

Collection, Processing, and Analysis of Process Data in the Production of Roofing Accessories.

Jakub Majda¹, Przemysław Zawadzki^{1,2}, Adrian Mróz^{1,3}

¹Folnet Polska Sp. z o.o., ²Politechnika Poznańska, ³Uniwersytet Kaliski im. Prezydenta Stanisława Wojciechowskiego,

Kalisz, 23–24.10.2025

ABSTRACT

As part of the R&D activities carried out by FOLNET Polska sp. z o.o., a project for an automated production system for roofing communication and snow protection accessories was developed.

OBJECTIVES

An innovative method of joining individual elements using cold sheet metal clinching technology was implemented, which is a novel approach in this field. The individual components of the product family were subjected to optimization work aimed at minimizing weight while maintaining strength requirements and improving aesthetic qualities (through the elimination of the welding process).

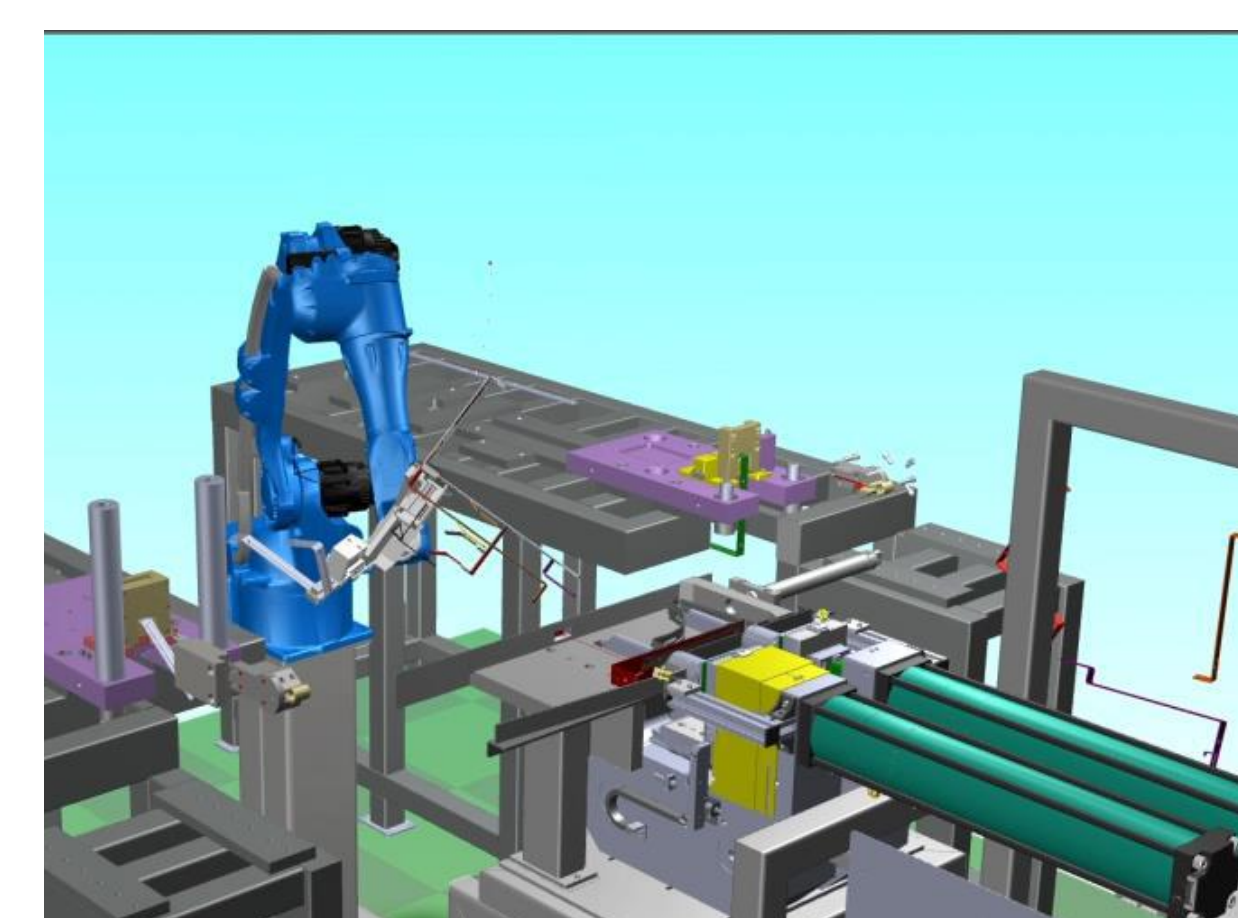
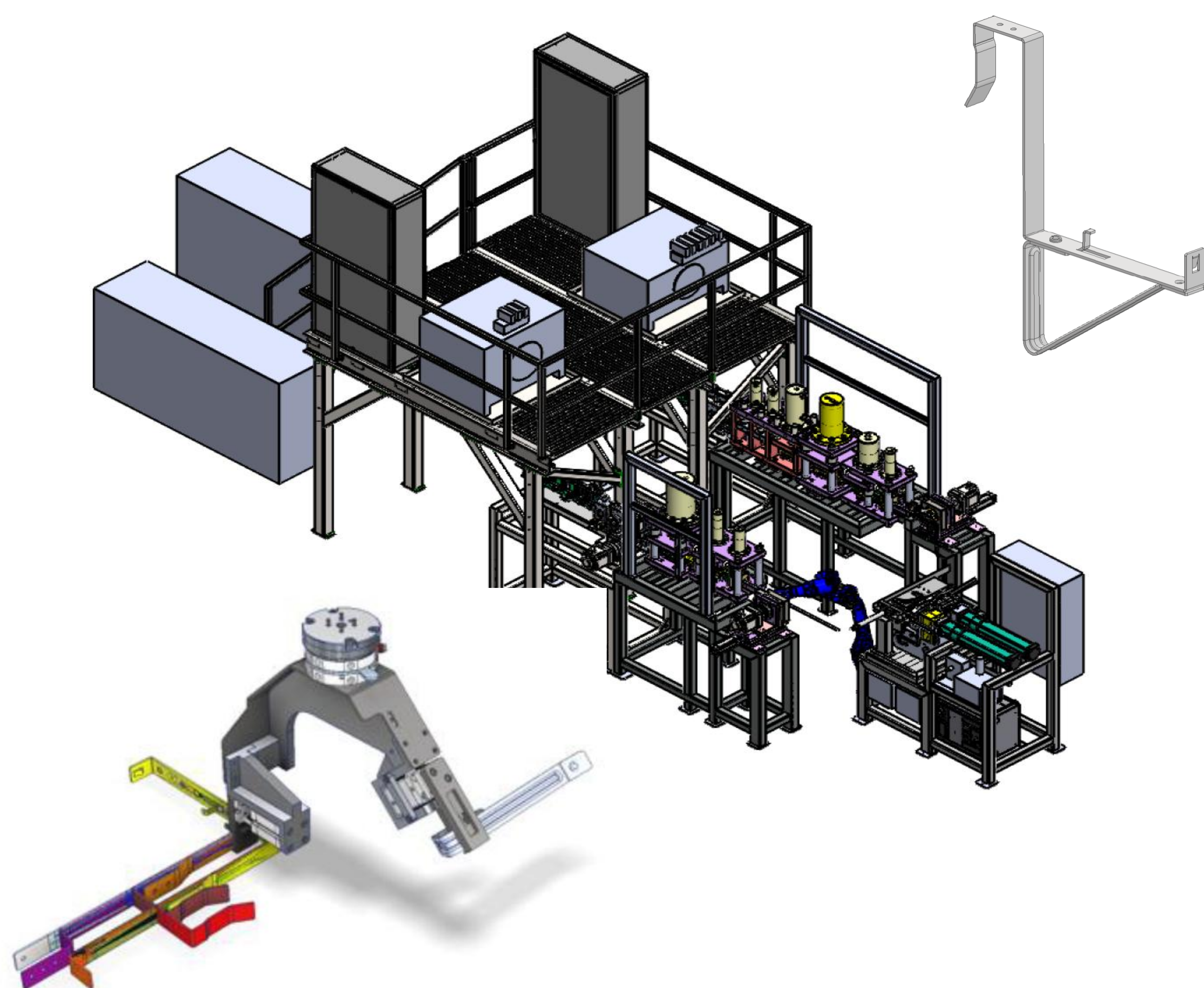
As part of the process innovation, a design of automated and robotized production lines was developed, enriched with a system for acquiring, collecting, and processing operational data in order to optimize resource consumption and increase efficiency

