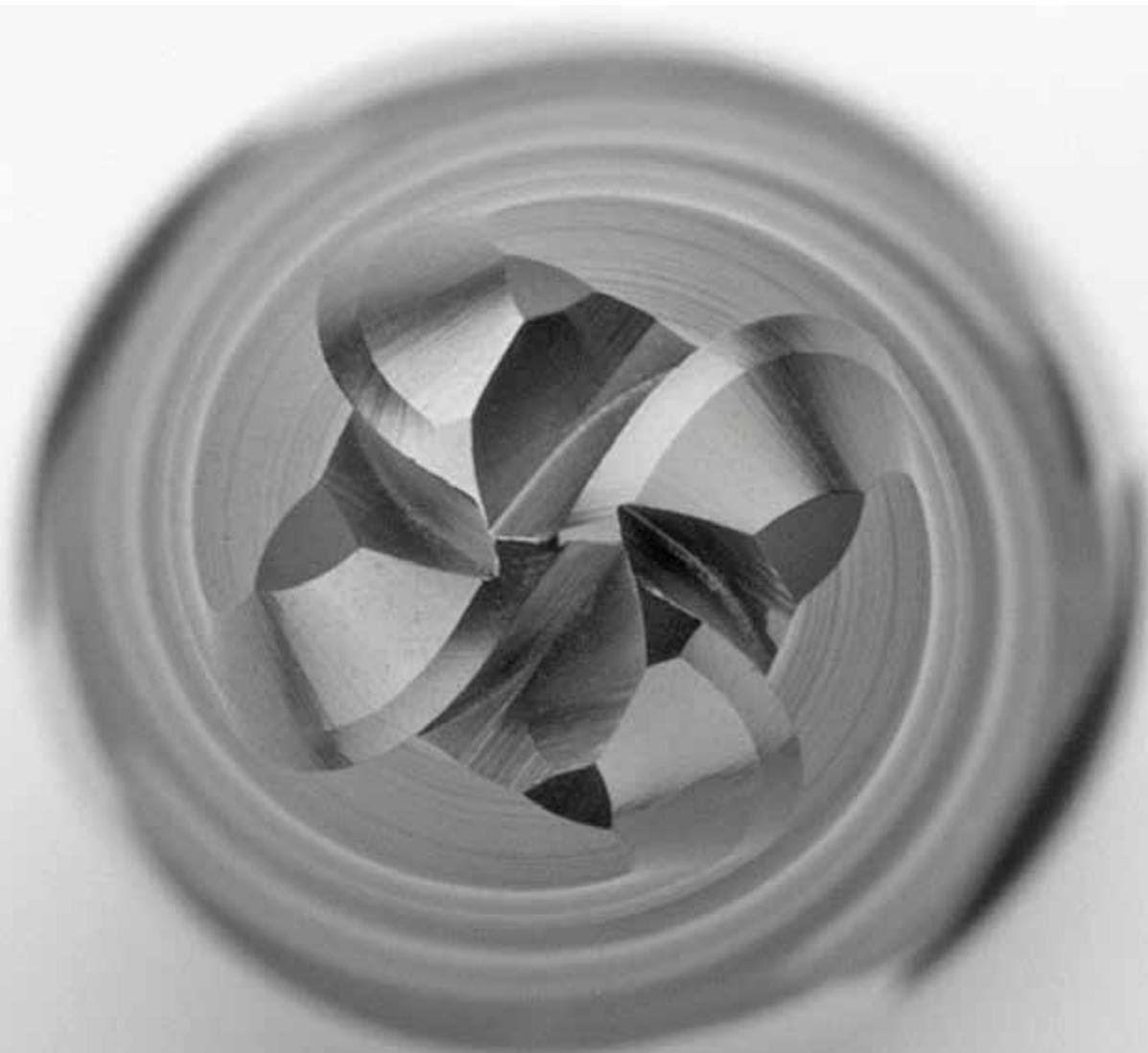

MÉCANIQUE AÉRONAUTIQUE PYRÉNÉENNE & MITSUBISHI MATERIALS

SUCCESS STORY AEROSPACE INDUSTRY



High flying projects



MMC Metal France S.A.R.L.
A Group Company of  MITSUBISHI MATERIALS CORPORATION

MITSUBISHI
 MITSUBISHI MATERIALS



MAP's head office at Serres-Castet (64)



