Case Study: Prototying Leads to a Feasible Design & Manufacturing Process

Customer

Industrial Automation Manufacturer

Part

Industrial Automation Frame

Manufacturing Issues

1. Increasing production costs.
2. The welded assembly wasn't strong enough to stop leakage problems from occurring.
3. Inconsistency in the frame was making hardware insertion difficult and timely.
4. Forming the aluminum frame was challenging because of its inherent softness.

Customer's Goal

Reduce production costs with an improved manufacturing process. Remove the need for welding in the frame and increase the part's strength. Develop a consistent and accurate method for hardware insertion.

Redesign Process

This two-piece aluminum frame, **27" long x 12" wide**, required welded assembly and contained multiple pieces of hardware. First, the redesign began with a form analysis to establish the manufacturability of the proposed one-piece design**.** Then various grades of aluminum were tested to identify the specific aluminum that would be strong enough for the new design. This included **shock and vibe tests** on the different types of aluminum until the results met the customer's standards. This entire prototyping process ensured the frame could meet its performance requirements in an industrial environment.

Second, we designed and built a progressive die to support this new one-piece design. Throughout the prototyping we utilized our fiber laser to cut different strip configurations and fine tune the die design to eliminate wrinkles.

Third, to improve accuracy and productivity during hardware insertion we utilized our Pemserter. This equipment has the capability to insert all the required hardware including three different types within one-set up.

Prototyping Leads to a Feasible Design & Manufacturing Process

Customer Outcome

This redesign created a more efficient manufacturing process that lowered costs and improved the frame's quality.

Prototyping provided 100% assurance that the frame would function hassle-free.

The customer selected Ultra to redesign their even larger frame – **35" long x 17 wide"** with a similar shape and hardware insertions.