Liste der Veröffentlichungen
Buchveröffentlichungen

M. Bäker
Funktionswerkstoffe – physikalische Grundlagen und Prinzipien
Springer-Vieweg Verlag, 1. Auflage, Wiesbaden, 2014, ISBN 978-3-658-02969-2

J. Rösler, H. Harders, M. Bäker
Mechanisches Verhalten der Werkstoffe
Vieweg+Teubner Verlag, 3. Auflage, Wiesbaden, 2008, ISBN 3-8351-0240-8
Englische Ausgabe:
Mechanical Behaviour of Engineering Materials
Springer Verlag, Berlin, Heidelberg, New York, ISBN 978-3-540-73446-8

M. Bäker
Finite Element Simulation of Chip Formation
Habilitationsschrift, Shaker Verlag, Aachen, 2004, ISBN 3-8322-2991-4

M. Bäker
Numerische Methoden in der Materialwissenschaft
Braunschweiger Schriften des Maschinenbaus Band 8, Braunschweig, 2002,
ISBN 3-936148-08-2
Als e-book zum download verfügbar unter `http://www.digibib.tu-bs.de/?docid=00026725`

Patent

J. Rösler, M. Bäker, C. Siemers
Verfahren zum Zerspanen eines Werkstücks aus einer Titan-Basislegierung
Patent DE 10332078, 1.9.2004
Europäisches Patent 1 644 158

Buchbeiträge

C. Siemers, M. Bäker, F. Brunke, D. Wolter, H. Sibum
Aluminum- and Vanadium-free Titanium Alloys for Application in Medical Engineering
Erscheint in: Titanium for Medical and Dental Applications: A review of all aspects of
titanium use in the medical and dental industries
Francis H. Froes and Ma Qian (eds.)

M. Bäker
Warum sind Autos nicht aus Glas, Spinnennetze nicht aus Eisen?
in: P. Sandhagen, *Warum sind Seifenblasen rund?*
Westermann Verlag, Braunschweig, 2009

M. Bäker, S. Kolling
Einige computergestützte Methoden der Materialphysik
in: S. Kolling (Hrsg.), *Beiträge zur Experimentalphysik, Didaktik und computergestützten Physik – Festschrift zum 70. Geburtstag von Professor Dr. rer. nat. Hans-Josef Patt*, Logos Verlag, Berlin, 2007

J. Rösler, M. Bäker, C. Siemers
Mechanisms of Chip Formation
in: H.-K. Tönshoff, F. Hollmann (eds.), *Hochgeschwindigkeitsspanen metallischer Werk-stoffe*, Wiley-VCH Weinheim, 2005

M. Bäker, J. Rösler, C. Siemers
Spanbildung bei der Hochgeschwindigkeitszerspanung von Titanlegierungen, in H. Tönshoff, F. Hollmann (Hrsg.), *Spanen metallischer Werkstoffe mit hohen Geschwindigkeiten*, Bonn, 2000, ISBN 3-00-06320-X

M. Bäker, G. Mack, M. Speh
Neural Multigrid for Disordered Systems— Lattice Gauge Theory as an Example
in *Handbook of Neural Computation*
IOP Publishing Ltd. and Oxford University Press, 1996

Artikel

M. Bäker, J. Rösler, T. Hentrich, G. Ackland
Influence of transition group elements on the stability of the δ- and η-phase in nickel-base alloys
Modelling and Simulation in Materials Science and Engineering, 2017, DOI: 10.1088/1361-651X/aa9759

Martin Bäker, Philipp Seiler
A Guide to Finite-Element Simulations of Thermal Barrier Coatings
Journal of Thermal Spray Technology, **26**, 2017, 1146–1160, DOI: 10.1007/s11666-017-0592-z

Torben Fiedler, Roland Groß, Joachim Rösler, Martin Bäker
Damage mechanisms of metallic HVOF-coatings for high heat flux application
Surface&Coatings Technology 316 (2017) 219–225

Martin Bäker, Torben Fiedler, Joachim Rösler
Stress evolution in thermal barrier coatings for rocket engine applications
Mechanics of Advanced Materials and Modern Processes **1**:5 (2015)