Brace machined by Mitsubishi Materials iMX exchangeable head end mills

ABOUT iMX

Profile General machining roughing, finishing and chamfering type exchangeable heads

Range Ø 10 - 25 mm
Geometry 19 different types
Type Steel and rigid carbide shanks with internal coolant supply

Features
 High repetition accuracy and rigidity due to two-face clamping



iMX : exchangeable head end mill

High flying projects

By giving priority to method, quality control and know-how, MAP is building its reputation on a solid foundation, showing continuous growth in its activity. With 260 employees to rely on, MAP can boast a wide-range of skills as an aerospace sub-contractor for machining complex parts and producing sub-assemblies. The attention to developments in the industry means it is maintaining momentum in performance improvement and can draw on the expertise of its cutting tools supplier, Mitsubishi Materials, for optimising strategies when machining complex parts.

At the controls of this family business, Xavier and Philippe Jean-Baptiste have backed the skills of the staff to improve production performance in the context of projects with targeted actions. In the main machine shop used for small and medium-sized parts, a multi-disciplinary team made up of Pierre Lafitte, Machine Shop Manager, Thierry Giordano, Programming Manager and Philippe Sebie, Cutting Tools Manager, decided in 2014 on prioritising the machining of titanium braces.

With a machining cycle time per part close to that of one operative's shift, manufacturing in batches of 10 to 20 braces takes the equivalent of one week per machine or even more. Time saving became a priority in order to

improve the economic return on this item and to prevent bottlenecks in the machine shop, which was being put under great pressure by the growth in MAP's activity.



As the first to be affected, the internal tool specialist started making enquiries with cutting tool suppliers that had a good reputation and know-how in the machining of difficult-to-cut materials. Following preliminary discussions, Julien Legland, a Mitsubishi Materials Technical Salesman, set out to treat the request from MAP as a complete project, encompassing all machining process aspects as well as the actual cutting itself, from roughing through to finishing. Philippe Sebie and his colleagues expressed their interest in having a solution that would incorporate the choice of tools and the optimisation of the tool paths and parameters. Having had a very favourable experience with Mitsubishi Materials' Coolstar VF solid end mills, a series of tools particularly well-suited to



Brace made of TA6V (Ti-6Al-4V)

working with stainless steels, titanium and Inconel, he kept Mitsubishi Materials on his short-list before the final evaluation of proposals.

In close co-operation, at Mitsubishi Materials, Christophe Arousseau, Aerospace Project Engineer and Grégory Lafon, Application Engineer, carried out a detailed analysis of a key part in the production range. The brace component made of TA6V requires precise final geometric tolerances but also needs significant material removal during the initial stages of machining. In the past, the 25 mm diameter HSS milling cutter moved at a slow feed rate to face machine almost all of the main 160 mm faces of the part. Due to rapid tool wear, the range of machining required the allocation of a separate tool for each operation. These non-standard tools had to be utilised for as long as possible which meant re-grinding them several times. Despite re-grinding these tools still needed to be replaced at least twice a month. In the light of this fact, Christophe Arousseau, in contact, for CAM, with Mitsubishi Materials' European Project department, decided to propose a more efficient strategy with standard tools developed by Mitsubishi Materials.

MAP and Mitsubishi Materials were in regular contact to adjust and validate the recommended solutions. From this study, the Mitsubishi Materials team

devised a complete process based on a package of 5 tools instead of the previous 15. The supplier's offer, put into perspective in a machining simulation model, brought together the reasoning regarding the choice of tools, the range of machining processes, time estimate and assessment of the economic gain.

The choice and performance of the tools were decisive for MAP's tools specialist, who had a competing offer with a much greater number of tools and longer machining times. "Our tooling costs went down significantly now that we have standard tools such as the ARP round insert cutter, specifically designed for machining heat-resistant materials, replacing the costly special tools. Also, the 16 to 25 mm diameter screw-in heads of the iMX indexable end mills are mounted on 110 and 180 mm carbide shanks. They feature unfailing rigidity that, in spite of very high feed rates, gives us an appreciable improvement in performance when compared to the old tools and produces a surface finish free from vibration marks. The iMX exchangeable head end mills are interchangeable on the machine, with dimensional repeatability lower than 5µ, and thus saves valuable the operative time".

