Curriculum Vita

Prof. Dr.-Ing. habil. Karl Ulrich Kainer
Helmholtz-Zentrum Geesthacht (formerly GKSS)
Director Institute of Materials Research
Magnesium Innovation Centre
D-21502 Geesthacht, Germany

Born: 01.07.1953 in Volmarstein/Germany
Studies at University of Applied Science Osnabrueck and University of Technology Clausthal in Materials Science – Metallic Materials

2006	Visiting Professor Chongqing University and Vice-Director of Chongqing Engineering Research Center for Magnesium Alloys, Chongqing/PR China
2000	Director of the Institute of Materials Research and Head of the Magnesium Innovation Centre, GKSS-Research Centre Geesthacht GmbH
1999	Appointment to Professor on Materials Technology, University of Technology Hamburg
1999	Head of Department “Materials Technology” at the Institute of Materials Research, GKSS
1996	Habilitation in "Materials Science" (Magnesium Matrix Composites)
1985-1999	Head of the Working-group ”Light Metals, Powder Metallurgy and Composite Materials” at the Institute for Materials Science and Technology at the University of Technology Clausthal
06/1985	PhD at the TU Clausthal (Creep of Aluminium Composite Materials)
1981	Graduated (Dipl. -Ing.) University of Technology Clausthal (TU Clausthal)
1977	Graduated (Ing. grad) University of Applied Science Osnabrueck

Research visits
Universitè de Caen, France 1983, 1986, 1991, 1998
Government Research Institute, Nagoya, Japan 1986
Luoyang Institute of Technology, China 1996
Light Metals Competence Centre Ranshofen, Austria 1999
Laval University, Quebec, Canada 2006 (Sabbatical)
CANMET Mtl, Ottawa, Canada 2006 (Sabbatical)

Awards
1986 Japanese Government Research Award for Foreign Specialists
1999 Hertha von Firnberg Fellowship, Austrian Research Center Seibersdorf
1999 Ford Research Award

Publications
170 Publications in JCR-listed journals
>350 Publications in proceedings and non JCR listed journals
360 oral presentations
90 invited oral presentations
19 pended or awarded patents
Editor and co-editor of 14 books or proceedings

Other activities
- Scientific advisor of UNIDO (SIS/POL/92/801) “High level advisory assistance for quality improvement for fibre reinforced Al-matrix composites” (1993-1994)
- Chairman of the Scientific Committee ”Metal Matrix Composites” of the DGM (1987-1999)
- Chairman of the Scientific Committee ”Magnesium” of the German Society of Materials (1999-2010)
- Member Advisory Board Light Metals Competence Centre Ranshofen/Austria (since 2003-2008)
- Co-ordinator of the Priority Programme “Innovative Magnesium Technology” of the German Research Foundation (2004-2010)
- Deputy Spokesperson of Review Board "Materials Science, Raw Materials" of the German Research Foundation (2003-2008)

- Chairman of the International Conference ”Magnesium Alloys and their Applications”, Munich, September 2000, Wolfsburg 2003, Dresden 2006, Weimar 2009,
- Member of Light Metals Group of TMS
- Member of German Society of Materials (DGM)
- Member of the International Magnesium Association: Member of the Board of Directors (since 2007), Chairman European Committee (since 2007), Vice President (since 2010)
- Member of VDG (German Foundryman Association)
- Member of VDI (The Association of German Engineers)

Scientific Activities and Competences in Materials Sciences and Applied Materials Research

- Development of creep resistant magnesium alloys
- Development and processing of magnesium wrought alloys (extrusion, sheets and forging), Formability and deformation behaviour of magnesium alloys
- Processing of thixotropic Mg-melts (Rheo-, Thixo-Casting, Thixomolding)
- Surface treatment and corrosion of Magnesium alloys
- Processing of metallic and ceramic powders, metal-/ ceramic powder mixtures
- Development and characterization of particle- and short-fibre-reinforced light metals
- Development of Metallic Biomaterials

Research Projects

- German Research Council (DFG) KA 1053/9-1-3 Coordination Priority Programme SPP 1168 InnoMagTec
- DFG KA 1053/7-1-3 Magnesium Recycling Alloy
- DFG-NSF KA 1053/10-1 Materials World Network: Developing a New Mg Alloy with Optimized Texture for Enhanced Formability
- Federal Ministry of Research and Education: OPTIMAL Optimized Mg Alloys for Sheets
- Core Programme Advance Engineering Materials: Topic Light-Weight Structural Materials

