O. Burkan Isgor, Ph.D., P.E. (ON), FACI, FCSCE

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Research Expertise

Corrosion of Metals:

- Passivity of metals
- Corrosion of steel in concrete
- Marine corrosion
- Microbially induced corrosion (MIC)
- Cladded and surface modified systems
- Electrochemical methods

Computational Materials Science:

- Multi-physics modeling
- Thermodynamic modeling
- Reactive molecular dynamics
- Reactive-transport modeling in porous media
- Corrosion modeling

Cementitious Materials:

- Cement and concrete
- Durability of concrete
- Microbially induced concrete deterioration (MICC)
- Service life modeling of concrete
- NDT/NDE of concrete structures

Non-Destructive Testing (NDT):

- Electrical and electrochemical methods
- Inverse modeling
- Model-assisted NDT
- Corrosion rate measurements of steel in concrete

Education

2001	Ph.D., Civil Engineering Carleton University, Ottawa, Ontario, Canada
1997	M.S., Civil Engineering Carleton University, Ottawa, Ontario, Canada
1995	B.S. (with honors), Civil Engineering Bogazici (Bosphorus) University, Istanbul, Turkey

Employment

Sept. 2016 - present	Professor School of Civil and Construction Engineering Oregon State University, Corvallis, OR
April 2022 – present	Affiliated Faculty, Doctoral student co-advisor ETH Zurich, Switzerland
Sept. 2020 – Apr. 2021	Visiting Research Professor ETH Zurich, Switzerland
July 2017 – July 2019	Professor and John and Jean Loosely Fellow School of Civil and Construction Engineering

Sept. 2012–Sept. 2016	Oregon State University, Corvallis, OR Associate Professor School of Civil and Construction Engineering Oregon State University, Corvallis, OR
July 2014–present	Adjunct Research Professor Department of Civil and Environmental Engineering Carleton University, Ottawa, Ontario, Canada
July 2008–July 2012	Associate Professor Department of Civil and Environmental Engineering Carleton University, Ottawa, Ontario, Canada
Sept. 2003–July 2008	Assistant Professor (Tenured in July 2007) Department of Civil and Environmental Engineering Carleton University, Ottawa, Ontario, Canada
Aug. 2001–Sept. 2003	Engineering Software Development Manager (Finite Element Analysis Software Division) Winsoft Software Inc., Ottawa, Ontario, Canada
Sept. 2000–Jan. 2002	Sessional Lecturer Department of Civil and Environmental Engineering Carleton University, Ottawa, Ontario, Canada
Apr. 1996–Sept. 2000	Finite Element Software Developer Winsoft Software Inc., Ottawa, Ontario, Canada
Sept. 1995–Sept. 2001	Research and Teaching Assistant Department of Civil and Environmental Engineering Carleton University, Ottawa, Ontario, Canada

Professional Appointments

Board of Directors:

2009–2011	Canadian Society for Civil Engineering (CSCE)
Leadership:	
2017–Present	Chair, Corrosion Committee 222, American Concrete Institute (ACI)
2013-2017	Secretary, Corrosion Committee 222, ACI
2009-2011	Vice President (Technical), CSCE
2009-2010	Vice President (Programs), CSCE
2009-2011	Member, National Management Committee, CSCE
2007-2012	Chair, Career Development, NACE National Capital Chapter
2006-2009	Chair, Engineering Mechanics and Materials Committee, CSCE
2005-2006	Chair, IT and Innovation Committee, CSCE

Editorships:

2018-Present	Associate Editor, Materials and Structures (RILEM)
2021-Present	Assistant Editor, Cement and Concrete Composites (Elsevier)
2017-2021	Associate Editor, Cement and Concrete Composites (Elsevier)
2014-2021	Associate Editor, ASCE Journal of Materials in Civil Engineering
2004-2012	Guest Editor (various issues), CSCE Civil Engineering Magazine
2004-2006	Editor, CSCE IT and Innovation Newsletter

Award Committees:

2014–Present	Member, Horst Leipholz Medal Selection Committee
2013-2014	Member, ACI Wason Medal Selection Committee

Standing Grant Evaluation Committees:

2014-2017	Member, NSERC Discovery Grants Evaluation Group 1509

Consulting:

Principal, OBIsgor, LLC
Scientific Advisor, Giatec Scientific Inc.
Consultant, StonCorr Inc.
Consultant, BCT Technologies Inc.
Consultant, Gorex Inc.

Awards and Other Recognitions

- ACI Sustainability Award, 2022
- ACI Wason Medal for Materials Research, 2021
- Fellow of American Concrete Institute (ACI), 2020
- Fellow of Canadian Society for Civil Engineering (CSCE), 2018
- PacTrans Technology Transfer Award, 2018
- John and Jean Loosley Faculty Fellow, 2017
- Certificate of Service and Appreciation, National Science and Engineering Research Council (NSERC), 2017
- Best Reviewer Award, Materials and Structures (RILEM), 2015
- Certificate of Appreciation, American Society for Nondestructive Testing, 2015
- Advisor of the doctoral research that received the Morris Cohen Award from the Corrosion Division of the Electrochemical Society, 2010
- Best Paper Award (CSCE 11th Environmental Specialty Conference, June 9-12, 2010), 2010
- NSERC Discovery Accelerator Supplement (DAS), 2009
- Carleton University Research Achievement Award, 2008
- Carleton University Teaching Achievement Award, 2006

Professional Registration

Aug. 2005–present Professional Engineer, Ontario, Canada, License No. 100077412

Publications

For publications after March 2023, please visit the following Google Scholar page. <u>https://scholar.google.com/citations?user=Q9k8tLkAAAAJ&hl=en</u>

Advisees (graduate students and postdoctoral researchers) are underlined.

