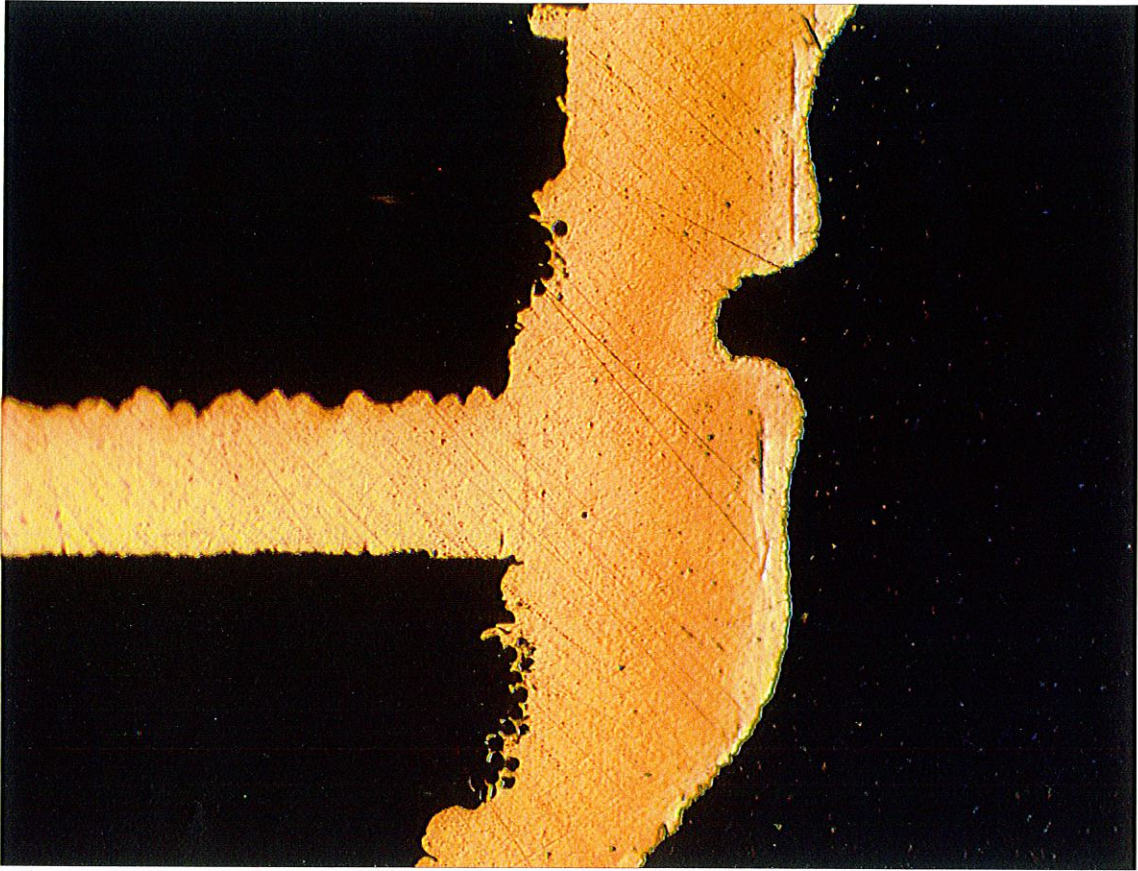


Illustration 5: S/N TB833036 200X magnification with DIC. Inner layer connection looks good.

