

CURRICULUM VITAE - Tomáš Polcar (05-2016)

Date and place of birth: 28th August 1975, Žatec, Czech Republic

Current position

University of Southampton	Professor of Materials Science and Tribology	2017
	Head of national Centre for Advanced Tribology	from 2015
Czech Technical University	Full professor in Applied Physics	2015
	Head of Advanced Materials Group (part time)	from 2009

Education & Qualifications

Czech Technical University	PhD: Tribological Characteristics of Protective Coatings at Elevated Temperatures	2000-2005
	M.Sc. (Ing.): design of boiler and optimization of combustion	1997-2000
	B.Sc. in alternative sources of energy	1993-1997

Professional experience (employment)

Czech Technical University	Lecturer	2009-2011
University of Coimbra	Visiting professor	from 2012
University of Coimbra	Research fellow	2007-2011
University of Coimbra	Postdoc	2005-2007
Czech Technical University	Lecturer	2003-2005

Other academic achievements:

Associated professor in Applied Physics, Czech Technical University in Prague	2012
Visiting professor, University of Coimbra	2012

Main research areas

Materials and Surface Engineering, Deposition and characterization of thin films, Tribology

R&D projects

Total amount >£6m from 2007.

Principal Investigator (or lead co-I in case of multipartner bids):

	Project	Funding body	For	Award
2017-22	Centre for Advanced Photovoltaics	Ministry of Education, Youth and Sports, CR	CTU UoS	€800k £340k
2017-19	Radiation damage tolerant nanomaterials: design of interfaces with self-healing properties	Czech Science Foundation	CTU	€325k
2016-19	Nanocomposite coatings based on metal oxides	Royal Society – Newton fund	UoS	£110k
2016-20	SOLUTION - Solid lubrication for emerging engineering applications	H2020 (MC ITN) Coordinator (€3.5m)	UoS CTU	€928k €465k
2016-19	ICARUS - Innovative Coarsening-resistant Alloys with enhanced Radiation tolerance and Ultra-fine - grained Structure for aerospace application	H2020 (FET Open)	Advamat	€225k
2016-18	Increase of reliability and lifetime of linear electromechanical actuators for aerospace applications.	Ministry of Industry and Trade, Czech Republic	CTU	€100k
2016-17	Tribological characterisation of new PAEK polymer developments	Innovate UK	UoS	£37k
2015-16	Solid lubricant coatings for powertrain	US Army, USA	UoS	\$10k

2015-16	Towards Big Data-driven design of High Strain-Rate materials	DSTL, UK	UoS	£64k
2013-16	HardAlt: New generation of protective coatings alternative to hard chrome	FP7 (Research for SME Associations)	UoS	€395k
2014-16	REACH Compliant Hexavalent Chrome Replacement for Corrosion Protection	TSB/EPSC, UK	UoS	£72k
2014-16	AgriSENSact - A new generation of wireless sensors for integrated precise agriculture	FP7 (Research for SMEs)	Advamat	€70k
2012-15	Micro Materials NanoTest Vantage Testing Suite with NTX4Controller	EPSC, UK	UoS	£491k
2012-14	HOTTRIB - Low friction coatings for tribological applications at high temperature	Fundação para a Ciência e a Tecnologia, Portugal	Univ Coimbra	€80k
2011-14	RadInterfaces - Interface Design of Crystalline Materials with Improved Radiation Damage Resistance Based on Multiscale Modelling Concepts	FP7 (NMM)	CTU	€486k
2010-13	Advanced self-adaptive low friction coatings based on transition metal dichalcogenides alloyed with carbon	Czech Science Foundation	CTU	€235k
2010-13	Stability of bioactive layered structures in model human body fluids	Czech Science Foundation	CTU	€125k
2009-12	BIOTIP – Functional coatings for medical implants	Ministry of Industry and Trade, Czech Republic	CTU	€240k
2007-13	Thin films reducing friction energy loss in mechanical systems	Fundação para a Ciência e a Tecnologia, Portugal	Univ Coimbra	€120k
2007-10	CARBOLUB - Metal-alloyed C-based coatings in lubricated sliding contact	Fundação para a Ciência e a Tecnologia, Portugal	Univ Coimbra	€150k
2009	3D profilometer for surface analysis	Ministry of Education, Youth and Sports, CR	CTU	€124k
2009	Advanced surface analysis	Ministry of Education, Youth and Sports, CR	CTU	€144k
2007-09	Self-lubricating coatings based on transition metal dichalcogenides	Czech Science Foundation	CTU	€51k
2007-09	Nanocomposite coatings with improved wear resistance at elevated temperatures	Grant Agency of the Academy of Sciences of the Czech Rep	CTU	€86k
2007	Center for study thin films tribological properties	Ministry of Education, Youth and Sports, CR	CTU	€56k