N. Rösemann, K. Ortner, J. Petersen, T. Schadow, M. Bäker, G. Bräuer, J. Rösler
Influence of bias voltage and oxygen flow rate on morphology and crystallographic properties of gas flow sputtered zirconia coatings
Surface&Coatings Technology 276 (2015) 668–676

Torben Fiedler, Martin Bäker, Joachim Rösler
Finite Element Simulation of Thermal Barrier Coatings in Rocket Engines
Simulia Community Conference 2015, Berlin

Torben Fiedler, Tatiana Fedorova, Joachim Rösler, Martin Bäker
Design of a Nickel-Based Bond-Coat Alloy for Thermal Barrier Coatings on Copper Substrates
Metals 2014 **4** 503-518; doi:10.3390/met4040503

Falkingham, Peter L., Julian Hage, and Martin Bäker
Mitigating the Goldilocks effect: the effects of different substrate models on track formation potential
Royal Society Open Science 1.3 (2014): 140225

Martin Bäker
Influence of material models on the stress state in thermal barrier coating simulations
Surface&Coatings Technology **240** (2014) 301–310

Martin Bäker
Hochleistungswerkstoffe für extreme Belastungen
Das Ingenieurmagazin Transfer, Institut für Wissenschaftliche Veröffentlichungen, 2013

Mikko Hokka, Tõnu Leemet, Aviral Shrot, Martin Bäker, Veli-Tapani Kuokkala
Dynamic Behavior and Numerical Modeling of Titanium 15-3-3-3 Alloy Dynamic Behavior of Materials, Volume 1 Conference Proceedings of the Society for Experimental Mechanics Series 2013, pp 235–242

M. Hokka, D. Gomon, A. Shrot, T. Leemet, M. Bäker, V.-T. Kuokkala
Dynamic Behavior and High Speed Machining of Ti-6246 and Alloy 625 Superalloys: Experimental and Modeling Approaches Experimental Mechanics doi 10.1007/s11340-013-9793-7

Philipp Seiler, Martin Bäker, Joachim Rösler
Multi-Scale Failure Mechanisms of Thermal Barrier Coating Systems
Computational Materials Science **80** (2013) 27–34

Martin Bäker, Aviral Shrot
Inverse Parameter Identification with Finite Element Simulations Using Knowledge-Based Descriptors
Computational Materials Science **69** (2013) 128–136

Martin Bäker
Finite element simulation of interface cracks in thermal barrier coatings
Computational Materials Science **64** (2012) 79–83

M. Hokka, T. Leemet, A. Shrot, M. Bäker, V.-T. Kuokkkala
Modelling of the Dynamic Behaviour of Hard-to-Machine Alloys
EPJ Web of Conferences, Volume 26 (2012) DYMAT 2012

M. Hokka, T. Leemet, A. Shrot, M. Bäker, V.-T. Kuokkkala
Characterization and Numerical Modeling of High Strain rate Mechanical Behavior of Ti-15-3 Alloy for Machining Simulation
Materials Science and Engineering A 550 (2012) 350–357

Martin Bäker, Joachim Rösler
Simulation of crack propagation in thermal barrier coatings with friction
Computational Materials Science **52** (2012) 236–239

P. Seiler, M. Bäker, J. Rösler
Influence of creep and cyclic oxidation in thermal barrier coatings
International Journal of Materials Research **103** (2012) 50–56

J. Schloesser, M. Bäker, J Rösler
Laser cycling and thermal cycling exposure of Thermal Barrier Coatings on Copper Substrates
Surface & Coatings Technology, 206 (2011) 1605–1608

J. Schloesser, M. Bäker, J Rösler
Thermal Barrier Coatings for Rocket Engines
Proceedings of International Thermal Spray Conference and Exposition, Hamburg, 2011

P. Seiler, M. Bäker, J. Rösler
Grenzflächenvariation und 3D-Simulation von Wärmedämmschichtsystemen
Tagungsband Deutsche Simulia-Konferenz, Bamberg (2011)

A. Shrot, M. Bäker
Determination of Johnson-Cook parameters from machining simulations
Computational Materials Science **52** (2012) 298–304

