

Ahmad Reza Rastkar

Current Location: Laser and Plasma Institute, Mechanical Engineering Department, Shahid Beheshti University Tehran, 19839, Evin, Iran

Current positions:

Associate Professor and Principal Consultant in Design, Material Selection, Manufacturing, Inspection and Maintenance of Oil and Gas, Automotive, Power Plant and Aviation Industries.

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Education

1995-2000	The University of Birmingham, Birmingham, England PhD in Metallurgy and Materials (Plasma Surface Engineering and Wear).
1989-1991	Shiraz University, Shiraz, Iran. MSc in Material Engineering (Material Selection and Manufacturing).
1985-1989	Shiraz University, Shiraz, Iran. BSc in Material Engineering (Metal Forming).

Work Experience

- **Research and development and Industrial activities.**

2015-2018	- Development of plasma arc additive manufacturing in joining and repair brazing of titanium, aluminum and Ni alloys.
2009-2017	- Development of hard coatings ($\text{Fe}_{2,3}\text{N}$, hard carbon, TiC, TiN, Ti_2AlN , Ti_2AlC , NiAl, TiNi, Ti_5Si_3 , Al_2O_3) against wear and friction on steel and titanium alloys using plasma enhanced CVD processes. - Research, Innovation and development in electrochemistry and surface engineering (galvanizing, electroplating, thin films deposition, PVD, CVD, PECVD, plasma nitriding MAO, plasma spray, arc spray, surfacing) of steels, titanium and aluminum alloys.

- Performance of analytical tests (Optical microscope SEM, FESEM, EDX, XRD, GDOES, FTIR Spectroscopy).
- Implementation of mechanical testing of material (tensile, compression, shear, fatigue and creep tests, micro and nano hardness tests).
- Direction and execution of NDT (VT, RT, UT, MT, PT, Phased Array, TOFD, UT Guided Wave and Velocity Ratio) operations and qualifications for industrial parts, thick walled reactors and heat exchangers in refineries, piping and steel structure.

2005-2009

- Development and direction of heat treatment, laser welding and surface finishing processes for steel and aluminum alloys.
- performance of most kinds of metallographic processes.
- Design and manufacture of electrical and mechanical parts and vacuum systems for magnetron sputtering and plasma nitriding and set up of vacuum systems (High vacuum chambers).
- Performance of tribology tests (wear and friction) on coated and/or thermochemical transformed surfaces of steels, titanium and aluminium alloys.
- Direction and performance of repair, restoration or revamping the systems and components in machineries, oil and gas and aviation industries.
- Development and manufacture of pulsed DC plasma electrolytic nitriding and nitro carburizing units for steel and aluminium.

2000-2005

- Teacher of courses for structural welding inspection in more than 1800 hours for more than 2000 construction and civil engineers in 36 hour modules.
- QA/QC management (ISO 9000).
- Inspection, Management and NDT of plates, pipes, valves and instruments, massive steel Structures and offshore Industries according to ASME, ASTM, API and other relevant standards.
- Preparation of WPS and PQR.
- Performance of failure analysis of rotors and vessels in food and wood industries.
- Interpretation of Radiographic Film of pipes and industrial components.
- Performance of corrosion evaluation.

● Teaching academic courses

- Advanced Surface Engineering and Coating of Materials.
- Manufacturing Processes of Materials.
- Ferrous and Non Ferrous alloys.
- Physical Metallurgy and phase Transformation of Materials.
- Heat treatment of Steels and light alloy (Ti and Al alloys).
- Welding and Non-Destructive Testing.

- Industrial Plasma Engineering I & II.
 - Plasma Engineering Labs (demonstration and application of corona, glow, abnormal glow and arc discharge).
 - Advanced Materials Analysis (X-ray and Neutron Diffraction, SEM, FESEM, TEM, AFM, GDOES, Raman, FTIR, SIMS, Gas Chromatography, Elipsometry, Spectrometry).
 - Advanced Thermodynamics.
- **Supervision of 25 graduate students**

Languages

Fluency in English and Persian, jetzt Nivea A2 in Deutsch

IT Skills

MS office (Word, PowerPoint, Excel), Auto CAD, ANSYS, MATLAB

Vocational trainings

Materials Selection, Material Characterisation, Surface Engineering, Non Destructive Testing (VT, MT, PT, UT, RT) Coating Techniques, Plasma Technology, Light and Electron Microscopy, Infrared and Raman Spectroscopy, Tribology (Wear and Friction), Micro and Nano Mechanical Testing, Corrosion testing and Evaluation, Metallography, Mechanical Testing, Optical Spectroscopy.