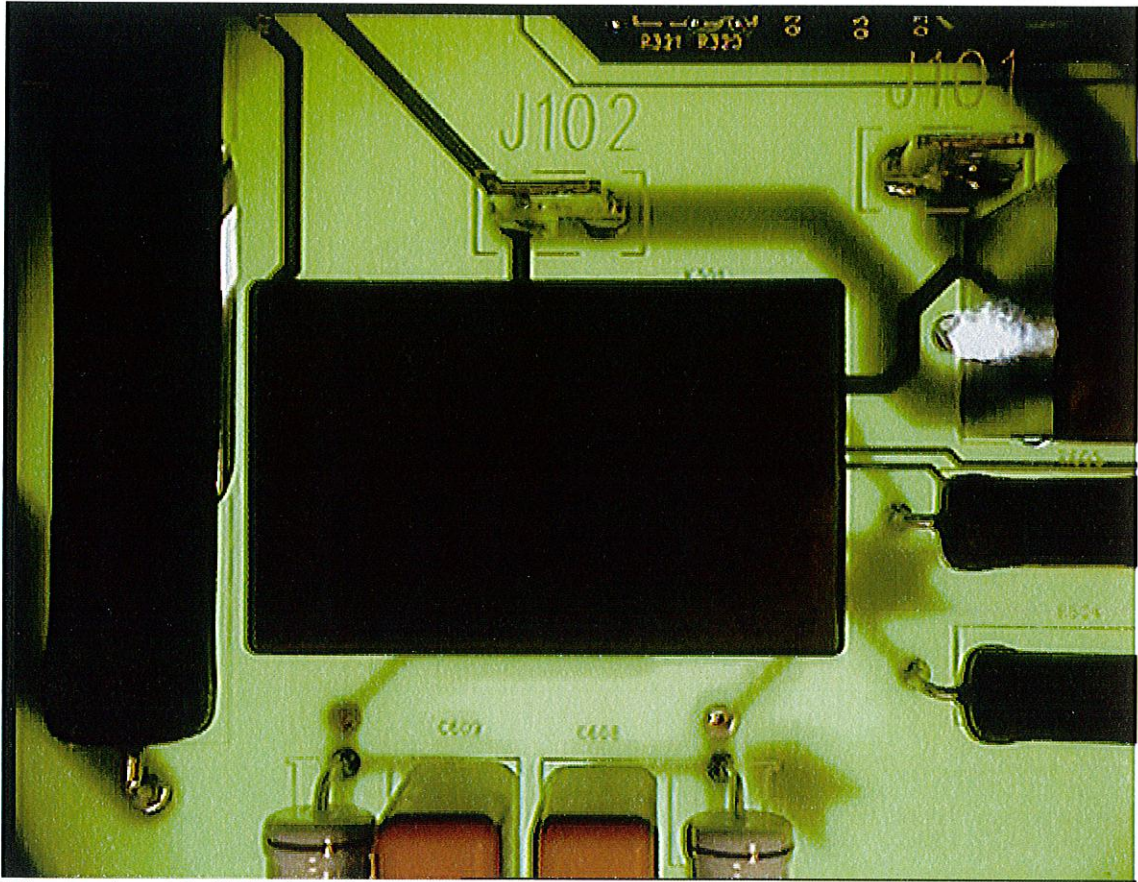


Illustration 11: S/N TB829199. Back lighting reveals inner layer conductors.