Refereed Books & Book Chapters:

- 1. Isgor, O.B. (2023). Chapter 17: Modelling of Corrosion of Steel in Concrete Structures. In *Corrosion of Steel in Concrete Structures*, edited by Amir Poursaee, Woodhead Publishing.
- <u>Gunay, H. B.</u>, <u>Salehi, M.</u>, Papavinasam, S., Obeyesekere, N. U., and Isgor, O. B. (2019). Investigation of Corrosion Inhibitor Persistency Using Electrochemical Quartz Crystal Nanobalance. In *Advances in Electrochemical Techniques for Corrosion Monitoring and Laboratory Corrosion Measurements*, STP1609-EB, Papavinasam, S., Rebak, R., Yang, L., and Berke, N., Ed., ASTM International, West Conshohocken, PA, 2019, pp. 195-210, <u>https://doi.org/10.1520/STP160920170205</u>.
- 3. Isgor, O.B. (2016). Chapter 13: Modelling of Corrosion of Steel in Concrete Structures. In *Corrosion of Steel in Concrete Structures*, edited by Amir Poursaee, Woodhead Publishing.
- 4. Abd El Halim, A.O., Elshafey, M., Isgor, O.B. (2010). Chapter 8: Reliable and Effective Protection, Detection and Repair System for Canadian Oil/Gas Pipeline System. In *Supply Chain Security*, edited by Andrew R. Thomas, ABC-CLIO, ISBN: 978-0-313-36420-4, 544 pp.
- 5. Razaqpur, A.G., Isgor, O.B. (2009). Chapter 3: Practical considerations in corrosion monitoring of reinforced concrete structures. In *Frontier Technologies for Infrastructures Engineering*, Structures and Infrastructures Book Series, Vol. 4, edited by Alfredo H.S. Ang, Shi-Shuenn Chen, CRC Press, ISBN: 978-0-415-49875-3, 462 pp.

Datasets:

- 1. <u>Albert, C.</u>, Isgor, O.B., Angst, U. (2022). Literature-based data on pore solution compositions of cementitious systems, ETH Zurich, DOI: https://doi.org/10.3929/ethz-b-000543461.
- <u>Bharadwaj, K.</u>, Isgor, O.B., Weiss, W.J. (2022) A literature-based dataset containing statistical compositions and reactivities of commercial and novel supplementary cementitious materials, Kiewit Center for Infrastructure and Transportation Research, DOI: https://doi.org/10.7267/ft848z051.
- <u>Ghantous, R.M., Zetterberg, K., Becker, H.H., Behravan, A.</u>, Ley, M.T., Isgor, O.B., and Weiss, W.J. (2022). A Dataset on the influence of air voids and fluid absorption on saltinduced calcium oxychloride damage, Kiewit Center for Infrastructure and Transportation Research, DOI: doi.org/10.7267/z890s2587.

Refereed Journal Publications:

(Papers that are in review or in press are not listed. Underlined indices trainees.)

- <u>Zhu, T.</u>, Juenger, M., Isgor, O. B., Katz, L. (2023). Methods of incorporation of new reaction products in thermodynamic databases of cementitious systems. RILEM Tech Letters, 7: 189-198, DOI: 10.21809/rilemtechlett.2022.166.
- <u>Wang, Y., Bharadwaj, K., Esmaeeli, H.S.</u>, Zavattieri, P., Isgor, O.B., and Weiss, W.J. (2023). Predicting fracture from thermodynamic modeling of cementitious systems, ACI Materials Journal, DOI: 10.14359/51738493.
- 3. <u>Choudhary, A.</u>, <u>Ghantous, R.M.</u>, <u>Opdahl, O.H.</u>, Isgor, O.B., Weiss, W.J. (2022). Heat of hydration, shrinkage, and flexural strength of portland limestone cement mortar, Advances in Civil Engineering Materials 11(1).
- 4. <u>Albert, C.</u>, Isgor, O.B., Angst, U. (2022). Exploring machine learning to predict the pore solution composition of hardened cementitious systems, Cement and Concrete research 162, December, 107001.
- 5. <u>Ramanathan, S., Chopperla, S.K.T.</u>, Isgor, O.B., and Weiss, W.J. (2022). ACI Materials Journal, October 2022, DOI: 10.14359/51737293.
- 6. <u>Tuinukuafe, A., Chopperla, S.K.T</u>., Ideker, J., Weiss, W.J., Isgor, O.B. (2022). Estimating Na+ and K+ concentrations of the pore solution based on ex-situ leaching tests and thermodynamic modeling, RILEM Technical Letters, 7, 88-97.
- 7. <u>Ghantous, R.M., Zetterberg, K., Becker, H.H.</u>, <u>Behravan, A.</u>, Ley, M.T., Isgor, O.B., and Weiss, W.J. (2022). The influence of air voids and fluid absorption on salt-induced calcium oxychloride damage, Cement and Concrete Composites, 133, October 2022, 104697.
- 8. <u>Bozeman, S.</u>, Isgor, O.B., Tucker, J.D. (2022). Effects of processing conditions on the solidification and heat-affected zone of 309L stainless steel claddings on carbon steel using wire-directed energy deposition, Surface and Coatings Technology, 444, 25 August 2022, 128698.
- <u>Coldsnow, K., Yan, D., Paul, G.E.</u>, Torbati-Sarraf, H., Poorganji, B., Ertorer, O., Tan, K., Pasebani, S., Alireza Torbati-Sarraf, S.A.S, Isgor, O.B., (2022). Electrochemical behavior of alloy 22 processed by laser powder bed fusion (L-PBF) in simulated seawater and acidic aqueous environments, Electrochimica Acta, 421, 20 July 2022, 140519.
- <u>Zaw, M.T.</u>, Isgor, O.B., Weiss, W.J., (2022). The influence of specimen preparation on the results of the Ball-on-Three-Ball (B3B) test for cementitious materials, Advances in Civil Engineering Materials, 11(1), September 2022: 438-448.

