

7 Donnelly, R. J., Herman, R., and Prigogine, I., *Nonequilibrium Thermodynamics, Variational Techniques and Stability*, 1st ed., University of Chicago Press, Chicago, 1966.

8 Silver, R. S., *An Introduction to Thermodynamics*, 1st ed., Cambridge University Press, Cambridge, 1971, pp. 47-52.

9 El-Sayed, Y. M., "On the Generalization of Thermodynamics," unpublished report, Department of Mechanical Engineering, Glasgow University, 1971.

10 Schlögl, F., "Produced Entropy in Quantum Statistics," *Zeitschrift für Physik*, Vol. 249, 1971, pp. 1-11.

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Elastodynamic Diffraction Problems

Diffraction of Elastic Waves and Dynamic Stress Concentrations. By Y.-H. Pao and C.-C. Mow. Crane, Russak & Co. Inc., New York, 1973. 693 Pages.

REVIEWED BY J. D. ACHENBACH¹

Elastodynamic stress concentrations near cavities and inclusions can be quite different in magnitude from the corresponding elastostatic stress concentrations. This interesting and typically dynamic effect, which is often due to the diffraction of elastic waves, has generated a good many analytical and experimental studies, including several important ones by Pao and Mow. These authors have now written a monograph in which they have collected the most useful methods of analysis for elastodynamic diffraction problems, together with extensive numerical information on the accompanying stress concentrations.

The book opens with an informative history of studies of elastic wave diffraction. The first chapter also contains sections summarizing the theory of elasticity and a brief discussion of pertinent aspects of wave propagation in elastic solids. In Chapter 2, an analysis of scattering of plane harmonic SH-waves by a cylindrical obstacle serves to introduce methods of analysis. The four remaining chapters present analytical and numerical results for both steady-state and transient diffraction by cylindrical and spherical obstacles. Chapter 3 focuses on a thorough presentation of circular cylinder problems, such as diffraction of longitudinal and transverse waves by cavities and rigid and elastic inclusions. The scattering of flexural waves by a circular inclusion in a plate is also discussed, as is the transient interaction of a circular shell with a surrounding elastic medium. Elliptic cylinder problems and parabolic cylinder problems are

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discussed in Chapters 4 and 5, respectively. Chapter 5 includes an analysis of the important problem of stress singularities generated by elastodynamic diffraction at the edge of a semi-infinite crack. The last chapter is concerned with the spherical inclusion problem.

This book packs a lot of information which until now was only partially available, and then dispersed in the technical literature. It will be valuable to anyone who is, or should be, interested in elastodynamic effects.

Introduction to Materials Science

Materials Science. By A. L. Ruoff. Prentice-Hall, Englewood Cliffs, N. J., 1973. vii-928. \$18.95 Cloth.

REVIEWED BY A. PHILLIPS²

This is an excellent introductory book on material science. It covers a large number of topics making it suitable for any engineer who wishes to be introduced to those aspects of the science of materials which are important for his work. Suitable references at the end of each chapter provide guidance for further study. The book covers material properties and behavior, electrons and atoms, micro and macrostructure, chemical equilibria, kinetics, mechanical properties, electrical properties, optical, and magnetic properties.

It is very well written and it includes a large number of examples and problems. It is a good text for teaching at the undergraduate level.

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TITLE: Surface Effects on the Diffraction of P Wave by an Arbitrary Shaped Cavity. AUTHORS: Zhiying Ou, Hongjun Han. KEYWORDS: Conformal Mapping, Dynamic Stress Concentration Factor, Irregularly Shaped Cavity, Surface Effect. JOURNAL NAME: Open Journal of Applied Sciences, Vol.9 No.6, June 3, 2019. The wave function expansion method and the conformal mapping method are used in the solution of dynamic stress concentration factor around an irregularly shaped cavity at nano-scale. The stress boundary conditions on the surface are obtained by using the generalized Young-Laplace equation. The results show that the degree of stress concentration becomes more obvious with curvature increasing. Start by marking "Diffraction Of Elastic Waves And Dynamic Stress Concentrations" as Want to Read: Want to Read saving | Want to Read. Currently Reading. Read. Diffraction Of Elastic by Chao-Chow Mow. Other editions. Want to Read saving | Error rating book. Refresh and try again. Rate this book. Clear rating. We'd love your help. Let us know what's wrong with this preview of Diffraction Of Elastic Waves And Dynamic Stress Concentrations by Chao-Chow Mow. Problem: It's the wrong book It's the wrong edition Other. The dynamic stress concentration around the holes is calculated to illustrate the effect of surface effects on the multiple scattering of P- and SV-waves. 1. Introduction. The diffraction of elastic waves by a single inhomogeneity embedded in an elastic medium was discussed in detail by Pao and Mow [1]. With the development of composite materials, there is an increasing demand for understanding the dynamic behavior of composite materials, and much attention has been directed toward the multiple scattering of elastic waves. Fang et al. obtained the multiple diffraction fields by two-particle re