

Prof. Michael Gasik

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Education:

- Dipl. Eng. (M. Sc.), special metallurgy (1983; diploma with excellence)
- Ph. D. in ferrous metallurgy (1987).
- Dr. Technol., materials manufacturing technology (1995; award for the best doctoral thesis in Finland)
- Dr. Tech. Sci., powder metallurgy and composite materials (2000).

Professional Career and Current Position:

- Dnipropetrovsk Metallurgical Institute, Ukraine, 1983-1991; research engineer, senior research scientist, assistant professor
- Manchester Materials Science Centre (University of Manchester and UMIST), UK, 1991, visiting research scientist
- Helsinki University of Technology – TKK, Espoo, Finland, 1991-2010, researcher, docent, professor
- Tohoku University, Sendai, Japan, 1998; visiting professor
- Aalto University Foundation, School of Chemical Technology, since 2010, professor (*current position*)

Expertise:

The main activities are in the areas of materials processing and new materials solutions (biomaterials, functional materials and applications, etc.) as well as their modelling and evaluation. The core competence is based on the chain “materials design – processing – structure – properties – testing – application” research and modelling. One specific focus is in multi-objective design and optimisation (MODAO) of biomaterials and phenomena and data processing.

Expert and consulting experience:

- *Member of the Management Committee:*
The International Advisory Committee on FGM, Japan; representative of Finland, 1994-; Co-chairman of European side, 2002-2006;
COST MP1005 "From Nano to Macro Biomaterials (design, processing, characterization, modelling) and applications to stem cells regenerative orthopaedic and dental medicine", representative of Finland, 2013-2015;
Japanese Society for Promotion of Science ACF, member of the board, 2013-, vice-chairman, 2015-
COST MP1301 "New generation biomimetic and customized implants for bone engineering", representative of Finland, 2015-2018
- *Reviewer:* J. Mechanical Behaviour of Biomedical Materials, J. Power Sources, J. of Physics, Int. Journal Solids and Structures, J. FGM Forum Japan, J. Materials Processing Technology, Thin Solid Films, Acta Biomaterialia, Biomaterials
- *Honorary Membership:*
Technet Alliance, 2013-
Academy of Sciences of the Highest Education, Ukraine, 2014-
European Orthopaedic Research Society (EORS), 2015-
- *Consulting:* European Commission, Research Executive Agency, Joint Undertakings, ERANET, research foundations of Cyprus, Portugal, Luxembourg, Estonia, Germany, Russia (Skolkovo), private companies in Europe and Asia.

Recent relevant grants, projects and awards:

2015-2016: company project “Validation of novel abutments efficacy for reduction of infection risk in dental implants”
2015-2016: company project “Novel scaffolds for cartilage and soft tissue repair”
2014-2016: company project “New generation scaffolds for tissue engineering and cancer cell research”
2013-2015: national project "Biomaterials Enhanced Simulation Test - BEST"
2011-2014: Finnish-Portuguese project "Functionally graded metal-ceramics dental implant materials"
2010-2012: Finnish-Japanese project "Pt- and Pd-alloyed biomedical Zr-Nb alloys"
2006-2012: EU “Multifunctional bioresorbable biocompatible coatings with biofilm inhibition and optimal implant fixation”
2001-2005: EU “Increasing the performance of total hip replacement prostheses through functionally graded materials innovation and design”

Some relevant publications:

