Dr. Larry W. Byrd

Biography:
Larry Byrd is a member of the Experimental Verification branch of the Structures Division of the Air Vehicles Directorate of the Air Force Research Laboratory at Wright-Patterson Air Force Base, Dayton, OH. He has worked with high temperature structures in extreme thermal and acoustic environments for more than ten years. His research has spanned the use of heat pipes to the sonic fatigue life of ceramic matrix composites and titanium/titanium boride functionally graded materials. He received BS and MS degrees in Mechanical Engineering from the University of Iowa and a PhD. from North Carolina State University. He has taught at Arkansas State University, Jonesboro, AR and Wright State University, Fair- born, OH.

Selected Publications:
Victor Birman (1) and Larry W. Byrd (2),
(1) Engineering Education Center, University of Missouri-Rolla, One University Boulevard, St. ouis, MO 63121
(2) Air Force Research Laboratory, AFRL/VASM, Building 65, Wright-Patterson Air Force Base, OH 45433
"Modeling and analysis of functionally graded materials and structures", Applied Mechanics Reviews, Vol. 60, No. 5, pp 195-216, September 2007, doi:10.1115/1.2777164
ABSTRACT: This paper presents a review of the principal developments in functionally graded materials (FGMs) with an emphasis on the recent work published since 2000. Diverse areas relevant to various aspects of theory and applications of FGM are reflected in this paper. They include homogenization of particulate FGM, heat transfer issues, stress, stability and dynamic analyses, testing, manufacturing and design, applications, and fracture. The critical areas where further research is needed for a successful implementation of FGM in design

are outlined in the conclusions.
299 references are listed at the end of the paper.

Birman, V., Chona, R., Byrd, L. W., and Haney, M. A., 2007, "Response of Spacially Tailored Structures to Thermal Loading," J. Eng. Math., in press.

Victor Birman and Larry W. Byrd, "Stability and natural frequencies of functionally graded stringer-reinforced panels", Composites Part B: Engineering, Vol. 39, No. 5, July 2008, pp. 816-825, doi:10.1016/j.compositesb.2007.10.009
ABSTRACT: The paper presents an analysis of stability and free vibrations of rectangular functionally graded panels reinforced by a system of parallel stringers. The exact solution of the problem is illustrated for large aspect ratio panels with simply supported long edges and arbitrary boundary conditions along the short edges (hereafter the reference to an "exact solution" implies a closed-form solution in the content of the theory of plates). The spacing between the stringers and the cross sections of individual stringers can be arbitrary. In the particular case where identical stringers are equally spaced, the solution is simplified using the smeared stiffeners technique. The optimization problem concerned with the choice of stringers and their spacing in the situations where the buckling loads or fundamental frequencies are prescribed is also considered. The closed-form solution of the optimization problem is shown in the case of blade stringers