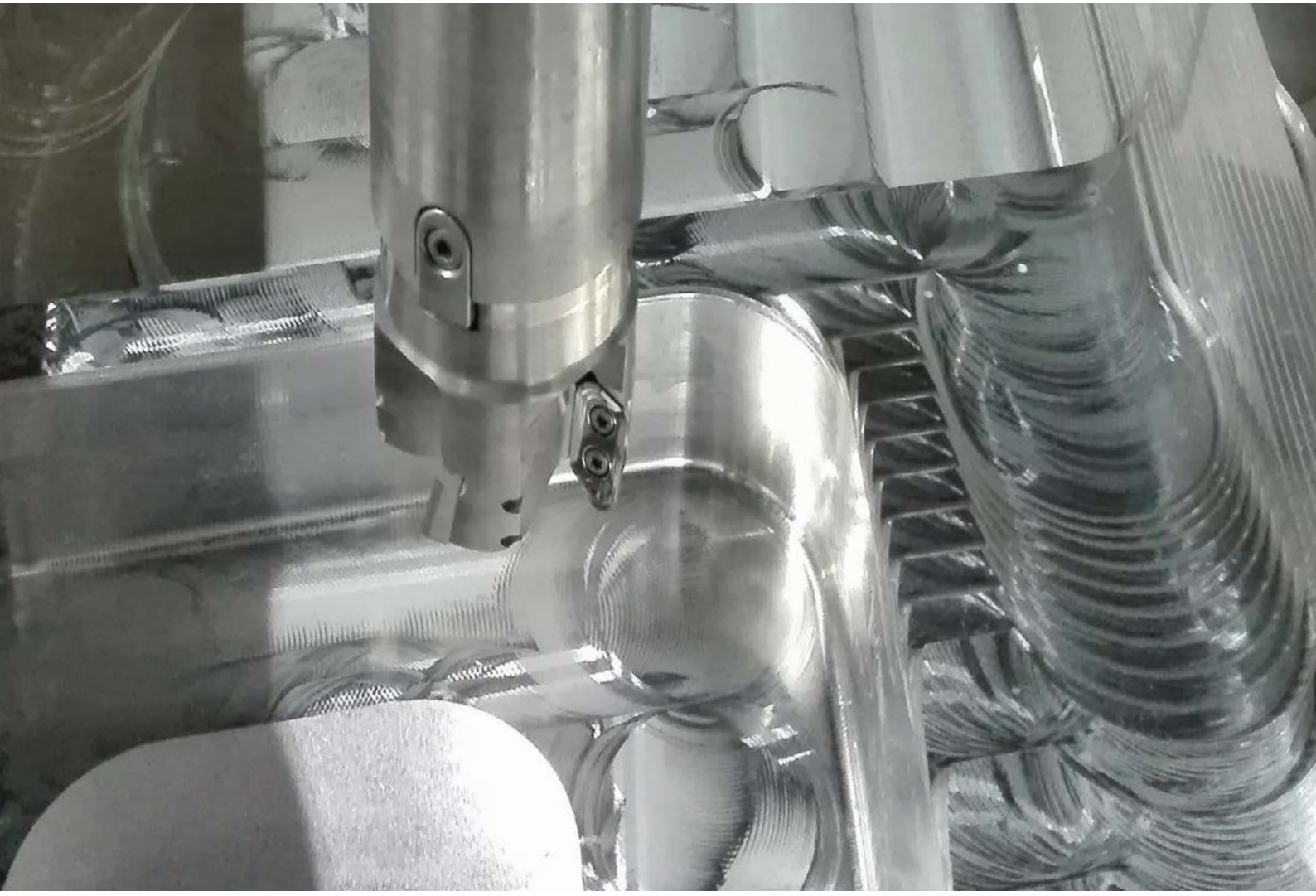
FIGEAC AÉRO & MITSUBISHI MATERIALS

A SUCCESS STORY



TO BETTER MEET ITS GROWTH POTENTIAL, FIGEAC AÉRO ADOPTS MITSUBISHI MATERIALS CUTTING TOOLS TO RATIONALISE ITS MACHINING ACTIVITIES

FIGEAC AERO

MITSUBISHI MATERIALS

Precision workshop. © Copyright Figeac Aéro

Palletising machine for the Figeac Aéro workshop CNC.

Aluminium part outlining.