Other activities

- Supervisor of 6 PDRAs and 3 PhD students; 6 PhD students defended
- Reviewer for journals (about 200 reports): Surface and Coatings Technology, Thin Solid Films, Tribology Letters, Applied Surface Science, Material Research Bulletin, Vacuum, Nanotechnology, Tribology International, Materials Chemistry and Physics, JVST, ACS Nano, ACS Applied Materials and Interfaces
- Reviewer of scientific projects for national funding agencies in the Czech Republic, USA, Israel, Hungary, UK and Romania
- Member of Institute of Physics (IoP) tribology group committee

Teaching (2014/15)

Surface Engineering, Part IV/MSc, University of Southampton
Materials, Part I, University of Southampton

Participation in scientific meetings

Participation in more than 40 international events (about 30 talks), such as conferences and congresses; 12 invited lectures; two awards

Publications

H index (Web of Science): 18 Number of citations: 900+
1st paper published: 2005

Chapters in books

Polcar, T.: Solid Lubricants, Layered-Hexagonal Transition Metal Dichalcogenides. In: Encyclopedia of Tribology, *Springer*, **2013**, ISBN 978-0-387-92896-8

Polcar, T.: Smart Surfaces for Lubrication: Solid Lubricants and Adaptive Texture. In: Coating Technology for Vehicle Applications, *Springer*, **2015**, ISBN 978-3-319-14770-3

Papers:

117. A. Cammarata, **T. Polcar**, Vibrational Contributions to Intrinsic Friction in Charged Transition Metal Dichalcogenides, *Nanoscale* (**2017**)

116. A. Cammarata, **T. Polcar**, Overcoming nanoscale friction barriers in transition metal dichalcogenides, *Physical Review B* (**2017**)

115. I. Sanzari, M. Callisti, A. De Grazia, D.J. Evans, **T. Polcar**, T. Prodromakis, Parylene C topographic micropattern as a template for patterning PDMS and Polyacrylamide hydrogel, *Scientific Reports* 7 (**2017**) 5764

114. B. Irving, P. Nicolini, **T. Polcar**, On The Lubricity of Transition Metal Dichalcogenides: an ab initio Study, *Nanoscale* 9 (**2017**) 5597

113. C. Jackson, G. Smith, D. Inwood, A. Leach, P. Whalley, M. Callisti, **T. Polcar**, A.E. Russell, P. Levecque, D. Kramer, Electronic metal-support interaction enhanced oxygen reduction activity and stability of boron carbide supported platinum, *Nature Communications* 8 (**2017**) 15802

112. J. Luxa, V. Mazánek, M. Pumera, P. Lazar, D. Sedmidubsky, M. Callisti, **T. Polcar**, Z. Sofer, 2H → 1T Phase Engineering of Layered Tantalum Disulphides in Electrocatalysis: Oxygen Reduction Reaction, *Chemistry – A European Journal* 23 (**2017**) 8082 – 8091

111. Q. Wang, F. Zhou, M. Callisti, **T. Polcar**, J. Kong, J. Yan, Study on the crack resistance of CrBN composite coatings via nano-indentation and scratch tests, *Journal of Alloys and Compounds* 708 (**2017**) 1103-1109

110. M. Danek, F. Fernandes, **T. Polcar**, A. Cavaleiro, Influence of Cr additions on the structure and oxidation resistance of multilayered TiAlCrN films, *Surface and Coatings Technology* 313 (**2017**) 158-167

109. M. Callisti, **T. Polcar**, Combined size and texture-dependent deformation and strengthening mechanisms in Zr/Nb nano-multilayers, *Acta Materialia* 124 (**2017**) 247-260

108. M.A. Monclús, M. Callisti, **T. Polcar**, L.W. Yang, J. Llorca, J.M. Molina-Aldareguía, Selective oxidation-induced strengthening of Zr/Nb nanoscale multilayers, *Acta Materialia* 122 (**2017**) 1–10

107. J. Borges, R. M. S. Pereira, M. S. Rodrigues, T. Kubart, S. Kumar, K. Leifer, A. Cavaleiro, **T. Polcar**, M. I. Vasilevskiy, and F. Vaz, Broadband Optical Absorption Caused by the Plasmonic Response of Coalesced Au Nanoparticles Embedded in a TiO₂ Matrix, *J. Phys. Chem. C* 120 (**2016**) 16931–16945

