

Photo-elasticity

*Edited by M. Nisida and K. Kawata
(Springer-Verlag, 1986)*

In the 19th century, photo-elasticity was one of the main physics topics studied by such famous academicians as Brewster, Fresnel, Maxwell, Neumann, Mach, and Pockels. Due to the remarkable advancement of high-polymer technology, photo-elasticity developed in the 20th century into a fundamental engineering science for estimating stresses and strains as well as for simulating their distributions in elements and structures to be constructed. Many wheels, bridges, and even a nuclear power plant were designed using photo-elastic analysis. Since the utilization of the finite element method for determining stresses is spreading dominantly over the world with the rapid development and distribution of electronic computers, some universities believe that photo-elasticity is no longer as important in engineering science as before.

However, photo-elasticity is still a powerful engineering science, not only for visually and analytically checking the results obtained by computers but also for analyzing residual stresses in semiconductor wafers and optoelectronic devices.

This book is the proceedings of the timely and fruitful International Symposium on Photo-elasticity held in Tokyo in 1986. It includes 35 reports, 18 by Japanese researchers and 17 by overseas participants. The proceedings is divided into nine sections as follows: historical survey (2 articles), visco-elastic-plastic behaviors (3 articles), moire and speckle (4 articles), high speed photo-elasticity (4 articles), caustics and stress intensity factors (5 articles), new techniques in photo-elasticity (6 articles), stresses in structures (5 articles), propagation of polarized light (3 articles), and numerical methods of stress analysis (3 articles). From these articles, we can clearly recognize recent development and advances in photo-elasticity.

Reviewer: Tomoya Ogawa, a professor in the Department of Physics, Gakushuin University, Japan, is noted for his expertise in the field of modern elasticity.

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