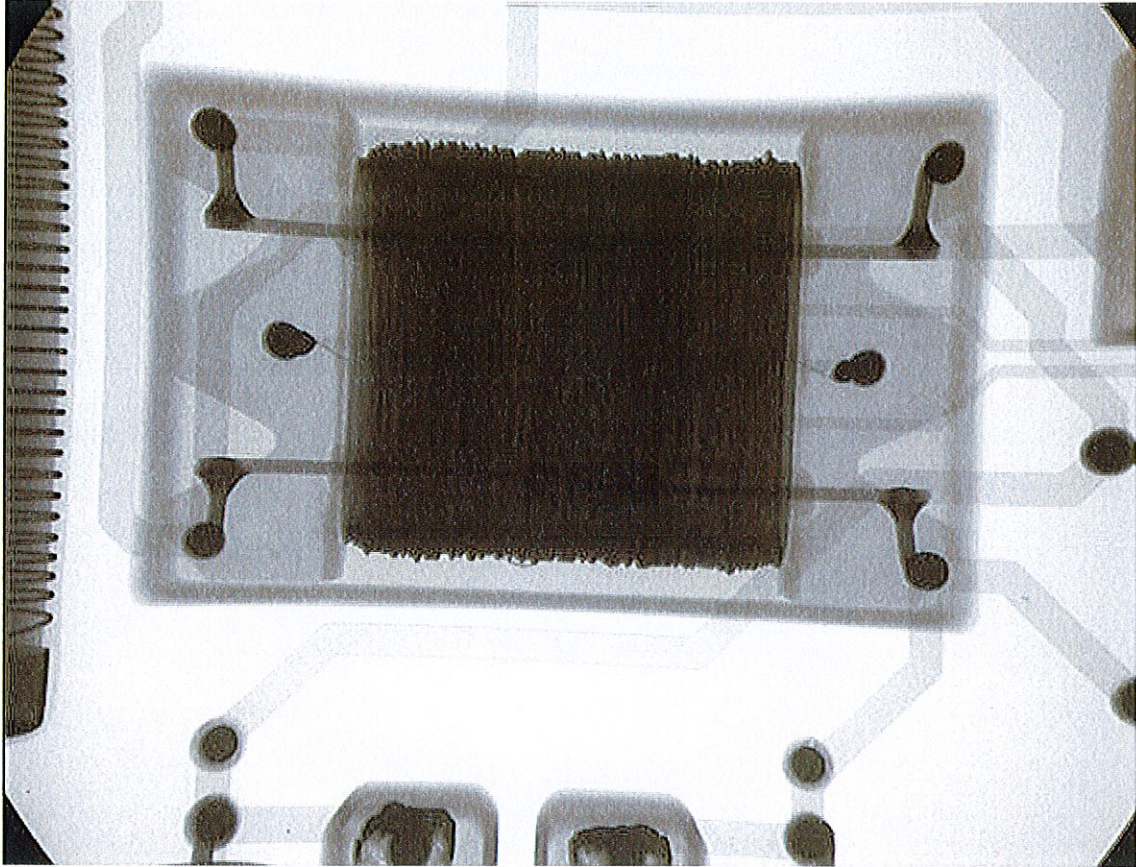


Illustration 12: S/N TB829199. X-Ray image reveals inner layer conductors.