Recognized Reviewer for Materials Science/ Materials Processing Journals.

Wear; Surface and Coating Technology; Chemical Engineering Journal; Tribology International; Journal of Nano science and Nanotechnology; Chemical and Materials Engineering and Tribology Transaction.

Journal Papers

- **Ahmad Reza Rastkar**, "Plasma Enhanced Paste Aluminizing of Ti-45Al-2Nb-2Mn-1B with Al-Si Alloys", Surface and Coatings Technology, 283 (2015) 19-21.
- **Ahmad Reza Rastkar**, Narges Rezvani, "The Effect of processing time on the microstructure and composition of plasma pack aluminized and oxidized surface layers on low carbon steel", Metallurgical and Materials Transactions A, 46A (8) (2015).
- **Ahmad Reza Rastkar**, "Phase Structure Wear Resistance and Antimicrobial Response of Austenitic Stainless Steels 316L by Sputtering Cu during Plasma Nitriding and PECVD of Silicon Nitride", Journal of Coating Science and Technology, 1 (2014) 117-129.

- **Ahmad Reza Rastkar**, P. Parseh, N. Darvishnia, S.M.M Hadavi, "Microstructural evolution and hardness of TiAl₃ and TiAl₂ phases on Ti-45Al-2Nb-2Mn-1B by plasma pack aluminizing", *Applied Surface Science* 276 (2013) 112-119.
- **Ahmad Reza Rastkar**, B. Shokri, "Surface modification and wear test of carbon steel by plasma electrolytic nitrocarburizing", *Surface and interface an analysis*, 44 (3) (2012) 342-351.
- **Ahmad Reza Rastkar**, A. Kiani, F. Alvand, B. Shokri, M. Amirzadeh, "Effect of pulsed plasma nitriding on mechanical and tribological performance of Ck45 steel", *journal of Nanoscience and Nanotechnology* 11(2011) 5365-5373.
- **Ahmad Reza Rastkar**, B. Shokri, "Surface transformation of Ti-45Al-2Nb-2Mn-1B titanium Aluminide by electron beam melting", *Surf. Coat. Technol.* 204 (2010) 1817-1822.
- **Ahmad Reza Rastkar**, B. Shokri, M. Kabir, M. Amirzadeh, M. R. Rahimpour, "Effect of Methane Pressure on the Size of Carbon Nanoparticles Deposited by Pulsed Plasma Enhanced Chemical Vapour Deposition", *Plasma Process. Polym.* 6 (2009) S855–S859.
- **Ahmad Reza Rastkar**, A. R. Niknam, B. Shokri, "Characterization of copper oxide nano layers deposited by direct current magnetron sputtering", *Thin Solid Films* 517 (2009) 5464-5467.
- **Ahmad Reza Rastkar**, B. Shokri and T. Bell, "Structural and mechanical Evaluation of the effect of oxygen boost diffusion on a Gamma Based Titanium Aluminide of Ti-45Al-2Nb-2Mn-1B", *Surf. Coat. Technol.* 202 (2008) 6038–6048.
- **Ahmad Reza Rastkar**, B. Shokri, "A multi-step process of oxygen diffusion to improve the wear performance of a gamma-based titanium aluminide", *Wear* 264 (2008) 973-980.
- **Ahmad Reza Rastkar**, A. R. Niknam, B. Shokri, "The Effect of Two Surface Treatments on the Tribological Behavior of Gamma-Based Titanium Aluminides", *Plasma Process. Polym.* 2007, 4, S761–S765.
- **Ahmad Reza Rastkar**, B. Shokri, T. Bell, "Effect of thermochemical treatments on the surface of a gamma based TiAl", 2006 Proceedings - 15th IFHTSE - International Federation for Heat Treatment and Surface Engineering Congress 2006, pp. 232-237.
- **Ahmad Reza Rastkar**, T. Bell, "Characterization and Tribological Performance of Oxide Layers on Titanium Aluminides", *Wear* 258 (2005) 1616-1624.
- **Ahmad Reza Rastkar**, T. Bell, "Tribological performance of Plasma Nitrided gamma based Titanium Aluminides", *Wear* 253 (2002) 1121-1131.
- **Ahmad Reza Rastkar**, A. Bloyce, T. Bell, "Sliding wear behaviour of two gamma-based titanium aluminides", *Wear* 240 (1-2) (2000) pp. 19-26.
- **Ahmad Reza Rastkar**, K. Mao, "Realising the Potential of Thermal Spraying", *Surface Engineering*, Vol. 13 (1997) No. 3.

