



Success Story

OPEN MIND Pushes Dormer Pramet to the MAXX

The Productivity Centre at Dormer Pramet has now installed the new *hyperMILL*® MAXX Machining roughing module from OPEN MIND to enhance the productivity benefits that the cutting tool manufacturer provides to its end users.

DORMER PRAMET

About Dormer Pramet

From a family-owned market leader in single markets to a worldwide operating group with strong local presence and global competence. With competence, dedication and openness, Dormer has developed from a traditional cutting tool manufacturer to one of the world's largest producers of Solid Carbide and High Speed Steel cutting tools.

Today, Dormer Pramet, ISO 9001- and ISO 14000-certified for many years, has branches in over 40 countries worldwide. People can acquire Dormer Pramet from over 100 countries around the globe. About 1,300 employees take care of the customer wishes.

› www.dormerpramet.com

Since re-locating to its new facility over two years ago, Sheffield based Dormer Pramet has invested considerable time, resources and expertise into selecting 'Technology Partners' to enhance the capabilities of its Productivity Centre department. Among the technology partners are Sandvik Coromant, Kelch, System 3R, Heller, Hexagon Metrology and OPEN MIND. This culmination of leading manufacturers enables Dormer Pramet to solve the cutting tool and production issues of its customers and the partners' customers by implementing a combination of cutting edge technologies from each partner.

Productivity Improvement

The company has three technical engineers in the Productivity Centre with an additional ten on the road that are imbued in customer surgeries, technical projects and customer and staff training. Always at the forefront of technology, the Dormer Pramet engineers were flabbergasted by the *hyperMILL*® MAXX Machining roughing module from OPEN MIND. As Dormer Pramet Machining Applications Engineer, Mr Matt Johnson comments: "I was invited by an OPEN MIND engineer to supply tooling for a demonstration piece at Warwick University and witness the benefits of this performance package. Using OPEN MIND's *hyperMILL*®, the pre-

vious machining time for the 18 mm deep pocket in the 316 stainless steel part was 25 minutes. I supplied our S356 solid carbide end mill and changed the cutting parameters to slightly reduce feeds and speeds, but machine the full 18 mm depth in one pass as opposed to the previous program that used three 6 mm deep passes. This strategy reduced the cycle time. Then the OPEN MIND engineer turned on the *hyperMILL*® MAXX Machining roughing strategies and asked

Heller Machining Aerospace Parts with *hyperMILL*® MAXX Machining roughing module



“The component has a number of pockets on each side and to demonstrate cycle time reduction with *hyperMILL*® MAXX Machining roughing strategies, one pocket was previously machined in 40 minutes. Dormer Pramet is now milling the pocket in 3 minutes.”

Matt Johnson,
Machining Application Engineer



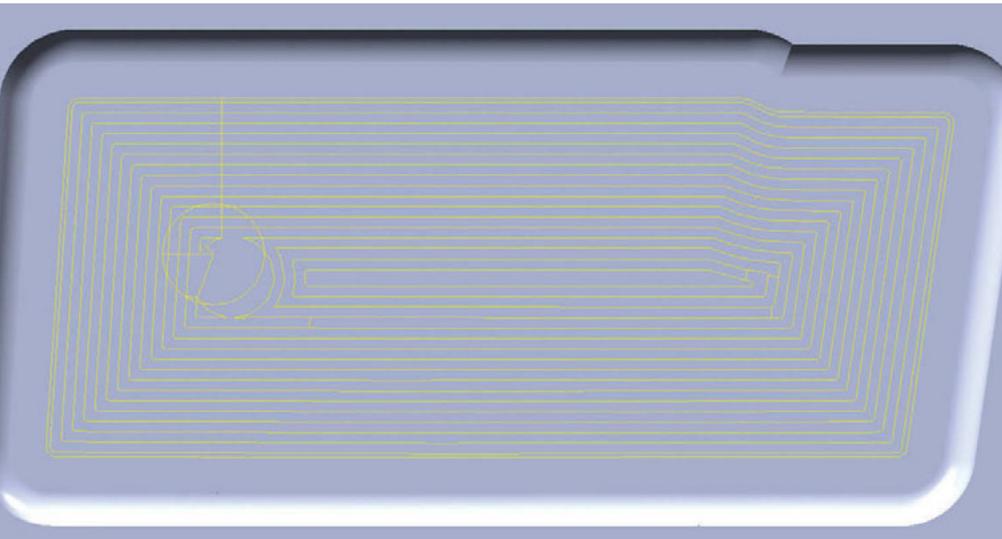
Matthew Johnson highlighting the HPC toolpaths.

me to treble the recommended Dormer Pramet feed and almost double the speed rates for the cutter. My apprehension was quelled by the confidence of the OPEN MIND engineer and we immediately witnessed a staggering result.”