About the AXD range

High-performance tool for aluminium alloys

- Multi-functional milling of aluminium alloys.
- 2 insert sizes for a cutting depth of up to 21 mm (twin clamping screws).
- Corner radius from 0.4 mm to 5 mm. Metal removal rate up to 10,000 cm^3/min.
- Excellent stability even at high spindle speeds.
- High balance quality.

Old cutting tool ranges were limited to a maximum spindle speed of 22,000 rpm. For Baptiste Chevalier this was not enough:

"The new machines we use now need tools that can operate at 33,000 rpm. In addition, we thought about how to standardise our cutting tools at the Figeac site, so that stocks could be better rationalised, tool availability improved and costs reduced."

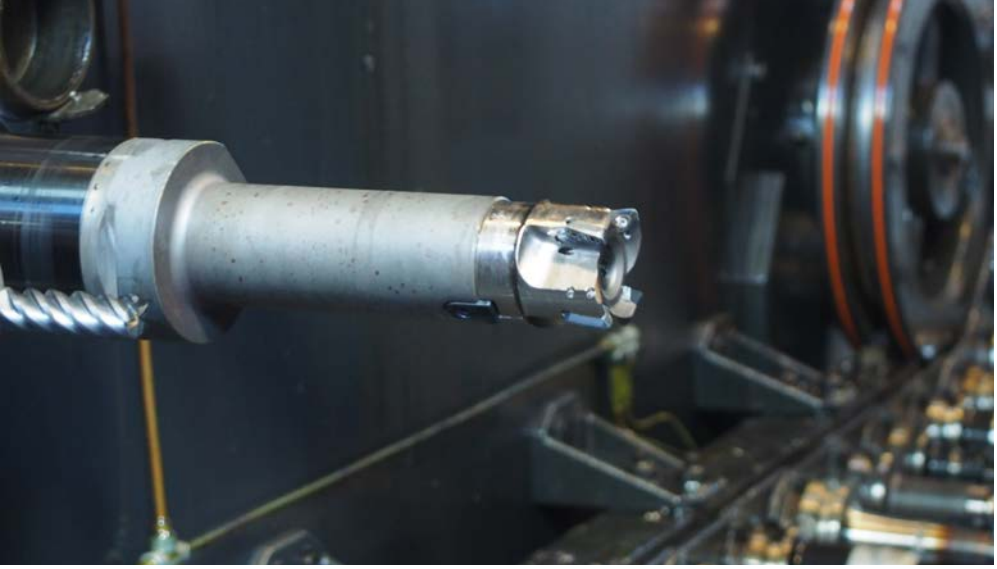
Complete control is no simple thing, and Figeac Aéro knows this better than anyone. The Lot-based company has decided to equip its machines with Mitsubishi Materials AXD4000 cutting tools for aluminium alloys as part of its drive to maintain the best possible quality of the machined components and to meet increased production demands. The AXD tool has fully satisfied the demands of the company, and have also reaped the benefits of technical support from the Japanese carbide tool company.

Whilst the small town of Figeac has scarcely 10,000 inhabitants and is therefore not very well known in France, it is known throughout the industrial world as home to some of the biggest names in the aeronautical industry, starting with Figeac Aéro. This French flagship of the aerospace industry followed the giants of the sector such as Airbus in their climbs in production rates. The potential growth figures posted by Nicolas Geneteaud, Marketing/ Communication and Business Investor Relations manager, speak for themselves: "From a turnover of €371m for the year ending March 2018, we are now aiming to reach €425m for 2019, €520m for 2020 and €650m for 2023."

This would represent incredible growth figures for the company founded in the Lot region by Jean-Claude Maillard. In just 30 years it has become a leading subcontractor to the aircraft manufacturing industry and now has fourteen production sites worldwide. "When I joined in 2000 there were only 120 employees at Figeac compared to around 1,200 today," says Jean-Marie Morel, Cutting Tools Manager for the "Structure" BU. Total staff numbers across the company, which was founded in 1989, have now reached 3,300 globally, including 2,000 workers in France.

METALWORKING CONSTRAINTS AND AN EXPLOSION IN DEMAND

Acquiring companies with technical and complementary know-how, while recruiting many in-house skills is not enough. To use the words of Baptiste Chevalier, Cutting Tools Manager for the "Engines" BU, we also need to constantly adapt our production resources to meet "an explosion in production demands". At Figeac alone, around a dozen production workshops have been set up over the last twenty years, all with a single objective: to manufacture parts and sub-assemblies for major projects such as the A350 (manufacture of floors and engine pylons) or the Boeing 787 (manufacture of door mechanisms and locking systems, etc.). "We are essentially working on the larger aircraft with more than 100 seats," explains Baptiste Chevalier. Aside from sub-assemblies, Figeac Aéro



The AXD4000 available in the machine's tool store.

