

Accepted Manuscript

Prediction of welding residual stress with real-time phase transformation by CFD thermal analysis

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PII: S0020-7403(16)30963-8
DOI: [10.1016/j.ijmecsci.2017.06.046](https://doi.org/10.1016/j.ijmecsci.2017.06.046)
Reference: MS 3775



To appear in: *International Journal of Mechanical Sciences*

Received date: 1 December 2016
Revised date: 9 June 2017
Accepted date: 26 June 2017

Please cite this article as: Jason Cheon , Suck-Joo Na , Prediction of welding residual stress with real-time phase transformation by CFD thermal analysis, *International Journal of Mechanical Sciences* (2017), doi: [10.1016/j.ijmecsci.2017.06.046](https://doi.org/10.1016/j.ijmecsci.2017.06.046)

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Highlights

- A new method of numerical thermal-metallurgical-mechanical analysis is proposed.
- A new thermal-metallurgical strain behavior of welding process is proposed.
- A simple volumetric strain balance was used to describe the strain history.
- The phase transformed weldment is apparently not always expanded.
- The stress concentration was affected due to the phase dependent strain and yield strength.

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