

## Case Study –Insulation Insertion

This manufacturer HVAC equipment had a labor-intensive process involving picking and placing fiberglass insulation material into formed sheet metal blanks. The assembly becomes the insulating wrap around the outside of air conditioners.

Sheet metal presses sets the line speed. There is a substantial variety of sheet metal sizes that can be formed run in the cell – to cover the size range of the HVAC units. As the presses blank and form the sheet metal, the parts are emptied onto a rough top conveyor and fed into the robotic system. A bank of fixed glue delivery nozzles resides over the conveyor and is triggered by the passing of the sheet metal under a stand. The nozzles apply hot melt glue to the sheet.

The robot is the insulation handler. There are two insulation infeed magazines, these have adjustment features that allow the size range of insulation to be accommodated. The robot is located above the magazines and through conveyor on a riser.

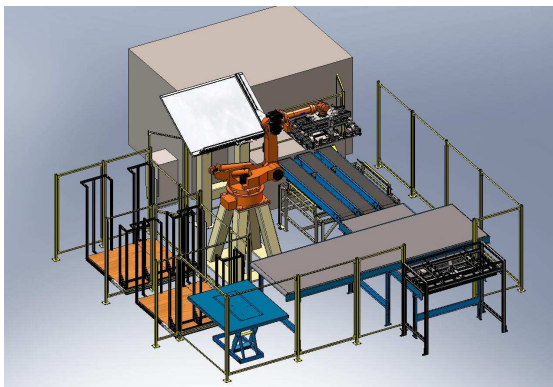
The robot moves to and grips a fiberglass sheet from a magazine, moves to and places the sheet onto a squaring station and grips and carries the sheet to the waiting sheet metal shell.

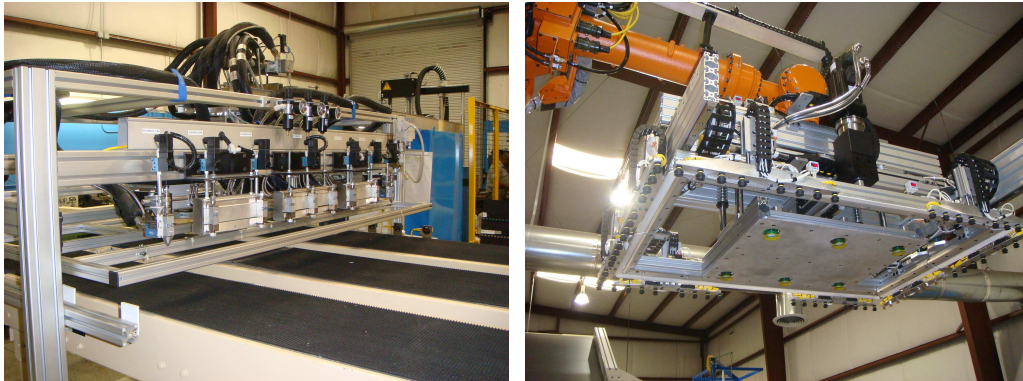
The squaring station is automated. Pneumatic cylinders push the fiberglass sheet into a pick location. The robot then has the fiberglass sheet located properly in the tool for placement into the sheet metal. The end-of-arm tool has two servomotors controlled by the robot controller. The tool automatically adjusts for the size of parts being run.

Once the fiberglass is placed into the sheet metal, by the robot, details in the tool combined with the robot path tuck the fiberglass under folded lips in the sheet metal.

### System Requirements

- 99% uptime
- Part to part changeovers done with no adjustments or change parts
- Tie into the conveyor and line PLC
- Follow the press output
- Provide labor reduction
- Provide consistent throughput





### Description of the Solution

The existing line conveyor and PLC controls were integrated into the robotic system. As the presses provide sheet metal, the glue station and robot respond.

The solution includes TEC sections of conveyor for the cell, the TEC sheet metal stop and squaring unit, NACHI SH200 shelf-mounted robot and TEC riser, TEC fiberglass pneumatic squaring stand, TEC end-of-arm tool and TEC glue station with Nordson hot melt units with bulk unloaders; these are all integrated into one working cell.

The customer's strict requirements for fiberglass placement and tuck quality were adhered to.



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