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# 286 239

REPORT NO. FTDM-2851  
DATE: 26 July 1962

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**MATERIAL, 2024-T86 ALUMINUM ALLOY -  
INFLUENCE OF OVERAGING ON CORROSION  
RESISTANCE OF**

ASTIA  
AUG 13 1962  
T.S.A. A

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**GENERAL DYNAMICS | FORT WORTH**

## TEST DATA MEMORANDUM

F T D M NO. 0001  
MODEL 517  
TEST NO. 2-11-51

TEST: Material, 2024-T3 Aluminum Alloy - Influence of Overaging  
on Corrosion Resistance of

OBJECT: Determine the change in corrosion resistance of the subject  
alloy after long time exposure at 305 F.

PROCEDURE: Seven 4FTW244 type panels were exposed  
for various durations of time in connection with Test Program  
E-400. One 4FTW608-51 type panel was exposed for 6700 hours. Two  
corrosion specimens approximately 1/2" x 1" were cut from a panel  
with one specimen with the cladding on, the other with the  
cladding removed. The corrosion test followed the procedure  
prescribed in ASTM 151a, Method C22- "Intergranular Corrosion Test  
for Aluminum Alloys." The average depth of intergranular attack  
was determined metallographically on three sections of the corrosion  
specimen, established a relative corrosion rating.

RESULTS: The relative corrosion ratings are shown by Table I.

DISCUSSION: The 8th edition of the Metals Handbook states that  
artificial aging of artificially aged 2024 alloy does not lower its  
resistance to corrosion. The results of this test substantiated  
these findings and further showed that there was little difference  
in the corrosion rates of the clad vs unclad specimens.

CONCLUSION: Extended exposures at 305F does not essentially alter  
the susceptibility of 2024-T3 to corrosive attack.

NOTE: The drawings for the 4FTW244 and 4FTW608-51 type panels are  
not included in this report but the location of the test specimens  
from the panels is not important. All panels were bonded panels  
composed of a core, a slug, glue, and two skins of 2024-T3 clad-  
one-side aluminum alloy. The bare side was glued to the core. The  
glue was not removed from the bare side of the skin on the specimens  
used in this test. Both skins of the 4FTW244 panels were .040 inch  
gage sheet purchased to General Dynamics/Fort Worth specification  
FW3-0033. This specification is a modification of QQ-A-362 such  
that the only differences are requirements for (1) the mill to roll  
the sheet with cladding on only one side and (2) the tensile strength  
to be half way between strengths of bare and clad-two-sides sheet per  
QQ-A-355 and QQ-A-362. The 4FTW608-51 panel had one FW3-0033 skin  
.040 inch thick and the other was an .098 inch thick skin machined on  
one side from .125 inch thick QQ-A-362 clad-both-sides sheet.

WITNESS:

DATE

BY *H. J. Hildebrand*  
CHECKED *H. J. K... G.N.F.*  
APPROVED *H. J. K...*

TABLE I

Relative Corrosion Ratings for 2024-T86  
Exposed at 325F for Extended Times

Panel No. Specimen No.	Exposure Time, Hrs.	CLAD		UNCLAD	
		N*	RCR**	N	RCR
Control 1***	0	35	6.0	48	5.9
<sup>4</sup> PT244 815-1A-2	0	17	5.5	26	6.1
813-1B-3	500	17	7.5	23	7.0
815-2A-4	1000	19	6.6	24	5.4
813-2B-5	1500	24	4.6	27	5.6
813-3A-6	2000	7	5.0	22	4.0
815-3B-7	3000	19	3.3	26	4.3
-8	5300	26	5.3	28	5.6
<sup>4</sup> PT608-51 861527-6-9	6700	26	6.1	23	5.1
861527-16-10	6700	48	6.1	29	5.1

\*N - Number of Measurements

\*\*RCR - Relative Corrosion Rating

\*\*\* The material for Control 1 was .040 inch thick 2024-T86 clad-one-side sheet per FMS-0033.