

AIRCRAFT CABIN

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MANAGEMENT

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Seen and not seen

MANY OF AIM ALTITUDE'S PRODUCTS ARE EXTREMELY HIGH PROFILE, HELPING TO DEFINE THE BRAND OF SOME OF THE WORLD'S LEADING AIRLINES, YET THE COMPANY IS RARELY RECOGNISED AS THE MANUFACTURER. IAN HARBISON REPORTS

← In a contract won before the acquisition, Altitude were chosen to create the bars on the Virgin Boeing 787 fleet. AIM had previously provided the bars for the airline's Airbus A330s (all photos: AIM Altitude)

* **AIM Altitude** is the new name for AIM Aviation, following the company's acquisition of Altitude Aerospace Interiors of New Zealand in September 2014. This move is the latest investment after TowerBrook Capital Partners acquired a controlling stake back in September 2013. The company's history dates back to the 1920s and includes famous names in aviation such as Jecco, Metair, Fliteform and Henshalls.

Despite its low public profile, AIM has worked solidly in the background to become one of the leading suppliers of cabin monuments, galleys, stowages, feature panels, partitions/class dividers and bins. Colin Thornton, Managing Director of AIM Altitude's Cabin Interiors division, says there are several reasons for its success. Though the industry is dominated by B/E Aerospace and Zodiac, with JAMCO also increasing its presence, these larger organisations are really set up for volume production of standardised components. However, major airlines often have a need for unique products that enhance their brand identity in their premium cabins, products that often push the boundaries of what is technically and aesthetically possible.

AIM has been able to respond to those requirements because of its extremely strong engineering and industrial design teams, he says. A similar engineering capability was the more attractive attribute of Altitude when it came to its acquisition, he adds, rather than the prospect of entering into the VIP completions market, which was its other main interest. The company had also been responsible for some innovative designs for its ex-parent company, Air New Zealand, so already had a good track record. However, it did not have the manufacturing capability required to enable its future independent growth. ↘

The company deals directly with airlines on small projects, or those consisting of standardised galleys and stowages. AIM's cutting edge work means it has to maintain a very close working relationship with many of the leading industrial design agencies contracted by the airlines to create the complete cabin experience they are seeking.

Two of the latest high profile projects have been bars for the Boeing 787. The first went into service in December 2012 with Qatar Airways, a project that also included newly designed ottomans; and Virgin Atlantic Airways, which has just received the first two aircraft out of 16. This was originally an Altitude Aerospace contract which also included all Upper Class stowages and closets, as well as a ceiling feature. AIM had previously won the contract for the bar that appears in the Virgin Airbus A330.

It seems that AIM Altitude has become something of a specialist in this area, having also supplied the horseshoe bar and accompanying lounge area for the upper deck of the Airbus A380 for Emirates Air Line. In some ways, this project changed from a bespoke item to a production item – seeing as the Dubai-based airline has 57 aircraft in service out of 140 on order.

AIM Altitude's other great strength, he says, is its in-house manufacturing capability. The company has facilities at Bournemouth in southern England for cabin interiors; Byfleet, west of London; Llanelli in Wales,

for galleys and stowages; and at Waterbeach in eastern England for composite manufacture. These have received a capital boost in recent years, reflecting the company's success in the market.

In July last year, a new 430m² static test facility was opened in Bournemouth, doubling its capacity. In addition, there is a 90m² dedicated metal fabrication and machine shop. This can accommodate all current galley and cabin furniture modules for the Boeing 747, 757, 777 and 787, as well as the Airbus A350, A380 and A400M military transport (the company also supplies a range of defence components, such as missile containers, lightweight transportation boxes and medical stretcher assemblies). It includes an extra 134m² for static and endurance testing of cabin interior monuments, galleys, sofas, seats and components.

The introduction of a third large test cube means that galleys and cabin furniture up to 3m x 3m x 9m in size can be static tested. Alternatively, two monuments sized 3m x 3m x 3m can be simultaneously tested, while further monuments are pre-loaded into an additional three cubes, increasing throughput. The maximum applied static load capability has been increased from 14,000kg to 24,000kg. For mechanisms, there are three endurance machines to validate long-term wear tests. In addition, the cooling test facilities have also been expanded. The chamber has an internal size of 5.3m x 4m x 3.5m and is equipped with a high capacity Lauda chiller, providing the cooled Golden heat transfer fluid used in the A340-500/600 and A380 distributed galley chilling systems.