- Henriques, B., Gasik, M., Miranda, G., Souza, J.C.M., Nascimento, R.M., Silva, F.S. Improving the functional design of dental restorations by adding a composite interlayer in the multilayer system: multi-aspect analysis. *Ciencia e Tecnologia dos Materiais* 11 (2015), 27, 36-40.
- Henriques, B., Bagheri, A., Gasik, M., Souza, J.C.M., Carvalho, O., Silva, F.S., Nascimento, R.M. Mechanical properties of hot pressed CoCrMo alloy compacts for biomedical applications. *Mater. Design*, 83 (2015), 829-834.
- Bilotsky, Y., Gasik, M. Modelling of poro-visco-elastic biological systems. *J. Phys. Conf. Series*, 633 (2015), 021234.
- Henriques, B., Miranda, G., Gasik, M., Souza, J.C.M., Nascimento, R.M., Silva, F.S. Finite element analysis of the residual thermal stresses on functionally graded dental restorations. *J. Mech. Behavior Biomed. Mater.*, 50 (2015), 123-130.
- Gasik, M., Braem A., Chaudhari, A., Duyck J., Vleugels, J. Titanium implants with modified surfaces: Meta-analysis of in vivo osteointegration. *Mater. Sci. Eng. C49* (2015), 152-158.
- Henriques, B., Gasik, M., Souza, J.C.M., Nascimento, R.M., Soares, D., Silva, F.S. Mechanical and thermal properties of hot pressed CoCrMo–porcelain composites developed for prosthetic dentistry. *J. Mech. Behaviour of Biomed. Mater.* 30 (2014), 103-110.
- Gasik, M., Keski-Honkola, A., Friman, M., Bilotsky, Y. Development and optimization of hydroxyapatite – β -TCP functionally graded biomaterial. *J. Mech. Behaviour of Biomed. Mater.* 30C (2014), 266-273.
- Gasik, M. New BEST - biomaterials enhanced simulation test. *ALTEX Proc.* 3 (2014), 1, 33-34
- Henriques, B., Miranda, G., Gasik, M., Souza, J., Soares, D., Silva, F.S. Functionally graded materials applied to dental restorative systems – a bio-inspired approach. *Proc. Conf. COBEM2013, Ribeirão Preto, Brasil* (2013).
- Henriques, B., Miranda, G., Gasik, M., Souza, J., Soares, D., Silva, F.S. Thermal and Mechanical FEM analysis of novel functionally graded dental restorations. *Proc. VII Intern. Materials Symp. MATERIAIS 2013, Coimbra, Portugal*, (2013).
- Gasik, M., Nomura, N., Kondo, R., Hanawa, T. Thermal analysis, transformations and properties of Pt- and Pd-Alloyed Zr-Nb Alloys. *Proc. 18th Plansee Seminar, Austria* (2013), 91-98.
- Henriques, B., Gasik, M., Soares, D., Silva, F.S. Experimental evaluation of the bond strength between a CoCrMo dental alloy and porcelain through a composite metal-ceramic graded transition interlayer. *J. Mech. Behavior Biomed. Mater.*, 13 (2012), 206-214.
- Isomäki, I., Hämäläinen, M., Gasik, M. Thermodynamic assessment of the ternary Ni-Ti-Cr system. *J. Alloys and Comp.*, 543 (2012), 12-18.
- Gasik, M., Van Mellaert, L., Pierron, D., Braem, A., Hofmans, D., De Waelheyns, E., Anné, J., Harmand, M.-F., Vleugels J. Reduction of biofilm infection risks and promotion of osteointegration for optimized surfaces of titanium implants. *Adv. Healthcare Mater.*, 1, No. 1 (2012), 117–127.
- Gasik, M. Simple optimization of graded biomaterial scaffolds made of calcium phosphates, *EnginSoft Newsletter*, 7 (2010), 3, 23-24.
- Gasik, M., Zhang, B. Modelling of processing of FGM bioimplants. *Mater. Sci. Forum*, 631-632 (2010), 217-222.
- Gasik, M. Metallic biomaterials for implants. *Materia*, 2 (2010), 54.
- Gasik, M. Elastic properties of lamellar Ti-Al alloys. *Comp. Mater. Sci.*, 47 (2009), 206-212.
- Gasik, M., Yu, H. Phase equilibria and thermal behaviour of biomedical Ti-Nb-Zr alloy. *Proc. 17th Plansee Seminar, Austria*, 1 (2009), 29/1-8.
- Zhang, B., Gasik, M., Facchini, A., Pressaco, M., DallaPria, P., Posocco, S. Computer-integrated safe design of FGM component for hip replacement prosthesis. *Mater. Sci. Forum*, 492-493 (2005), 483-488.