Orbitform

...solutions delivered.

Finding Solutions for YOUR Riveting/Forming/Fastening Assembly

PART FAILURE

IS NOT AN OPTION

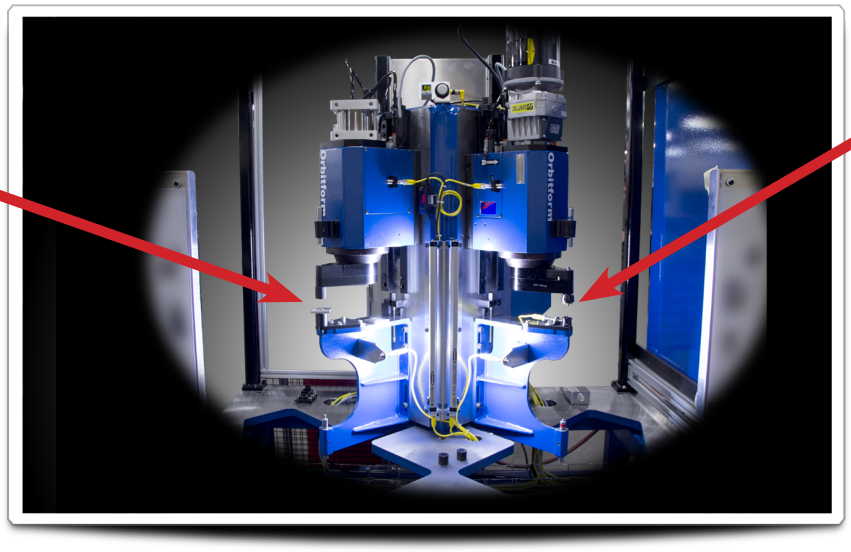
An Orbitform White Paper

INTRODUCTION

Manufacturers need to assure their customers that their products will function as promised, therefore suppliers need to provide parts in perfect working order. Part failure not only causes damage and affects opperation, production and performance, but it can impact your company brand and reputation.

If your part assembly has a wide tolerance range and can be approved visually, you are in great shape. However if you have tight tolerances it would befit everyone if the forming process was monitored, and collected assuring a flawless part was created.

CASE STUDY

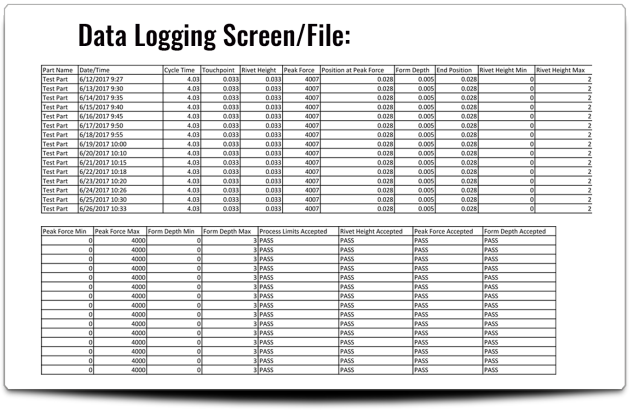


Significant challenges exist in manufacturing and assembly for the aerospace industry, both as a result of the tight tolerances required, and the organic shapes associated with weight saving parts. Orbitform had to accommodate both of these issues while designing a machine to permanently fix small, self-aligning bearings to the blocker doors of commercial airliners.

The eyelets that were required to hold the bearings on the back of the blocker doors had a parallel centerline located only 1.5" from the back face of the door. This left approximately 1" in diameter to hold all the bearings and industry standard tri-roller swaging tool. Additionally, special gearing was designed to offset the tooling and provide enough clearance for the large parts.

The aerospace industry requires tighter tolerances and has higher inspection standards than most areas of manufacturing, so it is important to prove out any new machine or concept. Orbitform designed an adjacent testing station to measure any axial displacement caused when a push-out force of 1,100 pounds was applied to the bearings. Each pair of bearings on the blocker doors had to stay within the .003" maximum, from both sides. Not only did the machine have to accommodate four forming positions per part, but all four sides had to be tested as well. With five different part configurations, Orbitform was able to design a machine that can finish and test assemblies quickly, and to tighter tolerances than was previously possible. The former process was done by hand, and was entirely dependent on operator skill. Orbitform was able to statistically eliminate failed parts. Adding process intelligence and part scanning along with our newest option, data logging allows for the forming data to be saved and recalled at a later date and time.

SOLUTION DETAILS



The Orbitform Data Logging system is a simple solution for customers looking to export and log data created during an industrial process. The system utilizes an industrial touchscreen panel PC that communicates with the machine's PLC. The data logging and communication functions are carried out by the proprietary data logging software that is installed on the PC. This software is custom tailored to the specific application, and can be designed with as much (or little) flexibility as the customer desires. Once exported, the data can be simply stored, or it can be processed for SPC and quality analysis.

The data logging hardware and software are configured to automatically launch and run when the machine powers up, making it entirely standalone and turn-key. The data is generally collected from the PLC at the end of every auto cycle, and is stored in the form of a .csv file that can be opened by any .csv-capable reader, such as Microsoft Excel. The data files are stored on the local PC hard drive but can be retrieved by the customer either remotely or locally.

The forms of data produced by the process that a customer may want to capture are limitless but could include process limits, forming data, testing data, cycle data, time/date stamp, part number, job number, or employee/shift information. The PLC data could be raw data produced by analog sensors or calculated data produced by PLC logic, and can be in any form, whether it be floating point, integer, ASCII string, or discrete "bits", such as those indicating a pass/fail status of a part.

SUMMARY

There are many challenges in the world of manufacturing. The main challenge manufacturers face is the exact specifications their components must meet. The application specific to the example described previously includes small self-aligning bearings attached to blocker doors of commercial airlines.

With the higher inspection standards of the industry in mind, Orbitform designed a two station machine with both forming and testing stations. The testing station made sure that every part met the specifications required. Additionally, this machine formed and tested parts of five different configurations. Incorporating the Orbitform Data Logging system allowed the forming and testing data to be stored for further analysis. The combination of efforts lead to the elimination of failed parts.

The Orbitform Data Logging system uses an industrial touchscreen panel PC that communicates with the machine's PLC. The system uses custom tailored software, designed to show the information that each customer finds relevant. Example data fields include process limits, forming data, testing data, cycle data, and others. This data is stored and can be retrieved by other methods.

At the end of the day, our data logging system provides a data driven, self-evaluation of every part that passes through the assembly. This keeps your process up to and exceeding par, for continual improvement. Orbitform ...solutions delivered.