

Desktop Printer Drop Correlation and Simulations



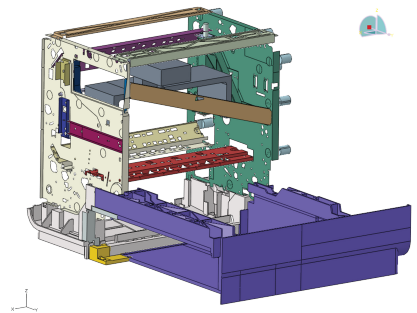
Case Study

OVERVIEW

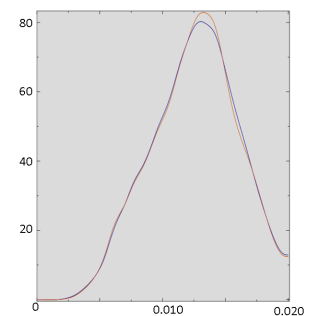
Hewlett-Packard (HP) has developed a new high-performance printer that greatly enhances the productivity and quality of office printing operations. As part of their printer development, HP must verify that their printers can maintain operability in the event of drops during the transportation or installation process. Rather than go through costly fabrication and drop-test cycles, a limited drop-test program was coupled with model correlation and analytical drop simulations. ATA provided key analysis and test support to compress the design lifecycle by several months and yield a more optimal product to the business market.

TASKS PERFORMED & KEY OUTCOMES

- Advised HP on accelerometer locations for limited modal tests and drop tests
- Correlated dominant mode shapes and frequencies of the finite element model (FEM) to the modal test to improve accuracy of drop simulations
- Performed nonlinear implicit drop simulations and adjusted the FEM to drop test data
- Scrutinized analytical drop simulation results to determine regions of structural weakness within the preliminary design and provided feedback to design engineers to improve drop survivability
- Rapidly evaluated several design iterations utilizing the test-verified model to converge upon on a final design
- Compressed the schedule by eliminating the need for multiple fabrication/ test iterations, resulting in substantial cost savings and acceleration of product release



Finite element model (element lines removed) used for modal analysis and drop simulations



Simulated print-bar acceleration due to drop