106. Q. Wang, M. Callisti, A. Miranda, B. McKay, I. Deligkiozi, T. Kosanovic Milickovic, A. Zoikis-Karathanasis, K. Hrisagis, L. Magagnin, **T. Polcar**, Evolution of structural, mechanical and tribological properties of Ni–P/MWCNT coatings as a function of annealing temperature, *Surface and Coatings Technology* 302 (**2016**) 195-201

105. E. Frutos, J.L. González-Carrasco, **T. Polcar**, Repetitive nano-impact tests as a new tool to measure fracture toughness in brittle materials, *Journal of the European Ceramic Society* 36 (**2016**) 3235-3243

104. Q. Wang, M. Callisti, J. Greer, B. McKay, T. Kosanovic-Milickovic, A. Zoikis-Karathanasis, I. Deligkiozi, **T. Polcar**, Effect of annealing temperature on microstructure, mechanical and tribological properties of nano-SiC reinforced Ni-P coatings, *Wear* 356–357 (2016) 86-93
103. M. Callisti, M. Karlik, **T. Polcar**, Bubbles formation in helium ion irradiated Cu/W multilayer nanocomposites: Effects on structure and mechanical properties, *Journal of Nuclear Materials* 473 (2016) 18-27
102. E. Frutos, J.L. González-Carrasco, **T. Polcar**, Nanomechanical characterisation of alumina coatings grown on FeCrAl alloy by thermal oxidation, *Journal of the Mechanical Behavior of Biomedical Materials* 7 (2016) 310-320
101. A. Cammarata, **T. Polcar**, Layering Effects on Low Frequency Modes in n-layered MX₂ Transition Metal Dichalcogenides, *Physical Chemistry Chemical Physics* 18 (2016) 4807 - 4813
100. P. Nicolini, **T. Polcar**, A comparison of empirical potentials for sliding simulations of MoS₂, *Computational Materials Science* 115C (2016) 158
99. M. Callisti, S. Lozano-Perez, **T. Polcar**, Structural and mechanical properties of gamma irradiated Zr/Nb multilayer nanocomposites, *Materials Letters* 163 (2016) 138-141
98. A. Cammarata, **T. Polcar**, Electro-vibrational coupling effects on intrinsic friction in transition metal dichalcogenides, *RSC Advances* 5 (2015) 106809
97. S.M. Marques, I. Carvalho, M. Henriques, **T. Polcar**, S. Carvalho, PVD-grown antibacterial Ag-TiN films on piezoelectric PVDF substrates for sensor applications, *Surface and Coatings Technology* 281 (2015) 117-124
96. F. Fernandes, A. Loureiro, **T. Polcar**, A. Cavaleiro, Effect of the substrate dilution on the room and high temperature tribological behaviour of Ni-based coatings deposited by PTA on grey cast iron, *Surface and Coatings Technology* 281 (2015) 11-19
