

## Introduction

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The last comprehensive symposium on atmospheric corrosion of metals was reported in *ASTM Special Technical Publication No. 175* (1955). To update these data and to test newer alloys, a 20-year test program was initiated in 1957. The program included statistical randomization of replicate panels in an alloy group and removals of triplicate panels after two-, seven-, and twenty-year exposure periods. Since aluminum alloys typically have a slower corrosion rate after two-years exposure in natural atmospheres, a one-year removal period was included additionally for these alloys. This program is discussed in detail in the *Proceedings* for 1959 (Report of Committee B-3 on Corrosion of Non-ferrous Metals and Alloys).

Exposures were made for all alloys at Kure Beach, N. C. 80-ft site; Newark, N. J. (New York area); Point Reyes, Calif.; and State College, Pa. Four aluminum alloys were exposed additionally at Sheffield, London, Hayling Island, Banbury, and Anglesey (all in England).

A breakdown of the 80 test metals and alloys included 37 aluminum, 19 copper, 2 lead, 5 magnesium, 1 molybdenum, 5 nickel, 1 tantalum, 8 titanium, and 2 zinc base compositions. Corrosion evaluations included measurement of pitting depth, corrosion rates based on weight loss determinations, and changes of mechanical properties due to corrosion. Results of the one-, two- and seven-year removals have been reported in the *Proceedings* for 1961, 1962, and 1966.

Although the 20-year panels remain on test, Committee G-1 believed an interim interpretation of results would be helpful to engineers, scientists, and others interested in the performance of metals in atmospheric environments. This symposium then is a natural outgrowth of this ASTM program. But to make these results more meaningful in the United States and abroad, papers were solicited on unrelated but relevant work from other investigators. Some papers touch on factors affecting corrosion, calibration of sites, handling of data, statistical interpretation, and the effects of stress and initial exposure conditions. In addition to reports on aluminum, zinc, copper, nickel, and titanium, several papers relate to studies on plain carbon steel and stainless steels.

Committee G-1 offers this Symposium on Metal Corrosion in the Atmosphere as an in-depth review of work relating to metals in natural atmospheres and a report of observations and results derived therefrom.

A bibliography representing a careful search of the literature which brings together a comprehensive listing of published articles on corrosion of metals in natural atmospheres is available on request.<sup>1</sup>

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<sup>1</sup>This Bibliography on Atmospheric Corrosion containing 480 references to technical papers published from 1912 to 1967 is available from University Microfilms, Inc., 300 N. Zeeb Road, Ann Arbor, Mich., 48106, at \$3.00 per copy.