

Solution of a thermal distortion issue in a StainlessSteel Steering Support by using AM process simulation early in the Design for Additive Manufacturing cycle (Sim-AM 2019)

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ABSTRACT

ANSYS and ProM established a partnership to explore the power of ANSYS Additive Manufacturing Suite in real applications where costs and reliability of the printing process are critical such as in the design and production of Formula SAE car parts.

We present the outcomes of the first joint work of validation and printing of a stainless steel Steering Support and the benefits of the adoption of Additive Process Simulation in the design stage instead of the classical trial and error approach used in Design for Metal Additive Manufacturing.

The work done includes actual part printing and metrology measurements to quantify simulation vs experiment deviation: very good agreement with experimental measurements (± 0.23 mm deformation and less than 0.5deg in angle distortion vs nominal shape) was found thanks to an accurate prediction of the printing process and the subsequent automatic calculation of the compensated geometry.

The use of simulation in the DfAM allowed ProM to print the right part in one burst.