

## BOOK REVIEW

Coatings for High Temperature Applications. Editor, E. Lang. Elsevier Applied Science Publishers 1983, xii + 440 pages £48.00

This book is a collection of the papers presented at a seminar on "Coatings for High Temperature Applications". The seminar was organised by the "Information Centre" Project of the High Temperature Materials Programme, the Joint Research Centre, Petten Establishment, The Netherlands. The aim of the seminar and thus of the book was, quoting from the Preface, "to provide, to scientists, engineers and technologists with an interest in, or active in, the field of high temperature materials selection and application, a comprehensive survey of the full range of the various technologies available for the deposition of metallic, cermet and ceramic coatings, to consider the procedures for their evaluation and assessment, including discussions of their principal degradation mechanisms, to report on the state of art of their application for various high temperature technologies, and to define criteria for the selection of coatings for specific applications in high temperature areas". Unfortunately the date of the seminar is not listed in the book to enable the reader to judge how up-to-date its contents are.

How well does this volume achieve its aim? It does cover all the topics mentioned in the stated objective by providing separate sections on fundamentals aspects, coating technologies, evaluation of coatings, and high temperature applications of coatings. In general, the individual papers in the various sections also further the aim of the book although some are more successful in doing so than others. For example, a book of the type reviewed here, and which is intended to report on the state of the art in a given area, should provide extensive lists of references or bibliographies. Only a few chapters in the Coating Technologies section do so. These chapters are on chemical vapour deposition and pack cementation processes by Duret and Pichoir; on evaporation and sputter techniques by Teer; and a chapter in the Evaluation of Coatings Section on performance evaluations by Nicoll. (Incidentally, an examination of all the reference lists found the most recent references to be 1981, thus fixing the date of the seminar as during that

year or later). Another measure of success in meeting the objectives of the book is the degree of thoroughness in the coverage of the subjects of the various papers. All of the chapters were quite satisfactory in this regard but some were especially outstanding. Among the more successful ones were (1) those cited above which, besides containing extensive references, also contained good discussions of fundamentals, (2) the chapter on fundamental aspects by Pettit and Gower, which contains a useful chart identifying systems susceptible to attack via the principal hot corrosion modes, and (3) the chapter on surface treatments for tribology problems by Child, which provides a good discussion of the fundamentals of wear, friction and lubrication.

It can be concluded, therefore, that this book rather successfully serves the needs of those engineers who are seeking to cope with the general trend towards increasing operation temperatures to achieve higher efficiencies of gas turbine bladings operating at high temperatures in corrosive environments. Similarly, it should prove useful to engineers working in industries concerned with developing energy resources, e.g., coal conversion, nuclear energy and petrochemistry. A major way of enabling the materials used in these technologies to resist failures in corrosive environments at high temperatures is by the application of coatings that provide corrosion protection, thermal insulation, and resistance to wear and erosion. This book provides valuable information for the use of engineers who require the application of high temperature coatings to the materials problem they seek to address.

Professor Jerome Kruger  
Johns Hopkins University  
Baltimore, Maryland  
U.S.A.

Lady Davis Fellow, Academic Year 1983-84  
Technion-Israel Institute of Technology  
Haifa, Israel.