

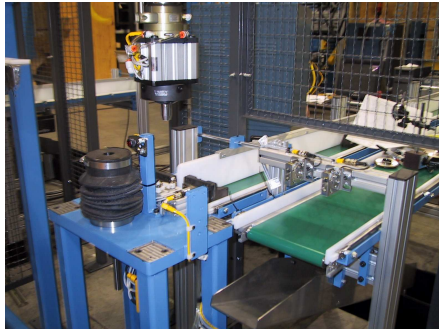
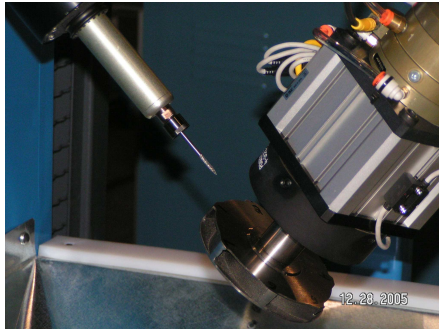
## Case Study – Deburring Pump Impellers

This plant uses dozens of machine tools, various material treatment facilities and assembly stations for the manufacture of oil field pumping equipment. The deburring process here cleaned up machined parts including pump impellers and diffusers. There is a total of over 70 parts to be deburred, each with a unique set of details with regards to dimensions and expected results.

The key to success in this application is the ability to manage the large number of part types and dimensions without reducing the affectivity of the robotic controller to do its job. A cell PC workstation with the **TEC Cell Manager** software, networked to the Staubli CS8C robot controllers, allows us and the customer to have reliable and inexpensive data management for the part programs.

### System Requirements

- Direct labor savings and indirect effects of organizing the environment
- To deburr impeller and diffuser openings and surfaces to a close tolerance
- To deburr parts quickly and consistently so that the cell output doubles the normal manual output in the same footprint
- Process 74 part numbers with the ability to expand the range of parts to be processed in the future
- Run economically and effectively in small batches (typically 100's)
- Create an operator friendly environment with little to no possibility of ergonomic issues
- Operate in such a way that the manual deburr operators will accept the system





## Description of the Solution

TEC designed and built a two-robot cell for each of the impeller and diffuser part ranges for a total of four robots at work. The infeed devices are simple in that they feed to a V-block locating fixture for robotic pick up. The robot orients the part against a part sensor that determines the correct starting point for each part style and size.

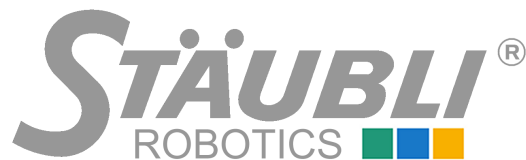
Once oriented, the robot presents the part to the fixed position but compliant ATI deburring tool. The robot manipulates the part in and around the deburring tool till completion then set the part down onto the exit conveyor for return to the cell attendant.

TEC analyzed all of the parts to be run with the customer and discovered key common features and reasons to separate and define parts; these decisions were used to create the overall environment of the cell PC set up screens and operator input points and data.

The set up screens in the cell PC working with the multitasking environment used in the robot controller allow us to pre-configure a new part to a point; then import the remaining part-specific data to complete the robot path generation. The operator's input is based on specific part numbers and information programmed into the cell PC. A new part, therefore, may be set up to run in a few minutes. The **TEC Teach Wizard** software makes the set up and part programming a simple, non-programmer experience.

## Customer Benefits

- Consistent throughput of parts throughout the range
- One asset with the ability to process many parts
- Met the financial and ergonomic goals set forth by the customer
- Drop in solution with a reasonable footprint and high value per square foot
- Safer work environment
- Organized work environment



**TEC is a Staubli Robotics Strategic Partner**

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