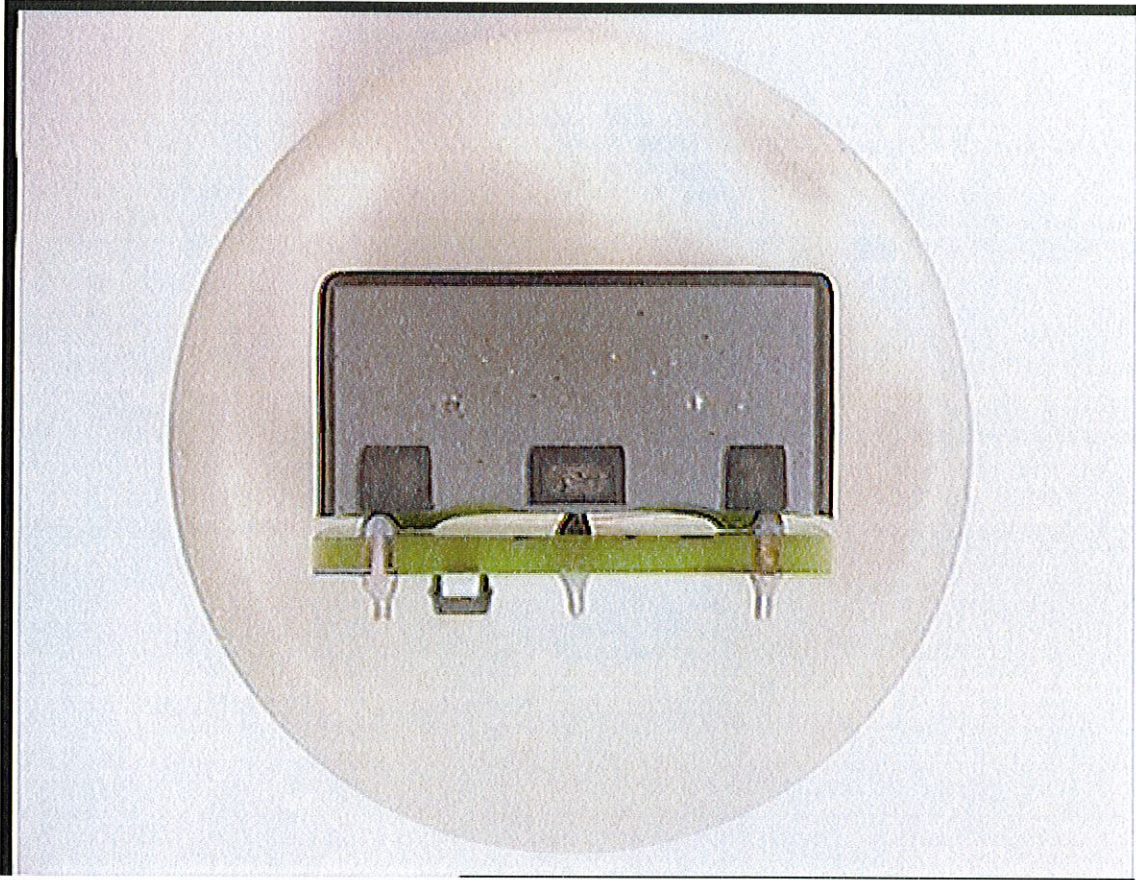


Illustration 13: S/N TB829199. The plated through hole on the left is the targeted hole with a connection to R601.

