

Case Study: Aircelle Ltd



Software: JETCAM Expert Premium
High Performance Nesting
Remote Control Processing
JETCAM Orders Controller
JET-Term
Laser Identification system

Machines: 2 x Zund L-2500CV Knife Cutters



At a glance:

- ✘ System paid for itself in 50 days
- ✘ Dynamic nests often 20% more efficient than previous nests
- ✘ Machine cycle time improved by 20%
- ✘ 'Continue after cut' allows for long plies to be cut on conveyer table
- ✘ Integrated nesting and laser ply identification
- ✘ Driving retrofitted 'Videojet' inkjet marker and solving daily problem of partly cut nests being destroyed
- ✘ Completely automated 'hands off' operation
- ✘ Can re-make single plies as required
- ✘ Working with JETCAM to develop and enhance laser identification system
- ✘ Recommended by machine vendor

Aircelle Ltd, based in Burnley, UK is part of the Safran group, and manufactures nacelles, thrust reversers and aerostructures for companies such as Airbus. In 2007 the company decided to replace their Exact knife cutter with conveyer bed tables, and also needed to upgrade their existing CAM system to provide an integrated nesting and ply identification system.

Said Kevin Hudson, Senior Manufacturing Engineer; *"At the time we were producing static nests by hand as they were more efficient than the ones nested by the previous software. We re-used the nests as it was too difficult for operators to unload complex dynamic nests. What was key for us was that we had a software system that could make more efficient use of material and also integrate with a laser identification system to help with the unloading of plies."*

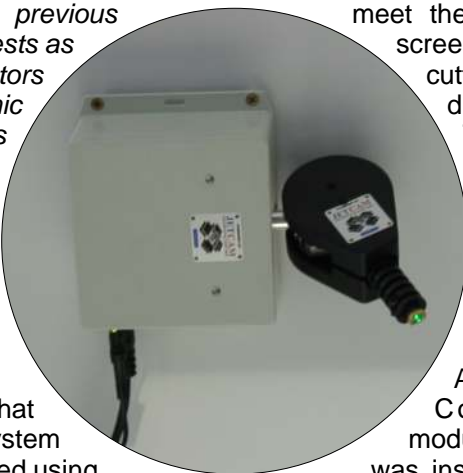
There were other problems that Aircelle needed the new system to address. Plies were marked using a retrofitted inkjet marker which could not be driven directly from the previous CAM system. Kevin added; *"We developed a separate program in Visual Basic that would provide the NC code for the 'Videojet' marker separately. The problem with this was that if the job stopped halfway through we could not just continue from that point - we had to scrap the nest and start again. Also, when we reached the end of a roll, if it was shorter than any of our nests we could not use it."* Neil Stansfield, Manufacturing Engineer, noted; *"We had to rely on manual nesting as automatically produced nests using previous software were never as good as the ones we could produce manually."*

Aircelle decided to purchase two conveyerized knife cutters. Although they considered upgrading their existing software and also looked at an alternative CAM system, the machine dealer recommended that they evaluate JETCAM for both the nesting and laser identification system. In tests JETCAM outperformed the existing static nests by an average of 20%, so the decision was made to purchase JETCAM.

Aircelle also worked with JETCAM to develop a custom specification for the laser identification to meet their requirements. A large LCD screen was mounted by one of the cutters, with the laser mounted directly above the machine table. The machine operator is provided with means of controlling the laser to indicate next or previous ply or kit.

The software was purchased in 2008 and a license of JETCAM Expert with High Performance Automatic Nesting and Remote Control Processing (RCP) modules for 'hands-off' automation was installed. The RCP module takes instructions for orders to be processed and nested from two licenses of JETCAM Orders Controller (JOC), which are running on workstations remote from JETCAM system.