- 11. Wong, H. S., U. M. Angst, M. R. Geiker, O. B. Isgor, B. Elsener, A. Michel, M. C. Alonso, M. J. Correia, J. Pacheco, J. Gulikers, Y. X. Zhao, M. Criado, M. Raupach, H. Sorensen, R. Francois, S. Mundra, M. Rasol and R. Polder (2022). Methods for characterising the steel-concrete interface to enhance understanding of reinforcement corrosion: a critical review by RILEM TC 262-SCI, Materials and Structures 55(4): 124.
- 12. <u>Choudhary, A.</u>, Ghantous, R.M., <u>Bharadwaj, K.</u>, Isgor, O.B., Weiss, W.J. (2022). Electrical and transport properties of cement mortar made using portland limestone cement, Advances in Civil Engineering Materials, 11(1): 263-279.
- <u>Choudhary, A., Bharadwaj, K.</u>, Ghantous, R.M., Isgor, O.B., Weiss, W.J. (2022). Pozzolanic reactivity test of supplementary cementitious materials, ACI Materials Journal, 119(2): 255-268.
- <u>Bharadwaj, K.</u>, Isgor, O.B., Weiss, W.J., <u>Chopperla, K.S.T.</u>, <u>Choudhary, A.</u>, <u>Vasudevan, G.</u>, <u>Glosser, D.</u>, Ideker, J.H., and Trejo, D. (2022). A new mixture proportioning method for performance-based concrete, ACI Materials Journal, 119(2): 207-220.
- 15. <u>Bharadwaj, K.</u>, Isgor, O.B., Weiss, W.J. (2022). Supplementary cementitious materials in portland-limestone cements, ACI Materials Journal, 119(2): 141-154.
- Angst, U.M., Isgor, O.B., Hansson, C.M., Sagues, A., and Geiker, M.R. (2022). Beyond the chloride threshold concept for predicting corrosion of steel in concrete, Applied Physics Reviews 9(1).
- 17. <u>Murkute, P., Sarfo, K.O., McGieson, I.</u>, Santala, M.K., Zhang, Y., Árnadóttir, L., Tucker, J.D., and Isgor, O.B. (2022). Effect of thermal aging on corrosion behavior of duplex stainless steels, SN Applied Science, 4(97).
- 18. Isgor, O.B. (2022). "M&S highlight: Andrade et al. (2004). Test methods for on-site corrosion rate measurement of steel reinforcement in concrete by means of the polarization resistance method, Materials and Structures 55(2).
- 19. Isgor, O.B. (2022). "M&S highlight: Mangat and Molloy (1994). Prediction of long-term chloride concentration in concrete, Materials and Structures 55(2).
- 20. <u>Yan, D.Q.</u>, Ghayoor, M., <u>Coldsnow, K.</u>, Pirgazi, H., Poorganji, B., Ertorer, O., Tan, K.S., Burns, J., Isgor, O.B., Pasebani S., and Torbati-Sarraf, A. (2022). Laser powder bed fusion and post processing of alloy 22, Additive Manufacturing 50.
- 21. <u>Furcas, F.E.</u>, Lothenbach, B., Isgor, O.B., Mundra, S., Zhang, Z.D., and Angst, U.M. (2022). Solubility and speciation of iron in cementitious systems, Cement and Concrete Research 151.
- 22. <u>Glosser, D.</u>, Isgor, O.B., Weiss, W.J. (2021). Non-Equilibrium Thermodynamic Modeling Framework for Ordinary Portland Cement/Supplementary Cementitious Material Systems, ACI Materials Journal 117 (6).

- Jana, S., Olszta, M., Edwards, D., Engelhard, M., Samanta, A., Ding, H.T., <u>Murkute, P.,</u> Isgor, O.B., and Rohatgi, A. (2021). Microstructural basis for improved corrosion resistance of laser surface processed AZ31 Mg alloy, Corrosion Science 191.
- 24. <u>Bharadwaj, K.</u>, Ghantous, R.M., Sahan, F., Isgor, O.B., and Weiss, W. J. (2021). Predicting pore volume, compressive strength, pore connectivity, and formation factor in cementitious pastes containing fly ash, Cement & Concrete Composites 122.
- Murkute, P., Coldsnow, K., McAlexander, M., Rada, H.M., Pasebani, S., and Isgor, O.B. (2021). Passivation and Chloride-Induced Depassivation of Additively Manufactured Duplex Stainless Steel Clads in Simulated Concrete Pore Solution, Journal of Materials in Civil Engineering 33(8).
- 26. <u>Sarfo, K.O.</u>, Isgor, O.B., Santala, M.K, Tucker, J.D., and Arnadottir, L. (2021). Bulk diffusion of Cl through O vacancies in alpha-Cr₂O₃: A Density Functional Theory Study,, Journal of the Electrochemical Society 168(7).
- 27. <u>Nigon, G.N.</u>, Isgor, O.B., Pasebani, S. (2021). The effect of annealing on the selective laser melting of 2205 duplex stainless steel: Microstructure, grain orientation, and manufacturing challenges, Optics and Laser Technology 134, 106643.
- 28. <u>Glosser, D.</u>, Suraneni, P., Isgor, O.B., and Weiss, W.J. (2021). Using glass content to determine the reactivity of fly ash for thermodynamic calculations, Cement & Concrete Composites 115.
- 29. <u>Deboodt, T.</u>, Wildenschild, D., Ideker, J.H., Isgor, O.B. (2021). Comparison of thresholding techniques for quantifying portland cement hydrates using synchrotron microtomography, Construction and Building Materials 266 (January 2021), 121109.
- <u>Nigon, G.N.</u>, Isgor, O.B., Pasebani, S. (2020). Effect of Build Orientation and Annealing on Corrosion Resistance of Additively Manufactured Duplex Stainless Steel in 3.5% NaCl, Journal of the Electrochemical Society 167 (14), 141508.
- Sarfo, K.O., Murkute, P.V., Isgor, O.B., Zhang, Y., Tucker, J. (2020). Density Functional Theory Study of the Initial Stages of Cl-Induced Degradation of α-Cr2O3 Passive Film, Journal of Electrochemical Society, 167, 121508.
- 32. <u>Pang, Q., DorMohammadi, H.</u>, Isgor, O.B., Arnadottir, L. (2020). Thermodynamic feasibility of the four-stage chloride-induced depassivation mechanism of iron, npj Materials Degradation 4 (26).
- 33. <u>Murkute, P.</u>, Pasabani, S., Isgor, O.B. (2020). Effects of Heat Treatment and Applied Stresses on the Corrosion Performance of Additively Manufactured Super Duplex Stainless Steel Clads, Materialia 100878.
- <u>Murkute, P.</u>, Pasabani, S., Isgor, O.B. (2020). Metallurgical and Electrochemical Properties of Super Duplex Stainless Steel Clads on Low Carbon Steel Substrate produced with Laser Powder Bed Fusion, Scientific Reports 10 (10162).