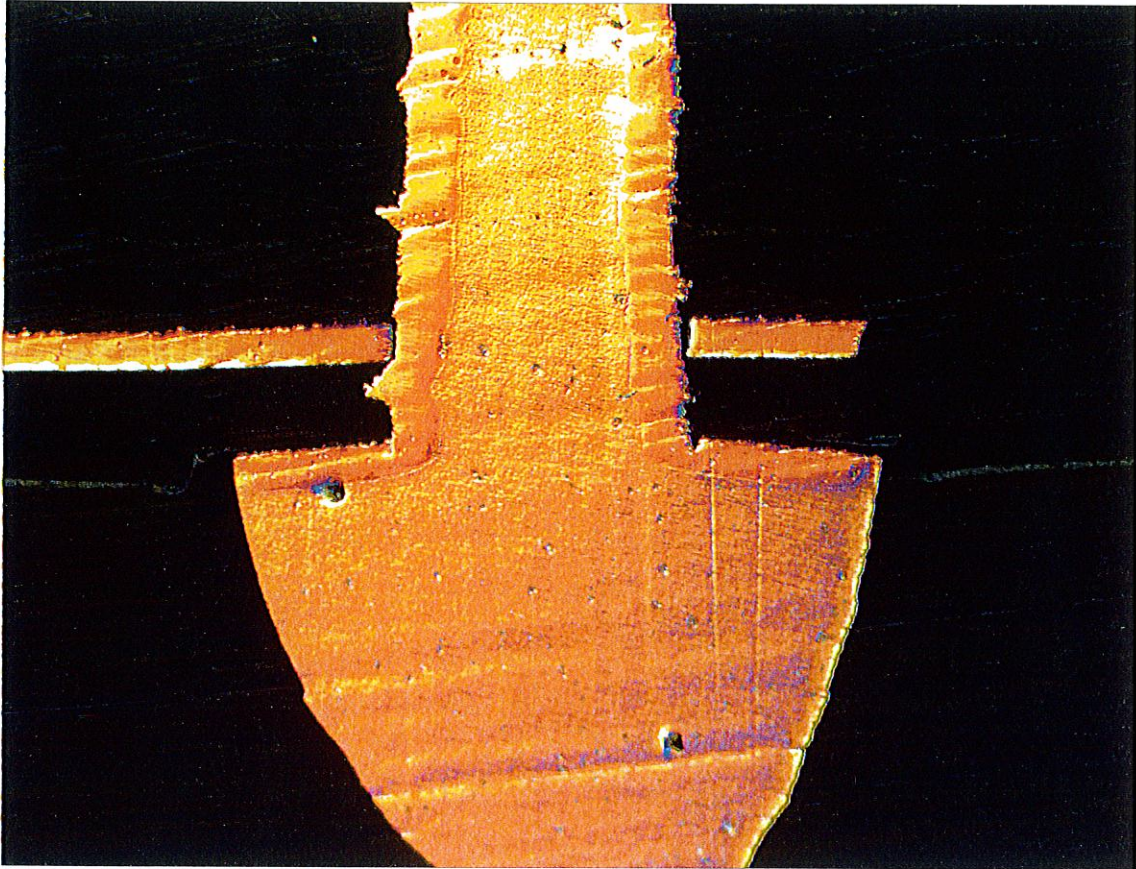


Illustration 14: S/N TB829199 50X magnification with DIC. Inner layer have separated from the copper of the hole wall.

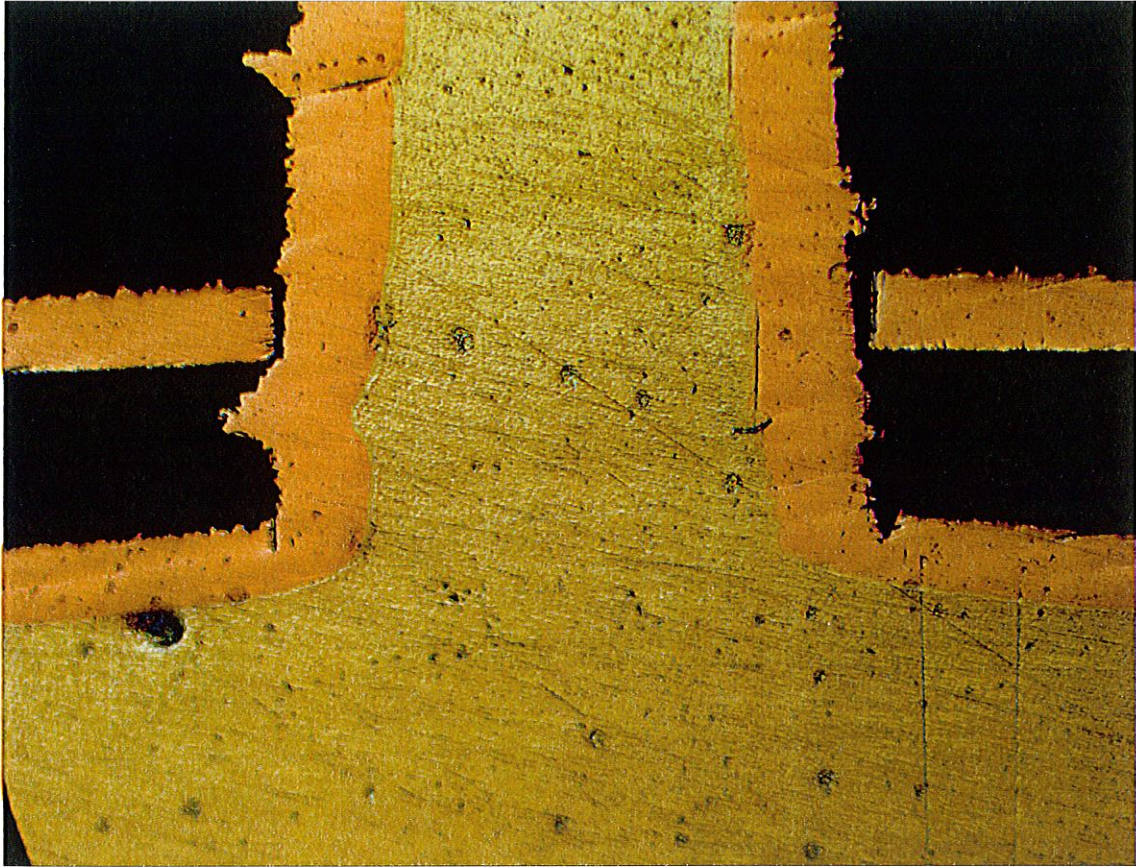


Illustration 15: S/N TB829199 100X magnification with DIC. Inner layer have separated from the copper of the hole wall.

