



John Leininger
Tech Ed
Essex Community Schools
Pella Corporation

Part I: Overview of Workplace

- Pella Corporation
- Started in 1925 in Pella Iowa
- Makes windows and doors for residential and commercial properties
- Shenandoah site opened in 1992 and makes custom windows and doors

Part II: Workplace Focus

- CNC routers used to produce door and window parts
- Holding fixtures for CNC tables,(vacuum tables or pods, vises and jigs)
- CAD/CAM software for the programmers to setup parts to be ran and held during the run
- Examples include curved parts for doors and windows,metal and wood muntins, standard parts

Part III: Introduce the Problem

- Need to be able to route along the bottom edge of wood for door and window parts, this causes concerns for clamping the parts without causing a collision with holding fixtures
- Some complex shapes do not fit with current holding fixtures
- How can we use existing fixtures to run the CNC router around complex shapes and not have a collision with a holding fixture (Existing fixtures removal would take a lot of time to changeover and would not be cost effective

Part IV: Background

- Understand the setup of tooling in the process of making door or windows
- Understand the limitations of the existing clamping
- Research ways modify or add to existing clamping
- Understand the reason why a part needs to be supported during machining

Part V: Workplace Solution

- Use a spoil board to attach the parts while they are machined. Parts are made oversized so screw inserts can be put in the spoilboard to hold the parts down along with double sided tape
- Special inserts were purchased that could be screwed into a steel part. The inserts have a window in them for a special glue to be applied that sets quickly with an ultraviolet light. The wood part will be glued to the metal holding part and then switchable magnets will be placed on the machine bed. The metal holding plates that are glued to the wood parts is this assembly is placed on the magnets and then energized to hold the part for machining.

Part VI: Educational Pathways

- High school graduate
- Tech school
- Four year college degree
- Engineering degree