Philippe Sebie carried out analytical monitoring of production in the first



An MAP operative with a brace blank

ABOUT ARP

Application	For turbine blade machining
Range	Ø 25 - 100 mm
Geometry	Arbor, shank and screw in type
Grades	For titanium and nickel based alloys
Insert Radii	5 and 6 mm
Features	Easy indexing of the insert without removing the clamping screw



ARP : round insert cutter



The ARP round insert cutter



C. Arousseau (MMC Metal France Aeronautical Projects Engineer), T. Giordano (MAP Programming Manager), P. Jean-Baptiste (MAP Vice-Chairman), G. Lafon (MMC Metal France Application Engineer), P. Sebie (MAP Cutting Tools Manager), J. Legland (MMC Metal France Technical Salesman) and P. Lafitte (MAP Machine Shop Manager)

ABOUT MAP

Since 1972, MAP - Mécanique Aéronautique Pyrénéenne - has been a family firm, now employing 260 people, whose core business is machining mechanical parts intended for the aeronautical sector. Due to the numerous investments made in recent years, particularly the acquisition of several large machining centres, MAP has been able to develop sustained commercial relationships with customers as prestigious as Airbus, Dassault, Nexter and Daher Socata.

Tel: +33(0) 5 59 33 16 88

Email: info@map-sa.com

Website: www.map-sa.com

ABOUT MMC METAL FRANCE

MMC Metal France, based in Orsay (France), is one of the seven European branches of the Japanese company Mitsubishi Materials Corporation cutting tools division. MMC Metal France reports to the European headquarters in Germany and since its establishment in 1992, the company has been supplying precision cutting tools and providing integrated solutions for the automotive, aerospace and medical sectors as well as the mould and die industry. MMC Metal France is in a position to offer French industry a varied range of precision tools for turning, milling and drilling.

Mitsubishi Materials Corporation employs over 23,000 people in 77 countries, operating with various head offices in Europe, India, Brazil, China, the United States, Japan and Thailand, as well as having modern research and development centres in Japan and Spain and at different production sites across the world.

Tel: +33(0)1 69 35 53 53

Email: mmfsales@mmc-metal-france.fr

Website: mitsubishicarbide.com | mmc-hardmetal.com

year. Being an authority regarding this project, he optimised tool management logistics with Julien Legland and overall production management with the support of Grégory Lafon.

From the operatives' point of view, because tool longevity has vastly increased, tool changes are far fewer and much easier to carry out. As the Machine Shop Manager sees it, this project management shared with the Mitsubishi team has also contributed to giving greater consideration to the production environment. Additionally the improved quality of the machining is appreciated by the assembly teams. However, Pierre Lafitte is delighted most of all by the benefits obtained in production: "For a series of 10 parts, we have saved the equivalent of one machine day per week when using a two shift pattern. Our old schedule was often very tight and we often had to make a split delivery, which is no longer the case". In agreement with the members of the improvement group, Thierry Giordano appreciates the contribution from outside. "Regarding the machining simulation, the programming department applied the recommendations made by the team at Mitsubishi Materials. The machining strategy, developed from a fresh perspective, formed a solid basis that we have refined together with the observations made by the machine shop and tooling managers. This has

put the process on a formal company process footing".

Since 2015, several parts projects have followed the same preparation process to obtain important benefits, especially for an Aluminium-Lithium HSM application with a dedicated milling cutter: the AXD4000. Julien Legland emphasises the importance of the package represented by this project concept at Mitsubishi Materials: "We put together a multi-disciplinary team in-house to be able to provide a product and service solution. On the ground, we keep up technical monitoring and create the conditions for a secure supply of tools. Our commitment makes the difference".

Mr Jean-Baptiste and Mr Jean-Robert Fournier, MAP's Business and Development Manager, have taken note of the strategic advantage of a skills cross-over of the expertise of the specialists who work closest to production with the supplier' project team. The involvement of the Mitsubishi Materials team, whose quality of service and innovative products are well-suited to the aerospace manufacturing environment, helps to position them in a relevant way for future projects from aircraft component manufacturers.