

Supplement to abstract: Monitoring Conformality in ALD Manufacturing: Comparing Lateral and Vertical High Aspect Ratio Test Structures, Mikko Utriainen, Stefan Riedel, Alireza M. Kia, Feng Gao and Riikka L. Puurunen

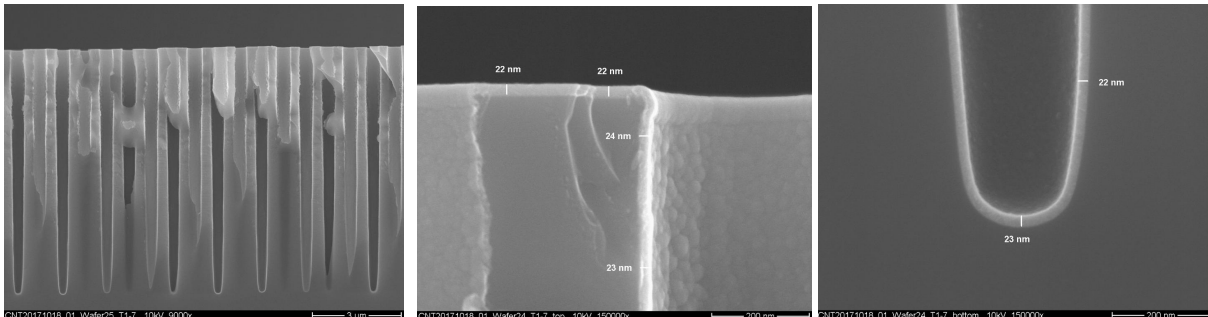


Fig. 1. SEM cross-sections of employed vertical high aspect ratio test structure. ALD ZrO_2/Al_2O_3 laminate step coverage and thickness are quantified from the images.

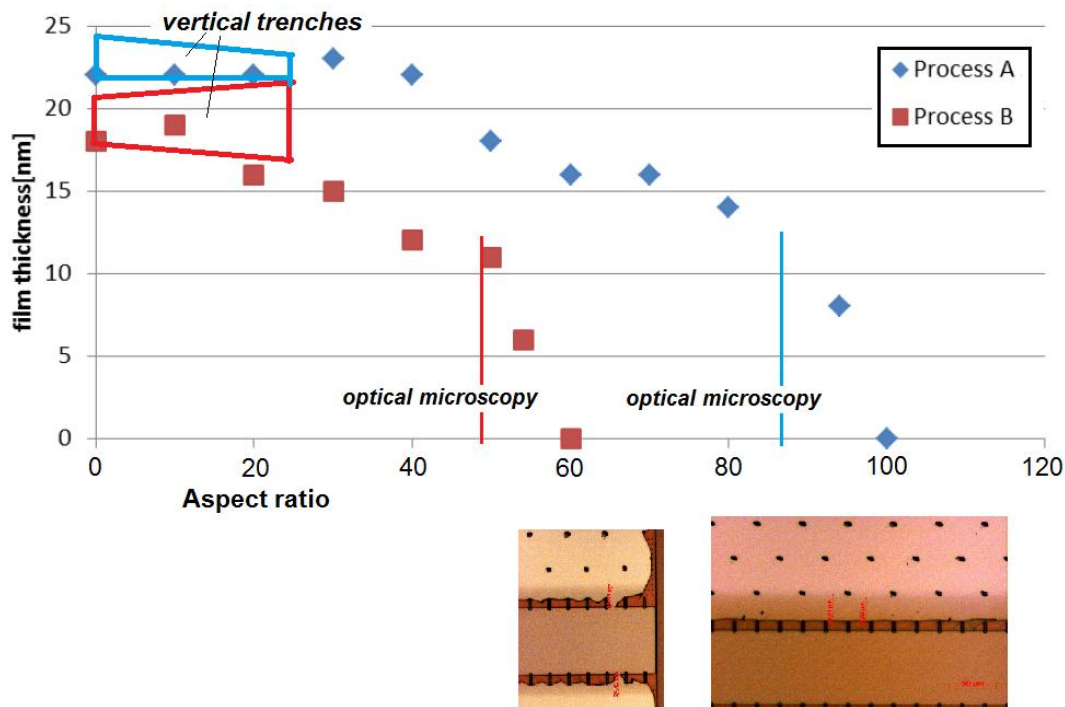


Fig.2. Comparison between step coverage metrology results from PillarHall® lateral high aspect ratio test structures and vertical high aspect ratio test structures as measured by cross-sectional SEM for 2 process variations (A=optimized for 3D, B=planar) of ALD ZrO_2/Al_2O_3 laminate at Fraunhofer IPMS. Optical microscopy images from corresponding LHAR test structures (after removal of top membrane) allows to quantify the relative penetration depth of the film.