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**Turbulence characteristics of flow through an open cell metal foam.**[1] YOUNGWOO KIM, CHANHEE MOON, KYUNG CHUN KIM, Pusan National University — Random nature of stochastic foam provides favorable geometrical properties for thermal applications such as large specific surface area and high porosity. However, notwithstanding intensive investigations for the last two decades, hydrodynamic characteristics of stochastic foam are still poorly understood. Current 3-D printing technology supports printing of transparent complex structures. This study investigates turbulence characteristics of a stochastic foam. Using micro-tomography and stereo-lithography, a transparent stochastic foam was printed. Quantitative flow visualization was performed using refractive index matching technique and time-resolved particle image velocimetry. Mixing and turbulence characteristics were discussed. Mechanical mixing and high turbulence in the stochastic foam is beneficial for thermal applications, but large wake area behind the struts cause high pressure drop. On the basis of the results, a new concept of turbulence due to complex geometry can be named as "structure generated turbulence (SGT)".

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