

# Handbook of Nanomaterials and Nanocomposites for Energy and Environmental Applications

## Wear-resistant metals and composites

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### Abstract

Wear-resistant materials (WRMs) have attracted enormous attention because of their general usages in the biomedical, medical, military, automotive, aerospace, and other industrial sectors. The wear of an article causes persistent devaluation, at the same time, but more importantly, wear can make a component become ineffective or vulnerable to sudden failure. Wear is the main problem in numerous engineering applications, and the advancement of wear-resistant materials, therefore, has both technical and economic advantages. The present dissipation of energy and the waste of treasured raw materials, owing to wear, are significant economic drawbacks. The cost of abrasion, on materials of value, for example, has been projected to range between 1% and 4% of the gross national product of an average technologically advanced nation. Recently, research efforts to design and produce cutting-edge wear-resistant materials for the economic benefits of the industrial sectors have increased tremendously. This chapter presents a comprehensive review of the recent developments in the production of wear-resistant metals and metal matrix composites, influence of nanoparticles on the wear behavior of metal matrix composites, and areas of application.