P. Seiler, M. Bäker, J. Rösler, M. Schweda, T. Beck
Thermal barrier coatings on surfaces with micro-machined roughness profiles
Proceedings International Thermal Spray Conference (ITSC 2011), Hamburg (2011)

P. Seiler, M. Bäker and J. Rösler
Variation of creep properties and interfacial roughness in thermal barrier coating systems
Proceedings of 35th International Conference on Advanced Ceramics and Composites (ICACC'11), Daytona Beach, USA (2011)

Aviral Shrot, Martin Bäker
Inverse identification of Johnson-Cook material parameters from machining simulations
Advanced Materials Research Vol. 223 (2011) 277–285

Jana Schloesser, Martin Bäker, Joachim Rösler, Robert Pulz
Oxidation Behavior of Thermal Barrier Coatings on Copper Substrates
Advances in Science and Technology Vol. 66 (2010) 74–79

P. Seiler, M. Bäker, J. Rösler
FEM Rissfortschrittssimulation mit zyklischer Oxidation in Wärmedämmschichtsystemen
Deutsche Simulia-Konferenz, Heidelberg (2010)

P. Seiler, M. Bäker, J. Rösler
FEM simulation of oxidation induced stresses in a simplified thermal barrier coating system
Proceedings in Applied Mathematics and Mechanics 10.1 (2010) 329-330

P. Seiler, M. Bäker, J. Rösler
FEM simulation of oxidation induced stresses with a coupled crack propagation in a TBC model systen
IOP Conference Series: Materials Science and Engineering, Proceedings of the World Congress on Computational Mechanics (WCCM), Sydney, 10:012056 (2010)

P. Seiler, M. Bäker, J. Rösler
FEM simulation of crack propagation and oxidation induced stresses in a TBC model systen
Proceedings of the 18th European Conference On Fracture, Dresden (2010)

Aviral Shrot, Martin Bäker
Is it possible to identify Johnson-Cook law parameters from machining simulations?
13th International ESAFORM Conference on material Forming, Italien

Jana Schloesser, Tatiana Fedorova, Martin Bäker, Joachim Rösler
Thermal Barrier Coatings on Copper Substrates for Rocket Applications
Journal of Solid Mechanics and Materials Engineering **4**, 2010, 1–6

Jana Schloesser, Nils Rösemann, Martin Bäker, Joachim Rösler
Thermal Cycling Behavior of Thermal Barrier Coatings on Copper Substrates
Proceedings of 18th European Conference on Fracture of Materials and Structures from Micro to Macro Scale, Dresden, 2010

Jana Schloesser, Joachim Rösler, Martin Bäker
Atmosphärisches Plasmaspritzen für Wärmedämmschichtsysteme auf Kupfersubstraten
in: 12. Werkstofftechnisches Kolloquium & 8. Industriefachtagung Oberfächen- und Wärmebehandlungstechnik, Chemnitz, 2009

M. Bäker
The influence of creep properties on crack propagation in thermal barrier coatings
Journal of Physics: Conference Series, Proceedings of 15th International Conference on the Strength of Materials (15th ICSMA), 240 012067, (2009)

P. Seiler, M. Bäker, T. Beck, M. Schweda, J. Rösler
FEM simulation of TBC failure in a model system
Jornal of Physics: Conference Series, Proceedings of 15th International Conference on the Strength of Materials (15th ICSMA), 240:012069 (2009)

M. Bäker, S. Laue
XFEM simulation of rafting in nickelbase-superalloys
in: International Conference on Extended Finite Element Methods – Recent Developments and Applications, XFEM 2009, T.P. Fries and A. Zilian (Eds), ©RWTH Aachen, Germany, 2009

M. Bäker
Simulation of crack propagation in thermal barrier coatings
in: Proceedings of Crack Propagation 2009, Vicenza, 2009, ISBN 978-88-95940-28-1

M. Bäker, J. Rösler, E. Affeldt
The influence of axial loading on the interface stresses of thermal barrier coatings
Computational Materials Science **47**, 2009, 466–470

K. Alam, A.V. Mitrofanov, M. Bäker, V.V. Silberschmidt
Conventional and ultrasonically assisted bone cutting: Finite element study
Proceedings of 8th World Congress on Computational Mechanics