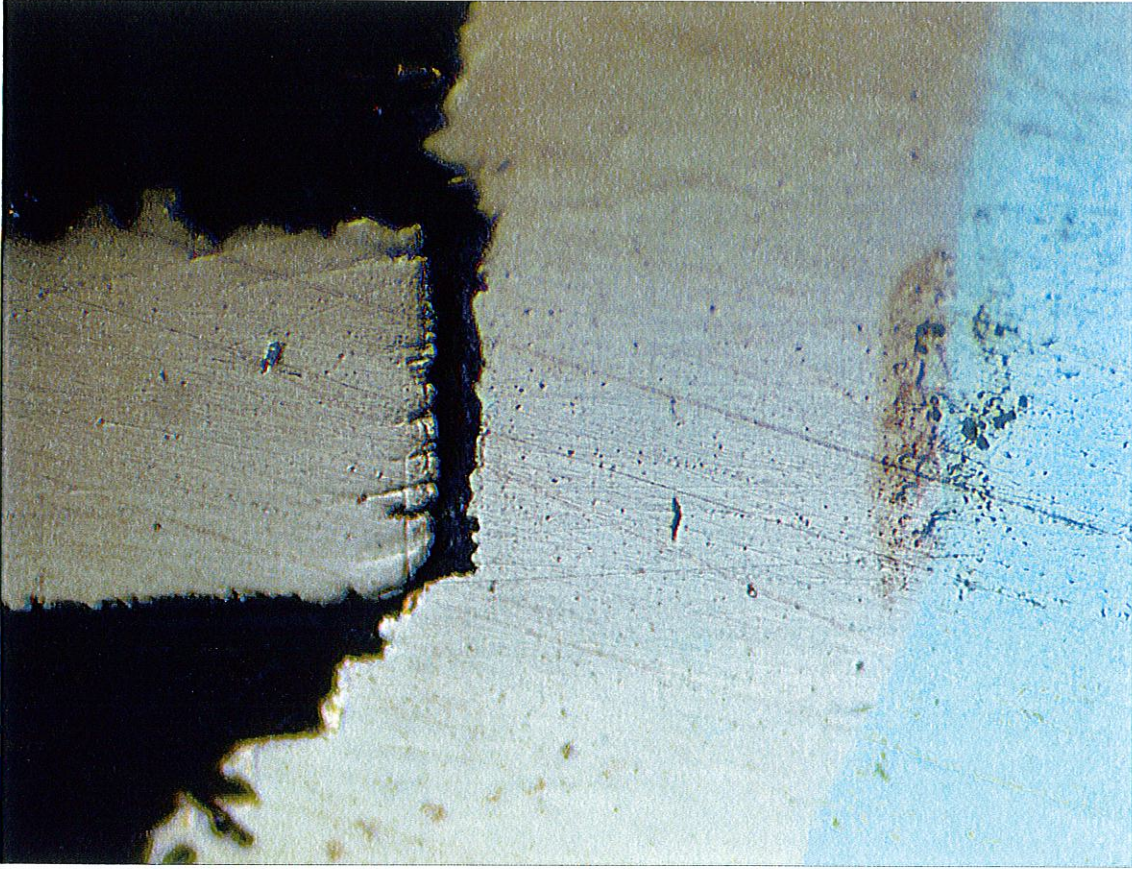


Illustration 16: S/N TB829199 500X magnification with DIC. Inner layer have separated from the copper of the hole wall.

Tested by: _____ Date: _____

Operations Supervisor

Reviewed by: _____ Date: _____

Operations Manager

Approved by: _____ Date: _____

President