Selected Publications (last 4 Years, more details: http://www.researcherid.com/rid/D-6417-2011)

1. Gan, W.; Huang, Y.; Yang, L.; Kainer, K.U.; Jiang, M.; Brokmeier, H.-G.; Hort, N.: Identification of unexpected hydrides in Mg-20 wt% Dy alloy by high-brilliance synchrotron radiation. J. Applied Crystallography 45 (2012) 17.
2. Blawert, C.; da Conceicao, T.F.; Kainer, K.U.; Izquierdo, P.; Klose, S.G.; Hoeche, D.: Influence of Die Lubricants on Pickling and Conversion Treatment of High-pressure Die-cast AM30 Magnesium Alloy. Advanced Engineering Materials (2011) (published online)
3. Huang, Y.; Kainer, K.U.; Hort, N.: Mechanism of grain refinement of Mg–Al alloys by SiC inoculation. Scripta Materialia 64 (2011) 8, 793
4. Kaysser, W.; Esslinger, J.; Abetz, V.; Huber, N.; Kainer, K.U.; Klassen, T.; Pyczak, F.; Schreyer, A.; Staron, P.: Research with Neutron and Synchrotron Radiation on Aerospace and Automotive Materials and Components. Advanced Engineering Materials 13 (2011) 8, 637
5. Rao, K.P.; Prasad, Y.V.R.K.; Dharmendra, C.; Hort, N.; Kainer, K.U.: Compressive strength and hot deformation behavior of TX32 magnesium alloy with 0.4% Al and 0.4% Si additions. Materials Science and Engineering A 528 (2011) 22-23, 6964
6. Yang, L.; Huang, Y.; Peng, Q.; Feyerabend, F.; Kainer, K.U.; Willumeit, R.; Hort, N.: Mechanical and Corrosion Properties of Binary Mg-Dy Alloys for Medical Application, Materials Science and Engineering B 176 (2011) 20, 1827
7. Zeng, R.; Kainer, K.U.; Blawert, C.; Dietzel, W.: Corrosion of an extruded magnesium alloy ZK60 component - The role of microstructural features, Journal of Alloys and Compounds 509 (2011) 13, 4462
8. Zhou, L.; Huang, Y.; Mao, P.; Kainer, K.U.; Liu, Z.; Hort, N.: Influence of composition on hot tearing in binary Mg‐Zn alloys, International Journal of Cast Metals Research 24 (2011) 3-4, 170.
9. Blawert, C.; Fechner, D.; Hoeche, D.; Heitmann, V.; Dietzel, W.; Kainer, K.U.; Zivanovic, P.; Scharf, C.; Ditze, A.; Groebner, J.; Schmid-Fetzer, R.: Magnesium secondary alloys: Alloy design for magnesium alloys with improved tolerance limits against impurities, Corrosion Science52 (2010) 7, 2452.
10. Bohlen, J.; Yi, S.; Letzig, D.; Kainer, K.U.: Effect of rare earth elements on the microstructure and texture development in magnesium–manganese alloys during extrusion. Materials Science and Engineering A 527 (2010) 26, 709.
11. da Conceicao, T.F.; Scharnagl, N.; Blawert, C.; Dietzel, W.; Kainer, K.U.: Surface modification of magnesium alloy AZ31 by hydrofluoric acid treatment and its effect on the corrosion behaviour. Thin Solid Films 518 (2010) 5209.
12. da Conceicao, T.F.; Scharnagl, N.; Dietzel, W.; Hoeche, D.; Kainer, K.U.: Study on the interface of PVDF coatings and HF-treated AZ31 magnesium alloy: Determination of interfacial interactions and reactions with self-healing

