

CASE STUDY

Vision Guided Robot Handling and Press Loading Range of Fittings

Component: Range of fittings—Straight coupler, 90 elbow, 45 elbow, and Tee Size range—1/2", 3/4", and 1"

Introduction

APL were contracted to design and manufacture an automated press loading system for a range of copper plumbing fittings. The system incorporated a bowl feeder, vision guided robot and control system to accumulate and load fittings into a hydro-form press. The project was for a global leader in the plumbing fittings industry that manufactured a diverse wide range of fittings often with short batch runs and short lead times.

The Challenge

- ⇒ Provide a flexible system that can load various fittings (3 sizes and 21 types) into a hydro-form press
- ⇒ The overall cycle time, loading and unloading were greatly dependant on the forming process time giving a short window for automatic handling
- ⇒ Provide quick and easy changeover between part runs
- ⇒ Limited space & access between the open press tooling

Solution

The components were presented to the robot by a bowl feeder that fed parts onto a pick conveyor mounted below a Robot Vision System. The robot utilized two elements of tooling: Part one included a single vacuum cup that picked single parts from the pick conveyor and placed them into a multi cavity nest.

The 2nd part of the tooling was a multi cavity nest fitted with an umbilical tool changer designed for quick changeover. The unit was also designed for multiple configurations of nests and different component sizes and shapes.

The part nest design was mirrored on both sides and fitted with vacuum cups to hold the product in place. During the robots 1st pass into the cell formed fittings are picked from the press tooling and dropped onto an outfeed conveyor out of the cell. The robot rotates the nest 180 degrees re enters the press and places the raw parts into the empty tooling cavities. The cycle repeats.

The system was supplied with ASI network control system, full perimeter guarding, CE marked, integrated and commissioned onsite with the hydro-forming system.

Key features & benefits

The System:-

- Provides a complete solution simple changeover between components of different sizes and shape
- The component handling system, press and hydro-form are controlled using the robot's built in more efficient PMC
- Improve operator safety by automating press operations.
- Offers cost-saving benefits such as labour and more efficient production speeds
- Offers additional incremental benefits such as reduced downtime and raised standards of health & safety.

All of these benefits deliver a short payback period and impressive return on investment.



<< Vision Guided Robot picks up fittings from a bowl feeder and loads them into a free issue press

