Online computational tool revolutionizes traditional welding processes

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calculations.ewi.org

Engineers at the heavy-manufacturing and energy industries today have access to a new online welding simulation tool, E-Weld Predictor, thanks to the Ohio Supercomputer Center's Blue Collar Computing™ initiative and a partnership between OSC and Edison Welding Institute (EWI).

This on-demand product will allow welding engineers to evaluate the changes in temperature profiles, material microstructures, residual stresses, and welding distortion to reduce the number of experimental trials during the design of welded joints – and ultimately improve productivity and profitability.

Currently, experimental welding procedure trials can be cost prohibitive due to the myriad of geometrical, process, and material combinations. By using E-Weld Predictor, engineers can explore a wider range of "what if" combinations and simulations. This results in a decrease in prototype costs and quicker production because E-Weld Predictor manages the "heavy-lifting" associated with evaluating multiple alternatives. The number of trials also will be reduced since only the most promising welding procedures are sent to the mock-up stage.

OSC programmers worked with EWI on the engineering application and collaborated on the user interface design, developing the final Web layout and the middleware. The Center also is hosting the application on its supercomputers.

"For the last two decades, simulation tools of this kind were only accessible to large-scale industries who could afford the expertise, technology, and infrastructure required to take advantage of these simulation tools. However, the launch of this service levels the playing field," said Henry Cialone, CEO of EWI.

The first launch of E-Weld Predictor is focused on arc welding processes and is primarily for steel pipe and plate weld simulation. Additional processes and applications, including automotive applications, will be evaluated for rollout in future versions. Meanwhile, a similar partnership with PolymerOhio will bring the same supercomputing access to small-and medium-sized plastics and polymer companies throughout Ohio.