THIXOTROPIC MODEL FOR A VISCOELASTIC FLUID: SILICONE OIL

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Silicone oils (PDMS) have important applications in many branches of modern industry. Their advantages include high temperature and chemical resistance, optical transparency, good electrical properties, etc. Recent developments in certain application areas and processing steps require a reliable rheological model of silicone oils.

Long time shear flow curves of the samples, measured at several temperatures with a rotational rheometer, show that the silicone oil is thixotorpic. However, the nonlinear viscoelastic properties of the silicone oil make both the measurement and the modeling of thixotropy difficult. We present experimental results and a simple lumped parameter model, which accounts for thixotropy and viscoelasticity in the linear regime.