

Abstract Submitted  
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**Development of an In-Situ Load Frame in a Large Chamber Scanning Electron Microscope** JASON LESZCZEWICZ, EDWARD KINTZEL, ROBIN WORACEK, Western Kentucky University, DAYAKAR PENUMADU, University of Tennessee-Knoxville, STEPHEN YOUNG, Western Kentucky University — A high capacity custom designed uniaxial (tension-compression) mechanical testing system has been developed and integrated in to a 1.5 meter Large Chamber Scanning Electron Microscope (LC-SEM). This testing system provides unique ability to apply large axial force (up to 90 kN) for imaging deforming materials using various imaging modalities possible with electrons (secondary, back-scattered, and diffracted) using a close-loop control interface using National Instruments hardware and software. A wide spectrum of specimen sizes and materials can be accommodated and there is no limitation to using small sized specimen, as usually required in traditional SEM based tensile stages offered through vendors such as Gatan. This system is integrated for user access at the recently established Nondestructive Analysis Center (NOVA) at Western Kentucky University (WKU) that offers LC-SEM for advanced material analysis. The LC-SEM is also equipped with Focused Ion Beam (FIB), Energy Dispersive X-ray Spectrometry (EDS), Fourier Transform-Infrared (FT-IR) Spectroscopy and can operate under variable pressure mode. Initial results will be presented in this paper for metallic and polymeric composite materials using secondary electron based images.

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