K. Alam, A.V. Mitrofanov, M. Bäker, V.V. Silberschmidt
Stresses in ultrasonically assisted bone cutting
Proceedings of 7th International Conference on Modern Practice in Stress and Vibration Analysis 2009, Cambridge
Journal of Physics: Conference Series **181**, 2009, 012014

K. Alam, A.V. Mitrofanov, M. Bäker, V.V. Silberschmidt
Temperature Calculations in Orthogonal Cutting of Cortical Bone Using Finite Element Analysis
Proceedings of 25th Southern Biomedical Engineering Conference 2009, Miami, Florida

M. Bäker

Simulation of crack propagation in mixed mode and at bimaterial interfaces using trial cracks

Computational Materials Science **45**, 2009, 680–683

S. Gatesy, M. Bäker, J. Hutchinson

Constraint-based exclusion of limb poses for reconstructing dinosaur locomotion

Journal of Vertebrate Paleontology **29**, 2009, 535–544

M. Bäker, P. Seiler

Identifikation von Materialparametern aus Indenterversuchen

Tagungsband des Abaqus Anwendertreffens 2008, Bad Homburg

M. Bäker

Finite element crack propagation calculation using trial cracks

Computational Materials Science **43**, 2008, 179–183

M. Bäker

Crack propagation calculation using trial cracks

Proceedings in Applied Mathematics and Mechanics **7**, 2007, 4030015–4030016

M. Bäker

Spannungsentwicklung und Rissausbreitung in Wärmedämmschichten

Tagungsband des Abaqus Anwendertreffens 2007, Baden-Baden

C. Siemers, P. Jencus, M. Bäker, J. Rösler

A new free-machining Titanium alloy containing Lanthanum

Proceedings of Ti-2007, Ed. M. Niinomi et al., Volume 1, 709–712, Kyoto 2007, Japan Institute of Metals

M. Bäker

Finite Element Simulation of High-Speed Cutting Forces

Journal of Materials Processing Technology, **176**, 2006, 117–126

C. Siemers, M. Bäker, P. Jencus, J. Rösler

So verbessert Lanthan die Titan-Zerspanbarkeit

WB Werkstatt und Betrieb, Hanser Verlag, 10/2006, 64–67

M. Bäker

Rissfortschrittssimulation mit automatischer Neuvernetzung

Tagungsband des Abaqus Anwendertreffen 2006, Erfurt

T. Steinke, M. Bäker

Monte-Carlo-Modell zur Simulation plasmagespritzter Wärmedämmschichten

in: Prof. B. Wielage (Hrsg.), *Verbundwerkstoffe und Werkstoffverbunde*

Schriftenreihe Werkstoffe und werkstofftechnische Anwendungen, Band 024

9. Werkstofftechnisches Kolloquium, Chemnitz, 2006

T. Steinke, M. Bäker

Monte Carlo Simulation of Thermal Sprayed Coatings

International Thermal Spray Conference ITSC 2006, Seattle

M. Bäker

Does Chip Formation Minimize the Energy?

Computational Materials Science **33**, 2005, 407–418

M. Bäker

Finite Element Investigation of the Flow Stress Dependence of Chip Formation

Journal of Materials Processing Technology, **167**, 2005, 1–13

C. Siemers, M. Bäker, J. Rösler

The free machining Titanium Alloy Ti6Al4V0.9La

Rare Metals Materials and Engineering , **35** Supplement 1, 2006, 320–323

Proceedings of XITC-05

T. Steinke, M. Bäker

Untersuchung des Schrägaufpralls von YSZ-Pulverpartikeln beim atmosphärischen Plasmaspritzen

in: Prof. B. Wielage (Hrsg.), *Tagungsband zur 6. Industriefachtagung "Oberflächen- und Wärmebehandlungstechnik" und zum 8. Werkstofftechnischen Kolloquium*

Schriftenreihe Werkstoffe und werkstofftechnische Anwendungen, Band 022

8. Werkstofftechnisches Kolloquium, Chemnitz, 2005

M. Bäker

Some aspects of high-speed chip formation

in: 8th CIRP International Workshop on Modeling of Machining Operations, Chemnitz, May 2005