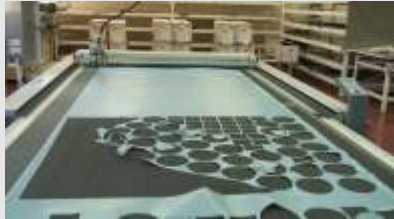
In day-to-day operation, staff would identify required orders in JOC as individual plies or whole assemblies by simply dragging these into 'Orders' window of JOC. When ready to cut, this job queue is passed onto RCP. On instruction from RCP module, JETCAM will automatically locate already processed ply files if they do exist. Alternatively it will locate required ply geometry files and will import and process them by healing any geometry problems and applying relevant machining information (once individual ply files with cutting



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➤ The Shop Floor



information have been created they are immediately available for nesting on either machine). JETCAM Expert will then automatically nest the ordered plies, create the CNC code and any specified reports, and updates JOC to show that the job is complete.

A JETTerm workstation is located at each cutter, which allows direct download of CNC programs to the machine. JETTerm was modified to integrate into JETCAM'S laser identification system, providing an on-screen visual representation of the nest and the next ply to be unloaded, which is also highlighted directly on the machine bed by the laser. This was also linked into a large high definition monitor making it easily visible from all sides of the machine bed.

After the system went live and Aircelle started to migrate static nests to dynamically produced ones a number of benefits immediately came to light. The problem with the videojet marker was resolved through a modification to JETTerm. If a nest was stopped halfway through it stored the marker's location so that it continues from the same point. Kevin noted; "Previously this was happening almost daily, which meant the nest had to be scrapped."

Tolbot Boulton, Manufacturing Engineer, noted; "We assigned a cost reduction exercise on the production of the Rolls Royce Trent engines to try to achieve a reduction of 25 hours per person per unit. Where savings other than time were achieved we calculated a time value to them. We analysed a week's production of static nests versus the new dynamic nests and achieved a 10.5% material savings, which alone comfortably met this target before considering any other savings. We expect this figure to further improve as we expand the system's usage."

As nests became more efficient machine runtime improved, as fewer nests were being cut, reducing loading/unloading time of material. With empty rolls being replaced with new ones several times per day across the two machines this can add up to a significant manpower saving over time. Aircelle noted that with one set of four nests they achieved a 20.5% improvement in runtime because of this.

Nests had often needed to be completely re-run in the past, perhaps either because

a ply had been damaged or because of a quality issue with the material. Neil noted; "Sometimes material width would change because of supply, which wasted all of our static nests." Kevin added; "We often have variances of material width, with some rolls including up to 40mm of sacrificial material on the edges. We could be losing 10-15% before we started. Nests can now be easily recreated to fit the exact width of the material currently available. If a single ply needs to be remade we simply add it into the orders list in JOC. Also, if we have say, 2m left on the end of a roll we can now quickly create a small nest of parts to make full use of it."

Reporting and the visibility of information has dramatically improved, with full efficiency stats immediately available. Previously Aircelle were reliant on operators manually logging information, which was time consuming and prone to errors.

Since going live Aircelle have had little reason to contact JETCAM for support, as most processes happen automatically without user intervention. JETCAM and Aircelle have an ongoing development partnership. After using the laser identification system for several months Aircelle have identified enhancements that could further streamline the ply picking process, which they are working on with JETCAM to develop the optimum solution.

The company is in the process of purchasing a third cutter, and is also implementing a new MRP system which will ultimately be used to completely automate the nesting process through automatic loading of orders. With no major support issues since installation, Aircelle are confident that JETCAM will play a major part in their expansion plans. Neil said; "For us the integration between the laser and the nesting was essential." Tolbot added; "Operators used to be reliant on the programmer being available if a nest had to be remade, but now nests can be 'tweaked' directly on the shop floor." Kevin concluded; "I didn't believe that we'd actually get the increase of efficiency that we did with JETCAM. The improvement in nesting efficiency and the quality of information that JETCAM system is providing has given us visibility of other issues such as the fluctuating material width. We believe we are still in the infancy of making the most out of JETCAM. Based on our projected savings over the year JETCAM has paid for itself in 50 days of use."

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