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Hot Embossing Microstructures onto Plastic Plates by Ultrasonic Vibration

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This research attempted to use ultrasonic vibration as a heat generator for hot embossing. The first part of this study investigated the microstructure replication capacity of ultrasonic-heating embossing of both amorphous and semi -crystalline plastic plates; the second part of this study examined the effects of various ultrasonic vibration parameters on the contour of microstructure, and the third part of this study identified the relative significance of all these parameters on molded part quality. In addition, the temperature profiles at different depths of the embossed plates by ultrasonic vibration were measured. The experimental results in this study suggested that ultrasonic vibrated hot embossing could provide an effective way of molding microstructures onto polymeric plates.