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QUARTERLY PROGRESS REPORT NO. 1

AN INVESTIGATION OF INTERGRANULAR CORROSION IN STAINLESS STEEL

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Project 2110

WRIGHT AIR DEVELOPMENT CENTER, U. S. AIR FORCE
CONTRACT NO. AF 33(616)-353

March, 1953

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INTRODUCTION

This research project has been undertaken under the sponsorship of the Wright Air Development Center of the U. S. Air Force. Its objectives are fourfold:

(a) to determine the effect of temperatures between 1600° and 2000°F on intergranular oxidation or corrosion;

(b) to examine the effects of alloy composition on intergranular oxidation or corrosion;

(c) to determine the nature of the penetrating material in areas of intergranular attack; and

(d) to devise methods of reducing or eliminating intergranular penetration.

MATERIAL

The basic material to be used in the investigation is type 310 stainless steel. It is expected, however, that a minor portion of the investigation will be concerned with several other materials such as types 304, 316, 347, and possibly extra-low-carbon 310 and 304.

The corrosive medium to be used in this investigation is atmospheric air.

EXPERIMENTAL PROCEDURE

Briefly, the samples will be held at the oxidizing temperature for a predetermined length of time in moving air. Folowing this treatment, the samples will be examined metallographically to determine the extent of attack, following which the corrosion products will be subjected to analytical procedures in an effort to identify them.

RESULTS

Although the contract authorizing this project was initiated on December 1, 1952, it was not cleared by the University until the latter part of January, 1953. Since no expenses could be incurred until this official clearance had been given, the project has not yet progressed to the point of obtaining experimental data.

Orders have been placed for materials and supplies necessary for carrying out the research, and some of these have arrived at the date of this writing. In addition, an extensive literature survey of the field of corrosion in stainless steels is approaching completion. It is anticipated that some significant results will have been obtained by the time the next progress report is submitted.