Physical properties of polyurethane foams depending on the gelling and blowing catalyst ratio

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Polyurethane foams are widely used in various industries since they have great physical properties, such as hysteresis loss, sag factor, stress relaxation, and compression strength. Water content, polyol molecular weight, types of fillers and many other parameters can affect the physical properties. In this study, flexible polyurethane foams were fabricated with various catalyst ratios (gelling : blowing), and physical properties were measured. By controlling the reaction rates, optimum foam structures for improved physical properties were obtained. Hysteresis loss showed a decreasing trend with increasing gelling catalyst content, while sag factor showed an increasing trend with increasing gelling catalyst content. The optimum catalyst ratio between gelling and blowing catalyst was 9:1.