Abstract for NANOMAN2024(500 words) Frictional properties analysis of milled surfaces at the micro-nano scale

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The friction properties of milled surfaces directly affect the stability and reliability of mechanical equipment, and its friction mechanism is not clear enough because it is affected by many factors. In this paper, the friction properties of milled surfaces of the metallic material HT300 at the micro-nano scale were investigated. First, milling experiments were conducted on HT300 metallic materials and milled surfaces with different roughness were obtained at the micro-nano scale. Then, micromotion friction and wear experiments were carried out on the milled surfaces with different normal loads, displacement amplitudes, micromotion frequencies and surface roughness. Next, the effects of different factors on the steady-state friction coefficient of the milled surfaces were analyzed. Finally, the relationships between normal load, displacement amplitude, micromotion frequency, surface roughness and steady-state friction coefficient were established. This study predicts the steady-state friction coefficients of milled surfaces at the micro-nano scale under the action of different factors, providing theoretical support for the study of friction and wear on machined surfaces.

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