

**APPLICATION PROFILE**

# **AEROSPACE**

Pneumatics

Challenge: **AEROSPACE COMPONENTS COMPOSITE MACHINERY**

Location: **WORLDWIDE**

Flodraulic was challenged with helping a customer design a system for a composite machine to measure and cut tape from a roll at predetermined points.

The mold is of an airplane wing. The tape is laid on this shape of an airplane wing in a crisscross pattern. The mold with the tape attached by adhesive is then shoved into a large oven, heated, and then when it reaches a certain time limit, the mold is removed and the tape, in the form of an airplane wing remains in the oven to cure longer. Our equipment clamps the tape then cuts it so different shapes can be adhered to during the wing forming process.

No other cylinder company would attempt to make the cylinder manifold that SMC proposed. Prior to Flodraulic getting involved, there was one other competitor who tried to make what SMC designed, but it failed miserably. Because space was so tight, SMC designed and built a "cylinder manifold" that integrated six cylinders within a single manifold block as opposed to six separate cylinder tube assemblies. The cylinders fire at the end of a programmed tape run to cut the tape, which is dispensed by a robot.

There were some initial challenges when it came to seal and fluid compatibility. The end customer performed wash downs with an acetone based fluid. This caused SMC to move away from its standard seals and go with a seal made of ethylene-propylene (EPDM). They had very little experience with EPDM and discovered, with the seal manufacturer's help, that SMC's standard lubrication grease caused EPDM seals to swell. This, in turn, caused the pistons to freeze-up in the cylinders. SMC quickly and successfully remedied this situation by switching to special "Krytox" grease.

SMC engineering and Flodraulic made a number of visits to the customer to help in the design of their "cylinder manifold." This collaborative effort led to an innovative and successful solution.

