

# **THERMAL STRESSES AND BIREFRINGENCE IN TUBES AND MULTI-LAYERED POLYMER SLABS: THEORY AND EXPERIMENT**

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Free quenching of tubes of PC and PS and three-layered slabs of PS-PC-PS and PC-PS-PC from various initial melt temperatures to below the glass transition temperature was carried out. The thermal residual stress and birefringence distributions along the thickness direction of the tubes and slabs were simulated and the birefringence was measured. Simulations were based on the linear viscoelastic and photoviscoelastic constitutive equations and the first-order rate equation for volume relaxation. The relaxation modulus and strain-optical coefficient functions of polymers as a function of time and temperature were used in the simulations. Comparisons indicated a reasonable agreement between the simulated and measured data.