ALPHASTAR ICME TECHNOLOGY APPLIED TO ADDITIVE MANUFACTURING

Melt Pool Engineering
- Calculate dynamic changes in melt pool based on process parameters (e.g., power, speed)
- Identify parameter configurations that maximize build quality of PBF parts

Material Modeling
- Develop materials for AM specific applications
- Generate anisotropic properties for material qualification
- Predict mechanical properties for metals i.e., fracture/fatigue

Thermal Process Simulation
- Toolpath driven thermal history
- Considers g-code, and variable print parameters

Raster Air Gaps Assessment
- Predict slicing or coverage gaps from toolpath raster
- Map macro-voids to structural analysis
- Used for process simulation and in-service load analysis

Mechanical Build Simulation
- Map transient temperature distributions to FE mechanical model
- Predict defects during print, and effect of defects on part performance
Predictive Digital Twin
Simulation of Deformed Shape Compared to 3D Scanned Data

Heatmap of Simulation
Heatmap of Printed Part

Stratasys F900 ULTEM 9085 Duct Model