

SYMPOSIUM ON ATMOSPHERIC CORROSION OF NON-FERROUS METALS

Presented at the
FIFTY-EIGHTH ANNUAL MEETING
AMERICAN SOCIETY FOR TESTING MATERIALS
Atlantic City, N. J., June 29, 1955



ASTM Special Technical Publication No. 175

Published by the
AMERICAN SOCIETY FOR TESTING MATERIALS
1916 Race St., Philadelphia 3, Pa

SYMPOSIUM ON ATMOSPHERIC CORROSION OF NON-FERROUS METALS

Presented at the
FIFTY-EIGHTH ANNUAL MEETING
AMERICAN SOCIETY FOR TESTING MATERIALS
Atlantic City, N. J., June 29, 1955



Reg. U.S. Pat. Off.

ASTM Special Technical Publication No. 175

Price \$2.75; to Members, \$2.00

Published by the
AMERICAN SOCIETY FOR TESTING MATERIALS
1916 Race St., Philadelphia 3, Pa.

COPYRIGHT, 1956
BY THE
AMERICAN SOCIETY FOR TESTING MATERIALS

Printed in Baltimore, Md.
May, 1956

FOREWORD

Two sessions, the Fourteenth and Seventeenth, of the Fifty-eighth Annual Meeting of the American Society for Testing Materials, held in Atlantic City, N. J., June 29, 1955, were devoted to a Symposium on Atmospheric Corrosion of Non-Ferrous Metals. The basis of the Symposium was the report on the 20-year tests sponsored by Committee VI of ASTM Committee B-3 on Corrosion of Non-Ferrous Metals and Alloys. The report of this subcommittee appears in this publication together with the papers analyzing these results and giving additional data sponsored by the individual authors.

The Symposium Chairman, under Committee B-3, was K. G. Compton, Bell Telephone Laboratories, Murray Hill, N. J., who also served with F. L. LaQue of the International Nickel Co., New York, N. Y., as co-chairman of the Fourteenth Session. C. P. Larrabee, U. S. Steel Corp., Monroeville, Pa., served as chairman of the Seventeenth Session.

The Symposium volume is the second dealing with these exposure tests of nonferrous metals. An earlier volume, issued in 1946, covered the 10-year exposure tests. Included in that volume was the report covering the original data on the exposure specimens and can be consulted for these data. The earlier symposium was entitled Symposium on Atmospheric Exposure Tests on Non-Ferrous Metals and is published as separate pamphlet *ASTM STP No. 76*.

NOTE.—The Society is not responsible, as a body, for the statements
and opinions advanced in this publication.

CONTENTS

	PAGE
Introduction—W. H. Finkeldy	1
Report of Subcommittee VI on Atmospheric Corrosion	3
Resistance of Aluminum-Base Alloys to 20-Year Atmospheric Exposure—C. J. Walton and William King	21
Discussion	45
Effect of 20-Year Marine Atmosphere Exposure on Some Aluminum Alloys—Fred M. Reinhart and George A. Ellinger	47
Discussion	65
Effect of Natural Atmospheres on Copper Alloys: 20-Year Test—A. W. Tracy	67
The Atmospheric Corrosion of Copper—Results of 20-Year Tests—D. H. Thompson, A. W. Tracy, and John R. Freeman, Jr.	77
Discussion	88
Atmospheric Galvanic Corrosion of Magnesium Coupled to Other Metals—H. O. Teeple	89
Galvanic Couple Corrosion Studies By Means of the Threaded Bolt and Wire Test— K. G. Compton and A. Mendizza	116
Discussion	124
The Atmospheric Corrosion of Rolled Zinc—E. A. Anderson	126
Discussion	134
The Use of Lead and Tin Outdoors—George O. Hiers and Elbert J. Minarcik	135
Atmospheric Corrosion Behavior of Some Nickel Alloys—H. R. Copson	141

THIS PUBLICATION is one of many issued by the American Society for Testing Materials in connection with its work of promoting knowledge of the properties of materials and developing standard specifications and tests for materials. Much of the data result from the voluntary contributions of many of the country's leading technical authorities from industry, scientific agencies, and government.

Over the years the Society has published many technical symposiums, reports, and special books. These may consist of a series of technical papers, reports by the ASTM technical committees, or compilations of data developed in special Society groups with many organizations cooperating. A list of ASTM publications and information on the work of the Society will be furnished on request.