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March 12, 1945.

## R E P O R T

of the

ORE DRESSING AND METALLURGICAL LABORATORIES.

Investigation No. 1810.

Examination of Surface Corrosion on  
Aluminium Alloy Sheet.

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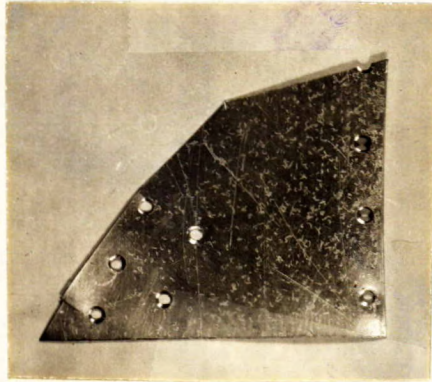
Origin of Material and Object of Investigation:

On March 3, 1945, two small pieces of sheet metal, presumably Alclad 17ST or 24ST, taken from the skin of an aircraft of the R.A.F. No. 45 Atlantic Transport Command, were received from A/C A. L. Johnson, Director of Aeronautical Inspection, for Chief of the Air Staff, Department of National Defence for Air, Ottawa, Ontario. The sheets were largely covered on one side with small marks due to corrosion (see Figure 1). It was desired (request letter of March 1, 1945, File No. 845-1-1(AMSO DAI)) that the extent and importance of this corrosion be determined.

(Continued on next page)

(Origin of Material and Object of Investigation, cont'd) -

Figure 1.



PART OF ONE OF THE SHEETS OF METAL  
SUBMITTED FOR EXAMINATION.  
(Approximately 2/5 actual size).

Tests and Results:

The following tests were performed:

1. Sections taken from both sheets were examined under the microscope.

Results -

The corrosion did not appear to penetrate below the surface to any great extent. No case was observed in which it penetrated nearly through the surface layer of the Alclad.

2. The yield point, maximum stress and elongation percentage were determined on two samples from each of the two sheets. On one sample from each sheet there was no indication of corrosion. On the other there were a number of corroded spots.

Results -

	<u>Maximum</u> <u>stress,</u> <u>p.s.i.</u>	<u>Yield</u> <u>point,</u> <u>p.s.i.</u>	<u>Elonga-</u> <u>tion,</u> <u>per cent</u>
<u>Sheet I</u>			
Uncorroded sample -	60,700	50,000	5.0
Corroded sample -	71,400	51,000	7.5
<u>Sheet II</u>			
Uncorroded sample -	64,300	53,400	5.0
Corroded sample -	64,300	50,000	7.5

These tests were made on samples of unusual design and they were not cut at exactly the same

(Tests and Results, cont'd) -

angle to the direction of rolling. However, they indicate quite clearly that the corrosion which had taken place on the sheets did not weaken them to any appreciable extent.

Conclusions:

1. The corrosion which occurred on the aluminium sheets appears to be largely a surface condition.
2. There is no indication that the strength or serviceability of the metal has been affected materially by this type of corrosion.

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