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Special Issue Reprint

Surface Engineering Processes for Reducing Friction and Wear

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Surface engineering is a key technological field that directly influences the performance, efficiency, reliability, and service life of engineering components and systems. In particular, surface modification technologies play a crucial role in reducing friction and wear, which are among the primary causes of energy losses, material degradation, and component failure across diverse sectors, including transportation, energy, biomedical engineering, electronics, and manufacturing. This Special Issue is dedicated to recent developments in tribology and surface engineering aimed at improving the wear resistance and operational performance of engineering materials and components. The published contributions address topics including the tribological behavior of metallic materials, wear mechanisms in industrial applications, the performance of coated cutting tools, and the influence of manufacturing processes and surface conditions on friction and wear. The collection also includes studies on additively manufactured alloys, multilayer-coated tools, bimetallic materials, and laser-directed energy deposition technologies for rail repair and surface enhancement. The papers presented experimental investigations and application-oriented studies that enhanced the understanding of the relationships between material microstructure, surface characteristics, and tribological performance. Collectively, the contributions demonstrate current approaches to improving component durability, reducing wear-related degradation, and extending service life in demanding engineering environments.

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