

VAN KEULEN INTERIEURBOUW

OPTIMISING CUSTOM INTERIORS

ADVANCED TECHNOLOGIES FOR DESIGN-TO-MANUFACTURE EXCELLENCE



In today's competitive landscape, having a production process as accurate as possible is a critical phase, especially for the production of custom made designs. The decisions made during quotation can significantly impact production times, material cost, delivery time of a product, and client satisfaction. Van Keulen Interieurbouw, a Dutch company specialising in interior construction, has refined this process by blending innovative interior construction designs with cutting-edge manufacturing technologies to deliver bespoke, high-quality interiors across various sectors, including retail, hospitality, healthcare, and corporate offices.

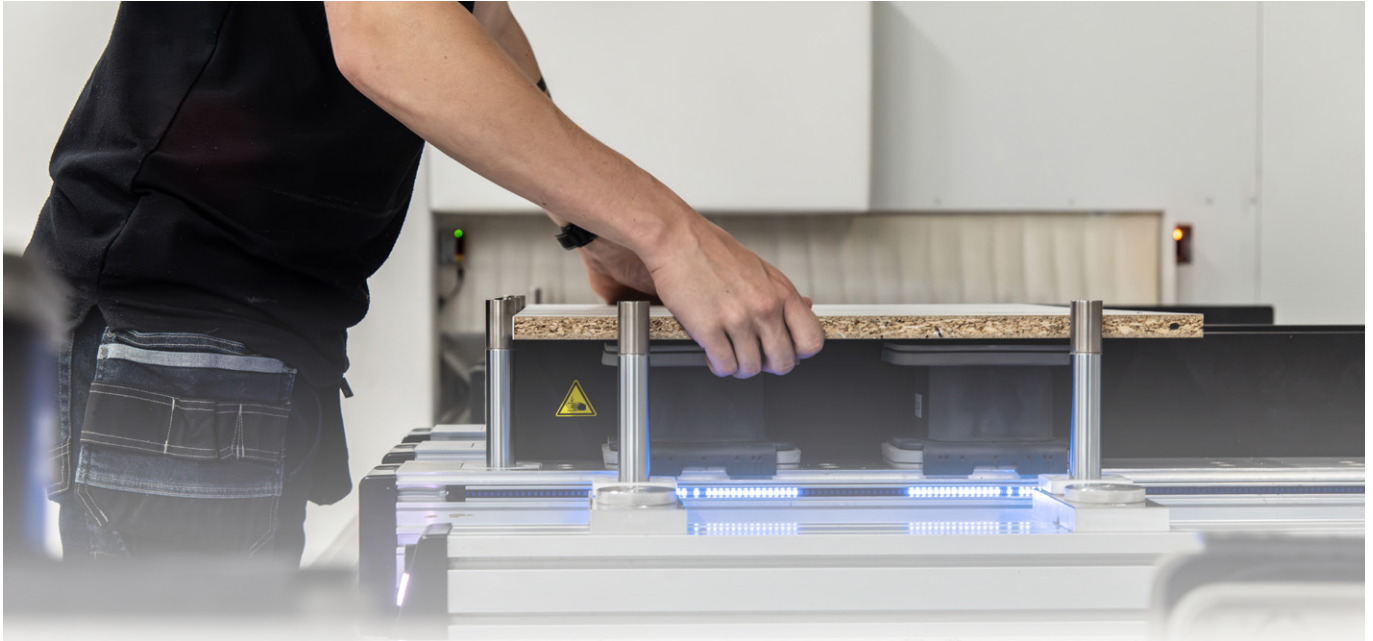
Van Keulen Interieurbouw is specialized in creating custom interior solutions. They manage every aspect of the interior construction process—

from design and manufacturing to installation—ensuring that each project is tailored, to meet the specific needs of their clients. Their portfolio includes a wide range of products, from intricate cabinetry and functional workstations to complete interior fit-outs, all designed and built to the highest standards of interior construction.

With a state-of-the-art manufacturing facility equipped with advanced automation technologies, Van Keulen Interieurbouw ensures optimisation, precision and quality in every manufactured part that leaves their factories. This in-house capability allows them to maintain control over the entire production process, ensuring that the final product is not only visually appealing but also made with unparalleled quality.

Commitment to Sustainability

As part of their commitment to manufacturing products of the highest quality, Van Keulen Interieurbouw underwent an extensive assessment of their environmental strategies. This in-depth evaluation across the company awarded them the ISO 14000 certification based on their efforts in reducing waste, using resources efficiently, and implementing an Environmental Management System (EMS). This globally recognised standard confirms that Van Keulen Interieurbouw meets the highest requirements in environmental management and the company's commitment to reducing their environmental impact.



