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Education and academic qualification

- 1997, ISŠ COP Olomoucká 61, Brno, specialization of CNC Operator
- 2002, Ing., Faculty of Mechanical Engineering, Master's programme Manufacturing Technology
- 2002, Ph.D., Faculty of Mechanical Engineering, Doctoral study programme Manufacturing Technology

Career overview

- 1.2.2002-30.6.2002, Faculty of Mechanical Engineering, Institute of Manufacturing Technology, Department of Machining Technology
- 1.12.2003-30.9.2005, Faculty of Mechanical Engineering, Institute of Manufacturing Technology, Department of Machining Technology
- od 1.10. 2005-now, Lecturer, Faculty of Mechanical Engineering, Institute of Manufacturing Technology, Department of Machining Technology
- 1.1.2010-31.12.2013, employee, EP13900004 (reg. n. CZ.1.05/2.1.00/01.0002) - NETME Centre
- 1.1.2012 editor - Technický týdeník

Scientific activities

- The main orientation of Polzer's scientific and research activities is directed to the development and application of CNC and CAD/CAM machining technologies. Great attention pays to the study and measurement of tool loading (KISTLER apparatus) during machining also, esp for milling of common surfaces with rounded milling cutters. He studies thermal fields during machining processes also, that are measured by the infrared thermo camera Flir SC2000 and assessed with software Researcher 2001.

Keywords

- NC, CNC
- CAD, CAM
- Sinumerik, Heidenhain
- PowerMill

- Productivity+

Projects

- Project FME BUT 2004 - Phase and structural analysis of monolite cutters by an electron microscopy.
- Project FME BUT 2004 - Cutting performance and complex analysis of modern end HSS mills.
- Project FME BUT 2005 - Specific variables when grinding and phase analysis of HSS when brittle cracking of tools occurs.
- Project FME BUT 2005 - Rapid prototyping of wax cores with CAD/CAM systems and CNC technologies.
- Project FME BUT 2005 - Mathematical modelling of solidification for investment castings.
- Project FME BUT 2005 - Drilling of silumin with HSS drills with duplex and triplex coatings.
- Project FME BUT 2006 - Thermal fields when drilling deep holes.
- 2005-2007 project ESF CZ.04.1.03/3.2.15.1/0075 - Advanced Innovations of the Bachelor, Masters and Doctoral Programmes of Manufacturing Technology, Manufacturing Technology and Management, Production Technology and Management.
- 2009-2012 projekt ESF CZ.1.07/2.4.00/12.0029 - OPUS - Eruditional Network for Production Technologies
- 2009-2012: Project ESF CZ.1.07/2.4.00/12.0017 - Network Supporting Co-operation among Technical and Managerial Oriented Universities and Companies in Douth Moravia Region.
- 2010: CZ.1.05/2.1.00/01.0002: NETME Centre

Supervised courses:

- Application of CAD/CAM in machining technology I (EAC-K)
- Application of CAD/CAM in machining technology I (EAC)
- Application of CAD/CAM in machining technology II (FAC-K)
- Application of CAD/CAM in machining technology II (HC2-K)
- Application of CAD/CAM in machining technology II (HC2-A)
- Application of CAD/CAM in machining technology II (HC2)
- Application of CAD/CAM in machining technology II (FAC)
- Application of CAD/CAM in Technology (HC1)
- Application of CAD/CAM in Technology (HC1-A)
- Application of CAD/CAM in Technology (HC1-K)
- CAD system I (9SC1)
- CAD system II (9SC2)
- Geometrical Modelling (MGM)

Publications:

- SLANÝ, J.; POLZER, A.; PÍŠKA, M.:
On the effective reaming of austenitic steels On the effective reaming of austenitic steels with cermet reamers and flood cooling,

Proceedings of the SPS 11, pp.228-234, (2011), The Swedish Production Academy
conference paper

*akce: SPS 11 The 4th International Swedish Production Symposium, Lund,
03.05.2011-05.05.2011*

- PÍŠKA, M.; DVOŘÁČEK, J.; SIZOVA, A.; SEDLÁK, J.; POLZER, A.; FOREJT, M.:

On the Cutting Performance of Nano-(Ti_xAl_{1-x})N PVD Coatings,

Materials Structure & Micromechanics of Fracture (MSMF-6), pp.395-398, ISBN 978-80-214-4112-5, (2011), Repropress, Srbská 53, Brno

conference paper

*akce: Materials Structure & Micromechanics of Fracture (MSMF-6), Brno,
28.06.2010-30.06.2010*

- DVOŘÁČEK, J.; POLZER, A.; ZOUHAR, J.; SEDLÁK, J.; PÍŠKA, M.:

On the Application of the PVD Hard Coatings for Ball Milling of Shaped Surfaces,

Internet Journal of Engineering and Technology, Vol.1, (2010), No.1, pp.11-18, ISSN 1338-2357

journal article

- PÍŠKA, M.; DVOŘÁČEK, J.; SIZOVA, A.; SEDLÁK, J.; POLZER, A.; FOREJT, M.:

On the Cutting Performance of Nano-(Ti,Al)N PVD Coatings,

Materials Structure & Micromechanics of Fracture (MSMF-6), pp.118-118, ISBN 978-80-214-4112-5, (2010), Repropress, Srbská 53, Brno

abstract

*akce: Materials Structure & Micromechanics of Fracture (MSMF-6), Brno,
28.06.2010-30.06.2010*

- PÍŠKA, M.; POLZER, A.; CIHLÁŘOVÁ, P.; POLZEROVÁ, D.:

