

CASE STUDY

AUTOMATED ROBOTIC COMPONENT TRIMMING

The context

A leading FRP manhole and trench cover manufacturer approached Adelphi to automate its manual trimming process, improving consistency, accuracy, and reducing operator dependency.

The challenge

The client needed to improve consistency, quality and safety while supporting future growth. Key challenges included:

Highly variable cycle times

Trimming times varied from 2–12 minutes per component depending on operator skill and speed.

Inconsistent product quality

Manual finishing led to uneven tolerances and dimensional variation.

Limited scalability

Potential future expansion was directly tied to, and limited by, operator performance.

Health and safety concerns

Prolonged exposure to dust and debris posed a potential risk to operators.

Results and benefits

Consistent throughput

Highly variable manual cycle times have been replaced by repeatable, predictable, and reliable trimming times meaning that productivity is now independent of operator variability.

Improved product quality

The use of repeatable robotic paths means that there is tighter process control, delivering a more consistent product.

Improved operational efficiency

The reduced reliance on manual labour has simplified production planning.

Enhanced operational safety

Automating the process helped to eliminate prolonged human exposure to the dust-heavy trimming environment, reducing associated health and safety risks and improving overall working conditions.

Scalable and adaptable production

Improved system flexibility allows the client to now easily introduce any new products, adapt tooling to mirror different finishing requirements and scale output without proportional increases in labour.

The solution

Adelphi delivered a fully automated trimming cell featuring a 6-axis industrial robot and air-driven trimming and deburring spindle. Integration with the existing extraction booth reduced costs and accelerated deployment.

Optimised robot handling

The robot's articulation and reach were configured to handle the largest product size, eliminating the need for further manipulation after loading, simplifying operations and minimising cycle time.

Proven industry standard trimming technology

The selected trimming and deburring spindle is already used widely in the industry ensuring a reliable performance, consistent finishing quality and lower maintenance requirements.

Intelligent programme selection

We created a standardised programme structure to facilitate the quick teaching and replication of trimming paths. A camera-based vision system automatically detects and identifies the component and selects the correct trimming process.

Flexible cell control

The system is controlled by a PLC, allowing for a flexible and future-proofed setup as well as easier integration with up and downstream processes.

Future proofed design

The cell was designed with future flexibility and expansion in mind. The trimming tool can be easily swapped out for other tooling options and additional products can be introduced to the system.

Conclusion

Replacing a highly variable, labour-intensive manual process with a fully automated robotic trimming system, we enabled our client to achieve greater consistency, improved product quality and enhanced operational efficiency. The implementation not only stabilised cycle times and removed operator-dependent variability, but also delivered meaningful improvements in workplace safety and process future-proofing.