

Special Issue Reprint

Advanced Nano-Structured Hard Coatings

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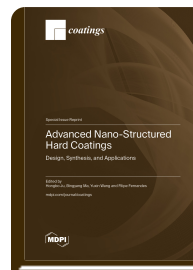
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The relentless demand for energy efficiency in our carbon-constrained world has exposed a critical challenge: nearly a quarter of all industrial energy is dissipated through friction and wear. This silent crisis finds its solution in the atomic-scale world of advanced coatings, where materials science meets tribological innovation. Coating technology thus emerges as a critical solution, offering transformative potential for addressing friction- and wear-induced energy losses. Advanced coatings are revolutionizing mechanical systems by fundamentally transforming surface interactions. Through innovative material engineering, these cutting-edge solutions simultaneously achieve self-lubricating functionality, dramatically reduce dependence on traditional lubricants, and push wear resistance to unprecedented levels. In the context of a global shift towards more efficient and sustainable technologies, continuous engagement with the latest developments in hard coating research is imperative. This Special Issue unveils the next frontier: coatings that do not just resist wear, but actively participate in energy systems. The frontier of coating technology now extends beyond traditional tribological applications, with promising developments in areas as diverse as biomedical implants and space exploration hardware. This Special Issue also brings together pioneering research and insightful critical reviews on the newest innovations, boldest ideas, and most promising real-world applications of hard coatings across all systems. Get ready to explore the future of surface engineering!

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