

研究論文

超音波定在波音場下における鋭敏色法および Sénarmont 法を用いた
固体中の応力測定

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Measurement of Stress in Glass Sample Using Sensitive Tint and Sénarmont Method under the Ultrasonic Standing Field

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Visualization and quantification of stress distribution in solids caused by ultrasonic standing waves is described. A strobe photoelastic system was improved for quantitative measurements of the stress associated with ultrasonic wave field. The stress field distribution and its value associated with the ultrasonic standing wave at the frequency from 54.30 kHz to 2.15905 MHz in glass was observed by the sensitive color method and the Sénarmont method. The measured value is shown with the frequency at 54.30 kHz at the center of the sample. As a result, by the sensitive color method, the distribution of stress value and the stress polarity are clearly visualized in red and blue colors, and by the Sénarmont method, the stress of several hundred kPa (603 kPa) can be quantitatively obtained at center position of the glass sample. As the results, improved photoelastic system introducing sensitive tint and Sénarmont method has the possibility of the quantitative measurement of the stress in glass sample.

Keywords : sensitive tint method, Sénarmont method, birefringence, retardation, standing wave