PLASTIC WAVE PROPAGATION IN BOUNDED SOLIDS (1000-1099)

Subtopics

Experimental technique; material behavior as deduced from wave propagation characteristics; and graphical wave propagation analysis.

PLASTIC WAVE PROPAGATION IN BOUNDED SOLIDS
(1000-1099)

Bibliography

1001 Taylor G I and Whiffin A C
THE USE OF FLAT-ENDED PROJECTILES FOR DETERMINING DYNAMIC YIELD STRESS
Proceedings of the Royal Society of London
1948, Series A, Vol. 194, p. 289.

The deformation of a flat-ended projectile, due to being fired at high velocity against a steei plate, is used as a measure of the dynamic yield stress of the projectile. In Part I the theory of the method is presented. Results of experimental tests are shown in Part II. Satisfactory results obtained for velocity of impacts from 400 to 2500 ft/sec.

1002 Johnson J E, Wood D S and Clark D S
DYNAMIC STRESS-STRAIN RELATIONS FOR ANNEALED 2S ALUMINUM UNDER COMPRESSIVE IMPACT
Journal of Applied Mechanics, Trans. ASME
1953, Vol. 75, pp. 523-529.

This paper presents the results of an experimental study of the dynamic stress-strain relations for annealed 2S Aluminum. Methods of obtaining data are presented. The technique used in analyzing the data involves the use of plastic and elastic stress-wave propagation.

Impact velocities to a maximum of about 150 fps.

1003 Von Karman T and Duwez P
THE PROPAGATION OF PLASTIC DEFORMATION IN SOLIDS
Journal of Applied Physics
1950, Vol. 21, pp. 987-994.

The stress wave caused by longitudinal impact on a cylindrical bar is analyzed for the case where impact velocity is large enough to produce plastic strain. The concept of a critical velocity is presented. An experimental investigation is performed which substantiates the theoretical presentation.