95. G. Levita, E. Molinari, **T. Polcar**, M. C. Righi, First-principles comparative study on the interlayer adhesion and shear strength of transition-metal dichalcogenides and graphene, *Physical Review B* 92 (2015) 085434
94. J. Borges, M.S. Rodrigues, T. Kubart, S. Kumar, K. Leifer, M. Evaristo, A. Cavaleiro, M. Apreutesei, R.M.S. Pereira, M.I. Vasilevskiy, **T. Polcar**, F. Vaz, Thin films composed of gold nanoparticles dispersed in a dielectric matrix: The influence of the host matrix on the optical and mechanical responses, *Thin Solid Films* 596 (2015) 8-17
93. J. Borges, M.S. Rodrigues, C. Lopes, D. Costa, F.M. Couto, T. Kubart, B. Martins, N. Duarte, J.P. Dias, A. Cavaleiro, **T. Polcar**, F. Macedo, F. Vaz, Thin films composed of Ag nanoclusters dispersed in TiO₂: influence of composition and thermal annealing on the microstructure and physical responses, *Applied Surface Science* 358 (2015) 595-604
92. J. Borges, F. Macedo, F.M. Couto, M.S. Rodrigues, C. Lopes, P. Pedrosa, **T. Polcar**, L. Marques, F. Vaz, The influence of nitrogen and oxygen additions on the thermal characteristics of aluminium-based thin films, *Materials Chemistry and Physics* 163 (2015) 569-580
91. J. Zekonyte, **T. Polcar**, Friction force microscopy analysis of self-adaptive W-S-C coatings: nanoscale friction and wear, *ACS Applied Materials & Interfaces* 7 (2015) 21056–21064
90. A. Cammarata, **T. Polcar**, Tailoring Nanoscale Friction in MX₂ Transition Metal Dichalcogenides, *Inorganic Chemistry* 54 (2015) 5739–5744
89. F. Fernandes, J. Morgiel, **T. Polcar**, A. Cavaleiro, Oxidation and diffusion processes during annealing of TiSi(V)N films, *Surf. Coat. Technol.* 275 (2015) 120-126
88. I. Carvalho, **T. Polcar**, M. Henriques, S. Carvalho, Materials incompatibility as a major cause of hip prostheses rejection, *Rev. Adv. Mater. Sci.* 42 (2015) 36-49
87. M.-G. Mureşan, A. Charvátová Campbell, P. Ondračka, V. Buršíková, V. Peřina, **T. Polcar**, S. Reuter, M.U. Hammer, M. Valtr, L. Zajíčková, Protective Double-Layer Coatings Prepared by Plasma Enhanced Chemical Vapor Deposition on Tool Steel, *Surf. Coat. Technol.* 272 (2015) 229-238
86. J. Borges, D. Costa, E. Antunes, C. Lopes, M.S. Rodrigues, M. Apreutesei, E. Alves, N.P. Barradas, P. Pedrosa, C. Moura, L. Cunha, **T. Polcar**, F. Vaz, P. Sampaio, Biological behaviour of thin films consisting of Au nanoparticles dispersed in a TiO₂ dielectric matrix, *Vacuum* 122 (2015) 360-368
85. M. Callisti, **T. Polcar**, Microstructural evolution of nanometric Ti(NiCu)₂ precipitates in annealed Ni-Ti-Cu thin films, *Vacuum* 117 (2015) 1-3