The structural test service complements both the extensive Fire, Smoke and Toxicity test house and the automated test range for radar transmission testing of radomes at AIM Composites in Waterbeach. This is qualified by Airbus in its Qualified Test Method List (QTML) for flammability testing, and boasts approvals including UKAS ISO 17025 fire testing capability for cabin materials. This is supplemented by a mechanical test facility for assessing composite panels, joints and insert-strengths.

Altitude bring a strong engineering capability to the new organisation. Below is a display of concept galleys





In September 2014, a 2,880m² factory extension was opened at the galleys and stowages business in Byfleet, providing additional production and galley testing facilities. The biggest news that month, however, was the announcement that a new 14,865m² advanced manufacturing unit was to be constructed for AIM Aviation at Bournemouth Airport's Aviation Business Park. Construction work will commence in May 2015 and is scheduled for completion by the summer of 2016.

The new unit will provide the Cabin Interiors Division with 30% additional production capacity, along with more offices and a new Customer Zone. This will be used for viewing mock-up interiors and styling options for existing and prospective customers. Thornton adds that the company works with 3D CAD and 360° viewing software, producing walk-through models at a very early stage in the development process for new products. He says that a leading industrial design agency has complimented the company on its ability to stick to the original design intent.

The Research and Development department will also have a dedicated facility for rapid prototyping. He says the company does not normally research materials and finishes independently – if an airline selects a particular product for its new cabins, others are unlikely to follow – but AIM Composites produces FliteLam, a range of sandwich panels that uses a variety of skin and core materials for different applications, such as overhead bins, floor panels, ducts and door liners. Development in that arena is set to continue.

Some of the cabin monuments are extremely complex structures and often come in unusual shapes. Despite this, the design and manufacture of the mould tooling and associated fixtures are carried out in-house using digital scanning, which can also be used to reverse engineer components. While many projects are unique, the engineering teams endeavour to use as much commonality in the structural elements of the design to ensure good value for its customers. However, he points out, in many ways the basic construction of the products is straightforward; the complexity lies in the certification of the features and functions.

To get the level and quality of finish, plus the detail required by the customer, requires a great deal of craftsmanship, which he feels is an important part of the skill sets of the AIM Altitude production staff. For example, leather work is not sub-contracted. Instead, sourcing the material, cutting and stitching are all done internally, as are surface effects such as patterns and textures. Use is also made of a Chameleon Products water transfer process to produce certain effects, such as wood, which are protected by layers of varnish for durability and come with a high gloss or satin finish.

Electrical wiring interconnection systems are an important component, with all wiring harnesses assembled in the company. This complements 30 years of electrical and electronics design expertise which aided in the design and development of a 16-channel digital Universal Lighting Control (ULC) system, first implemented in the Upper Class bar on Virgin Atlantic Airbus A330s. This has up to 64 pre-programmable lighting scenes that are selected by the cabin crew using a control panel concealed within the bar itself. The scenes can be set to transition in a pre-determined time of between two and 17 seconds.

He points out that the system was designed to operate independently of the aircraft's standard cabin lighting control system, avoiding airframe digital system re-programming issues. The ULC includes a Patent Applied For unique electronic pulse width modulation, which easily meets the most severe Type Certificate Holder's electromagnetic interference limits. It includes a sensor that allows it to interact automatically with the aircraft's own mood lighting system. The system is suitable for Airbus and Boeing longhaul aircraft and is now flying in the Airbus A350, A380 and the Boeing 787-8. These will shortly be joined by 787-9 and 777-300ER.

With the A380 and 787 in service, the A350 waiting in the wings and the 777X some way off, one could assume the market for AIM's high-end products could see a decline. Not so, says Thornton, as other airlines are looking at those same products and recognising that differentiation can be a powerful marketing tool. There is a continuous interest in upgrade programmes and the increase in production capability continues to show that demand is strong. ●

↑ Emirates were one of the first airlines to take advantage of the space inside the Airbus A380 by installing a bar and lounge area on the upper deck. With 140 aircraft on order, this has turned from a bespoke item into a standard production unit