

Ming Tang

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Highlights

- Ph.D. in Materials Science and Engineering
- Specialized in failure analysis, physical metallurgy, and solidification processing
- 6-year research experience in metallurgy, including steel, aluminum, and nickel-base alloys
- Strong academic record with 5 first-author peer-reviewed journal articles

Education

- Carnegie Mellon University**, Pittsburgh, PA May 2017
Doctor of Philosophy in Materials Science and Engineering, GPA: 3.9/4.0
Dissertation: Inclusions, Porosity, and Fatigue of AlSi10Mg Parts Produced by Selective Laser Melting
Committee: P. Chris Pistorius (Advisor), Anthony D. Rollett, Bryan Webler, Cagatay Yanar (Arconic)
- Carnegie Mellon University**, Pittsburgh, PA Dec 2013
Master of Science in Materials Science and Engineering, GPA: 3.8/4.0
Thesis: Effects of Water Vapor and Non-isothermal Reaction on Magnetite Pellet Oxidation
- Beihang University**, Beijing, P. R. China Jun 2012
Bachelor of Engineering in Materials Science and Engineering, GPA: 3.6/4.0

Skills

<i>Lab skills</i>	SEM/EDX, EBSD, XRD, TGA, DSC, BET, X-ray tomography, Mechanical tests (fatigue, tension, compression & hardness),
<i>Software</i>	Thermo-Calc, FactSage, QuikCAST, ANSYS, SketchUp, RStudio, JMP,
<i>Programming languages</i>	Python, Matlab, R

Research Experience

- Microstructure, Defect, and Fatigue of 3D-printed AlSi10Mg Parts** Aug 2014 - present
Research Assistant, NextManufacturing Center
- Evaluated residual porosity with 2D metallography and 3D synchrotron-based X-ray micro-tomography and successfully predicted the fatigue life by statistical analysis on porosity
 - Discovered the oxide-induced porosity as a novel type of defect which dominates the fatigue performance of additive manufactured aluminum alloy
 - Developed a 3D geometrical model (implemented in Excel and Python) which improves the volumetric build rate by 50% and correctly predicted the residual porosity in printed products
 - Collaborated closely with researchers in the Department of Mechanical Engineering and industrial partners from Arconic on fatigue, tension, and compression tests
- Oxidation of Magnetite Pellets** Aug 2012 - Dec 2013
Research Assistant, Center for Iron & Steelmaking Research (CISR)
- Designed and performed experiments to evaluate the effect of processing variables (heating rate, peak temperature, %H₂O, and %O₂) and particle size distribution on magnetite oxidation
 - Characterized the product with oxidation degree, cross-section microstructure and fracture surface after compression test by utilizing TGA, XRD, and SEM

Teaching Experience

- Teaching Assistant for 5 graduate courses** Aug 2014 - Aug 2016
- Courses include: Thermodynamics, Kinetics of Metallurgical Reactions and Processes, Solidification Processing, Process Design
 - Coached lab projects using simulation and quantitative analysis software, such as performing critical calculations to evaluate the feasibility of using shaft furnace in steelmaking to meet manufacturing needs within finance budget
 - Graded assignments and provided feedback

Publications

Journal papers

- M. Tang and P. C. Pistorius, "Anisotropic Mechanical Behavior of AlSi10Mg Parts Produced by Selective Laser Melting," *JOM*, vol. 69, pp. 516–522, 2017. doi: 10.1007/s11837-016-2230-5
- M. Tang, P. C. Pistorius, and J.L. Beuth, "Prediction of Lack-of-fusion Porosity for Powder Bed Fusion," *Addit. Manuf.*, vol. 14, pp. 39-48, 2017. doi: 10.1016/j.addma.2016.12.001
- M. Tang and P. C. Pistorius, "Oxide, Porosity and Fatigue performance of AlSi10Mg Parts Produced by Selective Laser Melting," *Int. J. Fatigue*, vol. 94, pp. 192-201, 2017. doi: 10.1016/j.ijfatigue.2016.06.002
- M. Tang, P. C. Pistorius, S. Narra, and J.L. Beuth, "Rapid Solidification: Selective Laser Melting of AlSi10Mg," *JOM*, vol. 68, pp. 960-966, 2016. doi: 10.1007/s11837-015-1763-3
- M. Tang, H. J. Cho, and P. C. Pistorius, "Early Gaseous Oxygen Enrichment to Enhance Magnetite Pellet Oxidation," *Metall. Mater. Trans. B*, vol. 45, pp. 1304-1314, 2014. doi: 10.1007/s11663-014-0064-5
- H. J. Cho, M. Tang, and P. C. Pistorius, "Magnetite Particle Size Distribution and Pellet Oxidation," *Metall. Mater. Trans. B*, vol. 45, pp. 1213-1220, 2014. doi: 10.1007/s11663-014-0104-1

Conference proceedings

- M. Tang, P. C. Pistorius, and J.L. Beuth, "Geometric Model to Predict Porosity of Part Produced in Powder Bed System," in *Materials Science & Technology*, Columbus, OH, 2015, pp. 129-136.
- P. C. Pistorius and M. Tang, "Prediction of Non-Isothermal Oxidation of Magnetite Pellets," in *Drying, Roasting, and Calcining of Minerals*, Orlando, FL, 2015, pp. 203-208.
- M. Tang and P. C. Pistorius, "Magnetite Pellet Oxidation: Effects of Water Vapor and Non-Isothermal Reaction," in *AISTech*, Indianapolis, IN, 2014, pp. 635-642.

Conference Presentations

- M. Tang and P. C. Pistorius, "Build rate improvement for powder bed fusion," *MS&T*, Pittsburgh, PA, Oct 2017 (abstract accepted).
- M. Tang and P. C. Pistorius, "Fatigue Life Prediction for AlSi10Mg Parts Produced by Selective Laser Melting," *RAPID + TCT Conference*, Pittsburgh, PA, May 2017.
- M. Tang and P. C. Pistorius, "Anisotropic Mechanical Behavior of AlSi10Mg Parts Produced by Selective Laser Melting," *TMS*, San Diego, CA, Mar 2017.
- M. Tang and P. C. Pistorius, "Relationship between Porosity Size and Fatigue Life Distributions of AlSi10Mg Parts Produced by Selective Laser Melting," *MS&T*, Salt Lake City, UT, 2016.
- M. Tang, P. C. Pistorius, "Oxide, Porosity and Fatigue Performance of AlSi10Mg Parts Produced by Selective Laser Melting," *TMS*, Nashville, TN, 2016.
- M. Tang, P. C. Pistorius, and J.L. Beuth, "Geometric Model to Predict Porosity of Part Produced in Powder Bed System," *MS&T*, Columbus, OH, 2015.
- M. Tang and P. C. Pistorius, "Magnetite Pellet Oxidation: Effects of Water Vapor and Non-isothermal Reaction," *AISTech*, Indianapolis, IN, 2014.

Selected Coursework

- Mechanical Metallurgy:* Mechanical Behaviors of Materials, Mechanics of Fracture and Fatigue, Advanced Characterization and Microstructural Analysis
- Process Metallurgy:* Computational Thermodynamics, Kinetics of Metallurgical Reactions and Processes, Solidification Processing
- Additive Manufacturing:* Additive Manufacturing for Engineers, Materials for Additive Manufacturing

Honors & Awards

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| NSF Graduate Travel Award | May 2017 |
| Outstanding Student Leader, Beihang University | Jun 2010 |
| Outstanding Supporting Education Volunteer, Beijing Migrant Workers' Home | Jun 2009 |