- 35. <u>Glosser, D.</u>, Suraneni, P., Isgor, O.B., Weiss, W.J. (2020). Estimating reaction kinetics of cementitious pastes containing fly ash, Cement and Concrete Composites, 112, 103655.
- 36. <u>Pang, Q.</u>, <u>DorMohammadi, H.</u>, Isgor, O.B., Arnadottir, L. (2020). The effect of surface defects on chloride-induced depassivation of iron a density functional theory study, Corrosion, 76 (7): 690–697.
- 37. <u>Erbektas, A.R.</u>, Isgor, O.B., Weiss, W.J. (2020). Comparison of Chemical and Biogenic Acid Attack on Concrete, ACI Mater. J 117, 255-264.
- 38. Isgor, O.B. and Weiss, J.W. (2019). A nearly self-sufficient framework for modelling reactive-transport processes in concrete, Materials and Structures, 52:3.
- Isgor, B., Angst, U., Geiker, M., Halmen, C., Hansson, C., Pacheco, J., Tepke, D., Trejo, D. and Vaddey, P. (2019). Recommended practice for reporting experimental data produced from studies on corrosion of steel in cementitious systems, RILEM Technical Letters, 40, 22-32. doi: 10.21809/rilemtechlett.2019.90.
- 40. <u>DorMohammadi, H., Pang, Q.</u>, Árnadóttir, L., and Isgor, O.B. (2019). Investigation of chloride-induced depassivation of iron in alkaline media by reactive force field molecular dynamics, npj Materials Degradation, 3(19).
- 41. <u>DorMohammadi, H.</u>, <u>Pang, Q.</u>, Árnadóttir, L., and Isgor, O.B. (2019). Investigation of iron passivity in highly alkaline media using reactive-force field molecular dynamics, Corrosion Science, 157: 31-40.
- 42. <u>Pang, Q., DorMohammadi, H.,</u> Árnadóttir, L., and Isgor, O.B. (2019). The effect of surface vacancies on the interactions of Cl with a α-Fe₂O₃ (0001) surface and the role of Cl in depassivation, Corrosion Science, 154: 61-69.
- 43. <u>Erbektas, A.R.</u>, Isgor, O.B., Weiss, W.J. (2019). An accelerated testing protocol for assessing microbially induced concrete deterioration during the bacterial attachment phase, Cement and Concrete Composites, 104, 103339.
- 44. <u>Murkute, P.</u>, Pasebani, S., Isgor, O.B. (2019). Production of corrosion-resistant 316L stainless steel clads on carbon steel using powder bed fusion-selective laser melting, Journal of Materials Processing Technology, 273, 116243.
- 45. <u>Bharadwaj, K.</u>, <u>Glosser, D.</u>, <u>Moradllo, M.K.</u>, Isgor, O.B., and Weiss, J.W. (2019). Toward the prediction of pore volumes and freeze-thaw performance of concrete using thermodynamic modelling, Cement and Concrete Research, 124, 105820.
- 46. <u>Erbektas, A.R.</u>, Isgor, O.B., Weiss, W.J. (2019). Evaluating the efficacy of antimicrobial additives against biogenic acidification in simulated wastewater exposure solutions, RILEM Technical Letters, 40: 49-56. doi: 10.21809/rilemtechlett.2019.62.

- 47. Angst, U.M., Geiker, M.R., Alonso M.C., Polder, R., Isgor, O.B., et al. (2019). The effect of the steel–concrete interface on chloride-induced corrosion initiation in concrete: a critical review by RILEM TC 262-SCI, Materials and Structures, 52:88.
- 48. <u>Murkute, P.</u>, Pasebani, S., Isgor, O.B. (2019). Microstructural analysis of additively manufactured corrosion resistant duplex stainless steel clads on carbon steel substrate, Microscopy and Microanalysis, 25: S2, 2570-2571.
- 49. Balonis, M., Sant, G., and Isgor, O.B. (2019). Mitigating steel corrosion in reinforced concrete using functional coatings, corrosion inhibitors, and atomistic simulations. Cement and Concrete Composites, 101, 15-23, doi.org/10.1016/j.cemconcomp.2018.08.006.
- 50. <u>Glosser, D.</u>, <u>Jafari Azad, V.</u>, Suraneni, P., Isgor, O.B., Weiss, W.J. (2019). An extension of the Powers-Brownyard model to pastes containing SCM, ACI Materials Journal, in press.
- 51. <u>Glosser, D., Choudhary, A.,</u> Isgor, O.B., Weiss, W.J. (2019). Investigation of reactivity of fly ash and its effect on mixture properties, ACI Materials Journal, 116(4): 193-200.
- 52. Jafari Azad, V., Erbektas A.R., Qiao, C., Isgor, O.B., and Weiss, W.J. (2019). Relating the formation factor and chloride binding parameters to the apparent chloride diffusion coefficient of concrete. ASCE Journal of Materials in Civil Engineering, 31(2): 04018392-1-10.
- 53. <u>Deboodt, T.</u>, Wildenschild, D., Ideker, J.H., and Isgor, O.B. (2019). Use of iodine for improving phase quantification using x-ray tomography. Cement and Concrete Research, 116, 102-112.
- 54. Tucker, J.D., Wei, Y., Marcum, W.R., Murkute P.V., Gibbons, B.J., and Isgor, O.B. (2019). Quantifying oxide layer growth at low pressures and temperatures for aluminum alloy 6061, Metallurgical and Materials Transactions A, 50(7): 3388-3398.
- 55. Trejo, D., Shakouri, M., Vaddey, N.P., and Isgor, O.B. (2018). Development of empirical models for chloride binding in cementitious systems containing admixed chlorides. Construction and Building Materials, 189:157-169.
- 56. <u>Moradllo, M.K.</u>, <u>Qiao, C.</u>, Isgor, O.B., Reese, S., and Weiss, W.J. (2018). Relating formation factor of concrete to water absorption. ACI Materials Journal, 115(6): 887-898.
- 57. Jafari Azad, V., Suraneni, P., Trejo, D., Weiss, W.J., and Isgor, O.B. (2018). Thermodynamic investigation of allowable admixed chloride limits in concrete. ACI Materials Journal, 115(5), September 2018.
- 58. <u>Sallehi, H.</u>, Ghods, P., and Isgor, O.B. (2018). Formation factor of fresh cementitious pastes. Cement and Concrete Composites, 91, 174-188
- 59. <u>DorMohammadi, H.</u>, <u>Pang, Q.</u>, Árnadóttir, L., and Isgor, O.B. (2018). Atomistic simulation of initial stages of iron corrosion in pure water using reactive molecular dynamics. Computational Materials Science, 145, 126-133.

