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An optimization research on the coverage of micro-textures arranged on bearing sliders

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Abstract: This paper optimizes the coverage of circular micro-textures on bearing sliders aiming at improving their tribological performance. Grid-like array of textures are arranged to present or absent, which are respectively marked as 1 and 0. Genetic Algorithm is used to evolve the coverages of textures. The algorithm allows the derivation of preferable area for texture coverage in shape of pyramid at the inlet of slider. Evaluation of influences of convergence ratio and width demonstrates that sliders with small convergence ratio and width tend to result in significant tribological improvement effect. Subsequent experimental tests confirmed the achievement of low friction coefficient of the so optimized texture coverage.

Keywords: surface textures; optimization; coverage; bearing sliders

Nomenclature

B bearing width, m

L length of the lower surface, m

l_p distance between adjacent dimples, mm

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