properties, Corrosion Science 53 (2011) 2, 712.
13. da Conceicao, T.F.; Scharnagl, N.; Dietzel, W.; Kainer, K.U.: Corrosion Protection of Magnesium alloy AZ31 Sheets by Spin Coating Process with Poly(ether imide) [PEI]. Corrosion Science 52 (2010) 6, 2066.
14. da Conceicao, T.F.; Scharnagl, N.; Dietzel, W.; Kainer, K.U.: On the degradation mechanism of corrosion protective poly(ether imide) coatings on magnesium AZ31 alloy. Corrosion Science. 52 (2010) 10, 3155.
15. da Conceicao, T.F.; Scharnagl, N.; Dietzel, W.; Kainer, K.U.: Corrosion protection of magnesium AZ31 alloy using poly(ether imide) [PEI] coatings prepared by the dip coating method: Influence of solvent and substrate pre-treatment. Corrosion Science 53 (2011) 1, 338.
16. Ghasemi, A.; Scharnagl, N.; Blawert, C.; Dietzel, W.; Kainer, K.U.: Influence of electrolyte constituents on corrosion behaviour of PEO coatings on magnesium alloys . Surface Engineering 26 (2010) 5, 321-327.
17. Janecek, M.; Yi, S.; Kral, R.; Vratna, J.; Kainer, K.U.: Texture and microstructure evolution in ultrafine-grained AZ31 processed by EX-ECAP. Journal of Materials Science 45 (2010) 17, 4665.
18. Nwaogu, U.C.; Blawert, C.; Scharnagl, N.; Dietzel, W.; Kainer, K.U.: Effects of organic acid pickling on the corrosion resistance of magnesium alloy AZ31 sheet. Corrosion Science. 52 (2010) 6, 2143.
19. Peng, Q.; Huang, Y.; Meng, J.; Li, Y.; Kainer, K.U.: Strain induced GdH2 precipitate in Mg-Gd based alloys. Intermetallics 19 (2011) 3, 382.
20. Prasad, Y.V.R.K.; Rao, K.P.; Hort, N.; Kainer, K.U.: Effect of thermal and mechanical treatments on the hot working response of Mg-3Sn-1Ca alloy. In: Int. Journal of Materials Research 101 (2010) 2, 300.
21. Bohlen, J.; Dobron, P.; Hantzsche, K.; Letzig, D.; Chmelik, F.; Kainer, K.U.: Acoustic emission study of the deformation behaviour of magnesium sheets, Int. Journal of Materials Research. 100 (2009) 6, 790-795.
22. Dobron, P.; Chmelik, F.; Bohlen, J.; Hantzsche, K.; Letzig, D.; Kainer, K.U.: Acoustic emission study of the mechanical anisotropy of extruded AZ31. Int. Journal of Materials Research 100 (2009) 6, 888-891
23. Ghasemi, A.; Raja, V.S.; Blawert, C.; Dietzel, W.; Kainer, K.U.: The role of anions in the formation and corrosion resistance of the plasma electrolytic oxidation coatings. Surface & Coatings Technology. 204 (2010) 9-10, 1469.
24. Hantzsche, K.; Bohlen, J.; Wendt, J.; Kainer, K.U.; Yi, S.B.; Letzig, D.: Effect of rare earth additions on microstructure and texture development of magnesium alloy sheets. Scripta Materialia. 63 (2010) 7, 725
25. Hantzsche, K.; Wendt, J.; Kainer, K.U.; Bohlen, J.; Letzig, D.: Mg Sheet: The Effect of Process Parameters and Alloy Composition on Texture and Mechanical Properties. Journal of the Minerals, Metals and Materials Society. 61 (2009) 8, 38.
26. Hort, N.; Huang, Y.; Fechner, D.; Stoermer, M.; Blawert, C.; Witte, F.; Vogt, C.; Druecker, H.; Willumeit, R.; Kainer, K.U.; Feyerabend, F.: Magnesium alloys as implant materials – Principles of property design for Mg–RE alloys. In: Acta Biomaterialia 6 (2010) 5, 1714.
27. Mondal, A.K.; Fechner, D.; Kumar, S.; Dieringa, H.; Maier, P.; Kainer, K.U.: Interrupted creep behaviour of Mg alloys developed for powertrain applications. In: Materials Science and Engineering A 527 (2010) 9, 2289.
29. Nwaogu, U.C.; Blawert, C.; Scharnagl, N.; Dietzel, W.; Kainer, K.U.: Influence of inorganic acid pickling on the corrosion resistance of magnesium alloy AZ31 sheet. Corrosion Science. 51 (2009) 11, 2544.
30. Peng, Q.; Huang, Y.; Zhou, L.; Hort, N.; Kainer, K.U.: Preparation and properties of high purity Mg–Y biomaterials. In: Biomaterials 31 (2010) 3, 398.
31. Witte, F.; Hort, N.; Vogt, C.; Cohen, S.; Kainer, K.U.; Willumeit, R.; Feyerabend, F.: Degradable biomaterials based on magnesium corrosion. Current Opinion in Solid State and Materials Science 12 (2008) 5-6, 63.

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