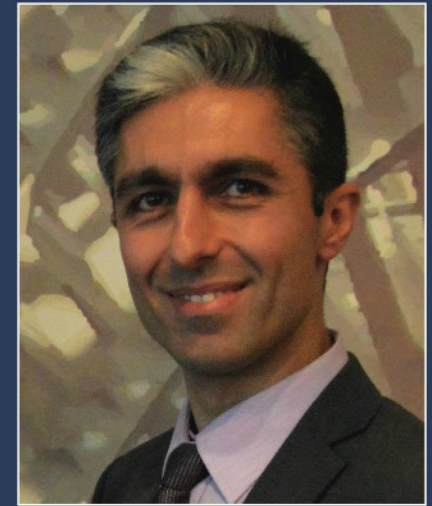


Microstructure map computed for first repair phase as part of a repair engineering project on a cracked drum. From left to right; Bainite, Pearlite, Ferrite, & Hardness.

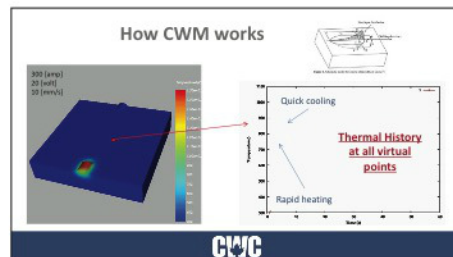
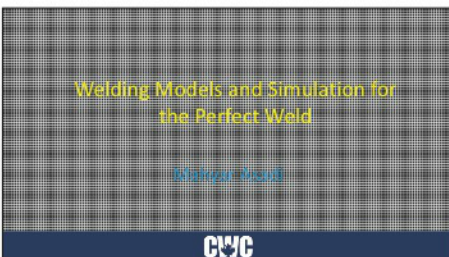


**MAHYAR ASADI**  
SKC Engineering

## Welding Models and Simulation for the Perfect Weld

Welding models, simulation algorithms, and computational welding mechanics (CWM) are now mature and can predict thermal, microstructural and mechanical aspects of welding with a good level of reliability. In addition, the fast-growing power of computation helps make the use of large and complex welding models much more feasible in terms of time and cost for actual structures. In other words, welding engineers are now capable of using modern high power computing methods for designer driven optimization of welded structures and related welding procedures for all levels of application. Using such a capability supports welding engineers allowing them to apply their creativity, expertise and skill to be optimal, more productive, and innovative when developing solutions to welding problems. The author will demonstrate projects performed and present the benefits of using welding models and simulation; and more importantly the synergy of combined welding modeling capability with extensive practical experience of welding engineers. This enables them to design and deliver complex methods for control of distortion, residual stress, sequence planning, microstructure control, fracture, and repair welding on high value assets.

Mahyar Asadi received his engineering degree in Material Science and Engineering (1999), and his Master's degree in Welding Engineering (2001). He started working in the automotive industry, and was promoted to manager of the engineering department. Later he obtained his PhD in Computational Welding Mechanics (2011) and joined companies for high-end services of welding engineering. Meanwhile, he lectures university-welding-courses. He is also licenced as a Professional Engineer in Ontario and BC. Currently, he is with SKC Engineering in Vancouver working on designer-driven welding optimization, simulation and delivering the perfect weld, as well as lecturing at UBC.



- Mahyar Asadi, Sepher Gerami, Mathew Smith



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