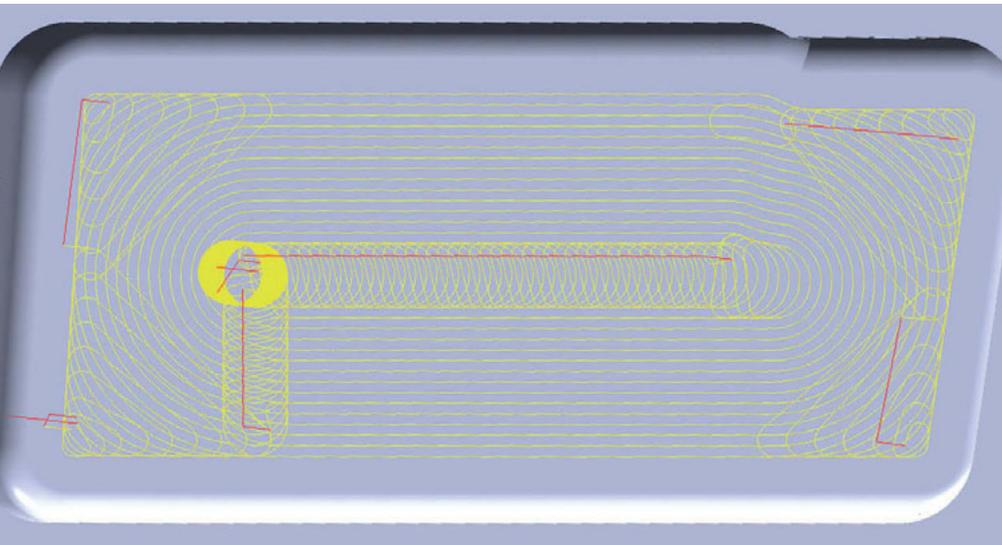
Most cutting tool manufacturers measure productivity benefits by calculating the Q_{Max} value for the machining cycle, this cubic (cm/min) value is the Depth of Cut X Step Over X Feed divided

by 1,000. “In this demo the original Q_{Max} value was 17.1 cm/min, using the Dormer 12 mm cutter at the recommended parameters resulted in a Q_{Max} value of 30 cm/min, a significant gain. However, when the roughing module was turned on, it gave us a value of 108 cm/min, a staggering 280 % improvement on the combined use of *hyperMILL*® and Dormer Pramet tooling. Compared to the first test piece, the result was a 630 % improvement,” says Mr Johnson.

Standard Tool Path on Pocket



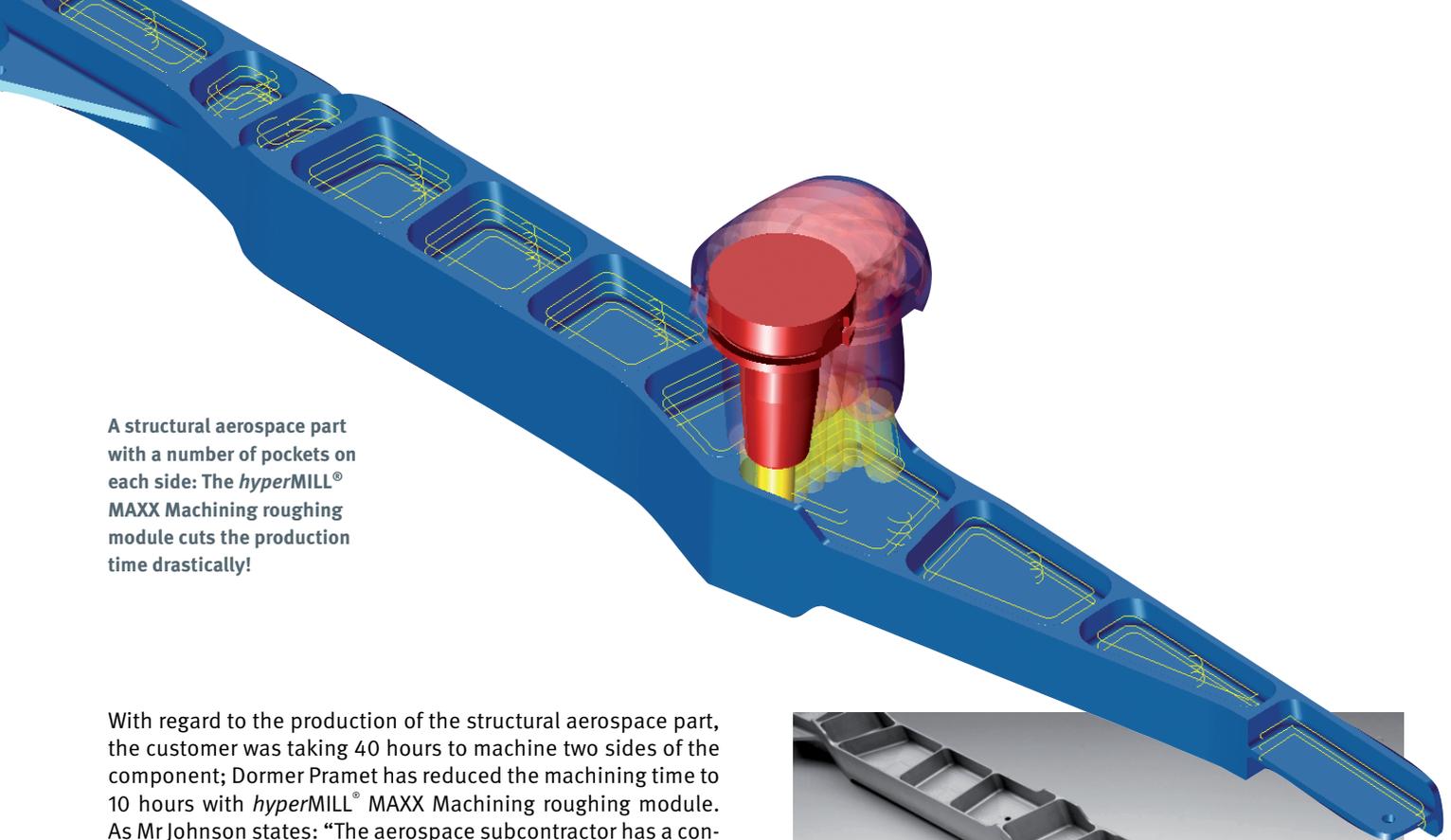
hyperMILL® MAXX Machining roughing module Tool Path on Pocket



