Curriculum vitae

Name	**doc. Ing. Pavel Hutař, Ph.D.**
Affiliation to IPM	**CEITEC UFM** **Member of the Council of the Institute**
Position in team	**Key member**
Role and tasks	• Coordinates part of project focused on fatigue of metallic materials • Research specialization: fatigue of materials, fatigue life, nucleation and growth of short fatigue cracks, numerical simulations, methodology of lifetime prediction

1. Education and academic qualification

- 2000, **Master Studies (ing.),** Brno University of Technology, Faculty of Mechanical Engineering, branch Applied Mechanics
- 2004, **Postgraduate Studies (Ph.D.)**, Brno University of Technology, Faculty of Mechanical Engineering, branch Engineering Mechanics
- 2011, **habilitation (doc.),** Brno University of Technology, Faculty of Mechanical Engineering, branch Applied Mechanics

2. Career overview

- 2004 - 2005, post-doc, Commissariat a l`Energie Atomique (CEA), DEN/DMN/SRMA, Gif-sur-Yvette Cedex, Francie.
- 2005-2011, External Lecturer, Faculty of Mechanical Engineering, Brno University of Technology
- 2005 - now, Research Fellow, Institute of Physics of Materials, Academy of Sciences of the Czech Republic
- 2011 – now, Head of High Cycle Fatigue Group, Institute of Physics of Materials, Academy of Sciences of the Czech Republic, v.v.i.
- 2017 – now, Member of the Council of the Institute
- 2017 – now, Member of Expert Panel, Evaluation of scientific results using Metodology 17+
- 2020 – now, Member of Expert Panel, RIS3 –Strategy

3. Research and development, experience

- Research areas: fatigue of materials and lifetime prediction, fracture mechanics, singular stress concentrators, generalised fracture mechanics, numerical simulations.
- Publications and other R&D activities:
  - more than 50 research articles in journal papers with impact factor (e.g. *Int. Journal of Fatigue, Engineering Fracture Mechanics, Polymer Testing …*)
  - more than 150 outcomes registered in RIV
- Proposer and executor of R&D projects.

4. Activities related to R&D (pedagogic activities, supervisor in PhD study)

- Teaching in Ph.D. programme at Brno University of Technology (BUT)
- Supervisor in PhD study programme at BUT, (7 PhD. students)

5. Relevance and interconnection of current research activities with goals, programmes and activities of the project, potential for successful realization of the project

- Experiences in leading research team (≈ 20 employees).
- Investigator of several project of the CSF, TACR and foreign projects (RCFS, FFG)
- Experiences from the membership in the Council of the Institute IPM ASCR.
- Experiences abroad stay (in total 1 year at the CEA France)
- Long term cooperation with Austrian competence centre PCCL.

6. Sum of citations (according to WoS) total/without self-citations

656/433

7. h-index:

15 (WoS)
17/14 (Scopus, with/without self-citations)

8. 5 most significant results

- Hutar P., Seitl S., Knesl Z., Effect of constraint on fatigue crack propagation near threshold in medium carbon steel, COMPUTATIONAL MATERIALS SCIENCE 37/1-2 (2006) 51-57;
- Hutar P., Nahlik L., Knesl Z., Quantification of the influence of vertex singularities on fatigue crack behavior, COMPUTATIONAL MATERIALS SCIENCE 45/3 (2009) 653-657;
- Hutar P., Nahlik L., Knesl Z., The effect of a free surface on fatigue crack behaviour, INTERNATIONAL JOURNAL OF FATIGUE, 32/8 (2010) 1265-1269;
- Hutar P., Sevcik M., Nahlik L., et al., A numerical methodology for lifetime estimation of HDPE pressure pipes, ENGINEERING FRACTURE MECHANICS, 78/17 (2011) 3049-3058;
- Hutar P., Poduska J., Smid M., et al., Short fatigue crack behaviour under low cycle fatigue regime, INTERNATIONAL JOURNAL OF FATIGUE 103 (2017) 207-215;

