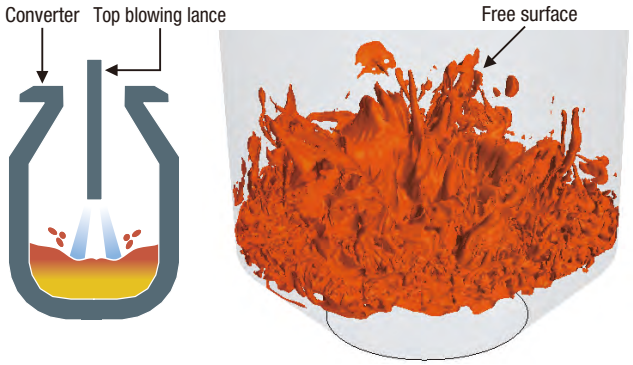
Numerical Simulation

The endeavor to practically apply our state-of-the-art simulation techniques, in the fields of thermal fluid, structural and computational materials science, makes important contributions in the development of new production processes, evaluation and application technologies of materials.

Process Simulation

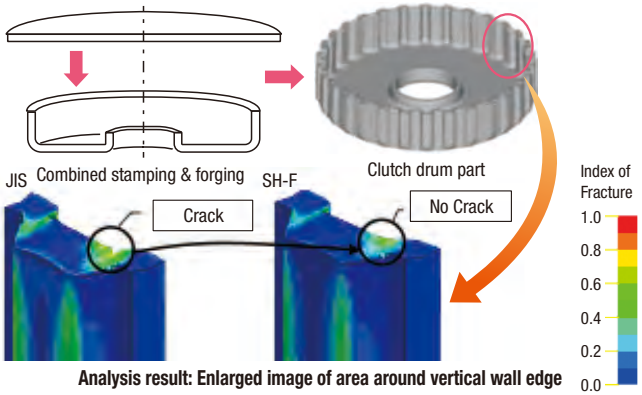
By applying highly precise simulation techniques to complex phenomena involving heat transfer, fluid dynamics, chemical reactions, etc., it is possible to predict and evaluate the effect and influence of studies of equipment introduction and operational improvement in advance.



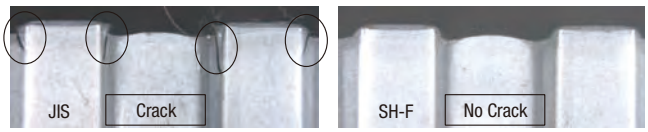
Example of analysis of disturbed free surface by the top blowing jet in a steelmaking converter

Material Evaluation & Utilization (Structural Analysis)

Computer Aided Engineering (CAE) makes it possible to predict the formability, strength, stiffness and crashworthiness of various products. Virtual experiments based on the prediction results can greatly reduce the time, trouble and cost necessary in the design, trial manufacture and testing of new products.



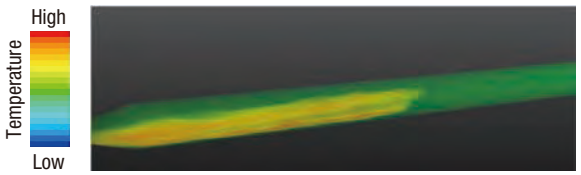
Analysis result: Enlarged image of area around vertical wall edge



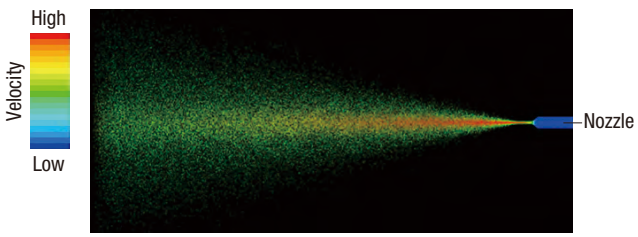
Experimental result: Enlarged photo of area around vertical wall edge

High Performance Computing

We are focusing on larger scale and more complex analyses by using the super computers and GPGPUs.



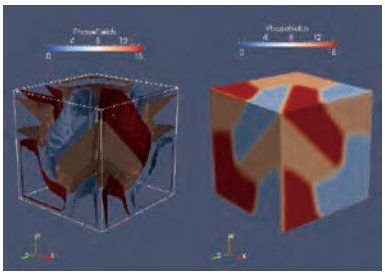
Example of non steady state simulation of pulverized coal combustion by the super computer



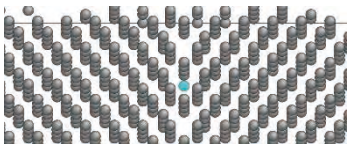
Example of analysis of cooling water jet behavior by GPGPU

Computational Materials Science

The importance of computational simulations in materials development is increasing by the day. Our aims include practical application of the Phase Field method and molecular dynamics as promising technologies for the future.



Phase Field simulation of martensite transformation



Molecular dynamics simulation model of diffusion behavior of H atoms in bcc Fe