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A 3D Computational fluid dynamics model validation for candidate molybdenum-99 target geometry[1] LIN ZHENG, The University of New Mexico, GREG DALE, Los Alamos National Laboratory, PETER VOROBIEFF, The University of New Mexico — Molybdenum-99 (^{99}Mo) is the parent product of technetium-99m (^{99m}Tc), a radioisotope used in approximately 50,000 medical diagnostic tests per day in the U.S. The primary uses of this product include detection of heart disease, cancer, study of organ structure and function, and other applications. The US Department of Energy seeks new methods for generating ^{99}Mo without the use of highly enriched uranium, to eliminate proliferation issues and provide a domestic supply of ^{99}mTc for medical imaging. For this project, electron accelerating technology is used by sending an electron beam through a series of ^{100}Mo targets. During this process a large amount of heat is created, which directly affects the operating temperature dictated by the tensile stress limit of the wall material. To maintain the required temperature range, helium gas is used as a cooling agent that flows through narrow channels between the target disks. In our numerical study, we investigate the cooling performance on a series of new geometry designs of the cooling channel.

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