84. M. Callisti, M. Danek, K. Yasuda, M. Evaristo, F.D. Tichelaar, A. Cavaleiro, **T. Polcar**, Ni-Ti(-Cu) shape memory alloy interlayers supporting low friction functional coatings, *Tribology International* 88 (2015) 135-142
83. E. Frutos, M. Callisti, M. Karlik, **T. Polcar**, Length-scale-dependent mechanical behaviour of Zr/Nb multilayers as a function of individual layer thickness, *Materials Science and Engineering: A* 632 (2015) 137-146
82. A. Escudeiro, M.A. Wimmer, **T. Polcar**, A. Cavaleiro, Tribological behavior of uncoated and DLC-coated CoCr and Ti-alloys in contact with UHMWPE and PEEK counterbodies, *Tribology International* 89 (2015) 97-104
81. P. Mutafov, M. Evaristo, A. Cavaleiro, **T. Polcar**, Structure, mechanical and tribological properties of self-lubricant W-S-N coatings, *Surf. Coat. Technol.* 261 (2015) 7-14
80. C. Lopes, C. Gonçalves, J. Borges, **T. Polcar**, M.P.M. Rodrigues; N.P. Barradas, E. Alves, E. Le Bourhis, F. Macedo, C. Fonseca, F. Vaz, Evolution of the functional properties of silver-titanium thin films for biomedical applications: influence of in-vacuum annealing, *Surf. Coat. Technol.*, 261 (2015) 262-271
79. M. Callisti, **T. Polcar**, Martensitic transformation in Ni-Ti(-Cu) interlayers supporting low-friction functional layers, *Applied Surface Science* 325 (2015) 192-202
78. A. Escudeiro, N.M. Figueiredo, **T. Polcar**, A. Cavaleiro, Structural and mechanical properties of nanocrystalline Zr co-sputtered a-C(:H) amorphous films, *Applied Surface Science* 325 (2015) 64-72
77. F. Fernandes, **T. Polcar**, A. Cavaleiro, Tribological properties of self-lubricating TiSiVN coatings at room temperature, *Surf. Coat. Technol.* 267 (2015) 8-14
76. F. Gustavsson, M. Bugnet, **T. Polcar**, A. Cavaleiro, S. Jacobson, Effect of choice of doping element on the sliding mechanisms of sputtered WS₂ coatings – a high resolution TEM/EELS study, *Tribological Transactions* 58 (2015) 113-118
75. W.Z. Li, Q.Z. Chen, **T. Polcar**, R. Serra, A. Cavaleiro, Influence of Zr alloying on the mechanical properties, thermal stability and oxidation resistance of Cr-Al-N coatings, *Applied Surface Science* 317 (2014) 269-277
74. A. Escudeiro, **T. Polcar**, A. Cavaleiro, Adsorption of bovine serum albumin on Zr co-sputtered a-C(:H) films: implication on wear behaviour, *Journal of the Mechanical Behavior of Biomedical Materials* 39 (2014) 316-327
73. T. Vitu, A. Escudeiro, **T. Polcar**, A. Cavaleiro, Sliding Properties of Zr-DLC Coatings: The Effect of Tribolayer Formation, *Surf. Coat. Technol.*, 258 (2014) 734-745
72. **T. Polcar**, A. Cavaleiro, High temperature behavior of nanolayered CrAlTiN coating: thermal stability, oxidation, and tribological properties, *Surf. Coat. Technol.* 257 (2014) 70-77
71. P. Mutafov, J. Lanigan, A. Neville, A. Cavaleiro, **T. Polcar**, DLC-W coatings tested in combustion engine - frictional and wear analysis, *Surf. Coat. Technol.* 260 (2014) 284-289
70. M.A. Monclús, M. Karlik, M. Callisti, E. Frutos, J. LLorca, **T. Polcar**, J.M. Molina-Aldareguía, Microstructure and mechanical properties of physical vapor deposited Cu/W nanoscale multilayers: Influence of layer thickness and temperature, *Thin Solid Films* 571 (2014) 275-282
69. G. Levita, A. Cavaleiro, E. Molinari, **T. Polcar**, M.C. Righi, Sliding Properties of MoS₂ Layers: Load and Interlayer Orientation Effects, *Journal of Physical Chemistry C* 118 (2014) 13809-13816
68. M. Evaristo, **T. Polcar**, A. Cavaleiro, Tribological behaviour of W-alloyed carbon-based coatings in dry and lubricated sliding contact, *Lubrication Science* 26 (2014) 428-439
67. R. Novak, **T. Polcar**, Tribological analysis of thin films by pin-on-disc: evaluation of friction and wear measurement uncertainty, *Tribology International* 74 (2014) 154-163
66. J. Zekonyte, A. Cavaleiro, **T. Polcar**, Frictional properties of self-adaptive chromium doped tungsten-sulfur-carbon coatings at nanoscale, *Applied Surface Science* 303 (2014) 381-3872
65. M. Callisti, B.G. Mellor, **T. Polcar**, Microstructural investigation on the grain refinement occurring in Cu-doped Ni-Ti thin films, *Scripta Materialia* 77 (2014) 52-55
64. F. Fernandes, A. Loureiro, **T. Polcar**, A. Cavaleiro, The effect of increasing V content on the structure, mechanical properties and oxidation resistance of Ti-Si-V-N films deposited by DC reactive magnetron sputtering, *Applied Surface Science* 289 (2014) 114-123

