

Influences of nano-silica particles on physical properties of polyurethane composite foams

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Polyurethane composite foams are widely used in various applications for automotive products (seat pad and sound absorption). In this work, two types of nano-silica particles are applied in fabrications of flexible polyurethane composite foams to investigate the static (sag factor, hysteresis, and compression strength) comfort properties. Nano-silica particles affect the formation mechanisms of cellular morphology (cavity and pore) of polyurethane composite foams by nucleating phase separations of the polyurethane composite foams. Comfort properties of urethane foams are strongly dependent on the form morphologies. Scanning electron microscopy (SEM), universal testing machine (UTM), impedance tube are used to analyze the physical properties of the foams.