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**ADVANCED
MANUFACTURING
CENTER**

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AMCNU

BOOSTING **INDUSTRIAL GROWTH** WITH **EMERGING TECHNOLOGIES**

Together with regional government and partners, the Fraunhofer Project Center (FPC) has developed the Advanced Manufacturing Program (AMP) to establish a transitional framework towards Manufacturing 4.0 and empowering manufacturing industries in the Eastern part of the Netherlands.

The Advanced Manufacturing Program (AMP) provides subsidies through the RegioDeal supported by the Province of Overijssel and the Dutch state. It aims to encourage rapid development of Twente and other regions in the East Netherlands by forming an Advanced Manufacturing hub with an outward looking European image. With this the AMP greatly enhances the region's reputation and business climate.

Within the AMP, the Fraunhofer Project Center at the University of Twente develops innovation projects around manufacturing technology themes. Every AMP project is built around solid industrial collaboration, empowering companies with relevant knowledge and new technological and industrial methodologies. Through the hub, these can be shared with other high-tech manufacturing industries in the region.

Member companies' of the AMP can solve their specific technology problems and answer their market-oriented questions. This is achieved by developing and creating demonstrators that offer participating companies direct technological insight. FPC then utilises workshops and master classes to further disseminate this newly acquired knowledge.

The Advanced Manufacturing Program (AMP) is a funding program that helps us support you in your transformation to manufacturing 4.0. IT is made possible through the RegioDeal supported by the Province of Overijssel and the Dutch state.



Rijksoverheid



regio
Twente





SUSTAINABILITY WITHIN THE SHEET METAL INDUSTRY

Sheet metal manufacturers have made considerable progress, in recent years, towards improving sustainability in their industry. Reduction of waste is currently one of the key business imperatives for steel and other sheet metal fabrication industries, because waste represents a tangible loss of resources, which translates into increased unit costs and lost revenue.

Whether minimising wasted materials or keeping a lid on unnecessary consumption of energy or other resources, like water, every step of the manufacturing process needs to be

carefully investigated for opportunities to reduce waste. The end result will be a more productive, profitable organisation that is able to reduce the final cost of their products, thereby delivering better value to their customers.

By investigating ways that they can minimise the amount of material wastage, sheet metal manufacturers should seek opportunities to reduce their operating costs, improve their margins, reduce the costs of disposing of their waste material and deliver cost-benefits to customers, thereby improving the long-term sustainability of their business.

What technology should those in the metal fabrication industry implement to ensure a more sustainable future?



Jellard Koers
Suplacon



We are increasingly finding ways to work more efficiently and sustainably, for example, we operate in a modern, well isolated production facility, heated by an electric heat pump. We attempt to source our workforce locally, reducing the need for travel time and cost resulting in fewer travel-related emissions per worker per day.

In production, we operate four highly energy efficient fibre lasers, reducing the resources required to run them, in comparison to earlier technologies. We are constantly looking for new and improved equipment that offers more sustainable processes. For example, we are now operating our first fully electric-powered bend presses, which are far more efficient than the hydraulic presses we formerly used. Where possible, we carefully plan our delivery routes to avoid back-tracking or single-delivery journeys, thereby improving fuel efficiency and time management.



Although the KORT project's objective was to optimise our production process times, sustainability remains an important topic to us. We see the marketplace changing and believe if we encourage consumers and customers to pay for usage of our products instead of paying to own them, sustainability will naturally follow. This is because the market demand will drive production. Manufacturers will have no choice but to produce better quality products because the market demands it. Furthermore, once a user has finished using a product, it is up to the manufacturer to maintain or repurpose it for further use. There is little doubt that there is a culture shift in place towards more sustainable manufacturing processes and products. We believe that those companies which satisfy consumers in this regard will ultimately succeed. We anticipate being one of them.



Cert Hoekman
Hoekman RVS



Arnold Hofmeijer
GS Metaal

While the KORT project actually focuses on production efficiency, there is also a link with sustainability. In general, the recyclability and recycling rate of basic material in the metal industry is well regulated. The recycling process is intensive from the perspective of energy consumption and transportation costs. Most companies processing sheet metal have implemented nesting software that ensures the best possible use of raw materials, time, and resources. Using software that helps the timing of the production process to maximise machine efficiency and provide effective workflows can not only help to reduce the chance of errors, but also the risk of damage or loss of materials. I believe that is where the KORT project and sustainability goals meet.





To become more sustainable, we decided to view things differently. For example, we see scrap not as a waste, but as a valuable basic raw material. Metal requires a substantial amount of energy in transitioning from ore (oxide) to metal. After metal is made, recycling is simply a melting and cooling process, where all heat can be recovered, making the transition from scrap to metal a potentially energy free process. Unlike plastic, concrete, stone or wood, recycling metals provides no deterioration in quality. For centuries, recycling metal has been integrated into metalworking processes, driven by the fact that scrap is valuable, making recycling a profitable process.



Guido Slump
**Disselhorst
Metaal BV**

Our contribution to sustainability lies in the very nature of sheet metal fabrication, which is a sustainable circular activity with no waste in the process.



About the KORT project

The KORT project, an AMP project run by the Fraunhofer Project Center, aims to develop a proof-of-concept solution that supports a reliable forecast of turnaround times. The KORT consortium consists of 4 companies from the region that specialise in processing steel metal plates towards products and solutions. The focus of this project is to determine the factors that influence throughput time and identify opportunities to manipulate them. In the initial stage of the project, FPC assessed the current production technology and operation processes amongst all the participating partners to recognise and categorise similarities between them, based upon their physical and digital infrastructure. The available data points were analysed to gain deeper insights into the current situation and gaps, which allowed us to identify potential challenges that influence the forecasting of turnaround times.

During initial discussions with the project partners, one of the challenges we identified was in how to make more responsible use of the input resources (i.e., metal sheets). Each company has already implemented a solution to support them in efficient usage of metal sheet plates, referred to as nesting. The challenges that come with these solutions, are often around the question of how the companies are using

nesting and if the solution provides sufficient options. Are there different solutions that would be a better fit with their company processes? Nesting often influences the planning and scheduling of orders, sometimes delaying planning and throughput because, for nesting purposes, it would be more efficient to prioritise another order. Therefore, optimised planning and efficient resource usage can be identified as one of the factors that influences the reliable forecast of turnaround times. Furthermore, advanced planning for optimisation of throughput to increase the efficient use of resources, is also being investigated in this project.

In conclusion

For most sheet-metal manufacturing companies, a certain amount of scrap is unavoidable – but the key is to continually investigate ways to minimise wastage and improve efficiencies. Software support, automation, and other technologies, if implemented effectively, go a long way towards reducing waste during the fabrication process. Professional sheet metal manufacturers should continually invest in improved manufacturing processes and updated equipment to ensure their ongoing competitiveness and sustainability.