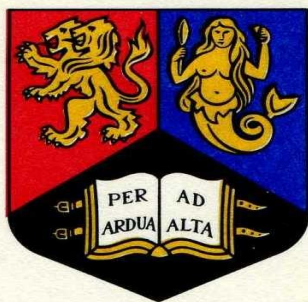
Selected Conference Presentations and Papers

- **A. R. Rastkar**, "Plasma enhanced diffusion of Al-Si alloys on the surface of Ti-45Al-2Nb-2Mn-1B titanium aluminide", Fifteenth International Conference on Plasma Surface Engineering-PSE 2016, Garmisch-Partenkirchen, Germany, September 12-16, 2016.
- **A. R. Rastkar**, "Diverse methods of surface engineering to combat wear of Titanium aluminides", Asia-Pacific Interfinish 2010, Singapore, October 19-22, 2010.

- **A. R. Rastkar**, B. Shokri, "Plasma electrolytic process compete gaseous plasma nitriding of AISI 1045 steel", Twelfth International Conference on Plasma Surface Engineering (PSE 2010), Garmisch-Patenkirchen, Germany, September 13-17, 2010.
- **A. R. Rastkar**, A. Kiani, B. Shokri, "Effect of pulsed plasma nitriding on Tribological performance of Ck45 steel", 3rd International Meeting on Developments in Materials, Processes and Applications of Emerging Technologies (MPA-2009), Manchester, UK, 21-23 July 2009.
- **A. R. Rastkar**, B. Shokri, M. Kabir, M. Amirzadeh and M. Rahimipour, "Effect of pressure on the size of carbon nanoparticles deposited by pulsed plasma enhanced CVD of methane", Eleventh International Conference on Plasma Surface Engineering-PSE, Garmisch-Patenkirchen, Germany, September 15-19, 2008.
- **A. R. Rastkar**, A. R. Niknam, B. Shokri, M. Kabir, M. Amirzadeh and M. R. Rahimipour, "Plasma enhanced CVD of graphite nano particles from methane at low temperatures", presented at MPA-2008, Cambridge, UK, January 6-8, 2008.
- **A. R. Rastkar**, A. R. Niknam, B. Shokri, "Tribological behaviour of surface treated gamma based titanium aluminides", 10th International Conference on Plasma Surface Engineering (PSE), Po 3098, Garmisch-Partenkirchen, Germany, September 10-15, 2006.
- **A. R. Rastkar** and T. Bell, "Surface engineering to improve tribological performance of gamma based titanium aluminides", EUROMAT 99, Munich, 1999.
- **A. R. Rastkar**, A. Bloyce, T. Bell, "Surface Engineering of Titanium Aluminides to Combat Wear", 2nd International Symposium on Structural Intermetallics, USA, 21- 26 Sept. 1997.
- **A. R. Rastkar**, "First World Tribology Congress", Institute of Materials, London, conference attendance, 1996.

Patents

- **A. R. Rastkar**, P. Parseh, plasma Pack Cementation of Titanium, Nickel and Iron based materials, Iran Patent No 82057, 2013.
- **A. R. Rastkar**, B. Shokri, the pilot of thermochemical coating of metallic and nonmetallic materials by pulsed direct current plasma electrolytic process, Iran Patent No 38812, 2007.
- **A.R. Rastkar**, A PVD Apparatus for DC Magnetron Sputtering with Variable Parameters, Iran Patent No. 43845, 2007.
- **A.R. Rastkar**, A. Boushehri, Thermal Chemical Vapor Deposition of Silicon, Iran Patent No. 24777, 1992.



**THE UNIVERSITY
OF BIRMINGHAM**

It is hereby certified that
Ahmad Reza Rastkar
was admitted to the Degree of
Doctor of Philosophy
(Metallurgy and Materials)
on the seventh day of July 2000

Maxwell Irvine

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The Editors of **SURFACE & COATINGS TECHNOLOGY**
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