T. Steinke, M. Bäker, J.-E. Döring

Examination of the Microstructure of Thermal Barrier Coatings

International Thermal Spray Conference and Exposition 2005, Basel

J. Rösler, M. Bäker, G. Heinze

A Parametric Study of the Stress State of Thermal Barrier Coatings – Part II: Cooling Stresses

Acta Mat. **53**, 2005, 469–476

J. Rösler, M. Bäker, K. Aufzug

A Parametric Study of the Stress State of Thermal Barrier Coatings – Part I: Creep Relaxation

Acta Mat. **52**, 2004, 4809–4817

M. Bäker, T. Steinke

Struktureller Aufbau plasmagespritzer Wärmedämmschichten – Experiment und Simulation

in: Prof. B. Wielage (Hrsg.), *Neue Materialien und Verfahren in der Beschichtungstechnik*

Schriftenreihe Werkstoffe und werkstofftechnische Anwendungen, Band 018

7. Werkstofftechnisches Kolloquium, Chemnitz, 2004

M. Bäker

The influence of plastic properties on chip formation

Computational Materials Science, **28**, 2003, 556

M. Bäker, J. Rösler, C. Siemers

The Influence of Thermal Conductivity on Segmented Chip Formation

Computational Materials Science, **26**, 2003, 175

M. Bäker

An Investigation of the Chip Segmentation Process Using Finite Elements

Technische Mechanik, **23**, 2003, 1

C. Siemers, M. Bäker, D. Mukherji, J. Rösler
Microstructure Evolution in Shear Bands during the Chip Formation of Ti6Al4V
G. Lütjering, J. Albrecht (eds.), Proceedings of Ti-2003 Wiley-VCH, Weinheim, 839–846

M. Bäker, J. Rösler
How Creep Properties Influence the Stress State of Thermal Barrier Coatings
In: Proceedings of THERMEC'2003, T. Chandra, J. M. Torralba, T. Sakai (eds.), Trans Tech Publications, Uetikon-Zürich, 2003

M. Bäker
Finite element simulation of segmented chip formation
In: Proceedings of VII International Conference on Computational Plasticity, COMPLAS 2003, E. Onate, D.R.J. Owen (ed.), Barcelona

M. Bäker
On the role of energy in chip formation
Proceedings in Applied Mathematics and Mechanics, **2**, 2003, 222-223

J. Rösler, M. Bäker, C. Siemers
Titanlegierungen mit verbesserter Zerspanbarkeit
Carolo-Wilhelmina Braunschweig, Jahrgang XXXVII, 2002, 6

M. Bäker, J. Rösler, C. Siemers
Finite Element Simulation of Segmented Chip Formation of Ti6Al4V,
Journal Manuf. Sc. & Eng., **124**, 2002, 485

M. Bäker, J. Rösler, C. Siemers
A Finite Element Model of High Speed Metal Cutting with Adiabatic Shearing
Computers & Structures, **80**, 2002, 495-513

M. Bäker, J. Rösler
Finite-Element-Simulation der Spannungsverteilung in thermischen Schutzschichten
ABAQUS Anwendertreffen 2002, Wiesbaden

M. Bäker, J. Rösler
The influence of creep properties on the stress state of thermal barrier coatings
in: Proceedings of the TurbOMat 2002, Bonn

J. Rösler, M. Bäker, C. Tiziani
Dual Scale Particle Strengthened Alloys for High Temperature Applications: Creep Behavior and Fundamentals of Design
TMS spring meeting, 2002

C. Siemers, D. Mukherji, M. Bäker, J. Rösler
Deformation and Microstructure of Titanium Chips and Workpiece
Zeitschrift für Metallkunde, **92**, 2001, 853

J. Rösler, M. Bäker, M. Volgmann
Stress State and Failure Mechanisms of Thermal Barrier Coatings: Role of Creep in Thermally Grown Oxide
Acta Materialia **49**, 2001, 3659-3670

