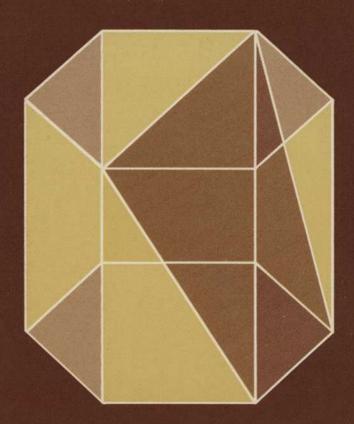
Applications Related PHENOMENA in TITANIUM ALLOYS



STP 432

American Society for Testing and Materials



APPLICATIONS RELATED PHENOMENA IN TITANIUM ALLOYS

A symposium
presented at a meeting of
Committee B-10 on
Reactive & Refractory Metals and Alloys
AMERICAN SOCIETY FOR
TESTING AND MATERIALS
Los Angeles, Calif., 18–19 April, 1967

ASTM SPECIAL TECHNICAL PUBLICATION NO. 432

List price \$20.00; 30 per cent discount to members



© BY AMERICAN SOCIETY FOR TESTING AND MATERIALS 1968 Library of Congress Catalog Card Number: 68-18768

NOTE

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

Printed in Baltimore, Md. March, 1968

Foreword

The Symposium on Applications Related Phenomena in Titanium Alloys was presented 18–19 April 1967 in Los Angeles, Calif. ASTM Committee B-10 on Reactive and Refractory Metals and Alloys sponsored the symposium. Hans Conrad, University of Kentucky, was the symposium chairman. It was divided into four sessions, and presiding as chairmen of these sessions were Dr. Conrad; R. I. Jaffee, Battelle Memorial Institute; H. P. Kessler, Reactive Metals, Inc.; and W. W. Minkler, Titanium Metals Corporation of America.

Related ASTM Publications

New Structural Materials for Aerospace Vehicles, STP 379 (1965), \$6.00

Stress-Corrosion Cracking of Titanium, STP 397 (1966), \$14.00

Structural Fatigue in Aircraft, STP 404 (1966), \$18.50

Plain Strain Crack Toughness Testing of High Strength Metallic Materials, STP 410 (1967), \$5.50

Contents

Introduction	1
Fracture Toughness and Notch Strength	
Source of Fracture Toughness: The Relation Between K_{1° and the Ordinary Tensile Properties of Metals—G. T. HAHN AND A. R. ROSENFIELD	5
A Review of Factors Influencing the Crack Tolerance of Titanium Alloys—J. L. SHANNON, JR., AND W. F. BROWN, JR.	33
Structural Ductility of High Strength Titanium Alloys—RALPH PAPIRNO	64
Toughness of Two-Phase 6Al-4V Titanium Microstructures—w. w. GERBERICH AND G. S. BAKER Relation of Strength and Toughness to Fine Structures in a Beta Ti-	80
tanium Alloy—B. R. BANERJEE, J. J. HAUSER, AND J. M. CAPENOS Plane Strain Fracture Toughness and Mechanical Properties of 5Al-	100
2.5Sn ELI and Commercial Titanium Alloys at Room and Cryogenic Temperatures—c. M. CARMAN AND J. M. KATLIN	124
Fracture Toughness in Aqueous Saline Environments	
Metallurgical and Mechanical Aspects of the Sea-Water Stress Corrosion of Titanium—I. R. LANE AND J. L. CAVALLARO The Influence of Composition and Heat Treatment on the Aqueous-	147
Stress Corrosion of Titanium—s. R. SEAGLE, R. R. SEELEY, AND G. S. HALL Effects of Heat Treating Environmental Conditions on the Stress-Corrosion Cracking Resistance of Several Titanium Alloys—D. G. HOWE AND R. J. GOODE	170 189
	107
Environmental Related Phenomena	
The Initiation of Hot-Salt Stress Corrosion Cracking of Titanium Alloys—s. P. RIDEOUT Crevice Corrosion of Titanium—J. D. JACKSON AND W. K. BOYD	205 218
Biaxial Properties of Titanium Alloys at Cryogenic Temperatures— S. F. FREDERICK AND D. L. CORN	227
Texture Strengthening and Fracture Toughness of Titanium Alloy Sheet at Room and Cryogenic Temperatures—T. L. SULLIVAN	236
Low Cycle Fatigue and Wear	
Effects of a 3.5 Per Cent Sodium Chloride Aqueous Saline Environment on the Fatigue Crack Propagation Characteristics of Titanium Alloys—T. w. CROOKER AND E. A. LANGE Lubricants and Wear Coatings for Titanium—s. J. KOSTMAN Surface Treatment of Ti-6Al-4V for Impact-Fatigue and Wear Resistance—R. D. WELTZIN AND G. KOVES	251 268 283
ance R. D. Wellem and G. Royes	403