Eneplan: cutting the environmental costs of machining

High-tech contract manufacturer Newburgh Engineering is working with the AMRC and partners across Europe to develop new machining techniques that could slash energy costs and improve performance.

Eneplan (Energy efficient process planning system) is a three-year research project involving 17 companies and research centres across Europe, funded under the European Commission's Seventh Framework Programe (FP7). It is investigating new techniques to make machining processes more environmentally friendly, energy efficient and cost effective.

Newburgh joined the project to apply the research to its precision engineering work for the aerospace sector. The company has taken on production of a new component, and is using techniques developed in Eneplan to find more efficient ways of making it.

"We got involved in the Eneplan project through our involvement with the AMRC, as it seemed a natural fit with our ethos of always looking for the most cost effective way to manufacture product with the minimal environmental impact," says Vince Middleton, chairman of Newburgh Engineering.

AMRC project engineer Udi Woy is working closely with Newburgh to study the energy use of the current machining process and investigate different methods of manufacture.

"We investigated alternative manufacturing processes to reduce energy and environmental impact while maintaining the same performance and quality measures," says Woy. "We found that with greener manufacturing processes such as abrasive waterjet, we could target material waste by nesting parts. We can get two components from the same block of material that only gave us one with traditional processes."

Waterjet machines use a precisely controlled stream of extremely high-pressure water, containing a small amount of abrasive particles, to rapidly cut metals and other materials.

Further work found that a combination of waterjet rough cutting and machine tool finishing could provide the same material benefits in a shorter time.

"By combining an existing process with alternatives, we found a more efficient way of manufacturing a part with reduced energy costs and environmental impact," Woy says. "For Newburgh, this gives them insight into where they can make changes across their factory floor."

Work is continuing on the AMRC's combined waterjet-milling centre, provided by member company WardJet. The GCM-

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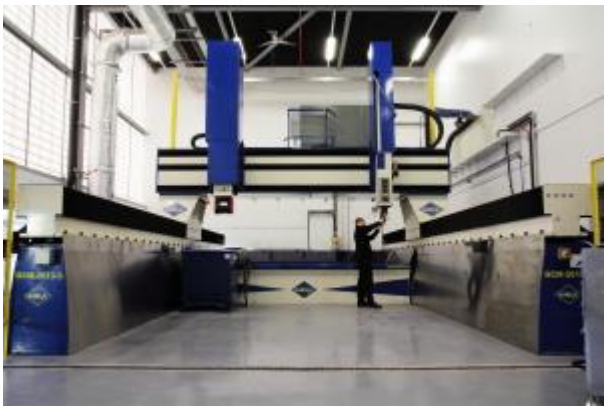
r.gault@amrc.co.uk

series machine is a giant gantry-style composite milling centre combining WardJet's proven waterjet technology with high-speed five-axis machining, providing highly efficient and flexible cutting of composites and metals. With over 1.5 metres of vertical travel for the cutting head and four metres of cross-beam travel, it is one of the world's largest combined waterjet-machining centres.

Newburgh also gains additional benefits from taking part in such an international collaboration between industry and academia. "The ability to tap into all the project partners across Europe has already paid dividends to our company through the transfer of cutting edge knowledge and the interaction with open-minded and intelligent individuals," says Middleton.

"Engaging with the project is developing our personnel and vastly expanding their horizons of what is going on in manufacturing across Europe and what is truly world class. Bringing this back into the business will benefit the company for decades to come."



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