

Customer Brief

Tusas Aerospace Industries, Inc. (TAI)



Industry
Aerospace

Location
Ankara, Turkey

Number of employees
2,400

Avure Equipment
Model QFC (1988) and
Model QFL (2004)
Flexform™ fluid cell presses



TAI's new Flexform press features fast setup and single-operator efficiency.



Multiple parts can be precisely formed in a single 2-3 minute cycle.

High Pressure Parts Forming at TAI

Established in 1984, Tusas Aerospace Industries, Inc. (TAI) has grown to become the largest aircraft manufacturer in Turkey, and is emerging as a globally recognized supplier of aerospace vehicles and components for both commercial and military customers.

TAI produces most of its own components in-house, and has invested heavily in advanced technology machinery within its 160,000 sq. meter facility in Ankara. In 1988, the company decided to manufacture the bulk of its formed sheet metal parts using a QFC Flexform™ fluid cell press from Avure Technologies (formerly ABB Pressure Systems).

Fluid cell technology

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.

The press at TAI features large 120x270 cm trays (47x106"), forming pressures up to 140 MPa (20,000 psi, a pressure force equivalent of 72,000 tons), and cycle times from two to three minutes. TAI has found the process to be very cost-efficient since multiple parts in differing materials (aluminum, stainless steel and titanium) and in varying thicknesses can be formed in a single cycle with little or no secondary work required.

Finished parts, even complex shapes with undercuts, consistently meet close tolerance specifications. Labor time, including setup and tool changes, averages a respectable 9 minutes per part.



Adding flexible capacity

In 2004, TAI purchased a second Flexform press from Avure, a Model QFL with smaller circular trays. This press was to support the Boeing Wichita Project and also provide a more flexible system for producing short runs of a wide range of smaller parts. İlhami Tanyolu, TAI's Manufacturing Manager, believes the investment in the QFL has been more than justified:

"The quality of the parts meets the same standards set by the original press, but setup time is reduced remarkably, about 2.5 minutes less per part. Only one worker is required on the new press, compared with two on the larger model, and overall labor time per part has been cut by 60 percent, from 9 minutes to 3.6 minutes."

İlhami Tanyolu,
Manufacturing Manager

Sharing technology

In addition to its growing manufacturing capabilities, TAI is contributing its research and software expertise through the recent construction of the TAI R&D buildings at the Middle East Technical University Technology Development Zone, known as "Technocity". With the support of consultant professors and students from several universities, TAI is engaged in a series of ongoing R&D projects that will ultimately benefit the national economy.

Avure Technologies

The Flexform presses at TAI 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. Avure Technologies is a wholly-owned subsidiary of The Gores Group, a private equity firm based in Los Angeles, California.



TAI produces aircraft and component parts in this modern complex in Akinci-Ankara, Turkey

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