- 60. Suraneni, P., Fu, T., <u>Jafari Azad, V.</u>, Isgor, O.B., and Weiss, J. (2018). Pozzolanicity of finely ground lightweight aggregates. Cement and Concrete Composites, 88: 115-120.
- 61. <u>Fahim, A.</u>, Ghods, P., Isgor, O.B., and Thomas, M.D.A. (2018). A critical examination of corrosion rate measurement techniques applied to reinforcing steel in concrete. Materials and Corrosion, doi: 10.1002/maco.201810263
- 62. Suraneni, P., <u>Jafari Azad, V.</u>, Isgor, O.B., and Weiss, J. (2018). Role of supplementary cementitious material type in the mitigation of calcium oxychloride formation in cementitious pastes. ASCE Journal of Materials in Civil Engineering, 30(10), 04018248-1-10.
- 63. Weiss, W.J., Isgor, O.B., <u>Coyle, A.T.</u>, and <u>Qiao, C.</u> (2018). Prediction of chloride ingress in saturated concrete using formation factor and chloride binding isotherm. ASTM Advances in Civil Engineering Materials, 7(1): 206-220.
- 64. <u>Deboodt, T.</u>, Ideker, J.H., Isgor, O.B., Wildenschild, D. (2017). Quantification of synthesized hydration products using synchrotron microtomography and spectral analysis. Construction and Building Materials, 157: 476-488.
- 65. Jafari Azad, V. and Isgor, O.B. (2017). Modeling chloride ingress in concrete with thermodynamically calculated chemical binding. International Journal of Advances in Engineering Sciences and Applied Mathematics, 9(2): 97–108.
- 66. Angst, M.U., Mette, R.G., Michel, A., Gehlen, C, Wong, H., Isgor, O.B., Elsener, B., Hansson, C.M., Francois, R., Hornbostel, K., Polder, R., Alonso, M.C., Sanchez, M., Correia, M.J., Criado, M., Sagues, A., Buenfeld, N. (2017). The steel–concrete interface, Materials and Structures, 50(143): 143.
- 67. Jafari Azad, V., Suraneni, P., Isgor, O. B., Weiss, W. J. (2017). Interpreting the pore structure of hydrating cement phases through a synergistic use of the Powers-Brownyard Model, hydration kinetics, and thermodynamic calculations. ASTM Advances in Civil Engineering Materials, 6(1): 1-16.
- 68. <u>Pang, Q., DorMohammadi. H.</u>, Isgor, O.B., Árnadóttir, L., (2017). Density functional theory study on the effect of OH and Cl adsorption on the surface structure of α-Fe₂O₃. Computational and Theoretical Chemistry, 1100(Jan): 91-101.
- 69. <u>Mazarei, M.</u>, Trejo, D., Ideker, J.H., Isgor, O.B. (2107). Synergistic effects of ASR and fly ash on the corrosion characteristics of RC systems. Construction and Building Materials, 153: 647-655.
- 70. Trejo, D., <u>Mazarei, V.</u>, Ideker, J.H., Isgor, O.B. (2017). Influence of Alkali-Silica Reaction Reactivity on Corrosion in Reinforced Concrete. ACI Materials Journal, 144(5).

- 71. <u>Suraneni, P., Jafari Azad, V.</u>, Isgor, O. B., Weiss, W. J. (2017). Use of fly ash to minimize deicing salt damage in concrete pavements. Transportation Research Record Journal of the Transportation Research Board.
- 72. <u>Whatley, S.N., Suraneni, P., Jafari Azad, V.</u>, Isgor, O.B., Weiss, J. (2017). Mitigation of calcium oxychloride formation in cement pastes using undensified silica fume. ASCE Journal of Materials in Civil Engineering, 29(10).
- 73. <u>Chang, M.T.</u>, <u>Suraneni, P.</u>, Isgor, O.B., Trejo D., Weiss, W.J. (2017). Using X-ray fluorescence to assess the chemical composition and resistivity of simulated cementitious pore solutions. International Journal of Advances in Engineering Sciences and Applied Mathematics, 9(3): 136–143.
- 74. <u>Ghods, P.</u> and Isgor O.B. (2016). A critical look at advanced nano-to-macro scale characterization techniques to study passivity and corrosion of steel in concrete. ACI Special Publication, SP-302: 1-18.
- 75. Jafari Azad, V., Li, C., Verba, C., Ideker, J. H., Isgor, O.B. (2016). A COMSOL–GEMS interface for modeling coupled reactive-transport geochemical processes. Computers & Geosciences, 92: 79-89.
- 76. <u>Karadakis, K.</u>, <u>Jafari Azad, V.</u>, Ghods, P., Isgor, O.B. (2016). Numerical investigation of the role of mill scale crevices on the corrosion initiation of carbon steel reinforcement in concrete. Journal of the Electrochemical Society, 163(6): C306-C315.
- 77. <u>Suraneni, P.</u>, <u>Jafari Azad, V.</u>, Isgor, O.B., Weiss, W.J., (2016). Calcium oxychloride formation in pastes containing supplementary cementitious materials: Thoughts on the role of cement and supplementary cementitious materials reactivity. RILEM Technical Letters, 1: 24-30.
- 78. <u>Williamson, J.</u>, Isgor, O.B. (2016). Investigation of Mott–Schottky analysis test parameters to study the semiconductive properties of passive films of carbon steel in highly alkaline environments. ASTM Advances in Civil Engineering Materials, 5(1): 80-106.
- 79. <u>Williamson, J.</u>, Isgor, O.B. (2016). The effect of simulated concrete pore solution composition and chlorides on the electronic properties of passive films on carbon steel rebar. Corrosion Science, 106: 82-95.
- 80. <u>Soleimani, S.</u>, Isgor, O.B., Ormeci, B. (2016). Effectiveness of E. coli biofilm on mortar to inhibit biodegradation by biogenic acidification. ASCE Journal of Materials in Civil Engineering, 28(4): 04015167.
- 81. Jafari Azad, V. and Isgor, O.B. (2016). A thermodynamic perspective on chloride limits of concrete produced with SCMs. ACI Special Publication, SP-308: 8.1-8.18.
- 82. <u>Adams, M.P., Fu, T., Cabrera, A.G., Morales, M.</u>, Ideker, J.H., Isgor, O.B. (2016). Cracking susceptibility of concrete made with coarse recycled concrete aggregates. Construction and Building Materials, 102:802-810.

