



Bellows Forming System

Bellows Hydroforming:

A Bellows form can be produced in a hydroforming press using a variety of alloys, particularly those with good elongation. The metal tube is placed inside the desired Bellows shaped tooling and the ends are sealed. The forming fluid fills the part. Intensifier pressure is used to bulge the tube enough to extend into the tooling plate gaps. The tooling plates are collapsed using an actuator until the bellows is formed. This approach to bellows forming provides a more repeatable process than standard methods.

Advantages of the ITC System:

- System design specific to convolute diameter from 1/8" to 16".
- Specific pressures from 5000 to 30,000 psi.
- Closed-circuit feedback to verify proper control and successful completion.
- The system has highly repeatable control to maintain tight tolerances minimize tool impact during movement.

Design:

The following tools and processes are used to determine feasibility and needs:

- Finite Element Analysis (FEA), Simulation, Tool Design, Tool Build, Die Tryout, and Prototype.
- Systems are designed to your facility, your floor space.
- Multiple, scalable channels of I/O are available.
- Systems are designed automation-ready.
- Friendly and intuitive software allows you to write your own recipes.





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ITC provides full service Bellows forming support:

Simulation:

Using simulation tools like Finite Element Analysis (FEA), we can swiftly perform a variety of measures and analyses with precision. This leads to informed decisions on necessary press forces, forming forces, and hydroforming pressures specific to a Bellows application. There's no need to build and test when ITC can simulate and prototype. Especially when we meet performance criteria on the first try. Customers continue to be impressed with ITC's ability to rapidly validate designs and promptly release into production. A sample simulation report is shown in the figures at right. It demonstrates the strain state of the material and the associated forming limit diagram.

Tooling:

Next is the creation of the tooling. ITC will design tooling to meet your determined specifications. Then we'll design and build your Hydraulic Bellows Hydroforming press. Press Size is determined by the size of the convolutes. ITC defines Small as 1/8" to 1", Medium as 1.5" to 3.5" and Large as 4" to 16" convolute diameter. This includes a fluid pressure intensification system. Once you're up and running, the partnership continues with project management, training, and service and support.

Collaboration:

ITC people possess the skills and abilities to help you achieve your goals. We'll work with you as a collaborator, encouraging you to lean on us. We'll build your design, and we're eager to go deeper. ITC engineers will develop, test, analyze, build samples, and create tailored products. At the same time we'll search for a better and more cost effective way to solve the problem. We don't just listen; we'll hear you and advise you.

