Exponent®
Engineering & Scientific Consulting

Gabriel Jen, Ph.D., P.E.

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Professional Profile

Dr. Jen specializes in concrete and associated high performance cement-based materials. He has expertise in evaluating the structural and durability performance of buildings and structures constructed with concrete, particularly specialty mixes designed to achieve superior performance through the addition of fiber reinforcement. Dr. Jen is also experienced in evaluating improved construction sustainability through a reduction in a structure's carbon footprint by addressing the underlying chemistry of cement production. In addition to experience with ASTM test procedures of cement and concrete, Dr. Jen has analyzed changes in material chemistry through x-ray fluoresce spectroscopy, quantitative x-ray diffraction, thermogravimetric analysis, isothermal conduction calorimetry and scanning electron microscopy.

Prior to joining Exponent, Dr. Jen was a research fellow at the University of Aberdeen in the United Kingdom where he was involved in a multi-national investigation targeting low-carbon cement production for incorporation into the planning and development of the 2022 World Cup to be held in Qatar. His contributions specifically involved microstructural analysis of the hydration, and subsequent propensity for environmentally-induced damage, of calcium sulfoaluminate type cements.

During his Ph.D., Dr. Jen assisted in teaching several graduate and undergraduate courses on the properties and performance of construction materials in the Department of Civil and Environmental Engineering at the University of California, Berkeley.

Academic Credentials & Professional Honors

Ph.D., Civil and Environmental Engineering, University of California, Berkeley, 2014

M.S., Civil and Environmental Engineering, University of California, Berkeley, 2006

B.S., Structural Engineering, University of California, San Diego, 2004

Carlson-Polivka Fellowship, U. of California, Berkeley

Popert Fellowship, U. of California, Berkeley

Outstanding Graduate Student Instructor Award, U. of California, Berkeley

Licenses and Certifications

Licensed Professional Civil Engineer, California, #88013

Licensed Professional Engineer, Colorado, #PE.0054944

Certified Concrete Slab Moisture Technician (ICRI)

Certified Xactimate 28 User (Level 1)

Certified Haag Inspector (Residential and Commercial Roofing)

Professional Affiliations

American Concrete Institute — ACI

American Society of Civil Engineers — ASCE

International Concrete Repair Institute — ICRI

Publications

Skalamprinos S, Jen G, Galan I, Whittaker M, Elhoweris A, Glasser FP. The synthesis and hydration of ternesite, Ca5(SiO4)2SO4. Cement and Concrete Research 2018; 113:27-40.

Nguyen W, Duncan JF, Jen G, Ostertag CP. Influence of matrix cracking and hybrid fiber reinforcement on the corrosion initiation and propagation behaviors of reinforced concrete. Corrosion Science 2018; 140:168-181.

Jen G, Strompinis N, Jones MR. Chloride ingress in a belite-calcium sulfoaluminate cement matrix. Cement and Concrete Research 2017; 98:130-135.

Jen G, Skalamprinos S, Whittaker M, Galan I, Imbabi MS, Glasser FP. The impact of intrinsic anhydrite in an experimental calcium sulfoaluminate cement from a novel, carbon-minimized production process. Materials and Structures 2017; 50(2):144.

Beltagui H, Jen G, Whittaker M, Imbabi MS. The influence of variable gypsum and water content on the strength and hydration of a belite-calcium sulfoaluminate cement. Advances in Applied Ceramics: Structural, Functional and Bioceramics 2017; 116(4):199-206.

Skalamprinos S, Whitaker M, Jen G, Galan I, Imbabi MS, Glasser FP. Towards a new generation of calcium sulfoaluminate cements. Cement and its Applications 2016; 6:75-79 (In Russian).

Hanein T, Galan I, Elhoweris A, Khare S, Skalamprinos S, Jen G, Whittaker M, Imbabi MS, Glasser FP, Bannerman MN. Production of belite calcium sulfoaluminate cement using sulfur as a fuel and as a source of clinker sulfur trioxide: pilot kiln trial. Advances in Cement Research 2016; 28(10):643-653.

Jen G, Ostertag CP. Experimental observations of self-consolidating hybrid fiber reinforced concrete (SC-HyFRC) on corrosion damage reduction. Construction and Building Materials 2016; 105:262-268.

Jen G, Trono W, Ostertag CP. Self-consolidating hybrid fiber reinforced concrete: Development, properties and composite behavior. Construction and Building Materials 2016; 104:63-71.