63. J.V. Pimentel, M. Daneš, **T. Polcar**, A. Cavaleiro, Effect of rough surface patterning on the tribology of W–S–C–Cr self-lubricant coatings, *Trib. Int.* 69 (2014) 77–83
62. M. Callisti, **T. Polcar**, The role of Ni-Ti-(Cu) interlayers on the mechanical properties and nano-scratch behaviour of solid lubricant W-S-C coatings, *Surf. Coat. Technol.* 254 (2014) 260–269
61. W.Z. Li, H.W. Liu, M. Evaristo, **T. Polcar**, A. Cavaleiro, Influence of Al content on the mechanical properties and thermal stability in protective and oxidation atmospheres of Zr–Cr–Al–N coatings, *Surf. Coat. Technol.* 236 (2013) 239–245
60. M.A. Monclús, S. J. Zheng, J. R. Mayeur, I.J. Beyerlein, N. A. Mara, **T. Polcar**, J. Llorca, J. M. Molina-Aldareguía, Optimum high temperature strength of two-dimensional nanocomposites, *APL Materials* 1 (2013) 052103
59. J. Chalupský, T. Burian, V. Hájková, L. Juha, **T. Polcar**, J. Gaudin, M. Nagasono, R. Sobierajski, M. Yabashi, J. Krzywinski, Fluence scan: an unexplored property of a laser beam, *Opt. Express* 21 (2013) 26363–26375
58. **T. Polcar**, A. Cavaleiro, Towards frictionless surface, *Materials World* 21 (2013) 24–26
57. A. Lazauskas, J. Baltrusaitis, V. Grigaliūnas, A. Baltušnikas, B. Abakevičienė, **T. Polcar**, Tribological properties of the two-step thermally deposited chromium films, *Appl. Surf. Sci.* 283 (2013) 1089–1095
56. F. Gustavsson, S. Jacobson, A. Cavaleiro, **T. Polcar**, Ultra-low friction WSN solid lubricant coatings, *Surf. Coat. Technol.*, 232 (2013) 541–548
55. N.K. Manninen, F. Ribeiro, A. Escudeiro, **T. Polcar**, S. Carvalho, A. Cavaleiro, Influence of Ag Content on Mechanical and Tribological behavior of DLC Coatings, *Surf. Coat. Technol.* 232 (2013) 440–446
54. W.Z. Li, **T. Polcar**, M. Evaristo, A. Cavaleiro, High temperature properties of the Cr-Nb-Al-N coatings with increasing Al contents, *Surf. Coat. Technol.* 228 (2013) 187–194
53. F. Gustavsson, S. Jacobson, A. Cavaleiro, **T. Polcar**, Frictional behavior of self-adaptive nanostructural Mo–Se–C coatings in different sliding conditions, *Wear* 303 (2013) 286–296
52. C.T. Wang, A. Escudeiro, **T. Polcar**, A. Cavaleiro, R.J.K. Wood, N. Gao, T.G. Langdon, Indentation and Scratch Testing of DLC-Zr coatings on Ultrafine-Grained Titanium Processed by High-Pressure Torsion, *Wear* 306 (2013) 304–310
51. A. Escudeiro, **T. Polcar**, A. Cavaleiro, a-C(:H) and a-C(:H)₂-Zr coatings deposited on biomedical Ti-based substrates: tribological properties, *Thin Solid Films* 538 (2013) 89–96
50. M. Callisti, B.G. Mellor, **T. Polcar**, Effects of Cu on the microstructural and mechanical properties of sputter deposited Ni-Ti thin films, *Surf. Coat. Technol.* 237 (2013) 261–268
49. **T. Polcar**, F. Gustavsson, T. Thersleff, S. Jacobson, A. Cavaleiro, Complex frictional analysis of self-lubricant W-S-C/Cr coating, *Faraday Discuss* 156 (2012) 383–401
48. F. Feng, Y. Zhou, H. Yun, A. Rocha, **T. Polcar**, L. Cvrcek and H. Liang, Potential Application of a Ti–C:H Coating in Implants, *Journal of the American Ceramic Society* 95 (2012) 2741–2745
47. J.V. Pimentel, **T. Polcar**, M. Evaristo, A. Cavaleiro, Examination of the tribolayer formation of a self-lubricant W-S-C sputtered coating, *Tribology International* 47 (2012) 188–193
46. A. Escudeiro, **T. Polcar**, A. Cavaleiro, Tribological behaviour a-C and a-C:H films doped with Ti in biological solutions, *Vacuum* 85 (2011) 1144–1148
45. **T. Polcar**, A. Cavaleiro, Review on self-lubricant transition metal dichalcogenide nanocomposite coatings alloyed with carbon, *Surface and Coatings Technology* 206 (2011) 686–695
44. **T. Polcar**, A. Cavaleiro, Structure and tribological properties of AlCrTiN coatings at elevated temperature, *Surface and Coatings Technology* 205 (2011) S107–S110
43. **T. Polcar**, A. Cavaleiro, High temperature properties of CrAlN, CrAlSiN and AlCrSiN coatings - structure and oxidation, *Material Chemistry and Physics* 129 (2011) 195–201
42. R.M. Balestra, A.M.G. Castro, M. Evaristo, A. Escudeiro, Petr Mutafov, **T. Polcar**, A. Cavaleiro, Carbon-based coatings doped by copper: Tribological and mechanical behavior in olive oil lubrication, *Surface and Coatings Technology* 205 (2011) S79–S83

