

INTERGRANULAR CORROSION OF STAINLESS ALLOYS

A symposium
sponsored by ASTM
Committee A-1 on Steel,
Stainless Steel, and
Related Alloys and
Committee G-1 on
Corrosion of Metals
AMERICAN SOCIETY FOR
TESTING AND MATERIALS
Toronto, Canada, 2, 3 May 1977

ASTM SPECIAL TECHNICAL PUBLICATION 656
R. F. Steigerwald
Climax Molybdenum Co.
editor

List price \$24.00
04-656000-27



AMERICAN SOCIETY FOR TESTING AND MATERIALS
1916 Race Street, Philadelphia, Pa. 19103

Copyright © by AMERICAN SOCIETY FOR TESTING AND MATERIALS 1978
Library of Congress Catalog Card Number: 78-55317

NOTE

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

Printed in Baltimore, Md.
October 1978

Foreword

This publication, *Intergranular Corrosion of Stainless Alloys*, contains papers presented at the Symposium on Evaluation Criteria for Determining the Susceptibility of Stainless Steels to Intergranular Corrosion which was held in Toronto, Canada, 2-3 May 1977. The symposium was sponsored by Committee A-1 on Steel, Stainless Steel, and Related Alloys and G-1 on Corrosion of Metals, American Society for Testing and Materials. R. F. Steigerwald, Climax Molybdenum Company, presided as symposium chairman and editor of this publication.

Related ASTM Publications

Localized Corrosion—Cause of Metal Failure, STP 516 (1972), \$22.50,
04-516000-27

Galvanic and Pitting Corrosion—Field and Laboratory Studies, STP 576
(1976), \$29.75, 04-576000-27

Stress Corrosion—New Approaches, STP 610 (1976), \$43.00, 04-610000-27

Structure, Constitution, and General Characteristics of Wrought Ferritic
Stainless Steels, STP 619 (1977), \$7.50, 04-619000-02

A Note of Appreciation to Reviewers

This publication is made possible by the authors and, also, the unheralded efforts of the reviewers. This body of technical experts whose dedication, sacrifice of time and effort, and collective wisdom in reviewing the papers must be acknowledged. The quality level of ASTM publications is a direct function of their respected opinions. On behalf of ASTM we acknowledge with appreciation their contribution.

ASTM Committee on Publications

Editorial Staff

Jane B. Wheeler, *Managing Editor*
Helen M. Hoersch, *Associate Editor*
Ellen J. McGlinchey, *Senior Assistant Editor*
Helen Mahy, *Assistant Editor*

Contents

Introduction	1
Theory and Application of Evaluation Tests for Detecting Susceptibility to Intergranular Attack in Stainless Steels and Related Alloys—Problems and Opportunities—M. A. STREICHER	3
Intergranular Corrosion in Nuclear Systems—A. TOBODA AND L. FRANK	85
Comparative Methods for Measuring Degree of Sensitization in Stainless Steel—W. L. CLARKE, R. L. COWAN, AND W. L. WALKER	99
Detecting Susceptibility to Intergranular Corrosion of Stainless Steel Weld Heat-Affected Zones—B. VYAS AND H. S. ISAACS	133
Variations in the Evaluation of ASTM A 262, Practice E, Results (ASTM Subcommittee A01.14 Round Robin)—W. L. WALKER	146
Niobium and Titanium Requirements for Stabilization of Ferritic Stainless Steels—H. J. DUNDAS AND A. P. BOND	154
Intergranular Corrosion Testing and Sensitization of Two High-Chromium Ferritic Stainless Steels—T. J. NICHOL AND J. A. DAVIS	179
Detection of Susceptibility of Alloy 26-1S to Intergranular Attack—A. J. SWEET	197
Intergranular Corrosion in 12 Percent Chromium Ferritic Stainless Steels—R. A. LULA AND J. A. DAVIS	233
Summary	248
Index	255

