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State; 3.6 Laser Peening; 3.6.1 Process Models; 3.6.2 Changes in the Surface State; 4 Changes of Surface States due to Thermal Loading; 4.1 Process Models; 4.1.1 Elementary Processes; 4.1.2 Quantitative Description of Processes; 4.2 Experimental Results and their Descriptions; 4.2.1 Influences on Shape and Topography; 4.2.2 Influences on Residual Stress State; 4.2.3 Influences on Workhardening State; 4.2.4 Influences on Microstructure; 5 Changes of Surface Layer States due to Quasi-static Loading; 5.1 Process Models 5.1.1 Elementary Processes 5.1.2 Quantitative Description of Processes; 5.2 Experimental Results and their Descriptions; 5.2.1 Influences on Shape and Deformation Behavior; 5.2.2 Influences on Residual Stress State; 5.2.3 Influences on Workhardening State; 5.2.4 Influences on Microstructure; 6 Changes of Surface States during Cyclic Loading; 6.1 Process Models; 6.1.1 Elementary Processes; 6.1.2 Quantitative Description of Processes; 6.2 Experimental Results and their Descriptions; 6.2.1 Influences on Residual Stress State; 6.2.2 Influences on Worhardening State 6.2.3 Influences on Microstructure 6.3 Effects of Surface Layer Stability on Behavior during Cyclic Loading; 6.3.1 Basic Results; 6.3.2 Effects on Cyclic Deformation Behavior; 6.3.3 Effects on Crack Initiation Behavior; 6.3.4 Effects on Crack Propagation Behavior; 6.3.5 Effects on Fatigue Behavior; 7 Summary; Acknowledgments; Index

Sommario/riassunto

The only comprehensive, systematic comparison of major mechanical surface treatments, their effects, and the resulting material properties. The result is an up-to-date, full review of this topic, collating the knowledge hitherto spread throughout many original papers. The book begins with a description of elementary processes and mechanisms to give readers an easy introduction, before proceeding to offer systematic, detailed descriptions of the various techniques and three very important types of loading: thermal, quasistatic, and cyclic loading. It combines and correlates experimental and
