Surface Engineering with Lasers

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著者:Dehosson, Jeff T. M.

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This book deals with fundamental and applied concepts in surface engineering, in particular focusing on laser synthesis and properties of coatings. A decade ago the emergence of the subject 'surface engineering' was greatly driven by the realization that the surface is usually the most important part of any engineering component. Structural components fail by wear, corrosion, high cycle fatigue etc., that is to say affected and initiated by the surface conditions. Consequently, an appropriate approach is to modify the surface layer of a base-material or coat it, so as to provide an enhanced performance. However, in many cases it is the combined effect of wear and corrosion that is damaging, and it is this complexity that makes the field of surface engineering so challenging. Although much progress has been made in recent years regarding laser applications, the complexity increasingly required in laser technology demands fundamental theoretical frameworks that can be tested experimentally. That is to say: not only to understand the functional behavior of the coating produced but also to test fundamental materials, scientific principles with the idea that new types of coatings with novel properties can be created. Keeping this view in mind, this book is devoted to a fundamental study of four interconnected aspects: laser processing, microstructural features, functional performance as well as the design of an appropriate theoretical and predictive framework.

作者介绍:

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