- 83. <u>Salehi, M.</u>, Ghods, P. Isgor, O.B. (2016). Numerical study on the effect of cracking on surface resistivity of plain and reinforced concrete elements. ASCE Journal of Materials in Civil Engineering, 49 (1-2): 301-316.
- 84. Razaqpur A.G., Isgor, O.B., Esfandiari, A. (2015). Nonlinear finite element analysis of strength and durability of reinforced concrete and composite structures. Challenge Journal of Structural Mechanics, 1(4): 173-184.
- 85. <u>Williamson, J.</u>, <u>Azad, V.J.</u>, Isgor, O.B. (2015). Modeling electronic properties of the passive films on carbon steel in simulated concrete pore solutions. Journal of the Electrochemical Society, 162(12): C619-C629.
- 86. <u>Gunay, H.B.</u>, Isgor, O.B., <u>Ghods, P.</u> (2015). Investigation of the kinetics of passive film formation and chloride-induced depassivation using electrochemical quartz crystal nanobalance (EQCN). Corrosion, 71(5): 615-627.
- 87. <u>Salehi, M.</u>, Ghods, P. Isgor, O.B. (2014). Numerical investigation of the role of embedded reinforcement mesh on electrical resistivity measurements of concrete using the Wenner probe technique. Materials and Structures. DOI 10.1617/s11527-014-0498-x, 1-16.
- 88. <u>Soleimani, S.</u>, Isgor, O.B., Ormeci, B. (2013). Resistance of biofilm-covered mortars to microbiologically influenced deterioration simulated by sulfuric acid exposure. Cement and Concrete Research, 53: 229-238.
- 89. <u>Soleimani, S.</u>, Ormeci, B., Isgor, O.B. (2013). Evaluation of E. coli biofilm as a protective barrier against microbiologically influenced deterioration of concrete (MICD) under mesophilic temperatures. Journal of Water Science and Technology, International Water Association (IWA), 68(2): 303-310.
- 90. <u>Bonany, J.E.</u>, Van Geel, P.J., <u>Gunay, H.B.</u>, Isgor, O.B. (2013). Simulating waste temperatures in an operating landfill in Québec, Canada. Waste Management & Research, 31(7): 692-699.
- 91. <u>Gunay, H.B.</u>, <u>Ghods, P.</u>, Isgor, O. B., Carpenter, G.J., Wu, X. (2013). Characterization of atomic structure of oxide films on carbon steel in simulated concrete pore solutions using EELS. Applied Surface Science, 274: 195-202.
- Isgor, O.B., <u>Karadakis, K., Ghods</u>, P. (2013). Numerical study of pore solution chemistry in surface crevices of carbon steel rebar. ACI Special Publication, ACI Special Publication, SP-291: Corrosion of Reinforcing Steel in Concrete - Future Direction, No. 3: 37-58.
- <u>Marinier, P.</u>, O. B. Isgor (2013). Refined half-cell potential mapping for corrosion detection using inverse modeling. ACI Special Publication, SP-291: Corrosion of Reinforcing Steel in Concrete - Future Direction, No: 7: 105-126.

