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CONVAIR DIVISION OF GENERAL DYNAMICS CORPORATION

REPORT NO. 7E 2206

QUALIFICATION OF SHELL ALVANIA

CONVAIR-
ASTRONAUTICS #2 GREASE 532-

JUN 15 1959

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REPORT NO. 7E 2206QUALIFICATION OF SHELL ALVANIA #2 GREASESUBJECT:

The object of this test was to determine the protective performance of Shell Alvania #2 Grease at temperature extremes encountered by missile-borne pod-mounted canisters.

TEST SPECIMEN:

The description of the canister used for testing is given in Convair Memo 58-545-7-349 by F. Reavell. This reference also outlines the test points employed for determining the performance of the subject test material.

The test canister, being subjected to salt atmosphere at the Point Loma Test Site in order to study the effect of corrosion, is illustrated in Figure 1 of this report.

TEST PROCEDURE:

The canister, used to test the resistance characteristics, was prepared by Missile Electrical Design, 545-7. The following procedure was employed for electrical evaluation.

1. Contact resistances were measured per last paragraph of Convair Memo 58-545-7-349.
2. The canister was subjected to liquid nitrogen temperature by filling the canister with liquid nitrogen and allowing it to boil off.
3. The canister was then exposed for one hundred (100) hours in a salt atmosphere per paragraph 4.3 of Convair Environmental Specification 7-00209 B.
4. Resistance measurements were made after each test. Visual changes during the tests were also noted.
5. Steps 2-4 were repeated in order to further establish the effect of these tests.

REPORT NO. 7E 2206TEST PROCEDURE: (Continued)

6. Resistance measurements were made on a canister which is described by Figure 1.

The covers, housing, and saddle were assembled according to Convair Report 7-00519 except for cover 7-41392. This cover was assembled with a chromate finish on each surface (2-3). The canister is now being tested in the natural atmosphere of the Point Loma Test Site, and will be inspected periodically in order to evaluate the effects of weathering in a marine atmosphere.

RESULTS AND CONCLUSION:

The resistance measurements in ohms after the various tests are shown in Table 1. They were obtained on a Kelvin Bridge by the Standards Laboratory, 532-4. An evaluation of these measurements indicates that the Shell Alvania #2 Grease provides adequate protection after exposure to temperature extremes encountered by missileborne pod-mounted canisters.

While the canister approached liquid nitrogen temperature, flaking and brittleness of the grease were noted. A slight amount of corrosion at the bonding area was also noted after the salt atmosphere tests. However, the resistance measurements show that the effects of these events are insignificant.

Note: The test data from which this report was prepared are recorded in Engineering Test Laboratories Work Book Number 7428.

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TABLE 1
CANISTER RESISTANCE MEASUREMENTS

(10 AMP. SENSITIVITY)

<u>TEST POINT:</u>	<u>1-6</u>	<u>2-3</u>	<u>4-5</u>	<u>5-6</u>
<u>TIME</u>	<u>ohms</u>	<u>ohms</u>	<u>ohms</u>	<u>ohms</u>
After assembly 11/19/58	.00004856	.00000418	.00000713	.00002192
Before any tests 2/21/59	.00007694	.00000558	.00000886	.00004717
After first liquid nitrogen exposure	.0002325	.00002047	.000001	.0001853
After first salt atmosphere exposure	.0002379	.00002618	.00000974	.0001838
After second liquid nitrogen exposure	.0003023	.00007994	.00000956	.0001969
After second salt atmosphere exposure	.0003100	.00009619	.00001135	.0001869

(5 AMP. SENSITIVITY)

	<u>1-8</u>	<u>2-3</u>	<u>4-5</u>	<u>6-7</u>	<u>7-8</u>
Reassembled canister (See Figure 1)	.0188	.01-19	.0001865	.00001428	.000206

FIGURE 1

TEST CANISTER - (EXPOSED AT POINT LOMA)

