

Customer Brief

Cessna Aircraft Company



Industry

Aerospace

Location

Wichita, Kansas USA

Number of Employees

Approx. 37,000

Avure Equipment

Model QCF (1981) and

Model QFL (2001)

Flexform™ fluid cell presses



High pressure forming produces a variety of complex shapes, at rates up to 120 finished parts per hour.

Cessna marks four decades of successful high pressure parts forming.

Cessna Aircraft Company will soon celebrate its 80th anniversary, and is busier than ever. In terms of unit sales, Cessna is the world's largest manufacturer of general aviation airplanes. In 2005, the company delivered 1,157 jet, turbo-prop, and piston aircraft for business and personal use, and over its history has supplied more than 187,000 airplanes to nearly every country in the world.

Production efficiency is key to Cessna's global competitiveness, and their in-house parts fabrication system is a prime example. Since the 1970s, the company has manufactured virtually all of its sheet metal components using Flexform™ high pressure fluid cell technology from Avure (then known as ASEA/ABB).

The Flexform concept

In Flexforming, sheet metal blanks are formed over a single, rigid, shape-defining tool half by a flexible rubber diaphragm under uniform hydraulic pressure. Tools and blanks are placed, without fixing, into trays on each end of the press, which shuttle in and out of the central frame containing the pressurized diaphragm.

Cessna's large QCF press features 13.1 ft. x 4.4 ft. (4 x 1.35m) forming trays and a maximum operating pressure of 14,500 psi (100 MPa, a pressure generating a force equivalent of 72,000 tons). This is used primarily to produce large panels and components from aluminum blanks ranging in temper from T4 to O. The more complex the shape, the softer is the temper.

High quality parts the first time

Cessna has become proficient in high pressure forming at their Wichita, Kansas facility. Multiple parts can be processed in a single three-minute cycle with little or no secondary work. Mike Irwin, Cessna's Manufacturing Manager, says "We are very confident with the quality of the parts out of the press. The metal spreads out evenly, and there's very little 'tweaking' needed".

This one-shot accuracy is a result not only of Cessna's years of experience with Flexforming, but also of their skill in designing and machining nearly all their own hydroblock tool halves. Blanks can be cut smaller, to final net size, eliminating post-cycle trimming.



Expanded forming capacity

Sixty percent of Cessna's sheet metal parts are very small, and in 2001, the company decided to improve its efficiency with these parts by purchasing a second Flexform press. This was a new design from Avure, a Model QFL 1.1-800 with smaller 3.6 ft.(1.1m) diameter circular forming trays and shorter cycle times. The results have been very positive:

"We can control the pressure more accurately on small parts in this press," says Mr. Irwin, "and eliminate even more touch labor. The press is easy to operate, is ergonomically friendly, requires little time to train operators, and needs little maintenance."

As part of a conversion to lean manufacturing, the new press has cut forming cycle times to 1.3 minutes, producing 120 finished parts per hour. All pressing operations have been consolidated in a single location to reduce parts handling. Production queues have been eliminated for formed parts, and the lead time has decreased from three days to one.

Avure Technologies

The Flexform presses at Cessna were designed, manufactured and installed by Avure Technologies in Vasteras, Sweden. With headquarters in Kent, Washington USA and a facility in Columbus, Ohio USA, Avure specializes in high pressure presses for metal forming, densification of critical industrial parts, and food preservation. Avure and its predecessor companies have been developing the application of high pressure technology for more than 50 years.

Corporate Headquarters:

Avure Technologies, Inc.
22408 66th Avenue South
Kent, WA 98032
U.S.A.
Phone: +1 800 610 1798
Fax: +1 253 981 6350

Sales in the Americas:

Avure Technologies, Inc.
3721 Corporate Drive
Columbus, OH 43231
U.S.A.
Phone: +1 614 891 2732
Fax: +1 614 891 4568

Sales and Manufacturing:

Avure Technologies AB
Quintusvagen 2
SE 72166
Vasteras, Sweden
Phone: +46 21 327000
Fax: +46 21 141817



Cessna's two Flexform presses each feature Quintus™ wire-wound technology to reinforce the pressure vessel and frame.



The Model QFL precisely forms multiple parts in a single 1.3 minute cycle.

For more information
about Avure and our
offerings, please visit:

www.avure.com

or email:

sales@avure.com