Balancing Customisation with Manufacturability

At the heart of Van Keulen's success is their meticulously structured production process, which seamlessly integrates client input with manufacturability considerations through advanced software technologies such as IronCAD, Para-Flex, and Dynfos ERP. The integration of these digital tools allows them to improve the company's production flow by making an efficient use of materials and shorter lead times in their entire production chain.

Van Keulen's collaboration with the client starts by the foundations, the design. IronCAD, a powerful 3D CAD system, works as the foundation of the design process, through a user-friendly interface which allows the designers to quickly create and modify complex designs. This provides them with the flexibility and speed needed to meet specific customer requirements.

The next step in the process is Para-Flex, an add-on for IronCAD created by Dynfos Business Solutions, to automatically generate all necessary data for a correct and flawless production process. The support from smart design tools such as Para-Flex can increase productivity, reduce costs, optimise resources, and shorten lead times.

This approach ensures that the designs are not only innovative but also feasible for automated production. Van Keulen Interieurbouw can rely on these advanced technologies for precision. As changes are made to the CAD design, this add-on can update materials, processes, reports, CAM output and production-related documentation. This collaborative process ensures that the final product is a true reflection of the client's desires, balanced with the practicalities of production.

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Dynfos ERP: Backbone of Sustainable Management

Dynfos Enterprise Resource Planning (ERP), developed by Van Keulen Interieurbouw's sister company, Dynfos Business Solutions, is the core of their business processes. This system integrates information from various sources and helps manage the entire production chain through its bi-directional integration with CAD/CAM, overview of production orders, and updated calculations according to design changes.

Through integration with Para-Flex, the environmental information from the 3D design in IronCAD can be directly processed into the ERP system. This ensures that Van Keulen can not only produce efficiently but also meet rigorous environmental requirements such as those required by ISO 14000 certifications.

Advanced Technologies for Supporting Optimisation

The collaboration between IronCAD, Para-Flex, and Dynfos ERP provides Van Keulen Interieurbouw, with a unique technological advantage in interior construction. This synergy enables a quick and efficient response to customer demands while maintaining the highest

quality and sustainability standards. The integration of these technologies allows the company to manage complex projects in ways that were previously impossible.

One of Van Keulen Interieurbouw's key strengths is their ability to align their design process with automated manufacturing technologies. In the continuous improvement of this approach, they work with the Fraunhofer Innovation Platform for Advanced Manufacturing at the University of Twente (FIP-AM@UT) to further optimise their quotation-to-production processes:

FRT

To enhance cross-software integration, Van Keulen Interieurbouw and Dynfos Business Solutions partnered with FIP-AM@UT in the research project Feature Recognition Tool (FRT) to automate the recognition process of design features for wood machining. When transferring CAD designs between different software some feature-related information may get lost or not recognised by the CAM software. This data gap requires time-consuming manual input for wooden products, while automatic feature recognition is already possible for metal systems. FRT led to the design of a self-learning feature recognition tool for advanced wood-based interior parts that will contribute to improve Van Keulen's production planning.

SCOPE

Building on the challenge of integrating the simultaneous processing of metal and wood, the follow up project is focusing on Scheduling for Configure-to-Order Processes and Efficiency (SCOPE). The complexity of managing diverse materials side by side in production can result in suboptimal performance, particularly in scheduling, when dealing with a multitude of custom design orders. The project partners aim to tackle this challenge by developing a prototype for an intelligent scheduling system integrating feature-to-process-to-time information to enhance the efficiency of interior construction. Such



system can inform production planning involving diverse materials, maximum capacity, required machining times, and a more efficient use of resources.

FIP-AM@UT's role in these projects is crucial due to their expertise in AI and custom-made simulations. By collaborating with FIP-AM@UT, Van Keulen Interieurbouw and Dynfos Business Solutions can further develop advanced technologies that enable interior construction systems to be self-learning, leading to further automation and optimisation of their production processes.

Van Keulen at the Forefront of Innovation

Van Keulen Interieurbouw's design-to-manufacture approach offers valuable lessons for the broader manufacturing industry. Their ability to seamlessly integrate unique designs with manufacturing, highlights the importance of collaboration between design and production from the outset. This integration ensures that designs

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are both innovative and manufacturable, reducing the risk of costly redesigns and production delays.

The key takeaway for industry leaders is the value of investing in advanced digital tools and manufacturing technologies. By doing so, companies can enhance their ability to deliver highly customised products while optimising operational efficiency.

As the manufacturing industry continues to evolve, the integration of advanced technologies and automated production will become increasingly critical. Companies that embrace this approach will be better positioned to deliver innovative, high-quality products that meet the changing demands of the market, driving growth and success in the years to come. ■