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Nota di contenuto	Chapter 1. Prolegomenon -- Chapter 2. Prediction model of grinding force under different lubrication conditions based on the principle of material fracture removal and plastic accumulation -- Chapter 3. Velocity effects and material removal mechanical behavior under different lubrication conditions -- Chapter 4. Probability density distribution of droplet size and convective heat transfer mechanism of nano bio-lubricant -- Chapter 5. Design and experimental evaluation of the measurement system for convective heat transfer coefficient of nano bio-lubricant spray Cooling -- Chapter 6. Dynamic model of temperature field in micro-grinding of biological bone cooled by nano bio-lubricant spray -- Chapter 7. Design of orthogonal experiments for grinding titanium alloys under different working conditions and analysis of signal-to-noise ratio and grey correlation -- Chapter 8. Numerical simulation and experimental validation of the temperature field of cryogenic air nano bio-lubricant MQL grinding.-Chapter 9. Experimental study of grinding ratio grinding energy and friction coefficient of cryogenic air nano bio-lubricant MQL grinding -- Chapter

10. The influence of vortex tube cold flow ratio on heat transfer mechanism of cryogenic air nano bio-lubricant MQL grinding -- Chapter 11. The influence of volume fraction of nano bio-lubricant on heat transfer mechanism of cryogenic air nano bio-lubricant MQL grinding -- Chapter 12. MQL grinding mechanism of Al2O3/SiC hybrid nano bio-lubricant and evaluation method of surface morphology -- Chapter 13. The influence of different ratios of Al2O3/SiC hybrid nano-biolubricants on the grinding performance of MQL -- Chapter 14. The influence of different physical synergies of hybrid nanoparticles on MQL grinding performance and microscopic characterization of surface morphology -- Chapter 15. Optimal design of MQL grinding jet parameters for nano bio-lubricant and evaluation of power spectral density functions for MQL.

Sommario/riassunto

This book discusses the thermodynamic mechanism of MQL grinding with nano-biological lubricant from the force, heat, surface integrity, and micro-morphology. It makes up the fatal defect of the lack of heat transfer capability of traditional MQL grinding. The machining accuracy, surface quality, especially surface integrity of the workpiece, are significantly improved; at the same time, the service life of the grinding wheel is increased and the working environment is improved. The general scope of the book’s content is the effects of MQL grinding with nano-bio-lubricant on grinding force, thermal mechanism, and surface. It provides a new method of sustainable green grinding for environment-friendly, resource-saving, and energy-efficient utilization and solves the technical bottleneck of the insufficient capacity in MQL heat transfer.