

Computer modeling of direct metal laser sintering

by

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A computational approach to modeling direct metal laser sintering (DMLS) additive manufacturing process is presented. The primary application of the model is for determining the temperature history of parts fabricated using DMLS to evaluate residual stresses found in finished pieces and to assess manufacturing process strategies to reduce part slumping. The model utilizes MSC SINDA as a heat transfer solver with imbedded FORTRAN computer code to direct laser motion, apply laser heating as a boundary condition, and simulate the addition of metal powder layers during part fabrication. Model results are compared to available data collected during *in situ* DMLS part manufacture.