

Supplementary material for: Use of Alloying to Effect an Equiaxed Microstructure in Additive Manufacturing and Subsequent Heat Treatment of High-Strength Titanium Alloys

Brian A. Welk¹, Nevin Taylor¹, Zachary Kloenne¹, Kevin J. Chaput², Stephen Fox³ and Hamish L. Fraser¹

¹Center for the Accelerated Maturation of Materials, Department of Materials Science and Engineering, The Ohio State University, Columbus, OH

²Aerospace Systems, Northrop Grumman Corporation, Melbourne, FL

³Henderson Technical Laboratory, Titanium Metals Corporation, Henderson, NV

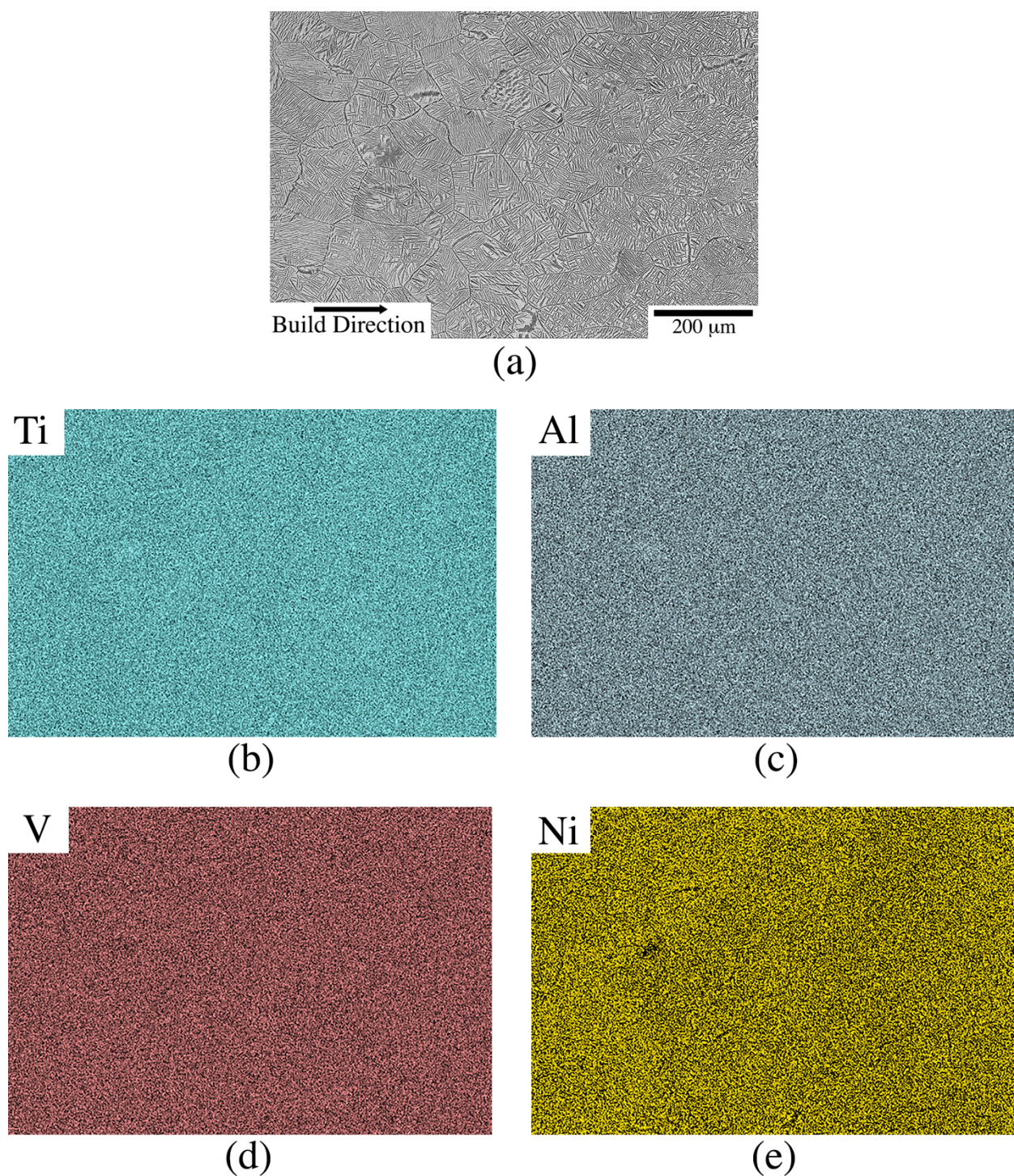


Fig. S-1. Selected region from the Ti64-xNi LENSTM gradient showing the composition is essentially uniform. This region has the composition of Ti64-3Ni. a) SEM BSE image of the microstructure. b-e) XEDS elemental maps with the elements marked.

