

Thermo-energetic Design of Machine Tools

Lecture Notes in Production Engineering

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Knut Großmann
Editor

Thermo-energetic Design of Machine Tools

A Systemic Approach to Solve the
Conflict Between Power Efficiency,
Accuracy and Productivity
Demonstrated at the Example of
Machining Production

 Springer

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Abbreviations

ADS	Automation Device Specification
AMDiS	Adaptive MultiDimensional Simulations
AS	Assemblies
BC	Boundary Conditions
BPMN	Business Process Management and Notation
BT	Balanced Truncation
CFD	Computational Fluid Dynamics
CFRP	Carbon Fibre-Reinforced Plastics
CL	Cooling Lubricant
CRC/TR 96	Collaborative Research Centres/Transregio 96
CS	Coordinate System
DBS	Block-oriented Digital Simulation
DFG	German Research Foundation
DoF	Degrees of Freedom
DPA	Digital Photogrammetric Analysis
FE	Finite Elements
FEM	Finite Element Method
GMRES	Generalized Minimal Residual Method
HMI	Human–Machine Interface
HPC	High Performance Cutting
IR	Infrared Camera
IRKA	Iterative Rational Krylov Algorithm
IWM	Institute for Machine Tools and Control Technology
IWU	Fraunhofer Institute for Machine Tools and Forming Technology
LTI	Linear Time Invariant
LTV	Linear Time Varying
MOR	Model Order Reduction
MOR Sim	Model Order Reduction Simulation
MR fluids	Magnetorheological fluids
MT	Machine Tool

NC	Numerical Control
ODE	Ordinary Differential Equation
PCM	Phase-Change Materials
PDE	Partial Differential Equation
PMOR	Parametric Model Order Reduction
POD	Proper Orthogonal Decomposition
SEM	Scanning Electron Microscope
SGR	Smoothed Grid Regression
SLS	Switched Linear Systems
TCP	Tool Center Point
VDMA	Association of German Machine and Plant Engineering
WZL	Laboratory for Machine Tools and Production Engineering