Curriculum Vitae of Prof. Daniele Ugues

Prof. Daniele Ugues (MSC Materials Eng., PhD in Metallurgical Eng.), born on 19th of October 1973, is currently Associate Professor in Metallurgy at Politecnico di Torino, Dept. of Applied Science and Technologies. Since October 2015 he is Responsible for the Teaching Activities within the Bachelor and Master of Science Courses of Materials Engineering at Politecnico di Torino. His teaching activities at Politecnico di Torino started in 2004. He currently **teaches** lessons for the "Metallurgy Plants" and "Surface Engineering" courses dedicated to Materials Science Engineers. In the Academic Period 2008/2009 he was Invited Professor for a six months period at University of Applied Sciences and Arts of Southern Switzerland. There within the framework of the Master of Science in Precision Manufacturing Engineering he gave lessons for the courses "Material for cutting tools in Precision Machining (PM)" and "Material for manufacturing in Precision Machining (PM)". Since 2015 he also gives lessons for a PhD course named "Wear of Materials".

The **research field** of Daniele Ugues lies within the sectors of the manufacturing and heat treating of complex metallic components and of the surface engineering.

As for the manufacturing of complex components the analysis of microstructural and mechanical properties provided to metallic components by the synergic effects of chemical composition, forming actions and thermal loads due to the manufacturing routes is the major aspect addressed. To this purpose it is worthwhile to note that Daniele Ugues is currently involved in two European Projects dealing with such topics. In particular he is currently vice-coordinator of the CLEANSKY JTI-CS-2013-3-SAGE-02-039 project titled "HiGh spEed TuRbinE cAsing produced by powDer HIP technology – GETREADY", where the concept of Near Net Shape Hipping is applied to the fabrication of a big dimension Ni superalloy casing for aeronautic engine. Furthermore, he is currently involved as researcher in the framework of the New Energy World JU Fp7 project titled "Integrated High-Temperature Electrolysis and Methanation for Effective Power to Gas Conversion – HELMETH". Within this project the main role of Daniele Ugues is to apply the Direct Metal Laser Sintering technology to the fabrication of two heat exchangers for high temperature harsh environment applications. In recent years he was also Scientific Responsible for Politecnico di Torino for the MANUNET project titled "Contribution of metallurgical and mechanical characteristics for the high load capacity gears manufacture improvement – PROENG -", where his main role was to apply numerical simulation to foresee the effects of industrial heat treatment on heavy duty steel gears. Besides the activities performed within these funded projects Daniele Ugues was/is Scientific Responsible for a large set of industrial research projects on similar topics with large and small-medium enterprises, such as Avio Aero, ITLA, Rotork etc.

As for the surface engineering sector the main aspects addressed are wear and corrosion mechanisms acting on metallic materials, surface modifications of metallic materials so as to counteract against wear and corrosion: Within this sector Daniele Ugues was involved in several project dealing with surface protection of dies and forming tools for metallic materials exposed to harsh service conditions. To this purpose it is worthwhile to mention that he was recently local scientific responsible and researcher respectively for the two Fp7 projects titled: "Multiscale Modelling for Multilayered Surface Systems - M3-2S -" and "Development of wear resistant coatings based on complex metallic alloys for functional applications – AppliCMA –". Furthermore he was local scientific responsible for two MANUNET projects titled "Optimal design of nanocomposite coatings for die casting tools and dies – OPTIDIES –" and "LASTECO". These projects were dealing with the deposition of highly wear resistant physical vapour deposition (PVD) coatings and with the modification of PVD coatings through laser machining techniques. Finally he joined as local scientific responsible to many Piedmont region funded projects dealing with surface protection of gears (Green Engine for Air Traffic 2020 fase 2 project), of fuel cells bipolar plates (GBMP project) and of hard metal tools for tunnelling boring machines (HM-Tunes project).vAlso in this field of applications Daniele Ugues cooperated with many different industries such as Fonderie Doglione, AVIO Aero, etc.

Further to the very frequent participation to European Projects the **scientific approach** of his work was progressively enriched by the publication of ca. 60 scientific papers and by many Conference oral presentations.