Tool Life Improvement

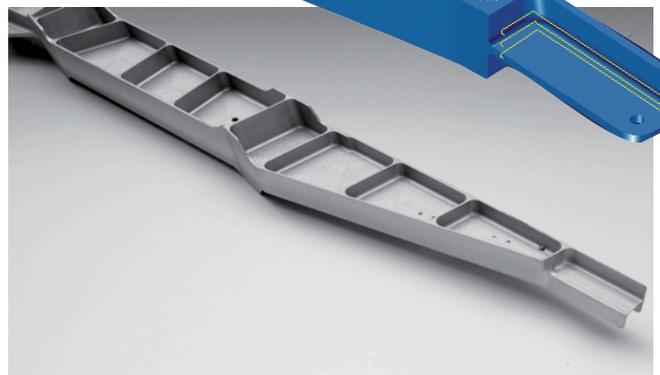
Considering the drastic improvement in productivity, the Dormer Pramet engineer expected the tool life to be significantly reduced. However, cutter wear was less than the pre-vious cycle. To demonstrate the reduction in cutter wear, Mr Johnson continues: “We are currently machining a structural wing component from titanium for an OPEN MIND and Dormer Pramet customer. Like the OPEN MIND customer, we are using the same Dormer S357 12 mm carbide cutter with a 3 mm radius and X-Ceed coating and we have extended tool life from 30 minutes to over 2 hours – a tool life improvement of over 200 %. The only difference is that we are using the *hyperMILL*® MAXX machining roughing module.”

The Dormer Pramet engineer recognises that the HPC tool paths are generated to reduce stress on the cutting tool whilst continually calculating the optimal speed and feed for each cut. The roughing module reduces the forces on the cutting tool by eliminating sharp directional changes in the tool path. As Mr Johnson continues: “The roughing module of *hyperMILL*® MAXX Machining maintains a constant load on the tool and eliminates sharp directional changes. It is the directional changes in alternate CAM packages that cause stress and contribute to the sudden failure of cutting tools. With the roughing module our tools are changed because they wear out, with alternate CAM packages our cutting tools, like all cutting tools undergo considerably greater stress that results in sudden breakages that are never an exact constant.”



A structural aerospace part with a number of pockets on each side: The *hyperMILL*® MAXX Machining roughing module cuts the production time drastically!

With regard to the production of the structural aerospace part, the customer was taking 40 hours to machine two sides of the component; Dormer Pramet has reduced the machining time to 10 hours with *hyperMILL*® MAXX Machining roughing module. As Mr Johnson states: “The aerospace subcontractor has a contract to produce over 150 parts that was taking close to a week to machine each part, we have now cut that production time drastically! The component has a number of pockets on each side and to demonstrate cycle time reduction with *hyperMILL*® MAXX Machining roughing module, one pocket was previously machined in 40 minutes. Dormer Pramet is now milling the pocket in 3 minutes. To achieve such a result and simultaneously improve tool life is exceptional.” ■



About OPEN MIND Technologies AG

OPEN MIND is one of the world’s most sought-after developers of powerful CAM solutions for machine and controller-independent programming.

OPEN MIND designs optimized CAM solutions that include a high number of innovative features not available elsewhere to deliver significantly higher performance in both programming and machining. Strategies such as 2.5D, 3D as well as 5-axis milling/mill turning, and machining operations like HSC and HPC are efficiently built into the *hyperMILL*® CAM system. *hyperMILL*® provides the maximum possible benefits to customers thanks to its full compatibility with all current CAD solutions and extensive programming automation.

OPEN MIND strives to be the best and most innovative CAM/CAD manufacturer in the world, helping it become one of the top five in the CAM/CAD industry according to the NC Market Analysis Report 2016 compiled by CIMdata. The CAM/CAD solutions of OPEN MIND fulfil the highest demands in the automotive, tool and mould manufacturing, production machining, medical, job shops, energy and aerospace industries. OPEN MIND is represented in all key markets in Asia, Europe and America, and is a Mensch und Maschine company.



We push machining to the limit

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