On the Structural Integrity of the nano-PVD Coatings Applied On Cutting Tools,

Damage and Fracture Mechanics Failure Analysis of Engineering Materials and Structures, pp.195-204, ISBN 978-90-481-2668-2, (2009), Springer

book chapter

- PÍŠKA, M.; POLZER, A.; POLZEROVÁ, D.:

Quality and Cutting Performance of Nanocomposite Coatings,

ICCE-17, pp.389-389, ISBN none, (2009), University of New Orleans

abstract

- PÍŠKA, M.; ZOUHAR, J.; POLZER, A.:

Stress-strain analysis of end milling HSS cutters reflecting the wear process,

CIRP Annual Meeting 2009, pp.1-6, (2009), CIRP

presentation

[List of publications at Portal BUT](#)

Abstracts of most important papers:

- PÍŠKA, M.; DVOŘÁČEK, J.; SIZOVA, A.; SEDLÁK, J.; POLZER, A.; FOREJT, M.:

On the Cutting Performance of Nano-(Ti_xAl_{1-x})N PVD Coatings,

Materials Structure & Micromechanics of Fracture (MSMF-6), pp.395-398, ISBN 978-80-214-4112-5, (2011), Repropress, Srbská 53, Brno

conference paper

akce: Materials Structure & Micromechanics of Fracture (MSMF-6), Brno, 28.06.2010-30.06.2010

The hard coatings on (Ti_xAl_{1-x})N prevails with unique properties belong to the most used coatings today. These coatings are deposited by PVD technology using either arc technologies or magnetron sputtering systems. New nanocomposite coatings (Ti,Al)N nad (Ti_{0,4},Al_{0,6})N were tested in dry and wet cooling conditions and this paper deals with material anylyses of the coating, testing of the cutting performance for a grooving technology in hardened low-alloyed steel.

- **DVOŘÁČEK, J.; POLZER, A.; ZOUHAR, J.; SEDLÁK, J.; PÍŠKA, M.:**
On the Application of the PVD Hard Coatings for Ball Milling of Shaped Surfaces,
Internet Journal of Engineering and Technology, Vol.1, (2010), No.1, pp.11-18, ISSN 1338-2357

journal article

Force load analysis is a usual procedure of current cutting tool testing in not only ball end milling but in general machining. This paper is aimed to force load analysis of the cutting tool when the HSS ball end milling is performed onto an alumina alloy. A variation of the cutting tool force loading has been observed when a tilt of the tool was set perpendicularly to the direction of the feed speed vector in the range 0-20deg and cutting conditions were kept constant. In the first part of the study, some uncoated HSS ball milling tools have been used to exclude an influence of PVD coating and its disperse in quality. In the second part of the project the PVD coatings on the base of (Ti_xAl_{1-x})N and TiB₂ have been successively applied. However, the main objective of the research was to quantify other cutting phenomena also, like the chip formation, roughness of the machined surface as they present a key role in the complex surface machining for moulds.

- **PÍŠKA, M.; DVOŘÁČEK, J.; SIZOVA, A.; SEDLÁK, J.; POLZER, A.; FOREJT, M.:**

On the Cutting Performance of Nano-(Ti,Al)N PVD Coatings,
Materials Structure & Micromechanics of Fracture (MSMF-6), pp.118-118, ISBN 978-80-214-4112-5, (2010), Repropress, Srbská 53, Brno

abstract

akce: Materials Structure & Micromechanics of Fracture (MSMF-6), Brno, 28.06.2010-30.06.2010

The hard coatings on (Ti_xAl_{1-x})N prevails with unique properties belong to the most used coatings today. These coatings are deposited by PVD technology using either arc technologies or magnetron sputtering systems. New nanocomposite coatings (Ti,Al)N nad (Ti_{0,4},Al_{0,6})N were tested in dry and wet cooling conditions and this paper deals with material anylyses of the coating, testing of the cutting performance for a grooving technology in hardened low-alloyed steel.

- **PÍŠKA, M.; ZOUHAR, J.; POLZER, A.:**
Precise Shoulder Milling with an Optimised 4-axis CNC-Toolpath Generation,
Technologies in Machine Building, Vol.XXVII, (2009), No.2009, pp.165-168, ISSN 1221-4566, University of Galati

journal article

akce: NEWTECH 2009, Galati, 23.09.2009-25.09.2009

On the precise shoulder milling with an optimized 4-axis CNC machining, using advanced CNC programmng and FEA,

- **PÍŠKA, M.; POLZER, A.; CIHLÁŘOVÁ, P.; POLZEROVÁ, D.:**
On the Structural Integrity of the nano-PVD Coatings Applied On Cutting Tools,

Damage and Fracture Mechanics Failure Analysis of Engineering Materials and Structures, pp.195-204, ISBN 978-90-481-2668-2, (2009), Springer
book chapter

The book covers recent methods and approaches to Damage Control and Fracture Mechanics. Written by leading international experts in the area, this book presents new ideas in the field at the highest level and will promote technology transfer and be a key reference for researchers in industry and academia. Subjects cover the broad field of materials properties and performance, including computational approaches to engineering and modelling, materials for energy applications, nanomaterials, biomaterials/biomechanics, pipeline materials, stress corrosion cracking and hydrogen embrittlement, design and construction in joining/welds, high strength steel (X100 and higher), fracture mechanics, structural reliability, failure analysis, fatigue, environmentally assisted cracking, fracture dynamics, polymers and composites, and reinforced concrete.