AXD4000

also produces structural elements such as longerons (parts over 10 metres in length) and their titanium ribs, frames, floor rails, engine housings, landing gear parts... the list is long and continues to lengthen as the group takes on new contracts such as that with MHI Canada Aérospace last November. Figeac Aéro will also manufacture parts and sub-assemblies for the Bombardier Global Express business jet programme.

We know now that producing increasing numbers of parts in aluminium, as well as titanium and other difficult to cut materials involves the machining away of large amounts of material, whilst still meeting optimal quality standards. But this is a difficult equation to resolve on the factory floor, especially since in 2014, our previous cutting tool supplier had expressed uncertainty regarding the continued development of its products. "To put it briefly, we could not be sure that the technology of their future cutting tools would meet the demands of our machines. So we needed to find a new supplier; we could not take the risk," says Jean-Marie Morel.

The priority for Figeac Aéro was to make sure it had the latest cutting tools able to respond to increasing production needs, especially after installing two new machine tools. These were now more efficient (spindle power increased from 80 to 120 kW). The old cutting tools were limited to a top speed of 22,000 rpm. For Baptiste Chevalier this was not enough: "The new machines now need cutting tools that can operate at 33,000 rpm. In addition, we thought about how to standardise our cutting tools at the Figeac site, so that stocks could be better rationalised, tool availability improved and costs reduced."

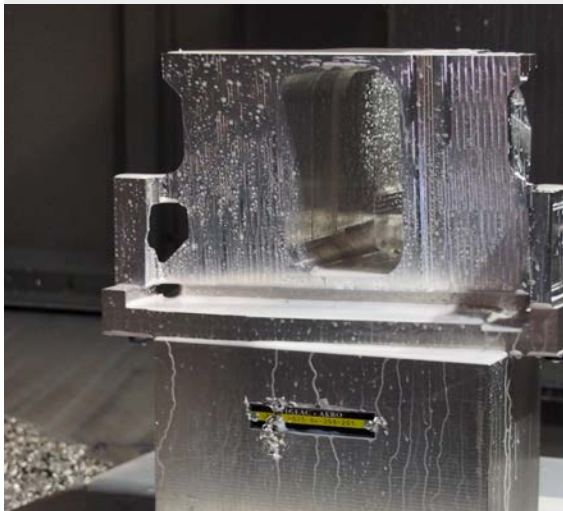
These considerations led the group to Mitsubishi Materials. "It was essential that the tools had the capability to utilise the 120 kW spindles and fit our existing tool holders. The supplier also had to be able to support in meeting our ramped up of production levels. In addition to being an international company, Mitsubishi Materials has offered us a solution that perfectly meets our needs."

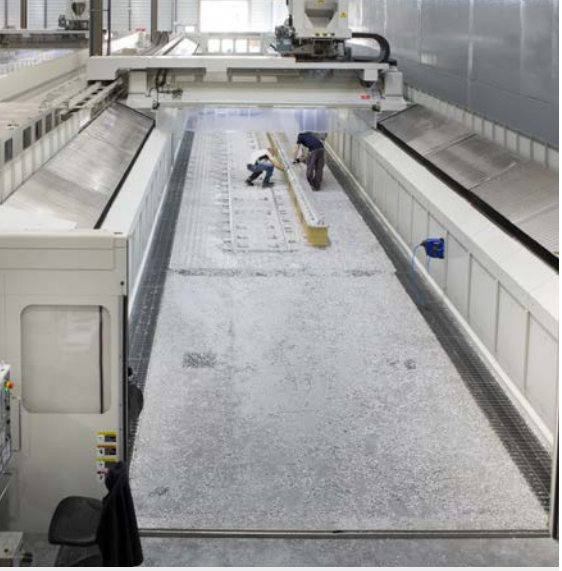
A TOOL DESIGNED TO MEET OUR METALWORKING CHALLENGES

Metalworking is the very heart of Figeac Aéro's business. The staff in the group's departments, who work across a number of different production units know exactly what they want. Working in close collaboration with Laurent Le Méteil, Aeronautics Business Manager, and Grégory Lafon, Application Technician (both of MMC Metal France), they were able to test the AXD4000, a cutting tool specially designed for machining aluminium at high speeds and feeds. This cutting tool was specially developed in Japan in partnership with Makino, the manufacturer of