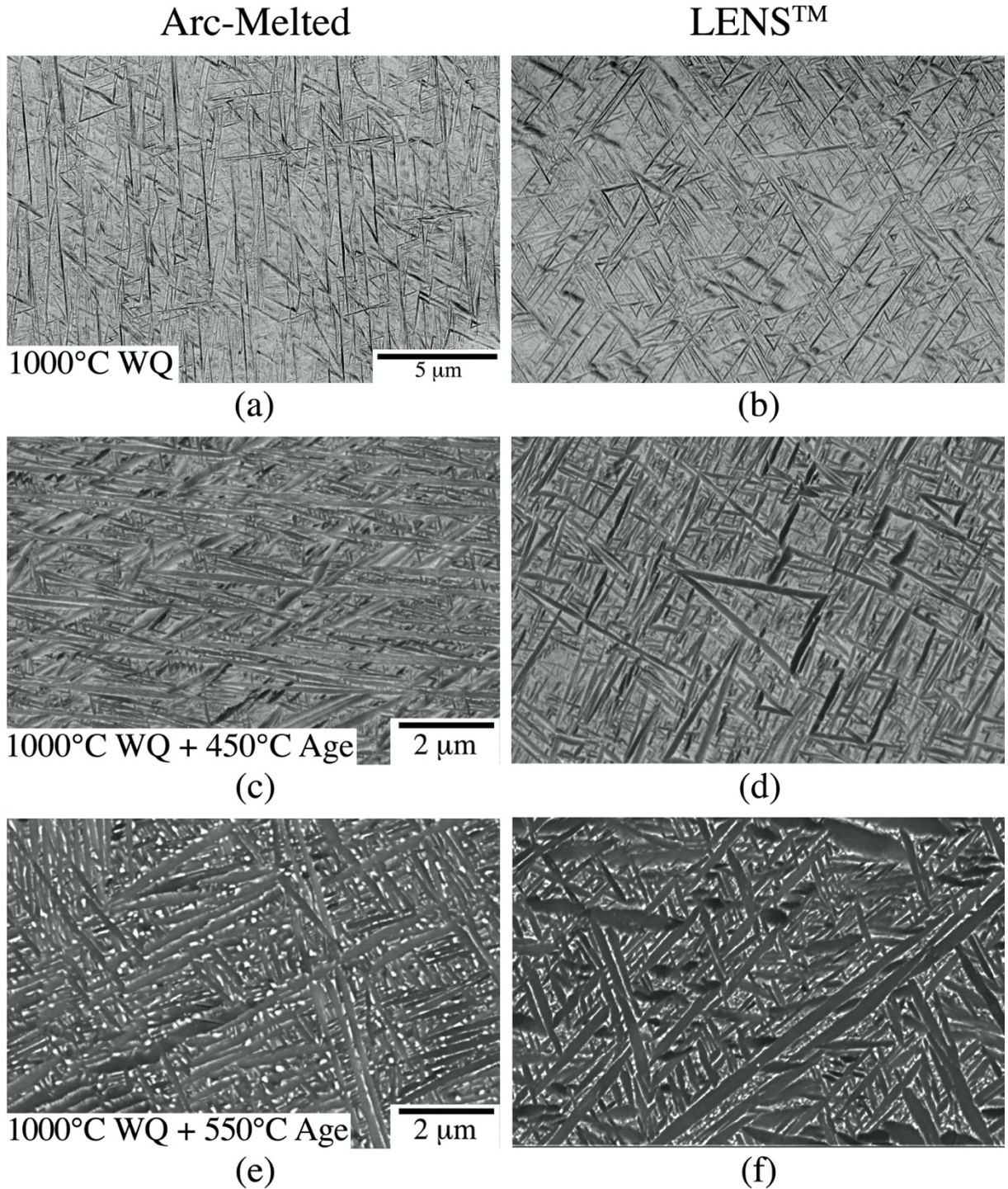


Fig. S-2. BSE images showing the similar microstructures of arc-melted and LENSTM deposited Ti64-3Ni following heat-treatment. a) arc-melted and b) LENSTM deposited microstructure following solution heat-treatment at 1000°C for one hour, followed by water quenching; c) arc-melted and d) LENSTM deposited microstructure following solution heat-treatment at 1000°C for one hour, followed by water quenching, and then aged for one hour at 450°C; e) arc-melted and f) LENSTM deposited microstructure following solution heat-treatment at 1000°C for one hour, followed by water quenching, and then aged for one hour at 550°C.