BOOK REVIEWS

Engineering Materials 3: Materials Failure Analysis (Case Studies and Design Implications)

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REFERENCE: D. R. H. Jones, *Engineering Materials 3: Materials Failure Analysis (Case Studies and Design Implications)*, Pergamon Press, New York, 1993, ISBN: 0-08-041905-4, $36.00.

Students, technicians, and professionals with a broad range of engineering backgrounds will find this book a valuable reference and "workbook" on failure analysis. A diverse and well-organized collection of case histories is assembled to illustrate the importance of engineering failures and their analysis to the design process. The individual studies presented involve real world problems, and have been carefully selected to underscore the close relationship between materials properties and engineering function. Failures involve a wide variety of components and systems, ranging from mountain climbing rope to steam boilers.

The book consists of case histories and a set of appendices. Case histories are divided into sections based on the general category of failure. Categories of failure represented include elastic and plastic deformation, creep, fast fracture, brittle fracture, fatigue, and environmentally assisted failure. The final section highlights some of the great engineering failures that have been documented over the years. Each individual study contains a wealth of supporting details including background information, operating conditions, pertinent formulas and supporting calculations, diagrams, materials properties and design considerations. The appendices provide an accompanying "workshop" on failure analysis as it relates to engineering design. Applicable tools, in the form of formulas and data, are summarized in the first appendix. Together, the second and final appendices provide working examples and their solutions, respectively, to help emphasize the books objectives and key principles. Individual references throughout the book are also valuable.