The **most relevant scientific papers** published are:

1) Bassini, E.; Vola, V.; Lorusso, M.; Ghisleni, R.; Lombardi, M.; Biamino, S.; Ugues, D.; Vallillo, G.; Picqué, B. (2017) Net shape HIPping of Ni-superalloy: Study of the interface between the capsule and the alloy. In: Materials science and engineering a-structural materials properties microstructure and processing, vol. 695, pp. 55-65. - ISSN 0921-5093.
2) Baudana, Giorgio; Biamino, Sara; Klöden, Burghardt; Kirchner, Alexander; Weißgärber, Thomas; Kieback, Bernd; Pavese, Matteo; Ugues, Daniele; Fino, Paolo; Badini, Claudio (2016) Electron Beam Melting of Ti-48Al-2Nb-0.7Cr-0.3Si: Feasibility investigation. In: INTERMETALLICS, vol. 73, pp. 43-49. - ISSN 0966-9795
3) Calandri, M.; Ugues, D.; Lorusso, M.; Demir, A.G.; Lecis, N.F.; Previtali, B. (2016) Laser surface texturing of PVD coatings applied to sheet forming dies for stainless steel. In: LA METALLURGIA ITALIANA, vol. 108 n. 3, pp. 27-35. - ISSN 0026-0843
4) Battiato, A.; Lorusso, M.; Bernardi, E.; Picollo, F.; Bosia, F.; Ugues, D.; Zelferino, A.; Damin, A.; Baima, J.; Pugno, N.M.; Ambrosio, E.P.; Olivero, P. (2016) Softening the ultra-stiff: Controlled variation of Young's modulus in single-crystal diamond by ion implantation. In: ACTA MATERIALIA, vol. Volume 116, pp. 95-103. - ISSN 1359-6454.
5) M. Lorusso, D. Ugues, C. Oliva, R. Ghisleni, Failure modes of PVD coatings in molten Al-alloy contact, Acta Metallurgica Slovaca, 2013, 19 (1) , pp. 30-42.
6) M. Terner, S.Biamino, D. Ugues, S. Sabbadini, P. Fino, M. Pavese, C. Badini, Phase transitions assessment on γ-TiAl by Thermo Mechanical Analysis, In: Intermetallics, 2013, 37, pp. 7-10.
7) A. G. Demir, N. Lecis, B. Previtali, D. Ugues, Scratch resistance of fibre laser surface textured TiN coatings, Surface Engineering (ISSN: 02670844) Available online since 24 January 2013, DOI: 10.1179/1743294412Y.0000000097.
8) Vandoni L., Demir A.G., Previtali B., Lecis N., Ugues D. Wear Behavior of Fiber Laser Textured TiN Coatings in a Heavy Loaded Sliding Regime. In: MATERIALS, 2012, vol. 5 n. 11, pp. 2360-2382. - ISSN 1996-1944
9) Peter I., Zago A., Actis Grande M., Ugues D., Thermo-mechanical and oxidation behaviour of high temperature advanced metallic alloys, Surface & Coatings Technology, 2009, pp. 9, 2009, Vol. 203, Issue 13, pagine da 1776 a 1784, ISSN: 0257-8972.
10) Torres Miranda E., Brytan Z., Ugues D., Perucca M., Development of multilayer coatings for forming dies and tools of aluminium alloy from liquid state, Journal of Physics D – Applied Physics, 2009, Vol. 42, pp. 1-8, ISSN: 0022-3727, DOI: 10.1088/0022-3727/42/10/105306
11) Pavese M.; Fino P.; Ugues D.; Badini C., High cycle fatigue study of metal-ceramic co-continuous composite, Scripta Materialia, pp. 1135-1138, 2006, Vol. 56, ISSN: 1359-6462
12) Firrao D.; Ugues D., Fracture of nitrided and nitrocarburized blunt notch three-point bending die steel specimens, Materials Science and Engineering A, pp. 309-316, 2005, Vol. 409, ISSN: 0921-5093
13) Ugues D.; Specchia S.; Saracco G., Optimal Microstructural Design of a Catalytic Premixed FeCrAlloy Fibre Burner for Methane Combustion, Industrial & Engineering Chemistry Research, pp. 1990-1998, 2004, ISSN: 0888-5885
14) Rosso M.; Scrivani A.; Ugues D.; Bertini S., Corrosion resistance and Properties of Pump Pistons Coated with Hard Materials, International Journal of Refractory Metals & Hard Materials, pp. 45-52, 2001, Vol. 19, ISSN: 0958-0611

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