Importantly, the project also aimed to design and verify, under real production conditions, an IT system for collecting and analyzing clinching process data in real time. Within the scope of the work, the structure of the IT system was developed, and an experimental clinching workstation was built, equipped with sensors for measuring the thickness of input material and tools for determining the volume of deformed material at the joint location. The system was equipped with an HMI panel, allowing for real-time monitoring of values from individual sensors.

During testing, a series of clinching operations were carried out to verify the correctness of process data collection within the system. The test results were positive. The system provides the functionality of visual suggestions for adjusting settings in individual modules of the production line that have a critical impact on the amount of generated production waste and the quality of permanent joints

CONCLUSIONS

The results of the project have been implemented in industrial practice by introducing the R&D outcomes into the business operations of FOLNET Polska sp. z o.o., through the launch of production..



REFERENCES

P.446513 - Zespół do osadzania elementów komunikacji dachowej (J. Staszewski, M. Michnik, P. Zawadzki, K. Klaba, J. Majda)

ACKNOWLEDGEMENTS

Projects co-financed by the National Centre for Research and Development under the European Regional Development Fund under the Smart Growth Programme: POIR.01.01.01-00-0832/21

CONTACT

dr inż. Adrian Mróz, prof. UK
a.mroz@uniwersytetkaliski.edu.pl