

**Mo-99 2015 TOPICAL MEETING ON
MOLYBDENUM-99 TECHNOLOGICAL DEVELOPMENT**

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**Powder Metallurgy Fabrication of
Molybdenum Target Materials and Assemblies**

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ABSTRACT

Powder metallurgy approaches for the fabrication of accelerator target materials are being examined to support the development of Mo-99 production by NorthStar Medical Technologies, LLC. An advantage of powder metallurgy is that very little material is wasted and at present, dense, quality parts are routinely produced from molybdenum powder. The current target design is a thin wafer, 29 mm in diameter with a thickness of 0.5 mm, with very stringent dimensional tolerances. Combinations of powder morphology, lubricants, pressing technique and sintering conditions have been explored to produce target disks with minimal variations in thickness and little or no distortion. Thermomechanical and thermophysical properties as well as thermal stability are being examined to support target design and assess in-accelerator material performance. In addition to the typical “press and sinter” approach to the fabrication of targets, additive manufacturing is being explored to produce complete target assemblies. This effort includes development of spherical powders for feedstock and characterization of processing-microstructure-property relationships to support design and modeling of performance.