C. Siemers, M. Bäker, C. Grusewski, D. Mukherji, J. Rösler
Querschnittpräparation von Spänen aus Ti6Al4V für die Analyse im Transmissionselektronenmikroskop — Verfahren und erste Ergebnisse,
Praktische Metallographie, **38**, 2001, 591–603

J. Rösler, M. Bäker, C. Tiziani
Some Thoughts on the Design of Dual Scale Particle Strengthened Materials for High Temperature Applications
In: Creep & Fracture of Engineering Materials & Structures, J. D. Parker (ed.), ISBN 1-86125-144-0, 2001, 65

J. Rösler, M. Bäker
A Theoretical Concept for the Design of Next Generation High Temperature Materials by Dual Scale Particle Strengthening
Acta Mater. **48**, 2000, 3553-3567

M. Bäker, J. Rösler, C. Siemers
High Speed Chip Formation of Ti6Al4V
Proceedings of Materials Week 2000, München

M. Bäker, C. Siemers
Simulation der Spanbildung bei hohen Geschwindigkeiten
ABAQUS Anwendertreffen 2000, Winterthur

J. Rösler, M. Bäker, C. Tiziani
Influence of Fiber Properties on the Creep Behavior of Dual Scale Particle Strengthened Materials
Proceedings of THERMEC 2000, Las vegas, USA, T. Chandra, K. Higashi, C. Surayanarayana, C. Tome (eds.), Special issue: Journal of Materials Processing Technology, CDROM, section A7, 2001

M. Bäker, J. Rösler, C. Siemers
Chip Formation of Titanium Alloys at High Cutting Speeds,
Proceedings of the 11th International DAAAM Symposiumy, B. Katalinic (ed.)

M. Bäker, C. Siemers
Simulation der Lamellenspanbildung mit ABAQUS/Standard
ABAQUS Anwendertreffen 1999, Essen

J. Rösler, M. Bäker
Design of New High Temperature Materials by Dual Scale Particle Strengthening, International Congress on Advanced Materials and Processes EUROMAT 99, 27-30 September 1999, München, Vol. 5, Eds.: T.W. Clyne, F. Simancik, p. 215

M. Bäker, J. Rösler, C. Siemers
Development of a Finite-Element-Model for the Design of Machinable Titanium Alloys
Proceedings of the 2nd International German and French Conference on High Speed Cutting, Darmstadt, 1999

M. Bäker
Automatische Neuvernetzung mit ABAQUS/Standard — Technik und Anwendungen
ABAQUS Anwendertreffen 1998, Stuttgart

H.-W. Hoffmeister, M. Bäker, A. Gente, T. Weber
High Speed Cutting of Superalloys — Experiments and Modelling
Annals of DAAAM for 1998 & Proceedings of the 9th International DAAAM Symposium, Ed. B. Katalinic, Wien, 1998

M. Bäker
Another Look at Neural Multigrid
International Journal of Modern Physics **C 8**, 1997, 191

M. Bäker

The Principle of Indirect Elimination

International Journal of Modern Physics **C 7**, 1996, 503

M. Bäker

Localization in two-dimensional SU(2) Lattice Gauge Theory and a New Multigrid Method

International Journal of Modern Physics **C 6**, 1995, 84

M. Bäker

Localization in Lattice Gauge Theory

Nuclear Physics **B 42** (Proc. Supp.), 1995, 856

M. Bäker

ISU: Multigrid For Computing Propagators

Nuclear Physics **B 42** (Proc. Supp.), 1995, 859

M. Bäker, G. Mack, M. Speh

Multigrid Meets Neural Nets

Nuclear Physics **B 30** (Proc. Supp.), 1993, 269

M. Bäker, T. Kalkreuter, G. Mack, M. Speh

Neural Multigrid for Gauge Theories and Other Disordered Systems

International Journal of Modern Physics **C 4**, 1993, 239

M. Bäker, G. Mack, M. Speh

Multigrid Meets Neural Nets

Physics Computing 92, World Scientific, Singapore

Dissertation / Diplomarbeit

M. Bäker

A Multiscale View of Propagators in Gauge Fields

Dissertation, Universität Hamburg, preprint DESY 95-134

M. Bäker

Ein Mehrgitterverfahren für ungeordnete Systeme

Diplomarbeit, Hamburg, 1993