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Static Mixer for Heat Transfer Enhancement for Mold Cooling Application RODOLFO BECERRA, RAUL BARBOSA, KYE-HWAN LEE, YOUNGGIL PARK, Univ of Texas Rio Grande Valley — Injection molding is the process by which a material is melted in a barrel and then it is injected through a nozzle in the mold cavity. When it cools down, the material solidifies into the shape of the cavity. Typical injection mold has cooling channels to maintain constant mold temperature during injection molding process. Even and constant temperature throughout the mold are very critical for a part quality and productivity. Conformal cooling improves the quality and productivity of injection molding process through the implementation of cooling channels that "conform" to the shape of the molded part. Recent years, the use of conformal cooling increases with advance of 3D printing technology such as Selective Laser Melting (SLM). Although it maximizes cooling, material and dimension limitations make SLM methods highly expensive. An alternative is the addition of static mixers in the molds with integrated cooling channels. A static mixer is a motionless mixing device that enhances heat transfer by producing improved flow mixing in the pipeline. In this study, the performance of the cooling channels will be evaluated with and without static mixers, by measuring temperature, pressure drop, and flow rate. The following question is addressed: Can a static mixer effectively enhance heat transfer for mold cooling application processes? This will provide insight on the development of design methods and guidelines that can be used to increase cooling efficiency at a lower cost.

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