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Engineering & Scientific Consulting

Pooya Delshad Khatibi, Ph.D.

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Professional Profile

Dr. Delshad specializes in failure analysis, corrosion, fatigue, welding engineering, and non-destructive examination across diverse industries, with a strong foundation in materials characterization, microstructural evaluation, and mechanical testing. With his experience in inspection and maintenance of heat exchangers and pressure vessels, pipeline integrity and storage tank engineering, Dr. Delshad offers comprehensive solutions to the complex challenges faced by various industry sectors. His knowledge of welding metallurgy and materials science allows him to identify and evaluate potential risks in the design, fabrication, and operation of these assets. Additionally, Dr. Delshad possesses American Petroleum Institute certifications as a Pressure Vessel Inspector (API 510) and an Aboveground Storage Tank Inspector (API 653).

Prior to joining Exponent, Dr. Delshad was involved in inspection and maintenance activities on heat exchangers and steam generators in power generation plants in Ontario, Canada. This work included employing various non-destructive examination (NDE) techniques to determine degradation mechanisms of heat exchanger tubes, conducting and evaluating visual inspections, and developing and executing tube plug welding and mechanical repair strategies. Prior to this role, Dr. Delshad carried out failure analysis and investigations for a diverse range of industries, such as oil and gas, power generation, pipeline, automotive, construction, and electrical.

During his graduate studies at the University of Alberta, Dr. Delshad's research focused on the rapid solidification of ferrous and non-ferrous alloys. He utilized the single fluid atomization technique to produce powder particles and additive manufactured components. He employed a blend of modeling and laboratory testing, including optical microscopy (OM), scanning electron microscopy (SEM), energy dispersive X-ray spectroscopy (EDS), X-ray diffraction (XRD), transmission electron microscopy (TEM), and differential scanning calorimetry (DSC) to analyze the mechanical properties and microstructures of these materials. Through his investigations, Dr. Delshad enriched the knowledge of these materials' performance qualities, uncovering ways to refine microstructures and improve mechanical properties particularly for applications in the aerospace industry.

Academic Credentials & Professional Honors

Ph.D., Materials Engineering, University of Alberta, 2014

M.S., Metallurgical and Materials Engineering, University of Tehran, Iran, 2008

Licenses and Certifications

API 510 - Pressure Vessel Inspector

API 653 - Aboveground Storage Tank Inspector

Prior Experience

Senior Engineer, Heat Transfer Equipment Department, Ontario Power Generation (Canada), 2018-2023

Team Lead/Failure analysis engineer, Failure analysis and Materials engineering department, Acuren Group Inc. (Canada), 2014-2018

Publications

Book

P. Delshad Khatibi, H. Henein and U. Fritsching (2017) “In-Situ, Real Time Diagnostics in the Spray Forming Process”, Book Chapter In: Metal Sprays and Spray Deposition, pp. 221-263, Springer, Cham

Journal Papers

AA. Bogno, P. Delshad Khatibi, H. Henein and C.A. Gandin (2016) “Quantification of Primary Dendritic and Secondary Eutectic Nucleation Undercoolings in Rapidly Solidified Hypo-Eutectic Al-Cu Droplets”, Metallurgical and Materials Transactions A 47 (9), pp. 4606-4615

P. Delshad Khatibi and H. Henein (2014) “The robustness of the two-colour assumption in pyrometry of solidifying AISI D2 alloy droplets”, Materials Science and Engineering Technology 45 (8), pp. 736-743

P. Delshad Khatibi and H. Henein (2017) “Estimation of droplet solidification temperature in rapid solidification using in-situ measurements”, Canadian Metallurgical Quarterly 56 (1), pp. 76-84

P. Delshad Khatibi, H. Henein and A.B. Phillion (2016) “Microstructure and mechanical characterization of rapidly solidified Cr-C tool steel: Annealing effects”, Advanced Powder Technology, Vol. 27, No. 5, pp. 2076-2083

A. Ilbagi, P. Delshad Khatibi, I.P. Swainson, G. Reinhart and H. Henein (2011) “Microstructural analysis of rapidly solidified aluminium–nickel alloys”, Canadian Metallurgical Quarterly 50 (3), pp. 295-30

P. Delshad Khatibi, A.B. Phillion and H. Henein (2014) “Microstructural investigation of D2 tool steel during rapid solidification”, Powder Metallurgy 57 (1), pp. 70-78

A. Ilbagi, P. Delshad Khatibi, H. Henein, R. Lengsdorf and D.M. Herlach (2011) “Effect of cooling rate on solidification of Al-Ni alloys”, Journal of Physics: Conference Series 327 (1), 012010

F. Akhlaghi and P. Delshad-Khatibi (2011) Effect of silicon content on size distribution and morphology of Al–Si powder particles produced by solid assisted melt disintegration (SAMD) method, Powder Metallurgy 54 (2), pp. 153-159

P. Delshad Khatibi, A. Ilbagi, D. Beinker and H. Henein (2011) “In-situ characterization of droplets during free fall in the drop tube-impulse system”, Journal of Physics: Conference Series 327 (1), 012014

AA. Bogno, P. Delshad Khatibi, H. Henein and C.A. Gandin (2013) “Quantification of primary dendritic and secondary eutectic undercoolings of rapidly solidified Al-Cu droplets”, Materials Science & Technology 2013 2, pp. 1153-1160

P. Delshad Khatibi and F. Akhlaghi (2008) “Ultrafine Primary Silicon Particles in Phosphorus-modified Hypereutectic Al-Si alloy Powders Produced by SAMD method”, International Journal of Modern Physics B 22 (18n19), pp. 3304-3310

F. Akhlaghi and P. Delshad Khatibi (2011) “Effect of melt chemical composition on the characteristics of Al-Si powder particles produced by SAMD method”, Powder Metallurgy 54, pp. 153-15

Selected Conference Presentations

P. Delshad Khatibi, M. Toloui, A. Di ilio and E. Ulvan (2017) “Failure Analysis Examination of a Titanium Condenser Tube”, 11th International Conference on CANDU Maintenance and Nuclear Components, Toronto, October 2017

P. Delshad Khatibi, D.G. Ivey and H. Henein (2012) “Effect of rapid solidification and heat treatment on D2 tool steel”, TMS Conference, Orlando, Proceedings: Materials Processing and Interfaces, Volume 1, pp. 505-512

P. Delshad Khatibi, A. Ilbagi and H. Henein (2011) “Microstructural investigation of D2 tool steel during rapid solidification using impulse atomization”, TMS Conference, San Diego, Proceedings: Materials Processing and Energy Materials, Volume 1, pp. 531-538

A. Ilbagi, P. Delshad Khatibi, H. Henein, C.A. Gandin and D.M. Herlach (2012) “Quantification of primary phase undercooling of rapidly solidified droplets with 3D microtomography”, 3DMS Conference, Seven Springs, Proceedings of the 1st International Conference on 3D Materials Science, pp. 67-72

P. Delshad Khatibi, A. Ilbagi and H. Henein (2011) "The effect of rapid solidification and heat treatment on the microstructure and properties of D2 tool steels", 23rd Canadian Materials Science Conference (CMSC 2011), Kelowna