

THE DEPENDENCY OF VIBRATION ENERGY DISSIPATION ON THE AMPLITUDE OF STRUCTURAL MOTION

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ABSTRACT

Quantitative values of structural damping factors for ground launched aerospace vehicles are seldom precisely determinable. This paper presents measured data from a large vibration test program and shows correlation of these data with the amplitude of motion. Experimental structural damping factor values and amplitude of vibratory motion from a vibration test are combined to show the amplitude dependency of structural damping factors. The experimental data show good correlation of structural mode damping factor with the amplitude of vibratory motion. The data were obtained from flight control frequency response testing of shuttle orbiter and ascent vehicles and structural mode damping factors obtained from Ground Vibration Tests, MSFC, Huntsville, Alabama, June 1978 through February 1979.

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