41. **T. Polcar**, D. Bharathi Mohan, C. Silviu Sandu, G. Radnoczi, A. Cavaleiro, Properties of nanocomposite film combining hard TiN matrix with embedded fullerene-like WS₂ nanoclusters, *Thin Solid Films* 519 (2011) 3191-3195
40. **T. Polcar**, A. Cavaleiro, Self-adaptive low friction coatings based on transition metal dichalcogenides, *Thin Solid Films* 519 (2011) 4037-4044
39. J.V. Pimentel, **T. Polcar**, A. Cavaleiro, Structural, mechanical and tribological properties of Mo-S-C solid lubricant coating, *Surface & Coatings Technology* 205 (2011) 3274-3279
38. **T. Polcar**, A. Cavaleiro, High-temperature tribological properties of CrAlN, CrAlSiN and AlCrSiN coatings, *Surf. Coat. Technol.* 206 (2011) 1244-1251
37. **T. Polcar**, A. Cavaleiro, Sliding mechanisms in tribological contact of TMD-C sputtered coatings, *TRIBOLOGY AND DESIGN*, 2010, 195-206
36. **T. Polcar**, T. Vitu, L. Cvrcek, J. Vyskocil, A. Cavaleiro, Effects of carbon content on the high temperature friction and wear of chromium carbonitride coatings, *Tribology International* 43 (2010) 1228-1233
35. **T. Polcar**, A. Cavaleiro, Structure, mechanical properties and tribology of W-N and W-O coatings, *International Journal of Refractory Metals and Hard Materials* 28 (2010) 15-22
34. **T. Polcar**, T. Vitu, J. Sondor, A. Cavaleiro, Tribological Performance of CrAlSiN Coatings at High Temperatures, *Plasma Processes & Polymers*, 6, 2009, S935
33. M. Evaristo, **T. Polcar**, A. Cavaleiro, Can W-Se-C coatings be competitive to W-S-C ones?, *Plasma Processes & Polymer*, 6, 2009, S92
32. **T. Polcar**, R. Martinez, T. Vítů, L. Kopecký, R. Rodriguez, A. Cavaleiro, High temperature tribology of CrN and multilayered Cr/CrN coatings, *Surf. Coat. Technol.* 203 (2009) 3254
31. **T. Polcar**, M. Evaristo and A. Cavaleiro, Self-lubricating W-S-C nanocomposite coatings, *Plasma Processes & Polymers*, 2009, 6, 417-424
30. **T. Polcar**, T. Vitu, L. Cvrcek, R. Novak, J. Vyskocil, A. Cavaleiro, Tribological behaviour of nanostructured Ti-C:H coatings for biomedical applications, *Solid State Sciences* 11 (2009) 1757-1761
29. **T. Polcar**, M. Evaristo, M. Stueber, A. Cavaleiro, Mechanical and tribological properties of sputtered Mo-Se-C coatings, *Wear* 266 (2009) 393-397
28. **T. Polcar**, M. Evaristo, A. Cavaleiro, Comparative study of the tribological behaviour of self-lubricating W-S-C and Mo-Se-C sputtered coatings, *Wear* 266 (2009) 388-392
27. M. Evaristo, **T. Polcar**, A. Cavaleiro, Synthesis and properties of W-Se-C coatings deposited by PVD in reactive and non-reactive processes, *Vacuum* 83 (2009) 1262
26. **T. Polcar**, T. Kubart, E. Malainho, M. Vasilevskiy, N.M.G. Parreira, A. Cavaleiro, Nanoscale colour control: W-O graded coatings deposited by magnetron sputtering, *Nanotechnology* 19 (2008) 395202
25. N.M.G. Parreira, Y.T. Pei, D. Galvan, **T. Polcar**, J.Th.M. De Hosson, A. Cavaleiro, TEM Characterization of W-O-N Coatings, *Microscopy and Microanalysis* 14 supp 3 (2008) 27-30
24. N.M.G. Parreira, **T. Polcar**, N.J.M. Carvalho and A. Cavaleiro, A simple model for the deposition of W-O coatings by reactive gas pulsing process, *EJP Appl Phys* 43 (2008) 321-325
23. **T. Polcar**, M. Evaristo, R. Colaço, C. Silviu Sandu, A. Cavaleiro, Nanoscale triboactivity: Response of Mo-Se-C coatings to sliding, *Acta Mater* 56 (2008) 5101-5111
22. A.M. Neves, V. Severo, L. Cvrcek, **T. Polcar**, C. Louro, A. Cavaleiro, In situ structural evolution of arc-deposited Cr-based coatings, *Surf. Coat. Technol.* 202 (2008) 5550-5555
21. T. Vitu, **T. Polcar**, L. Cvrcek, R. Novak, J. Macak, J. Vyskocil, A. Cavaleiro, Structure and Tribology of Biocompatible Ti-C:H Coatings, *Surf. Coat. Technol.* 202 (2008) 5790-5793
20. C. Silviu Sandu, **T. Polcar**, A. Cavaleiro, TEM investigation of MoSeC films, *Microscopy and Microanalysis* 14 supp 3 (2008) 7-10
19. **T. Polcar**, M. Evaristo, M. Stueber, A. Cavaleiro, Synthesis and structural properties of Mo-Se-C sputtered coatings, *Surface and Coatings Technology* 202 (2008) 2418-2422

