

The Crack Propagation on Glass in Laser Thermal Cleavage

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Abstract : In the laser cleavage of glass, the laser is mostly adopted as a heat source to generate a thermal stress state on the substrates. The crack propagation of the soda-lime glass in the laser thermal cleavage with the straight-turning paths was investigated in this study experimentally and numerically. The crack propagation was visualized by a high speed camera with the off-line examination on the micro-crack propagation. The temperature and stress distributions induced by the laser heat source were calculated by ANSYS software based on the finite element method (FEM). With the cutting paths in various turning directions, the experimental and numerical results were in comparison and verified. The fracture modes due to the normal and shear stresses were verified at the turning point of the laser cleavage path. It shows a significant variation of the stress profiles along the straight-turning paths and causes a change on the fracture modes.

Keywords : laser cleavage, glass, fracture, stress analysis

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