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Selected Publications:

Fischer, L.: **Theorie und Praxis der Schalenkonstuktionen**, W. Ernst, Berlin 1967; English translation, Theory and Practice of Shell Structures, Ernst & Sohn, Berlin 1968

G. Fischer, "Über den Einfluss der gelengkigen Lagerung auf die Stabilität dünnwandiger Kreiszylinderschalen unter Axiallast und Innendruck", Z. Flugwissenschaften, Jahrg. 11, Heft 3, Mär 1963, p. 111

Fischer, G., "Influence of Boundary Conditions on Stability of Thin-Walled Cylndrical Shells under Axial Load and Internal Pressure, AIAA Journal, Vol. 3, No. 4, April 1965, pp. 736-738.

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"Linear and Nonlinear Stability Analysis of Thin Cylindrical Shells under Wind Loads", Mechanics Based Design of Structures and Machines: An International Journal, Vol. 9, No. 1, 1981, pp. 91 – 113,
doi: 10.1080/03601218108907378
ABSTRACT: The stability of a cylindrical shell subjected to wind load is analyzed using numerical solution methods. The multisegment direct integration as well as the finite element method are applied in linear analysis, and a nonlinear finite element algorithm is used to take into account the nonlinear prebuckling effects of the perfect and imperfect structure. The calculated results are compared with measurements, and good agreement is derived with respect to both stability limit and buckling mode.

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"A proposal for the earthquake resistant design of tanks – Results from the Austrian Research Project", Proceedings of Ninth World Conference on Earthquake Engineering, August, 1988, Tokyo-Kyoto, Japan (Vol. VI)
SUMMARY: An engineering approach is presented for calculating the maximum dynamic pressure distributions caused by horizontal and vertical earthquake excitation of tanks. Three different possibilities for superposing the dynamic pressure components due to the horizontal and the vertical earthquake components on the static pressure and the different modes of wall instabilities are discussed. The results show that the dynamic pressure component caused by vertical excitation must not be neglected especially for tall tanks. An essential aim of this project has been the development of simple formulas and diagrams for engineers dealing with the construction of liquid storage tanks made of steel.

Marc Fischer, David Kennedy (Cardiff School of Engineering, Cardiff University, PO Box 686, The Parade, Cardiff CF24 3TB, United Kingdom Email: FischerM@cf.ac.uk), "Local Postbuckling Analysis Of Curved Aerospace Structures", ICAS 2000 Congress, 2000, pp. 423.1-423.1-10 (Optimage, Edinburgh).
ABSTRACT: Minimum mass design of aerospace structures is greatly enhanced by allowing for their postbuckling reserve of strength, which is mainly due to stress re-distribution within the structure following

buckling in a local mode. The paper first outlines a geometrically non- linear analysis for longitudinally compressed panels, in which the ratio of postbuckling to prebuckling axial stiffness is established by an iterative procedure, critical buckling loads and mode shapes being found by an 'exact strip' algorithm. The analysis is illustrated by its application to a simply supported, curved, stiffened panel. The paper next describes an incremental approach to the local postbuckling analysis of longitudinally stiffened cylindrical shells loaded by longitudinal compression and/or a bending moment. The shell is modelled as a collection of skin/stiffener portions, for each of which the critical buckling load and stiffness ratio are determined. Next the axial loads in each portion due to the applied loads are calculated under linear elastic assumptions, so that it is possible to determine which portion will buckle first. Thereafter the buckled portion is modelled with a reduced stiffness, so that the location of the shell's neutral axis changes and is found by an iterative improvement to a method originally developed by Bruhn.

N. Friedel, F. Rammertstorfer, F. Fischer, Buckling of stretched strips, Computers & Structures 78 (2000) 185–190.

Fischer, M., Kennedy, D., and Featherston, C. A. Multilevel optimization of a composite aircraft wing using Viconopt MLO. In Proceedings of the 9th AIAA/ISSMO Symposium on Multidisciplinary analysis and optimization, Atlanta, GA, 2002, paper AIAA 2002-5511 (AIAA, Reston, VA).

D Kennedy, M Fischer, C A Featherston (Cardiff School of Engineering, Cardiff University, Cardiff, UK), Review Paper: "Recent developments in exact strip analysis and optimum design of aerospace structures", Proceedings of the Institution of Mechanical Engineers, Part C: Journal of Mechanical Engineering Science, Vol. 221, No. 4, 2007, pp. 399-413, doi:10.1243/0954406JMES432
ABSTRACT: The current paper outlines recent developments to algorithms and software for critical buckling and natural vibration analysis and optimum design of prismatic plate assemblies, based on the exact strip approach and the Wittrick—Williams algorithm. The current paper acts as a single source document discussing recent progress and planned future explorations in: initial local postbuckling of stiffened panels; discrete optimization of composite structures to satisfy manufacturing requirements; discontinuous cost functions; constraints on fundamental natural frequencies and frequency-free bands; a feasibility study of response surface optimization; and multi-level optimization of composite aircraft wings. The numerous references provide fuller technical details and illustrative examples.