DEFENSE LOGISTICS AGENCY
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COLUMBUS, OH 43216-5000

IN REPLY
REFER TO

DSCC-VAC (Mr. Barone/DSN 850-0510 / (614)692-0510) 1 November, 2001

MEMORANDUM FOR VSS (Mr. Art Hudson)

SUBJECT: Dated Engineering Practices (EP) Study on Test Method Axial Glass Packages - Project Number: 5961- 2544

Findings and recommendations Engineering Practices (EP) Study, dated 30 Oct 2001, and attachments are enclosed.

It is requested that your office take the necessary electronic action to reflect completion of this project.

Enclosure

/Signed/
Thomas M. Hess
Chief
Active Devices Team

ENGINEERING PRACTICE STUDY

TITLE: Problems in the Standardization on Relative Resistance To Glass Cracking

30 OCTOBER 2001

STUDY PROJECT (SEE ATTACHMENT 1)

FINAL REPORT

Study Conducted by JC-13.1 task group

Prepared by

Alan Barone

I. **OBJECTIVE: The objective of this project is to identify axial glass cracks in glass packages.**

II. **BACKGROUND: The wave solder used by Original Equipment Manufacturers (OEMs) is known to prorogate cracks not otherwise found in testing. A JEDEC task group has been assigned to generate a new test method to optimize the detection of cracked glass.**

III. **RESULTS: JC-13.1 task group has proposed the enclosed new test method for industry review and comment.**

IV. **CONCLUSION: DSCC-VAC is now attempting to fully coordinate this new test method with government and industry. All comments are due in 45 days.**

V. **RECOMMENDATIONS: DSCC should incorporate this method into MIL-STD-750.**

PROPOSED TEST METHOD

GLASS COMPONENTS: RELATIVE RESISTANCE TO GLASS CRACKING

1. Purpose. This method provides a means of judging the relative resistance of glass encapsulated electronic components to cracking under conditions of thermal stress. It employs immersion in a hot liquid then water to simulate the thermal stresses associated with both device manufacturing processes and end user assembly procedures.

2. Apparatus. Liquid baths shall be used which are capable of providing and maintaining the specified temperatures in the working zone when loaded with a maximum load. Bath temperatures under maximum load conditions shall be verified as needed to validate bath performance. Liquid composition shall be as specified herein.

3. Procedure. Remove any paint or other surface coatings. Clean test specimens using a general purpose cleaner/degreaser and rinse in water then acetone. Subsequent to cleaning, specimens shall be placed into the baths defined in Table 1 for the applicable test condition using a dipping tool that will not significantly heat sink the body of the device under test. Specimens shall be fully immersed in the first bath for the specified period of time then transferred immediately to and fully immersed in the second bath. Unless otherwise specified, the test shall be considered complete upon removal of the specimen from the second bath.

3.1 Timing. Specimens shall be immersed into and removed from the first (hot) bath at a rate of 1.0 ± 0.5 inch per second. The maximum dwell time above the hot bath prior to immersion shall be 7.0 seconds. Dwell time in the hot bath shall be 6 ± 1.0 seconds. Specimens shall be released completely into the second bath within 3 seconds of their removal from the hot bath.

4. Failure Criteria. Specimens that fail to meet the glass crack criteria of MIL-STD 750, Method 2074 shall be considered rejects.

5. Summary. The following shall be specified in the applicable detail specification.

- **a. Sample size and acceptance number.**
- **b. Test condition.**
- **c. Special fixturing as applicable.**
- **d. Number of test cycles if other than 1 cycle.**

Table 1 : Conditions and Temperatures

Step		Test Condition & Temperatures	
		A	B
1	Temperature & Tolerance	100°C ± 5°C	235°C ± 5°C
	Recommended Fluid	Water	Molten Solder
2	Temperature & Tolerance	0°C ± 5°C	25°C ± 5°C
	Recommended Fluid	Water	Water