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### 7.3 The Iterative Convergence Method (ICM)

### 7.4 Material flow stress modelling for finite element

analysesReferences; Chapter 8. Applications of finite element analysis; 8.1 Simulation of BUE formation; 8.2 Simulation of unsteady chip formation; 8.3 Machinability analysis of free cutting steels; 8.4 Cutting edge design; 8.5 Summary; References; Chapter 9. Process selection, improvement and control; 9.1 Introduction; 9.2 Process models; 9.3 Optimization of machining conditions and expert system applications; 9.4 Monitoring and improvement of cutting states; 9.5 Model-based systems for simulation and control of machining processes

ReferencesAppendices; Appendix1: Metals' plasticity, and its finite element formulation; A1.1Yielding and flow under triaxial stresses: initial concepts; A1.2 The special case of perfectly plastic material in plane strain; A1.3Yielding and flow in a triaxial stress state: advanced analysis; A1.4 Constitutive equations for numerical modelling; A1.5Finite element formulations; References; Appendix2: Conduction and convection of heat in solids; A2.1 The differential equation for heat flow in a solid; A2.2 Selected problems, with no convection; A2.3 Selected problems, with convection

A2.4 Numerical (finite element) methodsReferences; Appendix3: Contact mechanics and friction; A3.1 Introduction; A3.2 The normal contact of a single asperity on an elastic foundation; A3.3 The normal contact of arrays of asperities on an elastic foundation; A3.4 Asperities with traction, on an elastic foundation; A3.5 Bulk yielding; A3.6 Friction coefficients greater than unity; References; Appendix4: Workmaterial: typical mechanical and thermal behaviours; A4.1 Work material: room temperature, low strain rate, strain hardeningbehaviours; A4.2 Work material: thermal properties

A4.3 Work material: strain hardening behaviours at high strain rates and temperatures

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### Sommario/riassunto

Metal machining is the most widespread metal-shaping process in the mechanical manufacturing industry. World-wide investment in metal machining tools increases year on year - and the wealth of nations can be judged by it. This text - the most up-to-date in the field - provides in-depth discussion of the theory and application of metal machining at an advanced level. It begins with an overview of the development of metal machining and its role in the current industrial environment and continues with a discussion of the theory and practice of machining. The underlying mechanics are analysed in detail.

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