9. Publications, monographs and chapters in books (selection)

Five most recent articles in peer reviewed journals:
• Vojtek, Tomas; Pokorny, Pavel; Oplt, Tomas; et al., Classically determined effective Delta K fails to quantify crack growth rates, THEORETICAL AND APPLIED FRACTURE MECHANICS, 108 (2020);
• Vojtek, T.; Pokorny, P.; Kubena, I.; et al., Quantitative dependence of oxide-induced crack closure on air humidity for railway axle steel, INTERNATIONAL JOURNAL OF FATIGUE, 123 (2019) 213-224;
• Oplt, Tomas; Hutar, Pavel; Pokorny, Pavel; et al., Effect of the free surface on the fatigue crack front curvature at high stress asymmetry, INTERNATIONAL JOURNAL OF FATIGUE, 118 (2019) 249-261;
• Oplt, Tomas; Sebik, Marek; Berto, Filippo; et al., Strategy of plasticity induced crack closure numerical evaluation, THEORETICAL AND APPLIED FRACTURE MECHANICS, 102 (2019) 59-69;
• Poduska, Jan; Hutar, Pavel; Frank, Andreas; et al., Numerical simulations of cracked round bar test: Effect of residual stresses and crack asymmetry, ENGINEERING FRACTURE MECHANICS 203 (2018) 18-31;
Ten most cited articles in peer reviewed journals:
• Hutar P., Sevcik M., Nahlik L., et al., A numerical methodology for lifetime estimation of HDPE pressure pipes, ENGINEERING FRACTURE MECHANICS, 78/17 (2011) 3049-3058, citace=46;
• Hutar P., Nahlik L., Knesl Z., The effect of a free surface on fatigue crack behaviour, INTERNATIONAL JOURNAL OF FATIGUE, 32/8 (2010) 1265-1269, citace=37;
• Nahlik L., Sestakova L., Hutar P., et al., Prediction of crack propagation in layered ceramics with strong interfaces, ENGINEERING FRACTURE MECHANICS 77/11 (2010) 2192-2199, citace=31;
• Sevcik M., Hutar P., Zouhar M., et al., Numerical estimation of the fatigue crack front shape for a specimen with finite thickness, INTERNATIONAL JOURNAL OF FATIGUE 39 (2012) 75-80, citace=29;

• Hutar P., Seitl S., Knesl Z., Effect of constraint on fatigue crack propagation near threshold in medium carbon steel, COMPUTATIONAL MATERIALS SCIENCE 37/1-2 (2006) 51-57, citace=26;
• Hutar P., Seitl S., Knesl Z., Quantification of the effect of specimen geometry on the fatigue crack growth response by two-parameter fracture mechanics, MATERIALS SCIENCE AND ENGINEERING A 387 (2004) 491-494, citace=22;
• Hutar P., Majer Z., Nahlik L., et al., Influence of particle size on the fracture toughness of a PP-based particulate composite, MECHANICS OF COMPOSITE MATERIALS 45/3 (2009) 281-286, citace=19;
• Hutar P., Nahlik L., Knesl Z., Quantification of the influence of vertex singularities on fatigue crack behavior, COMPUTATIONAL MATERIALS SCIENCE 45/3 (2009) 653-657, citace=19;
• Nezbedova, E.; Hutar, P.; Zouhar, M.; et al., The applicability of the Pennsylvania Notch Test for a new generation of PE pipe grades, POLYMER TESTING 32/1 (2013) 106-114, citace=19;
Pokorny, P.; Vojtek, T.; Nahlik, L.; et al., Crack closure in near-threshold fatigue crack propagation in railway axle steel EA4T, ENGINEERING FRACTURE MECHANICS 185 (2017) 2-19 , citace=17;

10. Projects and grants (executor or co-executor, selection)

- Innovative approach to improve fatigue performance of automotive components aiming at CO2 emissions reduction (INNOFAT) RFCS-02-2016 -747266, European Commission, 2017 – 2021.
- Polymer Institute Competence Center (PCCL), COMET-programme. Österreichische Forschungsförderungsgesellschaft (FFG), 2020-2024.
- Research and development of advanced precision casting technology of strongly thermally affected parts of new turbochargers from nickel based superalloys CZ.01.1.02/0.0/0.0/15_019/0002421. MIT, 2017 – 2019.
- Research and development of precision casting technology for new type of aircraft engine castings and axial turbocharger wheels CZ.01.1.02/0.0/0.0/15_019/0004399. MIT, 2017 – 2019.
- Research and development of precision casting technology for radial turbochargers wheels…TA04011525, TACR, 2014 – 2017.

11. Patents, applied results and other forms of protection of intellectual property

none

12. Cooperation with industry and with other users of outcomes of R&D (selection)

- Team member in several projects with industrial partners, e.g. RFCS, MIT, TACR
- Cooperation on R&D with companies, e.g. UNIPETROL RPA, s.r.o. - POLYMER INSTITUTE BRNO, Bonatrans Group a.s., PBS Velká Bíteš a.s., Idiada s.r.o…

13. Awards and membership in international and national organizations, platforms

Awards:
- 2019 – best project in Business category of TACR - Research and development of precision casting technology for radial turbochargers wheels…TA04011525
- 2020 – project awarded as bussiness project of the year 2020 – MIT - Research and development of advanced precision casting technology of strongly thermally affected parts of new turbochargers from nickel based superalloys CZ.01.1.02/0.0/0.0/15_019/0002421.

International organizations membership:
- 2018 – memeber of International Scientific Committee, conference Fatigue 2018
- Member of ESIS

Member of organization committee:
- 2010 - Fatigue 2010, Praha
- 2016 – ICSMA 17