

Dr. A. P. Coppa

Selected Publications:

A.P. Coppa (Missile and Space Division, General Electric Co, Philadelphia, PA), "On the mechanism of buckling of a circular cylindrical shell under longitudinal impact", Tenth International Congress of Applied Mechanics, 1960, DTIC Accession Number: AD0438856

CONTENTS: Stresses Due To Impact; Impact By an Infinite Mass: Initiation of instability, Critical length for inextensional buckling, Postbuckling behavior, Secondary buckling, Effect of internal pressure; Impact By a Finite Mass: Instability, Postbuckling behavior, Secondary buckling; and Experimental buckling behavior: Buckling at the impacted end, Inextensional nature of buckling, and Change of buckle pattern during postbuckling.

Anthony P. Coppa and W.A. Nash (General Electric Co. Missiles and Space Division, Philadelphia, PA), "Dynamic buckling of shell structures subject to longitudinal impact", Technical Documentary Report No. FDL-TDR-64-65, DTIC Accession Number: AD0610514, Handle / proxy Url :

<http://handle.dtic.mil/100.2/AD610514>

ABSTRACT: Experimental and theoretical studies of the buckling and collapse of circular cylindrical and conical shells under longitudinal impact are described. Various conditions of loading were investigated such as impact with rigid, fluid, and granular media, and such effects as initial geometrical imperfections, edge support, and loading asymmetry were included. In addition, the effect of axial impact at velocities up to 391 ft/sec on the buckling of thin cylindrical shells was studied experimentally. Finally, three problems, relating to the experiments were studied theoretically: (1) the dynamic buckling of a circular cylindrical shell subject to an axial loading which varies linearly with time, using the nonlinear theory, (2) dynamic buckling of a circular cylindrical shell subject to a constant velocity end displacement, including the effects of plasticity and incorporating extremely large deflections, and (3) the inextensional shortening and collapse modes of conical shells for the complete range of end shortening.

Coppa, A. P., "The Buckling of Circular Cylindrical Shells Subject to Axial Impacts" NACA TN D1510, Collected Papers on Shell Structures, (1962), 361.

A.P. Coppa, " Measurement of initial geometrical imperfections of cylindrical shells" (Imperfection maps of cylindrical shell surface measured with apparatus consisting of reference surface, rotating mounting plate, oscillograph, low pressure displacement transducer, etc), AIAA Journal, Vol. 4, January 1966, pp. 172-175

A. P. Coppa, "Effect of end conditions on buckling of cylindrical shells under axial compression impact", Test Methods for Compression Members, ASTM STP 419, Am. Soc. Testing Mats., 1967, p. 115

PARTIAL ABSTRACT: Experimentally observed effects of edge conditions on the buckling behavior of cylindrical shells under axial compression impact are presented. Three effects are discussed, namely, those due to (1) inward radial displacement restraint of the shell wall, (2) asymmetry of the applied loading resulting from obliquity between the impact plate and the end cross section plane of the shell, and (3) impact velocity...