Blunt J, Jen G, Ostertag CP. Enhancing corrosion resistance of reinforced concrete structures with hybrid fiber reinforced concrete. Corrosion Science 2015; 92:182-191.

Trono W, Jen G, Panagiotou M, Schoettler M, Ostertag CP. Seismic response of a damage-resistant recentering posttensioned-HyFRC bridge column. ASCE Journal of Bridge Engineering 2015;

20(7):04014096.

Panagiotou M, Trono W, Jen G, Kumar P, Ostertag CP. Experimental seismic response of hybrid fiber-reinforced concrete bridge columns with novel longitudinal reinforcement detailing. ASCE Journal of Bridge Engineering 2015; 20(7):04014090.

Moreno D, Trono W, Jen G, Ostertag CP, Billington S. Tension stiffening in reinforced high performance fiber reinforced cement-based composites. Cement and Concrete Composites 2014; 50:36-46.

Conference Proceedings and Presentations

Nguyen W, Jen G, Duncan J, Ostertag CP. Effect of hybrid fiber reinforcement on corrosion-induced damage of reinforced concrete. In Saouma V, Bolander J, Landis E (Eds.), Proceedings of the 9th International Conference on Fracture Mechanics of Concrete and Concrete Structures. Berkeley, CA, 2016.

Beltagui H, Whittaker M, Jen G, Imbabi MS, Glasser FP. The role of gypsum content on the durability of C$A cements in sulfate rich environments. In Imbabi MS (Ed.), Proceedings of the 35th Cement and Concrete Science Conference. Aberdeen, Scotland, 2015.

Jen G, Nguyen W, Ostertag CP. Influence of HPFRCC on corrosion initiation and corrosion propagation. In Reinhardt HW, Parra-Montesinos GJ, Garrecht H (Eds.), High Performance Fiber Reinforced Cement Composites 7 (pp. 497-504), 2015. Dordrecht, New York: Springer.

Nguyen W, Jen G, Ostertag CP. Tension stiffening effect of reinforced high-performance fiber-reinforced cementitious composites. In Reinhardt HW, Parra-Montesinos GJ, Garrecht H (Eds.), High Performance Fiber Reinforced Cement Composites 7 (pp. 417-424), 2015. Dordrecht, New York: Springer.

Trono W, Jen G, Ostertag CP, Panagiotou M. Tested and Modeled Seismic Response of a Rocking, Post-tensioned HyFRC Bridge Column. In Kapur J, Ostrom T (Eds.), Proceedings of the Seventh National Seismic Conference on Bridges & Highways, Paper No. C3-5, 2013. Madison, Wisconsin: Omnipress.

Jen G, Ostertag CP. Plenary Lecture: High Performance Hybrid Fiber Reinforced Concrete Composites for Durable and Sustainable Construction. Presentation, Durable Composite Systems (Duracosys), Brussels, Belgium, 2012.

Jen G, Ostertag CP. Mitigating alkali-silica reaction through crack control. Presentation, ACI Spring Convention, Dallas, TX, 2012.

Jen G, Ostertag CP. Resistance to corrosion induced cracking in self consolidating hybrid fiber reinforced concrete. In Parra-Montesinos GJ, Reinhardt HW, Naaman A (Eds.), High Performance Fiber Reinforced Cement Composites 6 (pp. 163-170), 2011. Dordrecht, New York: Springer.

Trono W, Jen G, Moreno D, Billington S, Ostertag CP. Confinement and tension stiffening effects in high performance self-consolidated hybrid fiber reinforced concrete composites. In Parra-Montesinos GJ, Reinhardt HW, Naaman A (Eds.), High Performance Fiber Reinforced Cement Composites 6 (pp. 255-262), 2011. Dordrecht, New York: Springer.

Moreno D, Trono W, Jen G, Ostertag CP, Billington S. Tension-stiffening in reinforced high performance fiber-reinforced cement-based composites under direct tension. In Parra-Montesinos GJ, Reinhardt HW, Naaman A (Eds.), High Performance Fiber Reinforced Cement Composites 6 (pp. 263-270), 2011. Dordrecht, New York: Springer.

Peer Reviewer

KSCE Journal of Civil Engineering

Advances in Applied Ceramics

ASTM Journal of Advances in Civil Engineering Materials

International Journal of Sustainable Built Environment