

UNCLASSIFIED

SANDIA SYSTEMATIC DECLASSIFICATION REVIEW	
1 st Review Date: <u>5/29/98</u>	Determination (Circle Number):
Authority: <u>W.C. Layne</u>	Classification Remained:
Name: <u>W.C. Layne</u>	Classification Changed to: <u>UNCL</u>
2 nd Review Date: <u>6/4/98</u>	Contains No DOE Classified Information:
Authority: <u>ADD</u>	Contains LICAL?:
Name: <u>W.C. Layne</u>	Comments:
	<u>Ready</u>

JUL 27 1959
 TX-43, 3-2
 Project No. T-16370
 Case No. 734.00

TO: DISTRIBUTION

Re: Humidity and Altitude Test of Moisture Barrier

Reason for Test

This test was conducted to determine if a vinyl plastic moisture barrier, in conjunction with desiccant, would prevent moisture from accumulating inside a TX-43 weapon case during shipment from an altitude of 6000 feet to sea level.

The test was requested in a Work Order Authorization from G. W. Handie, 1222 to A. W. Reger, 1613, dated 5-14-59. Mr. F. W. Melikin and R. G. Hogan were consultants.

Item Tested

The item tested was a vinyl plastic cover which was attached to one end of a section of a weapon case using a closed cell foam rubber gasket and a steel clamping band. The other end of the weapon case was sealed with an aluminum plate and epoxy resin.

Instrumentation Used

One Aminco Humidity Indicator, Serial No. 3002, S# 104494. This transducer was checked prior to the test by the Standards division, 1651, and found to have a maximum error of 1.7% relative humidity within the range of 12% to 100% relative humidity. One mercury manometer.

Procedure

An Aminco humidity transducer was installed inside the weapon case. The transducer leads and a pressure port were brought through the rear cover and sealed.

Twelve 16 unit bags of desiccant were weighed and placed inside the case. The moisture barrier was then placed on the case with the end of the barrier extending approximately 1" beyond the end of the weapon case.

The assembled test unit was then placed in the 27 Ft³ Bowser altitude humidity chamber. The chamber was maintained at ambient laboratory temperature and between 78 and 85% relative humidity. The chamber pressure was changed rapidly from ambient laboratory pressure (630 mm Hg) to 478 mm Hg and held for 2 minutes then changed rapidly to 630 mm Hg and held for 13 minutes for a total of 90 cycles.

RECEIVED

JUL 28 1959

CENTRAL RECORD FILE

SANDIA SYSTEMATIC DECLASSIFICATION REVIEW DOWNGRADING OR DECLASSIFICATION STAMP	
CLASSIFICATION CHANGED TO: <u>U</u>	AUTHORITY: <u>W.C. Layne</u>
PERSON CHANGING MARKING & DATE: <u>Emelda Selph 6/19/98</u>	RECORD ID: <u>98SN2291</u>
PERSON VERIFYING MARKING & DATE: <u>We Jerm 6-15-98</u>	DATED: <u>6/4/98</u>

CENTRAL RECORD FILE	1809
TX-43	
3-2	

UNCLASSIFIED

[REDACTED]

UNCLASSIFIED

Distribution

-2-

Project No. T-16370

Results

When the pressure in the altitude chamber was reduced at the beginning of the first cycle, leaks were found at the seam of the moisture barrier. After these leaks were patched and the pressure was again reduced in the chamber, the barrier slipped off the end of the case when the pressure differential between the weapon case and the chamber reached approximately 1 psi (52 mm Hg). For the remainder of the test the test unit was placed in the chamber with the end of the moisture barrier against the chamber door to prevent the barrier from slipping off.

Upon changing the chamber pressure from 630 mm Hg to 478 mm Hg, or from 478 mm Hg to 630 mm Hg, approximately 15 seconds was required for the pressure differential between the interior of the weapon case and the chamber to reduce to 2 mm Hg.

Maximum relative humidity within the weapon case during each cycle was 9% which occurred approximately 2 minutes after raising the chamber to ambient pressure. After 10 minutes, the relative humidity reduced to 7%. Approximately 2 minutes after reducing the chamber pressure to 478 mm Hg, the relative humidity went down to 3%. These values were the same for each of the cycles, #3 thru #90.

Desiccant weight at the beginning of the test was 5262 ^{grams} grains. At the end of 90 cycles, the weight had increased to 5290 ^{grams} grains for net increase of 28 ^{grams} grains or 0.53%.

Conclusions

The clamping system used to attach the moisture barrier to the case is not adequate to withstand a pressure of 1 psi gauge within the case; however, this pressure differential could occur only during an extremely rapid altitude change because of leakage between the barrier and the case. The moisture barrier and the twelve 16-unit bags of desiccant will keep the relative humidity within the weapon case below 10% throughout 90 shipping cycles as simulated in this test.

R. O. Brooks

R. O. BROOKS - 1612-3

D. W. Bauder

1613 Project Engineers: D. W. BAUDER - 1613-3

R. S. Cooper

Approved by: R. S. COOPER - 1613-3

DNB:1613-3:cc

UNCLASSIFIED

1810

[REDACTED]

[REDACTED]
UNCLASSIFIED

Distribution

-3-

Project No. T-16370

Copy to:

L. A. Dunn, 1222
Attn: F. W. Millikin
R. G. Hogan
W. A. Gardner, 1610
J. M. Wiesen, 1592
C. L. Gomel, 5523
R. K. Smeltzer, 4721-3

UNCLASSIFIED
[REDACTED]