SMART TOOLING

COMPLEX GEOMETRY
Y-SHAPED VENT TUBE

Learn more about how commercial aircraft composite parts with two appendixes can be made with an elegant, reusable process

PREVIOUS PROCESS

The baseline process was to lay-up this aerospace grade, Y-shaped vent tube in two halves into the female cavity of the cure mold that were joined for cure. This frequently resulted in the laminate being pinched and uneven. It also forced the lap joints to be staggered over the same area, resulting in a thicker composite part with inconsistent strength.

SMART TOOLING PROCESS

Smart Tools are rigid at room temperature and after the addition of a barrier film or other release layer, prepreg can be laid up on the rigid Smart Tool with butt joints staggered around the part to result in a 360 degree cured composite part with consistent thickness and strength.

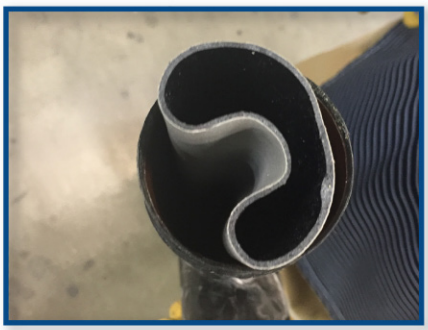
This Y-shaped vent tube also needed a non-permeable liner co-cured on the inside of the composite vent tube. This liner did not stick to barrier films so Smart Tooling manufactured the bladder with a cured release coating that the liner could stick to and it still allowed the Smart Tool to easily be released from the cured composite part.

This new method of manufacture allowed the Y-vent composite to be produced with consistent thickness & strength, lighter, and at a significant cost savings.

Finished composite vent tube and extracted Smart Tool

Coated Smart Tool with non-permeable liner

Smart Tool inside cured composite vent tube



Elastic Smart Tool being extracted