***The title and abstract have been slightly changed from the originally submitted version (Please use the title and abstract seen below)**

Room and elevated temperature sliding wear behavior of a cold sprayed Ni-WC composite coating

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Cold sprayed Ni-WC metal matrix composite coatings have advantageous tribological properties that have only been investigated in the literature at room temperature. In this study, dry sliding behavior of a Ni-WC composite was examined from room temperature up to 400°C and during thermal cycling with a sliding speed of 2 cm/s and a load of 2.45 N. Characterization of worn surfaces was conducted with SEM, EDS, XRD, XPS, Raman spectroscopy, interferometry, and hardness measurements. Results indicate that an increasing temperature leads to a decrease in friction and an increase in wear. The coefficient of friction decreased from 0.41 at 23°C to 0.32 at 400°C, while the wear rate increased from 0.47×10^{-4} mm^3 N^{-1} m^{-1} at 23°C to 3.67×10^{-4} mm^3 N^{-1} m^{-1} at 400°C. This lowering of friction is attributed to the formation of a lubricious phase formed in the wear track by tribochemical processes. The increase in wear is due to a combination of thermal softening and a change in the wear mechanism from adhesive to abrasive. During thermal cycling, the coating exhibited self-adaptive behavior from the high to low friction regime. While thermal softening and tribochemical reactions at elevated temperatures slightly compromised the wear resistance, the formation of the lubricious tribofilm

was advantageous for friction. Therefore, WC-Ni cold spray coatings are potential candidates for elevated temperature sliding wear applications.