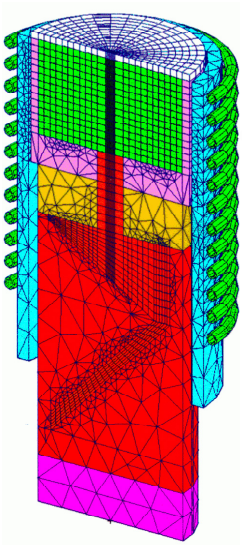
OAK RIDGE NATIONAL LABORATORY FACT SHEET
MANAGED BY UT-BATTELLE FOR THE DEPARTMENT OF ENERGY

Scientific Computing Within the ORNL Modeling and Simulation Group: Engineering Systems Analysis: Materials Processing Modeling

The ORNL Modeling and Simulation Group (MSG) develops sophisticated numerical solutions for a wide range of scientific, engineering, and operational applications. MSG core competency is computational physics and engineering, and within this context we have extensive expertise modeling metallurgical manufacturing processes. MSG staff have considerable expertise applying state-of-the-art commercial, in-house, and public-domain software to a broad range of materials processing applications. This analysis expertise includes the following.

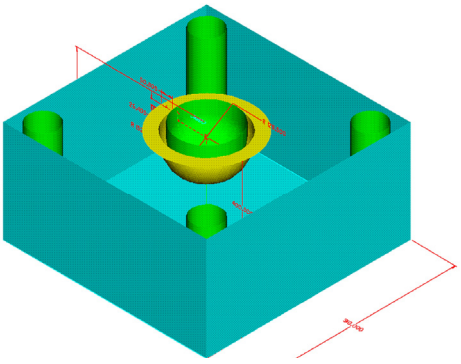
- **ProCAST** for vacuum-casting and injection-molding modeling.
- **ABAQUS/Standard** for solids, superplastic forming, and deformation modeling.
- **P/THERMAL** and **P/VIEWFACTOR** for inverse heat-conduction and quench analysis.
- **P3/PATRAN** for geometry model construction.
- **CFX** for non-casting fluids analysis.
- **BEPLATE** for electroplating simulation.
- **FAVOR** for deterministic and probabilistic fracture mechanics.
- **OPTQUEST and GRG2** for design optimization.

These applied scientific computing capabilities represent an extremely versatile modeling and simulation resource that can be applied across a broad range of R&D, industrial, homeland defense, and military applications. We welcome the opportunity to discuss your potential metallurgical modeling applications and ways MSG can contribute to a solution.

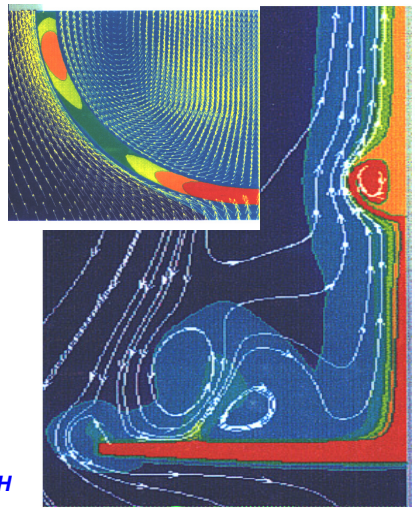


NEAR NET SHAPE VACUUM INDUCTION CASTING

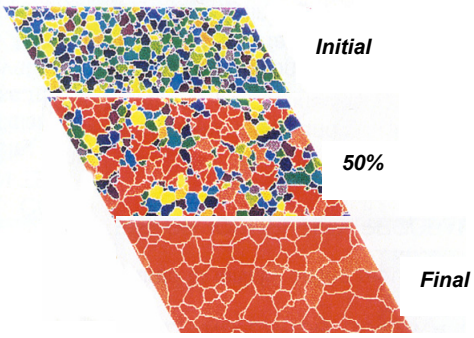
THIN SHEET FORMING



ELECTROFORMING



IMMERSION QUENCH



GRAIN RECRYSTALLIZATION

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