Dr. George Gerard

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George Gerard and Herbert Becker, “Handbook of structural stability, Part 3, Buckling of curved plates and shells, NACA TN-3783, August 1957, Accession Number : ADA302018,
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ABSTRACT: Available theories and test data on buckling of curved plates and shells are reviewed. The test data for torsion and external-pressure loadings are correlated in terms of linear buckling theories for both the elastic and inelastic ranges. The cases which exhibit a marked disagreement between linear theory and test data have been analyzed by a unified semi-empirical approach which is satisfactory for analysis and design purposes.

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ABSTRACT: The first part of this paper is in the nature of a progress report on recent developments of analysis methods for filamentary composites. Theoretical predictions of the stiffness and strength properties of a unidirectional composite based on a knowledge of the constituent properties are correlated with experiments for both tensile and compressive loadings. The analysis of multilayer or laminated composites based upon the unidirectional composite properties then requires the rather straight forward use of classical anisotropic shell theory. Some structural aspects of filamentary composites designed for biaxial loads are considered in the second part. In particular, certain design restrictions inherent in the use of such composites become evident when compared to the more familiar isotropic sheet. Some of these restrictions can be overcome by a close matching of filament orientations and stress field. These factors serve to emphasize the overwhelming importance of creative structural concepts in the design of successful filamentary composites.