

ENGINEERING PROPERTIES AND APPLICATIONS OF LEAD ALLOYS



Suranaree University of Technology



31051000604674

Sivaraman
Guruswamy

Contents

| | | |
|-----------------|--|-----|
| <i>Foreword</i> | Jerome F. Cole | v |
| <i>Preface</i> | | vii |
| 1. | Introduction | 1 |
| | I. Worldwide Sources of Lead | 2 |
| | II. Refined Lead Production and Consumption Patterns | 6 |
| | III. Production of Lead Metal | 15 |
| | IV. Health and Safety Issues | 18 |
| | V. Properties of Pure Lead | 19 |
| 2. | Properties of Lead and Its Alloys | 27 |
| | I. Physical Properties of Lead and Its Alloys | 27 |
| | II. Mechanical Properties of Lead and Lead Alloys | 57 |
| | III. Creep Behavior | 123 |
| | IV. Fatigue Strength | 168 |
| | V. Corrosion Properties | 192 |
| | VI. Acoustic Properties of Lead and Lead Composites | 232 |
| | VII. Nuclear Properties | 276 |
| 3. | Processing of Lead Products | 309 |
| | I. Melting and Casting of Lead Alloys | 310 |
| | II. Metal Forming | 342 |
| | III. Joining of Lead | 377 |
| 4. | Applications of Lead | 429 |
| | I. Lead–Acid Batteries | 430 |

| | | |
|--------|--|-----|
| II. | Use of Lead in Earthquake Protection | 458 |
| III. | Use of Lead in Brick Wall Infills | 476 |
| IV. | Lead-Tin Alloys in Organ Pipes | 479 |
| V. | Use of Lead Sheets in Architecture | 483 |
| VI. | Lead in Radiation Shielding and Waste Management | 499 |
| VII. | Use of Lead Alloys for Printing Types | 530 |
| VIII. | Bearing Metals | 534 |
| IX. | Packaging and Sealing | 539 |
| X. | Fusible Alloys | 542 |
| XI. | Lead Heat-Treating Baths | 546 |
| XII. | Use of Lead in Inertial Applications | 547 |
| XIII. | Solders | 550 |
| XIV. | Ammunition | 569 |
| XV. | Lead Cable Sheathing | 570 |
| XVI. | Insoluble Lead Anodes | 585 |
| XVII. | Use of Lead in Bi-Based Oxide High-T _c Superconductors | 587 |
| XVIII. | Lead in Glass | 589 |
| XIX. | Lead Chalcogenide Semiconductors | 591 |
| 5. | Lead in the Environment | 593 |
| I. | Toxic Properties of Lead | 596 |
| II. | Occupational Exposures | 599 |
| | <i>References</i> | 605 |
| | <i>Index</i> | 621 |