

CONTENTS

PART I. SUBSTRATE AND INTERFACIAL ASPECTS

The Role of Surface and Bulk Characterization in the Evaluation of Adhesive Joints

W. L. Baun 3

Practical Adhesion Measurement in Adhering Systems: A Phase Boundary Sensitive Test

A. A. Roche, M. J. Romand and F. Sidoroff 19

Effect of a Phenol Formaldehyde Resin on the Adhesion of a Polysulfide Sealant

R. Ramaswamy and P. Sasidharan Achary 31

Polysulfide-Polyurethane Interfacial Aspects

A. M. Usmani 41

Epoxy Resin Wetting of E Glass Single Filaments as it Relates to Shear Strength

E. J. Berger and Y. Eckstein 51

PART II. FACTORS INFLUENCING BEHAVIOR OF ADHESIVE JOINTS

Influence of Surface Roughness on Mechanical Properties of Joints

Y. Gilibert and G. Verchery 69

The Effects of Surface Conditioning of AISI-304 Stainless Steel on the Interfacial Properties of Alloy/Epoxy Composite Structure; Adherend Surface Characterization Using X-ray Emission Spectroscopy (LEEIXS)

F. Gaillard, A. A. Roche and M. J. Romand 85

Surface Characterization of Anodic Oxides on Aluminium Alloys by Means of Surface Potential Difference, Surface Impedance and Surface Morphology A. Kwakernaak, R. Exalto and H. A. van Hoof	103
Investigation into the Effect of Surface Treatment on the Wettability and the Bondability of Low Surface Energy Materials J. P. Jeandrou	121
The Effect of Moisture on the Dimensional Stability of Adhesively Bonded Joints E. J. Hughes, J. Boutilier, and J. L. Rutherford	137
The Dimensional Stability of Epoxy Adhesive Joints J. P. Sargent	151
Strength Characteristics of Mono and Multiple-Wire Steel to Steel Joints Bonded with an Epoxy Adhesive R. W. Hylands	165
A Study of Adhesive Joints Between Aliphatic Polyamides and Metals S. S. Pesetskii, V. E. Starzynskii, and S. V. Shcherbakov	195
"Honeymoon" Phenolic Fast-Setting Adhesives for Exterior-Grade Finger Joints A. Pizzi	214
Ageing of Structural Film Adhesives - Changes in Chemical and Physical Properties and the Effect on Joint Strength C. E. M. Morris, P. J. Pearce and R. G. Davidson	231
Structural Adhesives Based on Diallyl Phthalate A. M. Usmani	247
Possibilities of Integrating Surface Treatment of Bonding Parts in the Adhesive Bonding Process K. Ruhsland	257

PART III: EVALUATION AND CHARACTERIZATION

Evaluation of Adhesive Test Methods G. P. Anderson, K. L. DeVries and G. Sharon	269
A Critical Appraisal of Dental Adhesion Testing W. J. O'Brien and S. T. Rasmussen	289

Adhesive Joint Characterization by Ultrasonic Surface and Interface Waves S. I. Rokhlin	307
Nondestructive Evaluation of Some Bonded Joints T. C. Ward, M. Sheridan and D. L. Kotzov	347
Ultrasonic Assessment of Cure Rate Effects in Bonded Honeycomb Structures R. A. Pike and R. S. Williams	369
The Three-Point Bend Test for Adhesive Joints N. T. McDevitt and W. L. Baun	381
Accelerated Aging Procedures for Glue-Wood Bonds and Their Use for In-Plant Quality Control R. B. Jathar	395
Peel-Strength and Energy Dissipation T. Igarashi	419
The Estimation of Adhesion in Filled Polymer Systems Yu.S. Lipatov, T. T. Todosiychuk, P. K. Tsarev and L. M. Sergeeva	433

PART IV. DURABILITY OR STABILITY ASPECTS

Adhesion and Durability of Metal/Polymer Bonds J. D. Venables	453
Failure Mechanisms in the Boundary Layer Zone of Metal/Polymer Systems W. Brockmann, O.-D. Hennemann and H. Kollek	469
Joint Durability Studies with Abraded, Etched, Coated and Anodized Aluminum Adherends J. D. Minford	485
Comparative Study of Aluminum Joint Strength and Durability with Varying Thickness, Boehmite-Type Oxide Surfaces J. D. Minford	503
Epoxy Adhesion to Copper, Part II: Electrochemical Pretreatment J. M. Park and J. P. Bell	523
Hydrothermal Stability of Titanium/Epoxy Adhesive Joints F. J. Boerio and R. G. Dillingham	541

A Study on Elastomer/Metal Bonds Applicable in Underwater Sonar Systems R. Y. Ting	555
 PART V. STRESS ANALYSIS AND PERFORMANCE ASPECTS	
Life Prediction Methodology for Adhesively Bonded Joints J. Romanko, K. M. Liechti and W. G. Knauss	567
Stress Analysis of Adhesively Bonded Joints R. A. Kline	587
The Impact Strength of Adhesive Lap Joints J. A. Harris and R. D. Adams	611
The Performance of Adhesive-Bonded Thin-Gauge Sheet Metal Structures with Particular Reference to Box-Section Beams A. Beevers and A. C. P. Kho	627
Cyclic Debonding of Adhesively Bonded Composites S. Mall, W. S. Johnson and R. A. Everett, Jr.	639
Effects of Low Cycle Loading on Shear Stressed Adhesive Bondlines W. Althof	659
Effect of Scrim Cloth on Adhesively Bonded Joints E. C. Francis and D. Gutierrez-Lemini	679
 PART VI. FRACTURE ASPECTS	
Mechanical Measurement of Interatomic Bonding Energies at Interfaces E. H. Andrews	689
Review of Continuum Mechanics Factors in Adhesive Fracture M. L. Williams	703
Fracture Energetics of Adhesive Joints L.-H. Lee	739
Fracture of Composite-Adhesive-Composite Systems E. J. Ripling, J. S. Santner and P. B. Crosley	755
Characterization of the Fracture Behavior of Adhesive Joints D. L. Hunston, A. J. Kinloch, S. J. Shaw and S. S. Wang	789

Structural Precursors to Fracture in Adhesive Joints W. A. Jemian	809
Fracture Toughness of Elastomer Modified Epoxy Adhesives A. A. Donatelli, C. T. Mooney and J. C. Bolger	829
A Three-Dimensional Analysis of a Butt Joint with a Flaw R. S. Alwar and K. N. Ramachandran Nambisan	839
The Influence of Layer Thickness and Internal Stresses on the Bond Strength of Metal-to-Ceramic Joints W. Diem, G. Elssner, T. Suga and G. Petzow	855
Bond Strength Characterization of Metal-to-Ceramic and Adhesive Joints by Critical Energy Release Rates W. Diem, G. Elssner, T. Suga and G. Petzow	871
Interfacial Properties of Filled Epoxide Resins A. C. Moloney, H. H. Kausch and H. R. Stieger	883
About the Contributors	905
Index	923