- 94. <u>Ghods, P.</u>, Isgor, O. B., Carpenter, G., Li, L., McRae, G., Gu, G. P. (2013). Nano-scale study of passive films and chloride-induced depassivation of carbon steel rebar in simulated concrete pore solutions using FIB/TEM. Cement and Concrete Research, 47: 55-68.
- 95. <u>Bonany, J. E.</u>, Van Geel, P.J., <u>Gunay, H.B.</u>, Isgor, O.B. (2013). Heat budget for an anaerobic bioreactor landfill in a northern climate. Waste Management, 33(5): 1215-1228.
- 96. <u>Soleimani, S.</u>, Ormeci, B., Isgor, O.B. (2013). Growth and characterization of Escherichia coli DH5α biofilm on concrete surfaces as a protective layer against microbiologically influenced concrete deterioration (MICD). Applied Microbiology and Biotechnology, 97(3): 1093-1102.
- 97. <u>Porcari, G-L.</u>, Zalok, E., Isgor, O.B., (2012). Fire performance of corrosion damaged reinforced concrete beams, Journal of Structural Fire Engineering, 3(4): 311-318.
- 98. <u>Ghods, P.</u>, Isgor, O.B., Bensebaa, F., Kingston, D. (2012). Angle-resolved XPS Study of passive oxide film on carbon steel in simulated concrete pore solution and the role of chloride in depassivation. Corrosion Science, 58: 159-167.
- 99. <u>Fathifazl, G.</u>, Razaqpur, A.G., Isgor, O.B., <u>Abbas, A.</u>, Fournier, B., Foo, S. (2012). Bond performance of deformed steel bars in concrete produced with coarse recycled concrete aggregate. Canadian Journal of Civil Engineering, 39(2): 128-139.
- 100. <u>Soleimani, S.</u>, Ormeci, B., O.B. Isgor, and S. Papavinasam. (2011). Evaluation of biofilm performance as a protective barrier against biocorrosion using an enzyme electrode. Journal of Water Science and Technology, International Water Association (IWA), 64(8): 1736-1742.
- 101. <u>Fathifazl, G.</u>, Razaqpur, A.G., Isgor, O.B., <u>Abbas, A.</u>, Fournier, B., Foo, S. (2011). Creep and drying shrinkage characteristics of concrete produced with coarse recycled concrete aggregate. Cement and Concrete Composites, 33(10): 1026-1037.
- 102. Razaqpur, A.G., Shedid, M. and Isgor, O.B. (2011). Shear strength of fiber reinforced polymer reinforced concrete beams subjected to unsymmetrical bending. ASCE, Journal of Composites for Construction, 15(4): 500-512.
- 103. <u>Ghods, P.</u>, Isgor, O.B., Li, J. McRae, G., Gu, G. (2011). Microscopic investigation of mill scale and its effect on the chloride-induced depassivation of carbon steel rebar. Corrosion Science, 53(3): 946-954.
- 104. <u>Ghods, P.</u>, Isgor, O.B., Brown J., Bensebaa, F., Kingston, D. (2011). XPS depth profiling study on the passive oxide film of carbon steel in saturated calcium hydroxide solution and the effect of chloride on the film properties. Applied Surface Science, 257(10): 4669-4677.
- 105. <u>Fathifazl, G.</u>, Razaqpur, A.G., Isgor, O.B., <u>Abbas, A.</u>, Fournier, B., Foo, S. (2011). Shear capacity evaluation of steel reinforced recycled concrete (RRC) beams. Journal of Engineering Structures, 33(3): 1025-1033.

- 106. <u>Ghods, P.</u>, Isgor, O.B., McRae, G., Gu, G. (2010). Electrochemical investigation of chloride-induced depassivation of black steel rebar under simulated service conditions. Corrosion Science, 52(5): 1649-1659.
- 107. <u>Soleimani, S.</u>, <u>Ghods, P.</u>, Isgor, O.B., Zhang, J. (2010). Modeling the kinetics of corrosion in concrete patch repairs and identification of governing parameters. Journal of Cement and Concrete Composites, 32(5): 360-368.
- 108. <u>Majeed M.</u>, Abd El Halim, A.O., Isgor O.B., Contestable E. (2010). Utilization of different grid types to strengthening reinforced concrete panels subjected to impact loading. Transportation Research Record 2164: 19-25.
- 109. <u>Fathifazl, G.</u>, Razaqpur, A.G., Isgor, O.B., <u>Abbas, A.</u>, Fournier, B., and Foo, S. (2010). Shear Strength of Steel Reinforced Recycled Concrete Beams with Stirrups. Magazine of Concrete Research, 62(10): 685–699.
- 110. <u>Fathifazl, G.</u>, Razaqpur, A.G., Isgor, O.B., <u>Abbas, A.</u>, Fournier, B., and Foo, S. (2010). A reply to the discussion by D.K. Sahoo, B. Singh, and P. Bhargava of the paper "Shear Strength of Steel Reinforced Recycled Concrete Beams without Stirrups." Magazine of Concrete Research: 62(11), pp. 853-856.
- 111. <u>Pour-Ghaz, M.</u>, Isgor, O.B., <u>Ghods, P.</u> (2009). Quantitative interpretation of half-cell potential measurements in concrete structures. ASCE Materials Journal, 21(9): 467-475.
- 112. <u>Pour-Ghaz, M.</u>, Isgor, O.B., <u>Ghods, P.</u> (2009). The effect of temperature on the corrosion of steel in concrete. Part 1: Virtual polarization resistance tests and model development. Corrosion Science, 51(2): 415-425.
- 113. <u>Pour-Ghaz, M.</u>, Isgor, O.B., <u>Ghods, P.</u> (2009). The effect of temperature on the corrosion of steel in concrete. Part 2: Model verification and parametric study. Corrosion Science, 51(2): 426-433.
- 114. <u>Soleimani, S.</u>, Van Geel, P.J., Isgor, O.B., <u>Mostafa, M.</u> (2009). Modelling of biological clogging in unsaturated porous media. Contaminant Hydrology, 106: 39-50.
- 115. <u>Elshafey, M.M.</u>, Contestabile, E., Abd El Halim, A.O., Isgor, O.B. (2009). Numerical and experimental investigations for safer transportation of dangerous goods. Journal of Transportation Security, 2: 13-27.
- 116. <u>Ghods, P.</u>, Isgor, O.B., McRae, G., <u>Miller, T.</u> (2009). The effect of concrete pore solution composition on the quality of passive oxide films on black steel reinforcement. Cement and Concrete Composites, 31(1): 2-11.
- 117. <u>Elshafey, M.M.</u>, Contestabile, E., Abd El Halim, A.O., Isgor, O.B. (2009). Improving the safety of transportation of dangerous Goods: An Experimental Study. Transportation Research Record 2097: 117-124.

