Characterization of Powders using Scanning White Light Confocal Microscopy ADAM GOLDER, KYLE RAMOS, CLAUDINE ARMENTA, RAMON SAAVEDRA, JOHN LAZARZ, ERNIE HARTLINE, GARY WINDLER, CINDY BOLME, Los Alamos National Laboratory — The distribution of size, shape, and defect density of crystalline explosive powders is known to have a profound effect on explosive processing, sensitivity, and performance. The field of powder sample characterization covers a wide variety of methods for obtaining such information. Scanning white light confocal microscopy (SWLCM) allows for direct measurement of particle height data in the Z direction, in addition to the traditional XY directions. This capability can provide an added level of confidence in data when compared with other methods that record 2D information and use stereological assumptions in parameter/distribution analysis (e.g. providing volume as opposed to area-based distributions). Oftentimes common assumptions of simple geometric shapes do not represent the morphology of explosive crystalline powders well. For optically transparent crystals, including HE powders, SWLCM can also be used to characterize crystal defects and morphology. Baseline measurements of NIST Standard Reference Material (SRM) powders with known PSDs are made using this method and results are shown. A broad view of powder handling and observation techniques will be presented, in addition to results and specific material challenges of SWLCM.

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