

Study on the Dynamic Characteristics Change of Welded Beam Due to Vibration Aging

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Abstract : Fatigue fracture of an aluminum welded structure is a phenomenon frequently occurring from pores in a weld. In order to grasp the state of the welded structure in operation in real time, the acceleration signal of the structure is measured. At this time, the vibration characteristic of the signal according to the fatigue load is an important parameter of the state diagnosis. This paper was an experimental study on the variation of vibration characteristics of welded beams with vibration aging (especially bending vibration). First simple beams were produced according to welding conditions. Each beam was vibrated and measured beam's PSD (power spectral density) according to the degree of aging. Also, modal testing was conducted to compare the transfer functions of welded beams. Testing result shows that the natural frequencies of the beam changed with the vibration aging due to the change of stiffness in welding part and its stiffness was estimated by the finite element method.

Keywords : modal testing, natural frequency, vibration aging, welded structure

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