- 118. (Invited) <u>Abbas, A.</u>, <u>Fathifazl, G.</u>, Isgor, O.B., Razaqpur, A.G., Fournier, B., Foo, S. (2009). Durability of recycled aggregate concrete designed with equivalent mortar volume (EMV) method. Cement and Concrete Composites, 31: 555 563.
- 119. <u>Abbas, A., Fathifazl, G.</u>, Fournier, B., Isgor, O.B., Zavadil, R., Razaqpur, A.G., Foo, S. (2009). Quantification of the residual mortar content in recycled concrete aggregates by image analysis. Materials Characterization, 60(7): 716-728.
- 120. <u>Fathifazl, G., Abbas, A.</u>, Razaqpur, A.G., Isgor, O.B., Fournier, B., Foo, S. (2009). New mixture proportioning method for concrete made with coarse recycled concrete aggregate. ASCE Materials Journal, 21(10), 601-611.
- 121. <u>Fathifazl, G.</u>, Razaqpur, A.G., Isgor, O.B., <u>Abbas, A.</u>, Fournier, B., Foo, S. (2009). Shear strength of reinforced recycled concrete beams without stirrups. Magazine of Concrete Research, 61 (7), pp. 387-400.
- 122. <u>Fathifazl, G.</u>, Razaqpur, A.G., Isgor, O.B., <u>Abbas, A.</u>, Fournier, B., Foo, S. (2009). Flexural performance of steel reinforced recycled concrete (RRC) beams. ACI Structural Journal, 106(6): 858-867.
- 123. <u>Abbas, A., Fathifazl, G.</u>, Isgor, O.B., Razaqpur, A.G., Fournier, B., Foo, S. (2008). Proposed method for determining the residual mortar content of recycled concrete aggregates. Journal of ASTM International, 5(1), 12 pp.
- 124. <u>Ghods, P.</u>, Isgor, O.B., <u>Pour-Ghaz, M.</u> (2008). Experimental verification and application of a practical corrosion model for uniformly depassivated reinforcing bars in concrete. Materials and Structures, 41(7): 1211 1223.
- 125. <u>Craft, S.T.</u>, Isgor, O.B., Hadjisophocleous, G., Mehaffey, J. (2008). Modelling the thermal response of gypsum board subjected to constant heart flux. Journal of Fire and Materials, 32(6): 333-355.
- 126. <u>Craft, S.T.</u>, Isgor, O.B., Mehaffey, J., Hadjisophocleous, G. (2008). Modelling heat and mass transfer in wood-frame floor assemblies exposed to fire. IAFSS Fire Safety Science, Vol. 9: 1303-1314.
- 127. <u>Ge, J.</u>, Isgor, O.B. (2007). Effects of Tafel slope, exchange current density and electrode potential on the corrosion of steel in concrete. Materials and Corrosion, 58(8): 573-582.
- 128. <u>Ghods, P.</u>, Isgor, O.B., <u>Pour-Ghaz, M.</u> (2007). A practical method for calculating the corrosion rate of uniformly depassivated reinforcing bars in concrete. Materials & Corrosion, 58 (4): 265-272.
- 129. Isgor, O.B., Razaqpur, A.G. (2007). Advance modelling of concrete deterioration due to reinforcement corrosion. Canadian Journal of Civil Engineering, 33 (6): 707-718.
- 130. Isgor, O.B., Razaqpur, A.G. (2006). Modelling reinforcement corrosion in concrete structures. Materials and Structures, 39 (3): 259-265.

- 131. Razaqpur, A.G., Isgor, O.B. (2006). Proposed shear design method for FRP reinforced concrete members without stirrups. ACI Structural Journal, 103 (1): 93-102.
- 132. Razaqpur, A.G., Isgor, O.B. (2004). Concrete contribution to the shear resistance of FRP reinforced concrete members. ASCE Composites in Construction Journal, September/October: 452-460.
- 133. Isgor, O.B., Razaqpur, A.G. (2004). Finite element modelling of coupled heat transfer, moisture transport and carbonation processes in concrete structures. Cement and Concrete Composites, 26: 57-73.
- 134. Razaqpur, A.G., Isgor, O.B. (2003). A rational method for calculating deflection of continuous FRP reinforced concrete beams. American Concrete Institute, ACI Special Publication, SP 210: 191-208.

Professional Magazine Articles:

- 1. <u>Bharadwaj, K.</u>, Isgor, O.B., Weiss, W.J. (2022). A simplified approach to determine pozzolanic reactivity of commercial supplementary cementitious materials, Concrete International, 44(1): 27-32.
- 2. Clark, J.V., <u>Deboodt, T.</u>, Lange, D.A., Ideker, J.H., Isgor, O.B. (2020). Advances in X-Ray Computed Tomography for the Characterization of Cementitious Materials, Concrete International 42 (9), 30-36.
- 3. Trejo, T. Isgor, O.B., and Weiss, W.J. (2016). ACI's Allowable Admixed Chloride Conundrum. ACI Concrete International, 38(5): 35-42.
- 4. Suraneni, P. Jafari Azad, V., Isgor, O.B. and Weiss, W.J. (2016). Deicing salts and durability of concrete pavements and joints: Mitigating calcium oxychloride formation. ACI Concrete International, 38(4): 48-54
- 5. Isgor, O.B., Razaqpur, A.G., Foo, S. (2011). Decreasing environmental impact of buildings through innovative technologies. CSCE Canadian Civil Engineering Magazine, 28.4, 14-17.
- 6. <u>Fathifazl, G.</u>, Razaqpur, A.G., Isgor, O.B., <u>Abbas, A.</u>, Fournier, B., Foo, S. (2010). A novel method for proportioning structural concrete mixes made with recycled concrete aggregate. ACI Concrete International (March 2010), 32(3): 37-43.
- 7. <u>Soleimani, S.</u>, Ormeci, B., Isgor, O.B., Papavinasam, S. (2010). Evaluation of biofilm as a protective barrier for the inhibition of microbially influenced deterioration in treatment structures and sewer pipelines. CSCE Canadian Civil Engineering Magazine, 27.2, 8-10.
- 8. Isgor, O.B., <u>Pour-Ghaz, M.</u>, <u>Ghods, P.</u> (2009) Corrosion rate prediction using virtual experiments. CSCE Canadian Civil Engineer, 26.1 (Spring): 16-19.

- 9. <u>Fathifazl, G., Abbas, A.</u>, Razaqpur, A.G., Isgor, O.B., Fournier, B., Foo, S. (2008). Recycled aggregate concrete as a structural material. CSCE Canadian Civil Engineer, 24.5: 20-23.
- 10. Razaqpur, A.G., Svecova, D., Isgor, O.B. (2004). Design of Reinforced and Prestressed Concrete Structures by Internal FRP Reinforcement. CSCE Canadian Civil Engineer: 14-17.