Laser ablated micropillar energy directors for ultrasonic welding of microfluidic systems - DTU Orbit (09/11/2017)

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We present a new type of energy director (ED) for ultrasonic welding of microfluidic systems. These micropillar EDs are based on the replication of cone like protrusion structures introduced using a pico-second laser and may therefore be added to any mould surface accessible to a pico-second laser beam. The technology is demonstrated on an injection moulded microfluidic device featuring high-aspect ratio (h × w = 2000 µm × 550 µm) and free-standing channel walls, where bonding is achieved with no detectable channel deformation. The bonding strength is similar to conventional EDs and the fabricated system can withstand pressures of over 9.5 bar.

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