18. **T. Polcar**, N.M.G. Parreira and A. Cavaleiro, Structural and tribological characterization of tungsten nitride coatings at elevated temperature, *Wear* 265 (2008) 319-326
17. M. Evaristo, **T. Polcar**, A. Cavaleiro, Tribological behavior of C-alloyed transition metal dichalcogenides (TMD) coatings in different atmospheres, *International Journal of Mechanics and Materials in Design* 4 (2008) 137-143
16. L. Ipaz, L. Yate, **T. Polcar**, E. Camps, L. Escobar-Alarcon, G. Zambrano, P. Prieto, Mechanical and tribological characterization of CN_x films deposited by d.c. magnetron sputtering, *physica status solidi (c)*, 2007, 4, 4267-4274
15. **T. Polcar**, M. Evaristo, A. Cavaleiro, The tribological behaviour of W-S-C films in pin-on-discs testing at elevated temperature, *Vacuum*, 81 (2007) 1439-1442
14. **T. Polcar**, M. Evaristo and A. Cavaleiro, Friction of self-lubricating W-S-C sputtered coatings sliding under increasing load, *Plasma Processes & Polymers*, 2007, 4, S541-S546
13. T. Kubart, **T. Polcar**, O. Kappertz, N. Parreira, T. Nyberg, S. Berg, A. Cavaleiro, Modelling of magnetron sputtering of tungsten oxide with reactive gas pulsing, *Plasma Processes & Polymers*, 2007, 4, S522-S526
12. N.M.G. Parreira, **T. Polcar**, A. Cavaleiro, Thermal stability of reactive sputtered tungsten oxide coatings, *Surface and Coatings Technology* 201 (2007) 7076-7082
11. **T. Polcar**, A. Nossa, M. Evaristo and A. Cavaleiro, Nanocomposite coatings of C-based and TMD phases: a review, *Reviews on Advanced Materials Science*, 15 (2007) 118-126
10. N. Parreira, **T. Polcar**, N. Martin, O. Banakh, A. Cavaleiro, Optical and electrical properties of W-O-N coatings deposited by DC reactive sputtering, *Plasma Processes & Polymers*, 2007, 4, S69-S75
9. **T. Polcar**, N.M.G. Parreira and A. Cavaleiro, Tungsten oxide with different oxygen content: sliding properties, *Vacuum* 81 (2007) 1426-1429
8. N.M.G. Parreira, **T. Polcar**, A. Cavaleiro, Study of the cathode potential in a sputtering discharge by pulsing the reactive gas: case of W target (in Ar-O₂ atmosphere), *Plasma Processes & Polymers*, 2007, 4, 62-68
7. **T. Polcar**, N.M.G. Parreira and A. Cavaleiro, Tribological characterization of tungsten nitride coatings deposited by reactive magnetron sputtering, *Wear* 262 (2007) 655-665
6. **T. Polcar**, N.M.G. Parreira and R. Novák, Friction and wear behaviour of CrN coating at temperatures up to 500 °C, *Surface and Coatings Technology* 201 (2007) 5228-5235
5. N.M.G. Parreira, **T. Polcar** and A. Cavaleiro, Characterization of W-O coatings deposited by magnetron sputtering with reactive gas pulsing, *Surface and Coatings Technology* 201 (2007) 5481-5486
4. **T. Polcar**, R. Novák and P. Šíroký, The tribological characteristics of TiCN coating at elevated temperatures, *Wear* 260 (2006) 40-49
3. **T. Polcar**, L. Cvrček, P. Šíroký and R. Novák, Tribological characteristics of CrCN coatings at elevated temperature, *Vacuum* 80 (2005) 113-116
2. **T. Polcar**, T. Kubart, R. Novák, L. Kopecký and P. Šíroký, Comparison of tribological behaviour of TiN, TiCN and CrN at elevated temperatures *Surface and Coatings Technology* 193 (2005) 192-199
1. T. Kubart, **T. Polcar**, L. Kopecký, R. Novák and D. Nováková, Temperature dependence of tribological properties of MoS₂ and MoSe₂ coatings, *Surface and Coatings Technology* 193 (2005), Pages 230-233