

# Introduction

---

Localized corrosion is a major cause of metal failure in a wide variety of industries. More importantly it often results in unexpected failures because it is difficult to predict and is generally undetectable in its early stages. The total amount of metal attacked may be very small, but by being localized it can have very serious consequences. For example, one relatively small pit in the bottom of a liquid storage vessel will make it useless. Several of the various types of localized attack are not understood, and there is a general lack of standard test methods to evaluate susceptibility.

For these reasons Committee G-1 on Corrosion of Metals sponsored a symposium to review the state of the art for the various types of local attack including exfoliation, intergranular corrosion, crevice corrosion, pitting, and dealloying. These reviews covered: (1) practical aspects—what conditions cause attack, how can it be prevented, etc.; (2) mechanisms; and (3) testing. Papers providing new data on mechanisms and test methods were also presented, and the related topics of galvanic corrosion and hydrogen blistering were covered. Stress-corrosion cracking was not dealt with specifically, but much of the symposium content was relevant to situations which either lead to or exist during stress-corrosion cracking.

The contents will be useful to those who need to prevent, understand, or test for localized corrosion. In almost all cases both the metallurgical and the electrochemical aspects have been dealt with.

Testing methods receive the most emphasis. In particular, the new data and test methods for exfoliation will be of interest to users and producers of aluminum alloys. The papers on pitting, crevice corrosion, intergranular corrosion, dealloying, and galvanic corrosion highlight the mechanistic aspects and the need for better test methods. They will be of special interest to users of stainless steel, nickel base alloys, titanium alloys, and copper alloys.

The practical problems associated with localized corrosion are far from being solved, particularly in the case of pitting and crevice attack. The papers in this volume define the problems and offer some solutions. They will serve as a basis for more work aimed at increasing our understanding of the mechanisms of attack and for the development of standard test methods. Meanwhile they contain much useful information which will

## 2 LOCALIZED CORROSION—CAUSE OF METAL FAILURE

enable us to minimize, if not yet completely control, this insidious form of corrosion.

*Michael Henthorne*

Supervisor, Corrosion Research,  
R & D Center, Carpenter  
Technology Corp., Reading,  
Pa. 19603; symposium chairman.