A tool able to meet all of Figeac Aéro's metalworking challenges:

As J**ean-Marie Morel** confirms: *"We have been able to reduce stocks and the number of insert references. We now only use two different geometries for a single tool. And these can work just as well with the new 120kW spindles as with the old ones." Baptiste Chevalier adds: "We only needed to replace the cutting tool, nothing else; the original metal removal volumes were preserved by the Mitsubishi Materials design team. Generally speaking, the performances of the AXD4000 cutting tool have allowed us to meet the strong increase in production volumes. As for insert breakages, these have been greatly reduced and their operational life increased by about 25%."*





Figeac Aéro workshop. © Copyright Figeac Aéro

From left to right: Grégory Lafon, Laurent Le Méteil (MMC Metal France), Lionel Coustillière, Baptiste Chevalier and Jean-Marie Morel (Figeac Aéro).

ABOUT FIGEAC AÉRO

The FIGEAC AERO group is a key partner to major aeronautics companies and specialises in the manufacture of structural elements in lightweight alloys and hard metals, engine parts, landing gear and sub-assemblies. FIGEAC AERO is an international group with a workforce of 3,300 and operations in France, the United States, Morocco, Mexico, Romania and Tunisia. The Group's annual turnover for the financial year ending on 31 March 2018 was €371m.

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ABOUT MMC METAL FRANCE

MMC Metal France, based in Orsay (France), is one of the seven European branches of the Japanese Mitsubishi Materials Corporation group's cutting tools division. MMC Metal France reports to the European headquarters in Germany and since its establishment in 1992, the company has been producing precision cutting tools and providing integrated solutions for the automotive, aeronautical and medical sectors and the mould and die industry. With a large number of qualified partners, MMC Metal France is able to offer a wide variety of precision tools for turning, cutting and drilling to French industry.
The Mitsubishi Materials Corporation employs over 24,000 people in 77 countries, operating with head offices located in Europe, India, Brazil, China, the United States, Japan and Thailand. Plus amodern research and development centres in Japan and various production sites across the world, including one in Spain.

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the two powerful machines recently installed in our workshop, and is fully rated for spindle speeds of 35,000 rpm. "Thanks to these mutual development and design efforts, we were able to find the best possible compromise between performance, greater stability and safety," states Grégory Lafon. "Twin screws were used to clamp the inserts securely in the body to achieve a highly effective anti-ejection system with the added benefit of accurate positioning. This system serves to minimise the incidence of insert ejection and thus increase the operational life of the tool, plus guarantee an excellent surface quality on the parts."

These are not the only advantages of the AXD4000 tools. Ramping angles are sufficiently aggressive to optimise tool life and therefore save a considerable amount of machining time per component. As for the tool geometry, the chip pockets have been designed specifically to facilitate efficient chip ejection and removal without compromising the solidity of the tool body. Finally, and this is an essential factor for Figeac Aéro, there is the choice of tool body diameters, that range from 20 to 125 mm, and a wide choice of insert corner radius options, from 0.4 mm to 5 mm. "Thanks to its long operational life, this is a key tool which allows us to standardise a large volume of inserts," confirms Jean-Marie Morel. "We were therefore able to reduce stocks and the number of different insert types. We now only use two different geometries for a single tool. And these can work just as well with the new spindles as with the old ones." Baptiste Chevalier adds: "We only needed to replace the cutting tool, nothing else; the original metal removal volumes were preserved by the Mitsubishi Materials design team. Generally speaking, the performances of the AXD4000 cutting tool have allowed us to meet the strong increase in production volumes. As for insert breakages, these have been greatly reduced and their operational life increased by about 25%."

Laurent Le Métail adds that the second phase of the project allowed Mitsubishi Materials to adapt the arbors for the whole of the metalworking range. "We got the go ahead from Japan to supply other sizes of cutting tool. We developed specific schematics and adapted our tool diameter tolerances so that they could work on all of Figeac Aéro's parts." This is a fine example of cooperation that is so much more than a mere client/supplier exchange. A true partnership must always be present in order to make a success of a project of this magnitude.